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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME 58
1945

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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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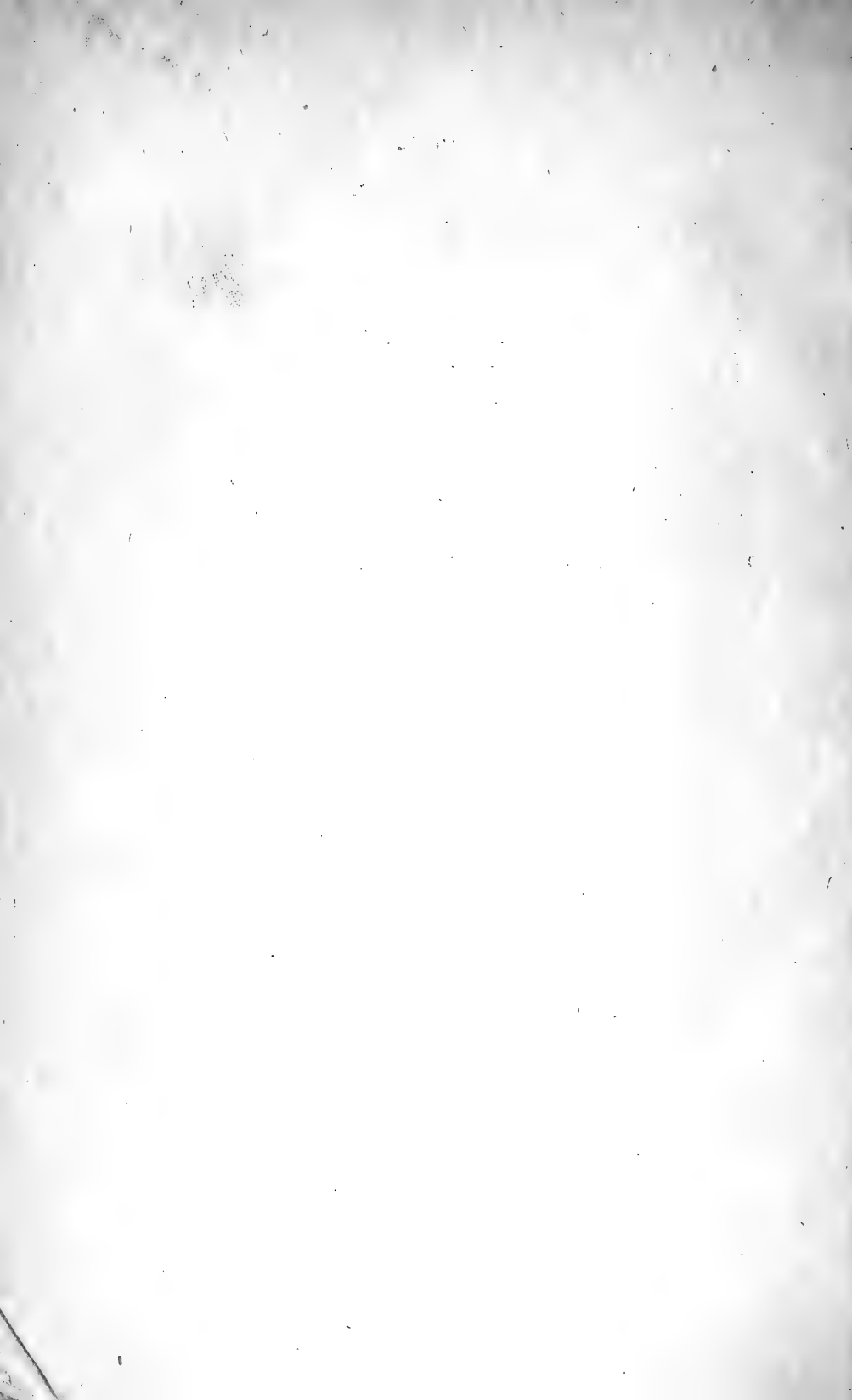
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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

The Society meets from October to May on the second Saturday of each month at 8 P. M. All meetings in 1945 were held in Room 43 of the U. S. National Museum, except the 947th and 949th meetings, which were held in the auditorium of the National Museum, and the 950th meeting, which was held in the restaurant of the National Zoological Park.

January 13, 1945—946th Meeting.

President Thone in the chair; 60 persons present.

New members elected: Robert Belton, F. Manfredi.

Informal communications: M. B. Waite, Note on curing sweet potatoes, and Note on effect of monthly distribution of rainfall on crops.

Formal communications: J. A. Fowler, Distributional note on two local salamander subspecies; L. W. Swift, A glimpse of National Forest wildlife for the hunter, fisherman, scientist, and outdoor man.

February 10, 1945—947th Meeting.

President Thone in the chair; 60 persons present.

New member elected: J. W. Gebhart.

Formal communication: W. C. Lowdermilk, Collaboration with China in soil conservation to increase food production.

March 10, 1945—948th Meeting.

President Thone in the chair; 76 persons present.

Informal communications: M. B. Waite, Note on botanical

specimens collected by him in Illinois in 1884, and Note on deer population in Ogle County, Illinois; F. Thone, Exhibition of new biological publications.

Formal communication: M. D. Burrill, Alaskan scenes and biology.

April 14, 1945—949th Meeting.

President Thone in the chair; 50 persons present.

New member elected: A. J. Coupe.

Informal communications: M. B. Waite, Exhibition of new biological publications.

Formal communications: H. B. Humphrey, The making of a naturalist; G. W. Trayer, The magic of new wood products.

May 17, 1945—950th Meeting.

President Thone in the chair; 50 persons present.

Formal communications: J. P. E. Morrison, Zoogeographic notes on some North American snails; R. K. Beattie, Angkor, the jungle-buried city.

May 26, 1945—951st Meeting.

SIXTY-SIXTH ANNUAL MEETING.

President Thone in the chair; 9 persons present.

New member elected: Albert G. Smith.

Reports were received from the Recording Secretary, Acting Corresponding Secretary, and Treasurer. The following officers and members of council were elected: President, Frank Thone; Vice Presidents, J. S. Wade, W. L. Schmitt, J. W. Aldrich, F. C. Lincoln; Recording Secretary, S. F. Blake; Corresponding Secretary, R. S. Bray; Treasurer, Allen J. Duvall; Members of the Council, I. N. Hoffman, J. E. Benedict, Jr., Malcolm Davis, J. A. Fowler, D. E. McHenry.

October 13, 1945—952d Meeting.

President Thone in the chair; 80 persons present.

New member elected; Anselm Keefe.

The deaths of C. W. Gilmore and M. B. Waite were noted.

Informal communication: F. Thone, Exhibition of new biological publications.

Formal communications: J. W. Hess, Australian wildlife and scenes.

November 10, 1945—953d Meeting.

President Thone in the chair; 48 persons present.

New member elected: W. B. Davis.

Informal communication: F. Thone, Exhibition of new biological publications.

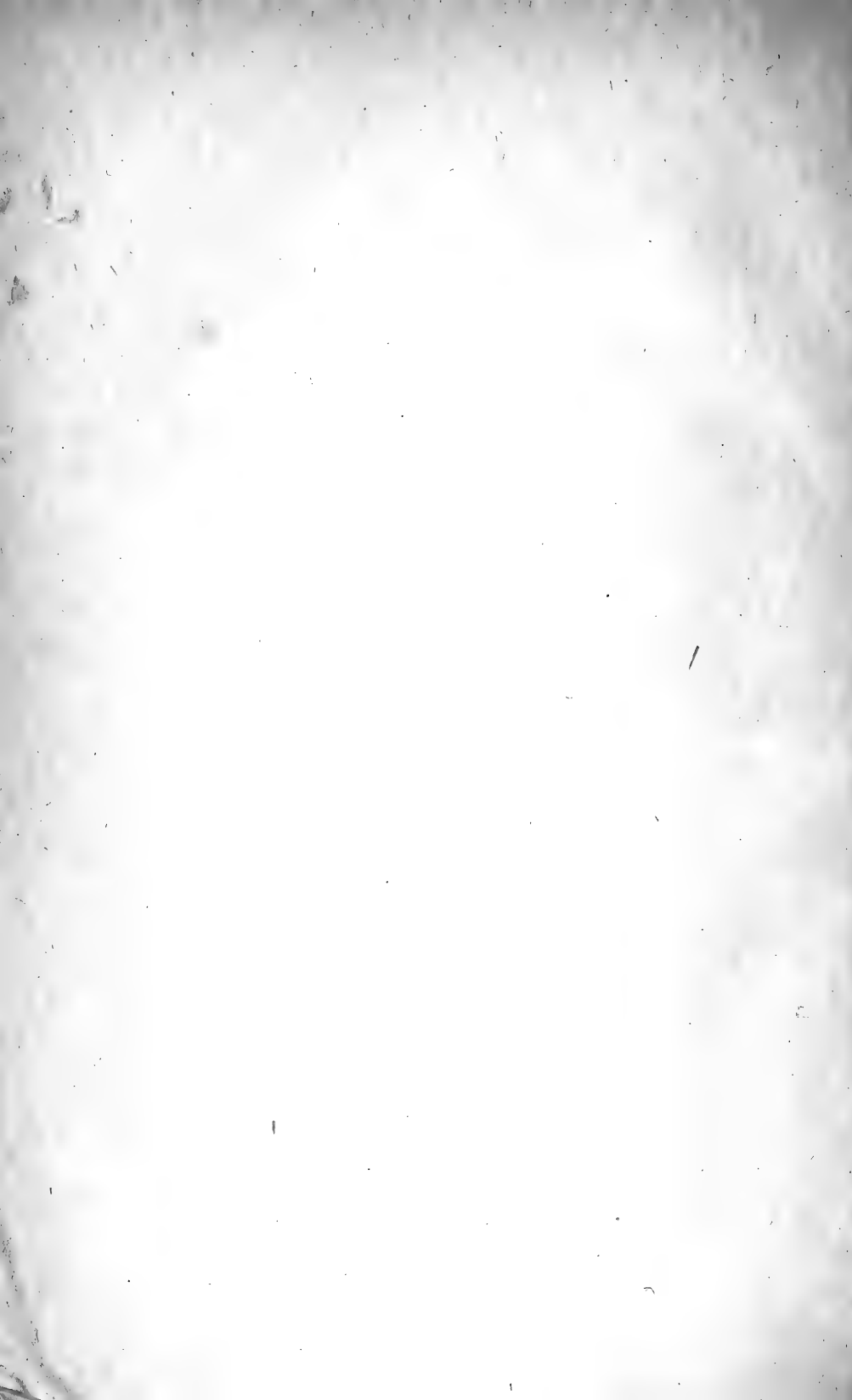
Formal communication: R. L. Sexton, Pribilof Islands—summer home of the fur seal.

December 8, 1945—954th Meeting.

President Thone in the chair; 60 persons present.

New members elected: Roger Conant, J. A. Ewan, S. M. Peel, F. E. Todd.

Formal communications: Symposium on News from pesticide frontiers: W. R. Kirner, New rodenticides and insect repellents; F. F. Davis, New weed killers and fungicides.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF *MARKEA* FROM COLOMBIA.¹

C. V. MORTON.

The following new species of *Markea* (Solanaceae) is an interesting addition to a genus of plants still rather insufficiently known. It was collected by the University of California Botanical Garden third expedition to the Andes. I am indebted to Dr. T. H. Goodspeed for the privilege of studying the material.

Markea dimorpha Morton, sp. nov.

Liana, caulibus elongatis, vix ramosis, juventute leproso-pubescentibus, angulatis; folia dimorpha, pleraque alterna, distantia, lamina ovali, abrupte acuminata, basi obtusa vel rotundata, integra, utrinque glabra, altera apice ramulorum brevium fasciculata, lamina oblanceolata, gradatim acuminata, basi anguste cuneata; rhachis elongata, apice florifera, valde nodosa, pedicellis racemosis, apice incrassatis, leproso-pubescentibus; calycis lobi liberi, lanceolati, acuti, incurvi, crassi, leproso-pubescentes; corolla aurantiaca, tubo medio abrupte ampliato, externe dense pubescente, fauce non contracto, limbo subregulari, lobis parvis, imbricatis, integris; filamenta glabra; ovarium glabrum; bacca aurantiaca, calycem accrescentem aequans.

Liana; stems elongate, straight, up to 7.5 mm. in diameter, sparingly branched, scurfy-pubescent when young, glabrescent, angulate, the bark exfoliating; leaves dimorphic, on some branches alternate, distant, short-petiolate (4-8 mm.), the blades oval, 5-11 cm. long, 3.3-5.3 cm. broad, abruptly short-acuminate, obtuse to rounded at base, entire, chartaceous, green and glabrous on both sides, the primary veins 4-6 pairs; leaves on other branches fasciculate at the apex of short lateral branchlets 0.5-2 cm. long, the blades oblanceolate, 8-14 cm. long, 2.5-4.5 cm. broad, gradually acuminate, narrowly cuneate at base; rhachis 1-8 cm. long, solitary, sometimes once or twice furcate, 4-5 mm. thick, ebracteate, conspicuously nodose from the scars of fallen pedicels, floriferous at apex only; pedicels racemose, 10-12 mm. long, thick, enlarged near apex, scurfy-pubescent, much thickened in fruit; calyx lobes 5, valvate, free to base, spreading,

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lanceolate, equal, 6 mm. long, 2.2 mm. broad at base, acute, strongly incurved at apex, thick, scurfy-pubescent on both sides, venose, the veins numerous, longitudinal; corolla orange, erect in calyx, 15 mm. long, the tube 12 mm. long, 2 mm. broad at base, abruptly amplified at middle, becoming 6-7 mm. broad, densely short-pubescent externally, glabrous within, not contracted in throat, the limb subregular, 10-12 mm. broad, the lobes imbricate in aestivation, spreading, ovate-deltoid to suborbicular, about 3 mm. long, undulate, entire; fertile stamens 5, the filaments inserted about 3.5 mm. above base of corolla tube, free, about 3 mm. long, glabrous; anthers oblong, 4 mm. long, 1.5 mm. broad, erect, acutish, introrse, the cells fully dehiscent longitudinally, confluent at apex; disk hypogynous, pentagonal, fleshy; ovary low and flat, glabrous, 2-celled; placentae axile, many-ovuled; style glabrous, 12 mm. long; stigma capitate; fruiting calyx accrescent, persistent, the lobes becoming 11 mm. long and 4.5 mm. broad; fruit an orange, fleshy, glabrous berry 10-12 mm. long, equaling or slightly surpassing the calyx.

Type in the U. S. National Herbarium, No. 1,833,445, collected north of Dabeiba, along road to Turbo, Department of Antioquia, Colombia, at 300 to 350 meters elevation, February 25 to March 1, 1942, by R. D. Metcalf and J. Cuatrecasas (No. 30198).

There is no described species with which *M. dimorpha* need be compared. It belongs to the group of species known as *Merinthopodium* Donn. Smith, which Mr. Standley and I reduced to *Markea* in the Flora of Costa Rica. This group is distinguished primarily by the elongate, thickened and nodose, probably perennial rhachis. In most species this rhachis is borne at the end of an elongate peduncle, which is wholly lacking in the present species. The flowers are the smallest of any species of *Markea*.

The present plant is noteworthy for its dimorphic leaves. In some specimens the leaves are alternate and distant, the blades being oval, abruptly acuminate at apex, and usually rounded at base. In others they are fascicled at the ends of short, spurlike branchlets, and are oblanceolate, gradually acuminate at apex, and narrowly cuneate at base. Both kinds of leaves are not found on the same twigs. I am unable to say whether or not they occur on the same plant. From the leaves alone one would hardly hesitate to say that two species were involved, but both kinds of twigs bear inflorescences which are indistinguishable. I have no doubt but that these forms are variants of a single species.

PROCEEDINGS
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BIOLOGICAL SOCIETY OF WASHINGTON

A NEW PRONGHORN ANTELOPE FROM SONORA.

BY E. A. GOLDMAN.

Three somewhat isolated, finger-like southern extensions carry the general range of the pronghorn antelope as a species into Mexico. These peripheral extensions represent geographic races differing from the typical form and from one another only in comparatively slight details of size, color, and structure. The three are as follows: (1) *Antilocapra americana peninsularis* of central Baja California, distinguished by fairly large size, rather dark coloration, the males with relatively short, thick, rugose horns, and the skulls with prominent orbits in both sexes; (2) *Antilocapra americana mexicana* of the plains of northern Chihuahua, very similar to typical *Antilocapra americana americana* of South Dakota, but somewhat smaller and paler; and (3) a hitherto unrecognized race in the desert region of central western Sonora, described as follows:

Antilocapra americana sonoriensis, subsp. nov.

SONORA PRONGHORN ANTELOPE.

Type locality.—Forty miles north of Costa Rica, a ranch on the northern side of the Rio de Sonora, southwest of Hermosillo, Sonora.

Type specimen.—Female adult, skin and skull; No. 250938, U. S. National Museum (Biological Surveys collection); collected by Vernon Bailey and Frederick Winthrop, December 11, 1932; original number, 11291.

Distribution.—Desert plains of central western Sonora and north to southern Arizona.

General characters.—Size smallest of the subspecies of *Antilocapra americana*. Similar in general to *Antilocapra americana mexicana* of northwestern Chihuahua, but smaller; color about the same; skull



smaller and differing in detail. Differs from *Antilocapra americana americana* of South Dakota, and *Antilocapra americana peninsularis* of central Baja California in smaller size and paler coloration; cranial characters also distinctive.

Color.—*Type* (fresh pelage): Upper parts in general near "cinnamon," becoming "orange-cinnamon" faintly mixed with black in the mane along median line of neck; rump patch white as usual in the species; middle of face "pinkish cinnamon," becoming thinly mixed with black across forehead, and varying to "pinkish buff" between the horns on top of head; nose and upper surface of muzzle brownish, changing abruptly to "pale pinkish buff" near lips; under parts, including narrow upward extensions on sides of neck in front of shoulders, white, interrupted by the usual "pinkish buff" areas on throat and across under side of neck; inner sides of fore limbs dull whitish near body, the outer sides "pinkish buff," this color extending all around from knees to hoofs; hind limbs pinkish buff, except inner surfaces of thighs which are white like under parts in general, and a gradually narrowing whitish line extending down inner sides to near hoofs; ears pinkish buff, edged with black externally, clothed with whitish hairs internally; tail above pinkish buff to near tip, this color extending up a short distance on median line of rump, below white, including tip, which is white all around.

Skull.—Most closely resembling that of *mexicana*, but decidedly smaller; frontal depression shallower; premaxillae less extended posteriorly along median line; auditory bullae more flattened, less projecting below level of basioccipital. Differs from those of typical *americana* and *peninsularis* in about the same characters as from *mexicana*.

Measurements.—*Type*: Total length, 1420 mm.; tail vertebrae, 120; hind foot, 410. *Skull* (*Type*): Greatest length, 251.5; condylobasal length, 233.5; greatest width at posterior borders of orbits, 118.5; maxillary tooth row (alveoli), 67.2.

Remarks.—*Antilocapra americana sonoriensis* is based primarily on a single specimen, presenting characters apparently beyond the range of individual variation in *A. a. mexicana*, to which it is most obviously related. A skull of a female in the U. S. National Museum (No. 3691), collected many years ago at Fort Buchanan, now Crittenden, Arizona, shares some of the characters of the type of *sonoriensis*, and may be referred to the same form. On geographic grounds, however, specimens from southeastern Arizona may be expected to exhibit gradation toward *mexicana*.

Specimens examined.—Total number, 2, as follows:

Arizona: Fort Buchanan (now Crittenden), 1 (skull only).

Sonora; Costa Rica (40 miles north), 1 (type locality).

PROCEEDINGS
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A NEW *GERRHONOTUS* LIZARD FROM UTAH.

BY ANGUS M. WOODBURY.

A specimen of *Gerrhonotus* taken in Kane County, extreme southern Utah, in August, 1933, not previously reported for lack of supporting specimens, is being described at this time in order to make the information available to other workers in the field. This appears to be the first specimen of the genus reported from Utah, and seems to be widely separated from other known races of the genus. I am indebted to Henry S. Fitch, Hobart M. Smith and Joe Tihen for advice and to T. L. Rodgers of the Museum of Vertebrate Zoology of Berkeley, California for the loan of comparative material.

The terminology used herein differs somewhat from that of Fitch (Amer. Mid. Nat., 1938:381-424) in his systematic account of the Alligator Lizards (*Gerrhonotus*). After consultation with Smith and Tihen and reference to other literature, I have adopted the following terms which are correlated with the Fitch terminology in the following table, most of which was worked out by Dr. Smith for use in his handbook:

<i>Woodbury</i>	<i>Fitch</i>
Supranasals.....	Anterior pair of internasals
Internasals.....	Posterior internasals
Frontonasal.....	Azygous prefrontal
Prefrontals.....	Prefrontals
Frontal.....	Frontoparietal
Frontoparietals.....	Anterior parietals
Interparietal.....	Interparietal
Parietals.....	Posterior parietals
Interoccipital.....	Interoccipital
Upper { postnasals.....	Anterior postnasals
Lower {	
Canthal {	Posterior postnasals
Loreal {	
Cantholoreal.....	Loreal
Supraoculars.....	Supraoculars
Medial row.....	Inner row
Lateral row.....	Outer row
Infralabials }	
Sublabials }	
Chinshields }	3 rows of infralabials
Postmentals }	



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***Gerrhonotus coeruleus utahensis* new subspecies.**

UTAH ALLIGATOR LIZARD.

Type.—Adult female, University of Utah, Museum of Zoology, No. 1676, taken in Sink Valley, south of Alton, about twenty miles north of Kanab, Kane County, Utah, about 6500 feet altitude, August, 1933 by Von Parkinson.

General Description.—Specimen in alcohol. Length of head, 20 mm.; neck, 15 mm.; snout to anus, 105 mm.; tail incomplete. Neck slightly constricted. Legs small and weak. Ear nearly concealed, opening posteriorly through a narrow slit into lateral fold, which begins just ventral to the angle of the mouth and extends backward to the hind leg, the base of which is enveloped at its end. The front leg base is also enveloped by the fold, which expands sufficiently at and behind the leg base to allow the upper arm to be almost enclosed when compressed closely against the side. This suggests the idea that it is an adaptation for burrowing and the idea is supported by the scalation of the head, especially that around the ears which are so nearly covered.

Scalation. There are 16 dorsal longitudinal scale rows on mid-body and 10 on the neck, all well keeled and 45 transverse rows on neck and body to a point dorsal to the posterior edge of the hind leg. Ventrally there are 57 scales from mental to preanals inclusive, arranged in transverse rows except in the gular region. On the abdomen, they are arranged in 12 longitudinal rows.

Head as shown in the drawings. Nasals are narrowly in contact with rostral. Two supranasals present, which adjoin behind the rostral to make the first postrostral pair. Behind these are a pair of internasals followed by a single large frontonasal, which is slightly azygous. Behind this single plate, lies a pair of prefrontals which are barely in contact at their corners, being almost separated by the anterior point of the frontal. This latter plate is slightly wider behind and is bordered posteriorly by a pair of frontoparietals which are in contact at their medial corners so that they completely separate the frontal from the interparietal. This latter plate bears a conspicuous pineal spot, is bordered laterally by the parietals and is adjoined behind by the interoccipital. The frontal is bordered laterally by the median row of supraoculars. The lateral row of supraoculars is enclosed between the medial row and the superciliaries.

A complete series of superciliaries (narrow) separates the eye from the supraoculars. A narrow series of 3 postoculars, 2 suboculars and a preocular completes the encirclement of the eye, except posteriorly where there is a narrow gap between the superciliaries and postoculars. The posterior subocular is wedge-shaped, wider behind. The preocular is large squarish and contains a conspicuous glandular space which narrows and extends backward between the suboculars and the eye. Supralabials 11-10; infralabials 10-10. Posterior two supralabials highly angular above. Underneath the head, a row of sublabials lies between the infralabials and the large chinshields. Behind the mental, the

postmentals are in contact as are the first pair of chinshields, but the succeeding two pairs are separated by smaller scales in the middle.

Coloration. Dark brown (15E6)¹ dorsally on head and most of neck, except tip of nose is lighter brown (15 F 5). Posteriorly, the body is a similar light brown but there are indications of about 13 incomplete brown (15 C 10) crossbands on the body, each about one scale wide extending nearly to the lateral folds and the series continues on to the tail. The first band lies directly over the bases of the front legs and the 13th over the hind legs. The ventral ground color is a very light brown (12F4), extending posteriorly from the chin. The dark brown pigment from the dorsal neck extends around the sides to suffuse with dark pigment the sides of the throat, which in turn are connected underneath by two faint bands. A similar faint pattern of dark pigment with indistinct outlines extends along the abdomen where it is plainer in the middle and faint or absent along the sides and absent on the preanal scales.

Diagnosis. Much lighter in color than other subspecies and has a much reduced color pattern. Little difference in general color of head and body, being much less than the difference exhibited in *G. c. shastensis*. The dark color of the abdomen lies mainly between scale rows but shows some dark pigment along the edges of both longitudinal and transverse rows as well as some diffusion of pigment in center of many scales. The white tips of dark scales on the sides are inconspicuous or missing as they are in some specimens of *G. c. principis*. No recognizable vertebral stripe is present.

All 16 dorsal scale rows well keeled; some scales on forearm and tibia well keeled; temporal scales not keeled; upper scales on side of tail behind leg keeled, weaker or absent on lower scales. The two frontoparietals are in contact thus definitely separating frontal and interparietal which are in contact in all the other specimens of other subspecies examined. Superciliary series complete. Supranasal plates form a pair behind rostral. Nasal narrowly in contact with rostral.

Discussion.—There is little doubt that this is a race of the species *Gerrhonotus coeruleus*, even though intermediate and intergrading material is not yet available. The 16 rows of dorsal keeled scales, the complete series of superciliaries, the azygous frontonasal plate and surrounding scales, the pair of supranasals behind the rostral, the frontal-parietal-occipital relations, the highly angular posterior supralabials, the sublabial-chinshield relationships and the general aspects of the color pattern all bespeak conspecific identity.

The geographic position and the detailed differences in color pattern, keeling and body proportions indicate sufficient distinction to warrant subspecific separation.

Comparisons. Nearer *G. C. shastensis* and *palmeri* than *G. c. coeruleus* and *principis*. Differs from *shastensis* in great reduction of color pattern and in number of white-tipped scales; less contrast between general

¹ All color determination from Maerz and Paul, Dictionary of Color.

color of head and body; difference in distribution of dark color of abdomen; in contact of the two frontoparietals instead of contact of frontal and interparietal.

Differs from *palmeri* in much lighter dorsal color which is slightly lighter than the head; noticeably smaller limbs and head; less distinct keeling on the sides of the tail; contact of the two frontoparietals instead of contact of frontal and interparietal; difference in distribution of dark color of abdomen and almost total lack of white-tipped scales on sides.

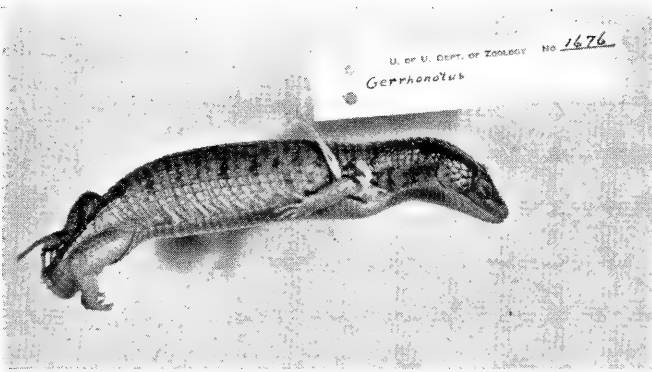


FIG. 1. Type specimen of *Gerrhonotus coeruleus utahensis*, Utah Alligator Lizard. Photo by W. P. Cottam.

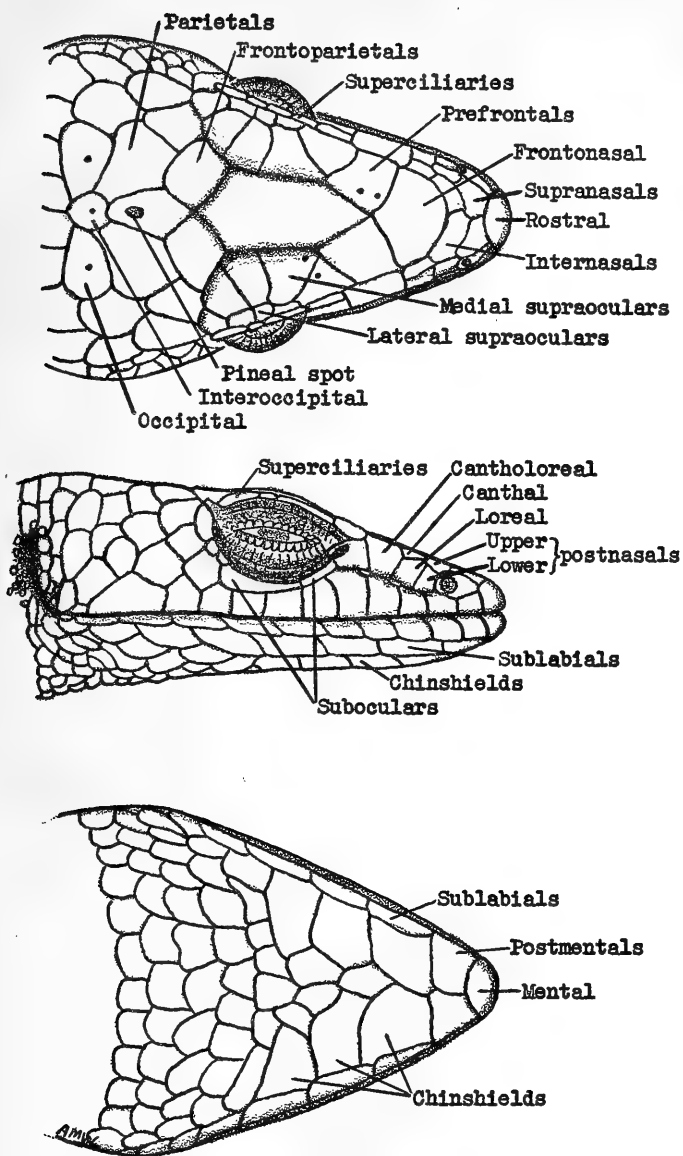


FIG. 2. Head scalation of *Gerrhonotus coeruleus utahensis*.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON FISHES IN THE ZOOLOGICAL MUSEUM
OF STANFORD UNIVERSITY.

XIV.—A NEW GENUS AND THREE NEW SPECIES OF
GOBIES FROM THE PHILIPPINES.

ALBERT W. C. T. HERRE.

The extraordinary richness and bewildering variety of the goby fauna of the tropical Pacific continues to astonish the students of Philippines fishes. There are easily far more species of gobies than of any other group of marine fishes.

Among the most singular of gobies are those with vomerine teeth. These teeth, which are incisor-like, are always large and may be of relatively enormous size. They are placed transversely across the vomer, their inner edges often touching. In some species they are fused to form a gigantic chisel. Usually they are strikingly evident when the mouth is opened enough to enable one to see its roof plainly, but in some species the vomerine teeth are more or less hidden by a velum and are then very apt to be overlooked. No doubt numbers of species already known will be found to possess vomerine teeth too, when carefully examined for this character, while among those as yet undiscovered there will also be some with these singular teeth. Parallel evolution is strikingly displayed in the gobies and eleotrids in numerous cases, and this is also true of some of the gobies with palatal teeth. For example, the genus *Intonsagobius*, described in an earlier paper, is very near to *Callogobius* in most respects, and unless one examined the vomer he would call it a member of that genus. The new species here presented were obtained during my last trip to the Philippines in 1940-41. Lengths given are always of the standard length.

MINDOROGOBIUS Herre, new genus.

Dorsal VI-I-10; anal I-9; scales ctenoid, 38-40 in longitudinal series; predorsal scales 14-16.

Head naked, with scarcely visible rows of sensory papillae on cheeks; eyes high up, very close together, in the anterior half of the head, mouth



terminal, jaws even, the small teeth in 3 rows in both jaws, with one or two pairs of posterior canines in the lower jaw; on the vomer is a pair of very large incisors, fused into a single chisel-like mass; the tongue is truncate, free, of moderate size. The dorsals are well separated, the second dorsal and anal not reaching the base of the pointed caudal, which is longer than the head; the pectorals and ventral are narrow and elongate. The gill openings are no wider than the pectoral base, the isthmus broad.

Type of the genus *Mindorogobius lopezi* Herre, new species.

KEY TO THE GENERA OF GOBIES WITH VOMERINE TEETH.

A. Scales ctenoid, 40 or less.

B. Scales about 26; predorsal scales 6.

C. Scales covering head and body; no prominent ridges or rows of sensory papillae on head.....1. *Macrodontogobius*
One species from the Pelew Islands.

CC. Head naked, with many transverse and longitudinal ridges with sensory papillae; median lateral scales of trunk with vertical rows of sensory papillae.
2. *Intonsagobius*
One species from Jolo, Sulu Islands, Philippine Islands.

BB. Scales 38 to 40; predorsal scales 14 to 16; head naked; mouth terminal, very little inclined; rows of sensory papillae scarcely evident; lower jaw with one or two pairs of recurved lateral canines.....3. *Mindorogobius*
One species from Mindoro, P. I.

AA. Scales 40 or more, ctenoid or cycloid.

D. Scales more or less ctenoid, at least on the posterior half.

E. Scales 40 or 50, more or less cycloid on anterior half, those on posterior part enlarged; mouth nearly vertical, chin prominent; no conspicuous lines of sensory papillae on cheeks.....4. *Mangarinus*
One species from Mindoro, P. I.

EE. Scales 60 to 65, all ctenoid, or only those on posterior half; mouth moderately oblique, the jaws nearly or quite equal; head with many conspicuous lines sensory papillae.....5. *Mars*.....
One species from Samoa and two from the Philippines.

DD. Scales cycloid, more than 50.

F. Maxillary extended on preopercle, the lower jaw projecting; scales about 60; head, predorsal area, a strip back to second dorsal, and area below a diagonal from pectoral axil to anus all naked.
6. *Myersina*
One species from Culion, P. I.

FF. Mouth moderately oblique, jaws equal, maxillary not prolonged backward; scales 70 to 85; naked back to first dorsal origin and ventral base; upper lip lined with a dense papillate fringe.....7. *Smilogobius*
Two Philippine species and two from Singapore.

***Mindorogobius lopezi* Herre, new species.**

Dorsal VI-I-10; anal I-9; pectoral 17; longitudinal series of scales 38 to 40, and 14 in a transverse series.

The depth of the low elongate body is 6, the head 3.85, the long pointed caudal 3, the ventrals 5 times in the length; the elongate pointed pectoral equals the head and extends beyond a vertical to the ventral tip. The eyes are high up, dorso-lateral, 3.7 in the head, very close together, the interorbital breadth not more than a third of the eye; the snout is short, convex, 4.66 in the head; the mouth is terminal, nearly horizontal, the posterior angle of the maxillary beneath the anterior part of the eye, or the front margin of the pupil. The teeth are in 3 rows in both jaws, the outer row enlarged, the others very small, slender, and pointed; the teeth of the outer row of the lower jaw are much the stoutest and terminate laterally in one or two recurved canines on each side; the vomerine teeth are as given in the generic diagnosis.

The dorsals are well separated, the first dorsal spines with elongate tips, the first spine greatly elongated with filiform tip and equal to the head in length; the second dorsal and anal are rather low, not reaching the caudal when depressed, the second dorsal height one and three-fourths in the head, the anal height two and a third times. The least depth of the caudal peduncle is two and a third times in the head and one and two thirds times in its own length.

The color in alcohol is pale yellowish, much paler on the under side of the head and trunk, with two longitudinal brownish stripes; the upper one extends from above the opercle to the top of the caudal peduncle, the other from under the pectoral to the middle of the caudal base; two pairs of circular brown spots on top of the head, and vestiges of 8 or 9 short brown crossbars over the back; a nearly vertical brown band from below the middle of the eye across the cheek behind the mouth to the under side of the head; the dorsals and caudal more or less crossbarred by rows of brown spots; the outer half of the anal and the middle ventral rays are dusky; the pectoral is colorless.

The type, 27 mm. long, and two paratypes, 22 and 26 mm. in length were taken from a mangrove swamp at Hacienda Waterous, Mangarin, Mindoro.

Named for Gregorio Lopez, fisherman and linguist extraordinary, my field collector and companion for many years, who accompanied me to Mindoro on my last trip.

***Vaimosa mindora* Herre, new species.**

Dorsal VI-I-7 or 8; anal I-7 or 8; pectoral 16; scales in lateral series 28 or 30; transverse 8; predorsal scales 14, the anterior one enlarged and lying between the posterior part of the eyes; opercular scales 6.

The type, a male 23 mm. long, has the depth 6.4, the head 3.7, the caudal 3.28 times in the length; the body is elongate, low, the dorsal and ventral profiles nearly horizontal and parallel, the head low and broad, the trunk compressed posteriorly, the fish wedge-shaped when viewed

from above. The eyes are rather large, 3.4 in the head, close together, the interorbital space 1.8 times in an eye diameter, the short snout 4.7 in the head. The slightly oblique mouth is terminal, the jaws even, the maxillary extending beneath the middle of the eye, its length 2.7 times in the head. The small, sharp-pointed teeth are in 3 rows in both jaws. The dorsals are well separated, with 4 scales between them, the first and third spines of the first dorsal elongate and threadlike, reaching the third or fourth ray of the second dorsal when depressed, and 3.28 times in the length. The second dorsal and anal are of equal height, not reaching the caudal when depressed, 1.55 times in the head or 5.75 times in the length; the short ventral equals the longest second dorsal and anal rays; the pointed pectoral is 4.6 times in the length and 1.24 times in the head. The color in alcohol is very pale yellowish, the scales on the upper half of the body more or less marked by short bars and spots of brown; sides and under part of head with 3 brown nearly vertical stripes; conspicuous circular brown or dusky dots on the posterior margin of the opercle, on the pectoral base, and in a patch on the side under the pectoral; a row of 5 or 6 small brown spots along the middle of the side, the last on the caudal base being the largest; a brown strip from the eye to the maxillary and another to the angle of the mouth; both dorsals with conspicuous crossbars of reddish brown dots; 5 or 6 similar bars of spots on the caudal; the anal and ventral are more or less dusky, the ventral base dotted with dusky.

A male paratype 20 mm. long agrees in every essential. A female paratype, 21 mm. long, is deeper, and has no elongated or threadlike dorsal spines. It agrees otherwise, except that it has retained its colors better so that the markings are better defined.

The 3 specimens were collected in a brackish swamp on Hacienda Waterous, Mangarin, Mindoro.

The combination of characters given above, 28-30 lateral scales, 14 predorsal and 6 opercular scales, with 7 or 8 anal and second dorsal rays the character of the mouth, and the distinctive head markings, separate this from other members of the genus.

Herreolus philippinus Herre, new species.

Dorsal VI-I-18; anal I-17-18; pectoral 18.

The naked scaleless slender body is laterally compressed, the dorsal profile gently curved, the greatest depth at the dorsal origin, 5.7 times in the length; the head and caudal are equal, 4.8 times in the length; the large eye is contained 3 times in the head; the interorbital width equals the blunt snout, and is half or a little more than half the eye. The mouth is nearly vertical, its angle not extending beneath the eye; the small teeth are in a single row in both jaws; a pair of stout anterior canines behind them in the lower jaw.

The fins are all low, the dorsals well separated, the origin of the second dorsal in advance of the anus; the first dorsal does not reach the second when depressed, its height a third of the head; the second dorsal and

anal rays are twice in the head, their posterior rays not, or the last dorsal ray almost, reaching the caudal when depressed; one specimen has the second dorsal rays 2.5 times in the head. The broad pectoral is 1.4 to 1.25 times in the head or 6.8 to 6 times in the length; the pointed narrow ventrals are 1.66 times in the head or 8 times in the length. A low ridge or fold of skin extends forward from the first dorsal to a point above the hind margin of the preopercle.

In life this slender pale little fish is nearly translucent, with a conspicuous black spot on the caudal base. In alcohol the color is very pale yellow, with a black spot nearly as large as the eye on the caudal base; the upper half of the body is darkened by minute brown dots, which form a more or less definite band on the caudal peduncle before the caudal spot; a faint blackish and very fine line along the middle of the side; a brown subdorsal band from the head to the caudal peduncle, becoming darker on and covering the first dorsal and basal part of the second dorsal; the anal is more or less brown, or may be clear along the middle, with brown base and a black margin; the other fins are clear, or the caudal may be brownish.

Described from the type, a female 24 mm. long, 3 female paratypes 21 to 24 mm. long, and a male paratype 21 mm. long. They were collected under and between the logs of a raft in front of the sawmill at Santa Maria, Zamboanga Province, Mindanao.

KEY TO THE KNOWN SPECIES OF HERREOLUS.

- A. Second dorsal I-13-16; anal I-12-15; a broad black stripe from lower jaw and across eye to tip of caudal.....*H. formosus*
Distribution, Siam and Philippines.
- AA. Second dorsal I-18; anal I-17-18; a black spot nearly equal to eye on caudal peduncle*H. philippinus*

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A REVIEW OF THE GIANT ANTPITTA *GRALLARIA GIGANTEA*.

BY ALEXANDER WETMORE.

The Giant Antpitta *Grallaria gigantea* Lawrence has been known as one of the rare birds of Ecuador, as comparatively few specimens have come to museums. Recent receipt of one from Dr. F. Carlos Lehmann V, taken in southern Colombia, has led to comparisons with the type in Washington and with a small series in New York through which it appears that the material available divides readily into three subspecies of which two are new to science. The details of my studies are summarized in the following review. Thanks are due to the authorities of the American Museum of Natural History for use of specimens in their collections.

Grallaria gigantea gigantea Lawrence.

Grallaria gigantea Lawrence, Ann. Lyc. Nat. Hist. New York, vol. 8, June, 1866, p. 345 ("Ecuador").

The specimen that served as Lawrence's type, U. S. Nat. Mus. No. 35,101, came to Baird with a small lot of skins from John Akhurst, a dealer in natural history material of Brooklyn with a letter dated November 25, 1864. It has only Ecuador as a locality and no other data. However, it seems probable that it came from the eastern slope of the Andes as the other skins received with it include *Gymnoderus foetidus* and *Archiplanus leucoramphus leucoramphus*, species found on the eastern slope that have not yet been recorded from western Ecuador. There is also one skin of *Grallaria rufula* which is darker above than the average, thus suggesting the form described as *Grallaria rufula saturata* by Domaniewski and Stolzmann from San Rafael on Volcán Tunguragua, on the eastern slope above the Río Pastaza, a race, however, that is not currently recognized.

The type *Grallaria gigantea* remained unique for years since Sclater¹

¹ Ibis, 1877, pp. 439-440.



had only this one bird available in his review of the genus in 1877. For a time the bird was mounted but was subsequently made into a skin. It is in excellent condition today with no indication of fading from exposure to light, since the reddish brown of the sides of the neck, where fully exposed, is even darker than that of the sides beneath the protection of the wings. The bird is fully adult, having no indication of the rufescent and black tips and bars found on back, wing coverts and rump in many individuals that seem to mark the plumage of the first year.

This specimen differs from all others seen, so that the characters of the typical form may be summarized as follows:

Below paler, the center of the breast and the abdomen being much lighter, becoming ivory yellow along the median line; above browner, back, wings and tail being bister; forehead and loreal space duller brown; brown area of pileum more definitely delimited posteriorly, and extending farther back past middle; under wing coverts heavily barred and spotted with fuscous; flanks much more heavily barred.

Measurements.—Type, sex not known, wing 142.2, tail 54.3, culmen from base 39.4, tarsus 69.8 mm.

Range.—Probably in the upper Lower Tropical and lower Upper Tropical Zones in eastern Ecuador.

Remarks.—The only other specimen recorded from the supposed range is a male taken by Dr. E. Festa at Pun on the Río Chingual, below Tulcán, a locality well down on the eastern slope.² The authors' remarks say nothing of the colors.

Grallaria gigantea hylodroma subsp. nov.

Characters.—Similar to *Grallaria gigantea gigantea* Lawrence, but much more deeply rufescent below, barring on the lower surface less heavy, being especially reduced, in some nearly absent, on the flanks; more olive above on back, wings, and tail; forehead and loreal area much brighter, more rufescent; primaries and secondaries margined heavily with russet.

Description.—Type, American Museum of Natural History, male adult, No. 124,426 from Gualea, 6000 feet elevation, Province of Pichincha, Ecuador, June 14, 1913, collected by Wm. B. Richardson. Forehead and loreal area between tawny and russet; crown and hindneck deep mouse gray, washed anteriorly with bone brown; feathers above and behind eye narrowly barred with russet, forming part of an indistinct ring; rest of dorsal surface olive brown; wing coverts with a slight margin of russet, the inner greater coverts with a narrow subterminal bar of dull black and a narrow tip of russet; outer webs of primaries russet, merging to tawny on the free margin; outer webs of secondaries with a narrow margin of tawny; back, scapulars and rump with a few feathers tipped with russet crossbarred narrowly with one or two narrow bands of dull black; rectrices very narrowly tipped with russet; sides of head, sides of

² See Salvadori and Festa, *Boll. Mus. Zool. Anat. Comp. Roy. Univ. Torino*, vol. 15, no. 362, Nov. 17, 1899, p. 33.

neck, upper breast, sides and flanks amber brown, becoming tawny on the throat, middle of the breast, abdomen and under tail coverts, the whole narrowly barred with sooty black, the barring heaviest on breast, becoming almost obsolete on flanks; center of throat of warm buff, the anterior feathers white basally, the whole forming an indistinct longitudinal line; chin russet; under wing coverts russet, with a few small, scattered spots of sooty black. Maxilla natal brown, becoming fuscous black on culmen; mandible honey yellow; tarsus and toes benzo brown (from dried skin).

Measurements.—Four males, wing 144.2–152.6 (148.3), tail 54.5–61.8 (57.0), culmen from base 38.7–40 (39.4), tarsus 66.3–70.6 (69.7)³ mm.

Female, 1 specimen, wing 147.3, tail 61.3, culmen from base 39 mm. (tarsus broken).

Type, male, wing 152.6, tail 61.3, culmen from base 38.7, tarsus 70.6 mm.

Range.—Recorded from Gualea, Pachijal and Cerro Castillo; probably confined to the western slope of the Andes of Ecuador in the Upper Tropical and upper Lower Tropical Zone.

Remarks.—The six specimens of this bird examined are so uniform in their differences from the type of *gigantea* as to leave no question concerning their distinctness in the characters outlined above. Except as noted under *Grallaria gigantea gigantea* published records of the Giant Antpitta appear to pertain mainly to the present subspecies. Menegaux⁴ listed a male taken by Dr. Rivet at Pachijal on the western slope, his excellent plate showing a bird that agrees in every way with the series here under discussion. Dubois⁵ records the species only from "Ecuador," his plate supposedly being taken from the specimen in the Museum in Brussels, which, according to Sclater⁶ was the second one known. Dubois' figure shows a bird that is evidently immature as shown by the rufescent and black bars on the wing, back and rump. It agrees with *hylodroma* in the deep rufescent color of the ventral surface, but differs from any specimen seen in the restriction of the black barring on the under surface.

Grallaria gigantea lehmanni subsp. nov.

Characters.—Similar to *Grallaria gigantea gigantea* but barring on the central area of the lower surface definitely heavier; dorsal surface olive brown.

Description.—Type, U. S. National Museum No. 376,732, sex not marked, from San Marcos, elevation 3000 m., Moscopán, Cauca, Colombia, collected November 7, 1941 by Dr. F. C. Lehmann V. Forehead tawny basally, with tips of olive-brown, becoming olive brown that extends back over pileum past posterior angle of eyes; back of pileum and upper hindneck rather dull neutral gray; lower hindneck, back, wings

³ 3 specimens.

⁴ Miss. Serv. Geogr. Armee Mes. Arc. Merid. Equat., pt. 9, 1911, pp. B 36–37, pl. 3.

⁵ Syn. Av., pt. 1, 1900, p. 171, pl. 4, fig. 1.

⁶ Cat. Birds Brit. Mus., vol. 15, 1890, p. 312.

and tail olive brown; part of wing coverts, and a few feathers on lower back tipped with tawny and barred subterminally with dull black; upper tail coverts tipped also with tawny, with subterminal barring dark to deep neutral gray; primaries edged narrowly externally with cinnamon-brown, this changing on the outermost to a narrow outer margin of ochraceous-tawny; lores tawny; rictal bristles black; sides of head and neck tawny, barred with dull black; center of throat and upper foreneck ivory yellow, barred with black; chin, foreneck (except for ivory yellow area), upper breast, sides and flanks ochraceous-tawny, heavily barred with black; center of breast and abdomen light ochraceous-buff heavily barred with black; under tail coverts ochraceous-tawny without bars or spots; under wing coverts tawny to ochraceous-tawny heavily barred and spotted with black. Maxilla dusky neutral gray; mandible benzo brown; tarsus benzo brown; toes fuscous (from dried skin).

Measurements.—Type, sex not known, wing 154.1, tail 60.7, culmen from base 38, tarsus 73 mm.

Range.—Known only from San Marcos, 3000 meters elevation, and Tijeras, 2300 meters, Moscopán, Cordillera Central, Cauca, southern Colombia.

Remarks.—From *Grallaria g. hylodroma* the type of this race differs in being decidedly less rufescent on the lower surface, with the dark bars much heavier, these being heavy and distinct on the flanks where they are weak or absent in the west Ecuadorian birds. The under wing coverts are heavily barred and spotted with black as in typical *gigantea*. The series of *hylodroma* is so uniform in maintaining these differences that I do not hesitate to describe *lehmanni*, even though only a single specimen is available. Dr. Lehmann writes me that in the Museo de Historia, Natural of the Universidad del Cauca, in Popayan there is a female taken March 8, 1944, at Tijeras in the same area as that where the type was obtained but at the slightly lower elevation of 2300 meters.

In one way *G. g. lehmanni* seems to indicate variation or change in coloration in the direction of *Grallaria excelsa excelsa* Berlepsch from the Mérida region in western Venezuela. The two species *gigantea* and *excelsa* are similar in bulk and in length of wing, *excelsa* differing in having the bill, tarsus and foot much more slender. These differences to date are definite but it is possible that the two may intergrade in the intervening area from which no antpitta of this style is yet known.

This new form is named for the collector Dr. F. Carlos Lehmann V., in recognition of his studies on the ornithology of Colombia.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GENUS AND SPECIES OF SQUIDS FROM THE
PHILIPPINES.

HARALD A. REHDER.¹

*Associate Curator, Division of Mollusks,
United States National Museum.*

While Smithsonian representative on the U. S. Bureau of Fisheries steamer *Albatross* during the Philippine Expedition in 1907 to 1909, Dr. Paul Bartsch collected numerous examples of an interesting squid in Jolo Harbor, Jolo, in the Sulu Archipelago. An examination of this form shows that it represents a new genus which is here described.

Order Decapoda
Suborder Teuthoidea
Family Loliginidae

UROTEUTHIS,² new genus.

Body cylindrical, slender, gradually tapering posteriorly to an attenuated tail-like portion beyond the transversely rhomboidal fins. Mantle articulating with the neck by three sets of cartilages as in *Loligo*, except that the lateral cartilages are more narrow and regular. Pen narrow, lanceolate, three-ridged, gradually narrowing posteriorly to a point, which is concave through the edges being pinched together.

Head, arms, and tentacles comparatively short and small. Eyes of medium size, covered by a transparent skin, and with a pore anterior and slightly ventral of the eyes. Olfactory crests projecting behind each eye in the shape of a short scoop. Siphon rather broad, ventrally flattened, situated in a deep groove on the head, and furnished with an internal valve.

Arms with two rows of suckers, right ventral arm of males hectocotylized. Tentacular clubs with four rows of suckers. Buccal membrane with seven protuberances furnished with suckers.

¹ Published by permission of the Secretary of the Smithsonian Institution.

² Greek *ουρα* = tail + *τευθις* = squid.



Sexes showing dimorphism, the females being smaller, with shorter and less acute "tails," and without the slender ventral ridge in the mantle.

Genotype: *Uroteuthis bartschi*, new species.

This group resembles *Alloteuthis* (Naef) Wülker 1920 in having the mantle prolonged beyond the fins, but in that genus the buccal membrane lacks any prominent processes and is without suckers, the pen is broadened in the middle portion and involute for quite a distance posteriorly, and the fins are more heart-shaped. *Uroteuthis* agrees with *Loligo* in the presence of projections and suckers on the buccal membrane. It differs from both *Alloteuthis* and *Loligo* in the mantle being longer and more slender, and the arms and tentacles shorter.

UROTEUTHIS BARTSCHI, new species.

Figs 1-3.

Animal of moderate size, body firm, elongate, rather slender, cylindrical, tapering gradually posteriorly to a slender tail-like point beyond the rhomboidal pair of fins. This portion constitutes in the male animals one-fifth of the total mantle length; in the females, one-sixth. A fine raised ridge runs down the mantle in the center of the ventral surface of males, being absent in the females. The color of the body is a seashell pink on the ventral surface, becoming slightly darker dorsally. Along the center of the dorsal area is a narrow, elongate-ovate area of clustered small ovate spots of purplish color. This area, which stretches from the edge of the mantle to the center of the fins, is broadest, and the spots darkest and crowded closest together, a short distance anterior to the beginning of the fins. Around the periphery of this area the spots become lighter and more widely separated, and posterior to the center of the fins, they are smaller and fainter, often appearing like tiny specks or streaks.

The mantle articulates with the neck by three sets of cartilages. Dorsally an elongate dumbbell-shaped cartilaginous ridge about 15 mm. long, fits into a groove of the anterior portion of the pen, the end of which supports a pointed projection of the mantle edge. In each ventrolateral region a slender cartilaginous ridge about 13 mm. long, on the inside of the mantle, fits into an elongate-ovate concavity on the neck which has a raised cartilaginous edge around the anterior portion, which is narrowed at the end and slightly flexed ventrally. This broad groove is much shorter than the corresponding ridge on the mantle, being about 6 mm. long, and apparently the ridges slide along these grooves as the animal moves the head in and out of the mantle. The mantle edge is broadly acuminate in the region of these ridges.

The head region is comparatively rather small, and has a dark cluster of the color spots between each eye and the dorsal projection of the mantle. Over the rest of the dorsal region of the head and arms the spots are fainter and less crowded. The eyes are of medium size, covered by a transparent skin, which is pierced by a pore at the anterior rim of the eye.

The nuchal crests below each eye are in the form of a broad short scoop, slightly narrower at the edge, projecting from the head into the mantle cavity.

The siphon is rather broad and is ventrally flattened with a rounded depression on that surface at the height of the mantle edge. A tongue-like valvular flap protrudes from the transversely narrow opening. The siphon lies in a broad, moderately deep depression of the neck.

The arms and tentacles are comparatively short. In the males the arms are successively longer from the dorsal to the ventral pair, while in the females the ventral pair is about as long as or slightly longer than the second pair but shorter than the third pair. The second and fourth (ventral) pairs of arms are roughly trapezoidal in cross-section at base of arms, while the dorsal and third pair are more compressed with a keel on the outer side. All pairs have more or less thin marginal membranes. The suckers on all arms are in two regular rows, being largest on the second and third arms, slightly smaller on the dorsal arms, and considerably smaller on the ventral ones. The pedicellate suckers have a strong fleshy margin and the horny ring is brownish, with the teeth largest on the outer side.

The left ventral arm in the males is hectocotylized by a transformation of the suckers, commencing slightly beyond the middle of the arm. Here the pedicels increase in size and the sucker cups diminish in size and soon disappear, leaving fleshy fingerlike projections, which gradually diminish in size towards the tip.

The tentacular arms are compressed-ovate in cross-section, and on the outer edge bear a thin membranous keel which commences approximately a fifth of the way from the base; slightly beyond the beginning of the club it becomes wider and lies folded against the side. The club is margined on either side by a thin, wavy, scalloped membrane. At the proximal end of the club are two rows of suckers, but very soon a row of suckers appears on each side of these rows so that there are four rows of suckers at the broadest portion where they appear to be irregularly arranged because of their crowded nature. Distally the suckers become smaller and appear to be more regular in arrangement. The horny ring is lighter in color than in the suckers of the arms, and the large teeth appear to be more numerous.

The outer buccal membrane is moderately prominent and has seven triangular projections, which bear about seven or eight pedicellated suckers, with denticulated horny rings.

The mandibles are typical, the exposed portion being blackish brown in color. The radula is like that in *Loligo*; the formula is 2:1:1:1:2, the median tooth with a prominent mesocone and two smaller ectocones, while the laterals have a mesocone and a slightly smaller outer octocone; the marginals are simple.

The pen is long and slender with no prominent expansion anywhere, and of a pale yellowish-brown transparent color, the anterior portion somewhat paler than the posterior part. A strong central rib of a darker, horny color runs the length of the pen. A short distance below

	MALES				FEMALES		
	TYPE	LARGEST	SMALLEST	AVERAGE ¹	LARGEST	SMALLEST	AVERAGE
Length of mantle (along ventral line)	199	223	181	199.9	131	120	124.3
Length of body to base of ventral arms	208	234	188.5	209.4	140	130	132.9
Total length (to tip of tentacular arms)	237	269	217	240.6	172	172	162.4
Length of fin	78	88	73.5	79.1	53	43.5	46.8
Length of "tail"	40	47	34.5	40.7	18.5	20.5	19.8
Ratio of tail length to mantle length	20	21	19	20.25	14	17	15.8
Width of body	15	15.5	14	14.8	14.5	14	14.25
Width across fins	43	43	42	41.6	32.5	33	32.75
Width of head	14	14.5	13	13.75	13.5	13.7	13.1
Length of dorsal arm	18.5	18.5	16	17.9	15	17	14.8
Length of second arm	23	25	22	22.7	22	23	20.2
Length of third arm	26	27.5	25	25.3	23.5	23	21.3
Length of ventral arm	27.5	29	25	27.7	22	23	20.3
Length of tentacular arm	29	35	28.5	31.2	32	42	29.5

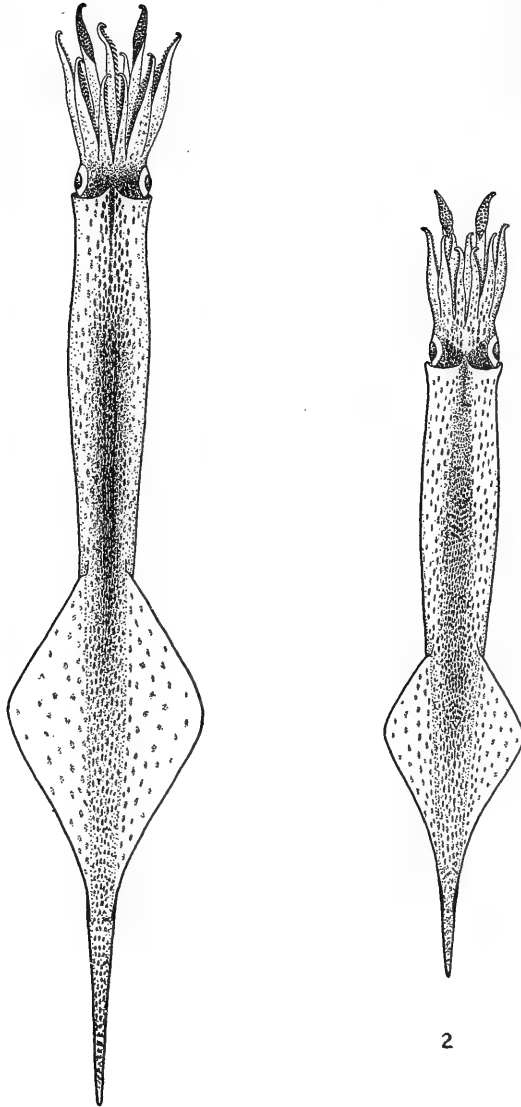
¹ This average includes all male specimens including the type, except one immature specimen.

the anterior end a marginal rib appears on each side, also of a darker color. About 38 mm. below the anterior end the pen broadens slightly, forming a marginal border on the outside of the lateral ribs. The edge of these borders also becomes thickened and darker, while the lateral ribs gradually become paler and more obscure. Towards the posterior end the pen narrows to a fine point, with the margins pinched together ventrally to form a narrow troughlike concavity.

The type, a male, is U.S.N.M. No. 573515 and is figured in this paper. One female, U.S.N.M. No. 573512 also is figured here. Sixteen other male specimens, U.S.N.M. No. 573513, and 5 females, U.S.N.M. No. 573514, were collected simultaneously. The measurements for these specimens are presented in tabular form.

All these specimens were collected on the night of February 8, 1908, in Jolo Harbor, Jolo, Philippine Islands. They were gathered at the gang plank of the U. S. *Albatross* by means of a submarine light and dip net. For a vivid description of the capture of these graceful and elusive creatures, see Paul Bartsch: *Pirates of the Deep. Stories of Squid and Octopus* (Ann. Rep. Smithsonian Inst. 1916, pp. 362-363. 1917).

Attention may again be drawn briefly at this time to the sexual dimorphism apparent in the table of measurements above. The females are shorter, with a small, somewhat stumpier tail, and without the slender ventral ridge along the mantle; the ventral arms are shorter, instead of longer, than the third pair of arms.



1

2

EXPLANATION OF FIGURES

FIG. 1. *Uroteuthis bartschi*, new species; male. 2. *Uroteuthis bartschi*, new species; female.

(Drawn by Mrs. Aime M. Awl)

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

A TRICARPELLARY MAPLE.

WILLIAM A. DAYTON.¹

Sometime in October, 1944, Capt. Howard S. Rappleye, of the U. S. Coast and Geodetic Survey and Treasurer of the Washington Academy of Sciences, informed me that, in the Takoma Park section of the District, where he resides, is a maple tree with its fruits often in 3's instead of pairs. Following Capt. Rappleye's directions, I visited on October 18th the intersection of Laurel and Walnut Streets where I saw the tree to which Capt. Rappleye undoubtedly referred, and from which the material was collected on which the accompanying drawing (Fig. 1) is based. The tree is a Planetree or Sycamore Maple (*Acer pseudoplatanus* L.), the species with which the south side of Walnut Street is planted. At this season of the year much of the fruit had fallen and probably some of the trees are male, but there was evidence that other trees in this row sometimes had fruit in 3's. The corner tree, near Laurel St., seemed to have the majority of its fruits in threes. As far as I have been able to ascertain, tricarpellary fruits in maples are not on record. While the condition here mentioned is doubtless "freakish" it presumably has some genetic significance and seems worthy of record.

¹Chief, Div. of Dendrology and Range Forage Investigations, U. S. Forest Service, Washington, D. C.



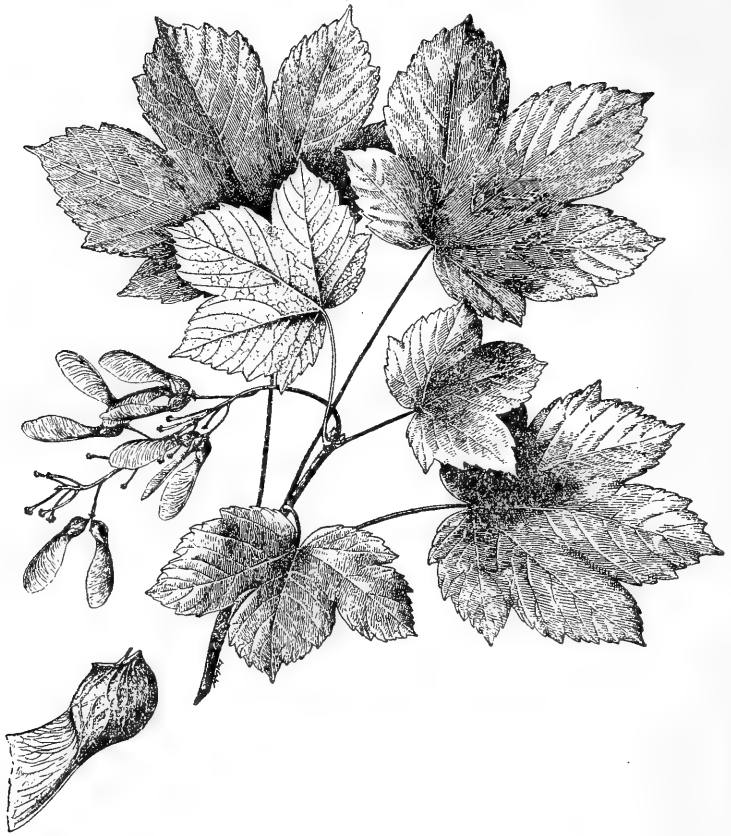


Fig. 1. Planetree or Sycamore Maple (*Acer pseudoplatanus* L.). Drawing by Miss Leta S. Hughey of the U. S. Forest Service from material collected by W. A. Dayton October 18, 1944, on Walnut St., near intersection of Laurel St., Takoma Park, D. C. Apparently more than half of the fruits on this tree were in threes. Note fuzziness of lower leaf surfaces, reticulated nutlets (some of which had a few short hairs) and the rather narrow angle of the keys.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW SOUTH AMERICAN *LEPTOTYPHLOPS*.

BY HOBART M. SMITH AND LEONARD E. LAUFE.

Through the courtesy of Dr. Doris Cochran in providing material for anatomical study, a specimen has come to hand of a species of *Leptotyphlops* hitherto unannounced. Dr. Dunn has examined our description and verifies the distinctness of the species from the forms he recently described, and from others of the Panamá-Colombia area. We name the new form

***Leptotyphlops striatula* sp. nov.**

Type.—U. S. Nat. Mus. No. 98889, collected at Yamachi, in the Southern Yungas, Bolivia, by M. Cárdenas.

Diagnosis.—A member of the *albifrons* section of the genus, having large supraoculars, a normal snout, two supralabials, a lined pattern, a yellowish snout and tail-tip, a total length/tail ratio of 12.7, and a total length/diameter ratio of 41.6. Related to *rufidorsum* and *tenella*, having the supraoculars enlarged more than is usual in the *albifrons* section, and narrowly separated from the 1st supralabials. Differs from these by having 12 scale rows around the tail, 249 dorsal scales, 23 subcaudals, and every scale row with a very distinct, broad median dark stripe.

Description.—Head somewhat flattened. Snout projecting far beyond lower jaw; snout rounded in lateral and dorsal profile. Portion of rostra, visible from above about $1/5$ longer than broad (by measurement; to the eye it appears proportionally longer), strongly tapered a short distance back of snout, sides elsewhere only slightly convergent. Posterior tip of rostral extending very slightly posterior to anterior borders of eyes and narrowly in contact with prefrontal. Latter longer than any other dorsal scale of head or neck, very slightly broader than long. Frontal as broad but only about half as long as prefrontal. Interparietal and interoccipital successively longer and broader than the preceding scale. First nuchal equally as broad as interparietal, but a little shorter. Nasal completely divided, the suture passing diagonally upward through the naris from the posterior to the anterior margin of the scale. Lower borders of naris and eye about on a level with each other. Supraoculars



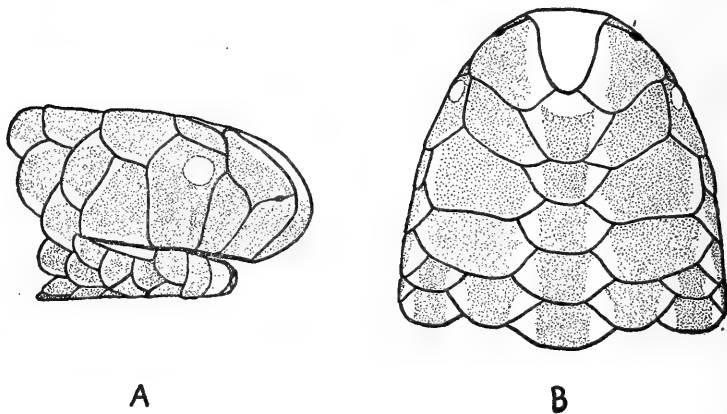
twice as broad (maximum, diagonal) as long (diagonal), narrowly separated from 1st supralabial. Parietal slightly smaller than upper portion of nasal, longer than succeeding occipital, extending laterally nearly to lower margin of orbit. Occipital extending as far laterally as parietal, but not so long as that scale. Sides of rostral divergent toward lip. First supralabial narrow, anterior and posterior borders nearly parallel; upper edge even with middle of eye and with upper edge of nostril. Ocular large, bordering lip, second in size only to rostral of the head scales; eye near anterior border of ocular; suture of ocular and nasal $3/5$ that between 1st supralabial and upper section of nasal. Second supralabial subtriangular, almost as long as parietal, length nearly equal to width (height). Temporal about the size of interparietal. Lip bordered successively from anterior to posterior by nasal, 1st supralabial, ocular and 2nd supralabial, the labial borders increasing in size in the same order.

Mental very short but broad; 4 infralabials, the anterior 3 subequal in size, the posterior extremely large and concealed when mouth is closed, the first separated from its mate by a single scale.

Head scales, above and below, with many sensory pits, which are more numerous on the anterior scales, and larger on the ventral surfaces; on the ventral surface of the rostral they are almost in contact with each other.

Scale rows 14, reducing to 12 at the extreme base of tail; tail with 12 scale rows to very near tip. Dorsal scales 249 from rostral to caudal spine; caudal spine short, pointed, conical. Subcaudals 23. Total length 241 mm.; tail 19 mm.; diameter of body 5.8 mm.

A broad, very dark brown band following the middle of each scale row, occupying most of the width of each; a narrow light brown line following the edges of adjacent scale rows. The dorsal and ventral



A. *Leptotyphlops striatula*, type; lateral view of head. B. Same, dorsal view of head.

surfaces are almost exactly alike, except that the dark stripes are slightly lighter on the belly than on the dorsal surface. The chin is light. A large yellowish or light tan spot on tip of snout, occupying all the dorsal surface of the rostral and part of the adjacent nasals, and united with the paravertebral light stripes. The entire tip of the tail, including some two scale rows back of the terminal spine, is light also, like the snout.

Comparisons.—This species is most clearly distinguishable from others of the *albifrons* group by the possession of 12 instead of 10 scale rows about the tail. No other species of the group has been recorded with a like number. Unusual also is the high number of subcaudals, exceeded only by *columbi*, a species otherwise markedly different. In dorsal count, body proportions and relation of the first supralabial and supraocular *striatula* resembles to some extent *rufidorsum* and *tenella*, although the supraocular does not extend quite so near the 1st supralabial as in either of these latter species. The last 3 species mentioned may well form a natural subgroup; each occupies an area distinct, so far as now known, from that inhabited by any of the others, *viz.*: *tenella* in British Guiana, *rufidorsum* in Peru, and *striatula* in Bolivia. There is a uniform north-south trend in supraocular-supralabial relation (greater degree of separation toward the south), but in dorsal scale count, pattern and other characters there is little or no evidence of any geographic gradients.

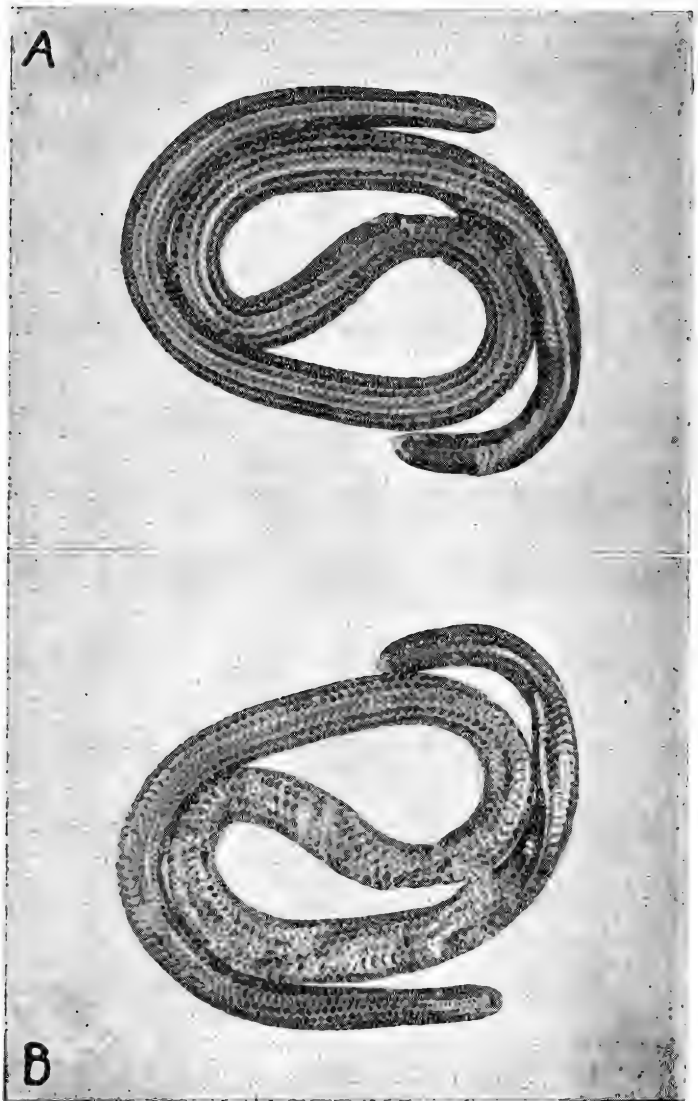


Fig. A. *Leptotyphlops striatula*, type; dorsal view. Fig. B. Same, ventral view.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ON SOME MILLIPEDS FROM SAIPAN.

BY RALPH V. CHAMBERLIN.

The small collection of millipeds considered in the present paper was made by my former student, Nathan W. Riser. All were taken north of Magicienne Bay on Saipan during August, 1944. The types are at present retained in the author's collection.

Orthomorpha coarctata (Saussure).

Three specimens of this tropicopolitan species are in the collection.

Opisthoporodesmus obtectus Silvestri.

One female tentatively referred to this species which was previously known from Tamara Id., near New Guinea, and Celebes. The male may possibly exhibit some differences.

Prosopodesmus jacobsoni Silvestri.

One female conforming as far as it goes with this species which was reported originally from Java.

Phagostrophus riseri, new species.

The general color is fuscous or black with an annulus about the caudal border of each typical segment yellow to light ferruginous. Collum dark excepting for a narrow light band over the anterior border and one over the posterior border which extends forward at the middle in a triangular or deltoid form. Head typically dark, usually with a lighter shield-shaped area in the frontal region and tending to be lighter down the sides. Antennae also lighter and the legs typically yellowish. Last tergite dark excepting a narrow caudal border of yellow. Anal valves mostly dark, commonly paler ventrally.

Head in general smooth; clypeal setigerous foveolae 2-2, the outer one on each side submarginal in position. The median sulcus across vertex lightly impressed. Eyes much more than their diameter apart. Antennae when stretched straight caudad not reaching the caudal margin



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of the collum; second and sixth articles longest, the third, fourth, and fifth nearly equal to each other.

Collum much narrowed down each side, the lower end of the form shown in Pl. VI, fig. 5 and 6.

Segments moderately depressed in a shallow encircling furrow; segmental sulcus distinct on sides but weak or indistinguishable above, slightly angled above level of pore which is in front of and a little separated from it.

Anal tergite convexly rounded behind, not surpassing the anal valves which at middle extend caudad beyond it with mesal borders compressed and elevated.

Legs without tarsal pads. In the male the coxae of third to sixth pairs of legs with triangular processes compressed in the antero-caudal direction and with pointed apex directed ventrad; these processes decreasing in size from third to sixth pair. (See fig. 2.)

Number of segments, 44-48.

Length, near 35 mm. Diameter of male, 2.8 mm.; of female, 3 mm. Two males and two females.

Genus SAIPANELLA, new.

Differing from genera of Cambalopsidae previously known from the Asiatic and East Indian region in having the repugnatorial pores begin on the sixth instead of the fifth somite and also in wholly lacking tubercles and keels on the tergites. Without a neck-like constriction back of the head. Ordinary somites moderately furrowed or constricted about the middle. Eyes present, well-developed, with ocelli multiseriate. Clypeal foveolae 4-4. Antennae filiform, not clavate. Mentum entire, anteriorly separating the lamellae linguales. Anterior legs of male all with normal claws, not reduced or otherwise specially modified.

Saipanella marianna, new species.

Excepting in having the mentum entire (double) this genus seems more closely related to some members of the Cambalidae than to others in the Cambalopsidae than to others in the Cambalopsidae. Dorsum dark; Cambalopsidae. Dorsum dark; the body below level of pores becoming paler down sides and on ventral surface; a series of black spots over repugnatorial glands along each side; legs and antennae light brown.

Ocelli typically in five vertical series; e.g., 7, 8, 7, 6, 4; eyes separated by fully twice their diameter. Antennae short, subfiliform, the distal articles scarcely thicker than the proximal ones; second and sixth articles longest, the fourth shortest with the third and fifth about equal to each other. Antennae fitting into a pronounced excavation on each side. Gnathochilarium as shown in Pl. VII, fig. 2.

The collum in both sexes of form shown in fig. 1; the end portion on each side projecting ventrad as a free wing; the second and third tergites also similarly but less produced ventrad; finely margined below and up anterior border to level of eye, otherwise smooth.

Repugnatorial pore of a typical segment located on the metagonite somewhat less than half way from the segmental furrow to caudal margin; strongly striate below and up the side to a little below the pore, the striae running across both prozonite and metazonite. Above level of these striae the prozonite characteristically marked with numerous horseshoe-shaped impressions which are open caudad.

Anal tergite rounded behind, not at all produced and not exceeding the valves. Anal valves not compressed, meeting evenly at the middle line, not there forming a furrow.

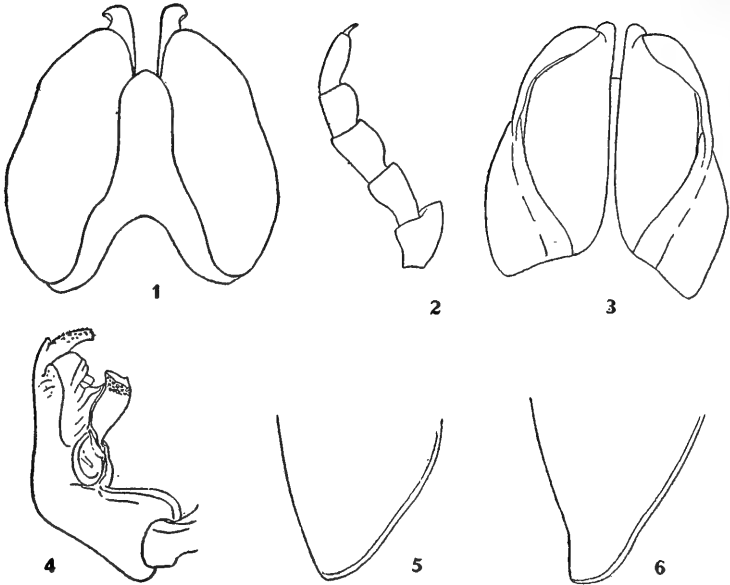
Gonopods of male partly exposed when in situ as shown in fig. 3. Details of structure as shown in figs 4 and 5.

Number of segments, 39.41.

Length, 23 mm; diameter, 2 mm. Two males and three females.

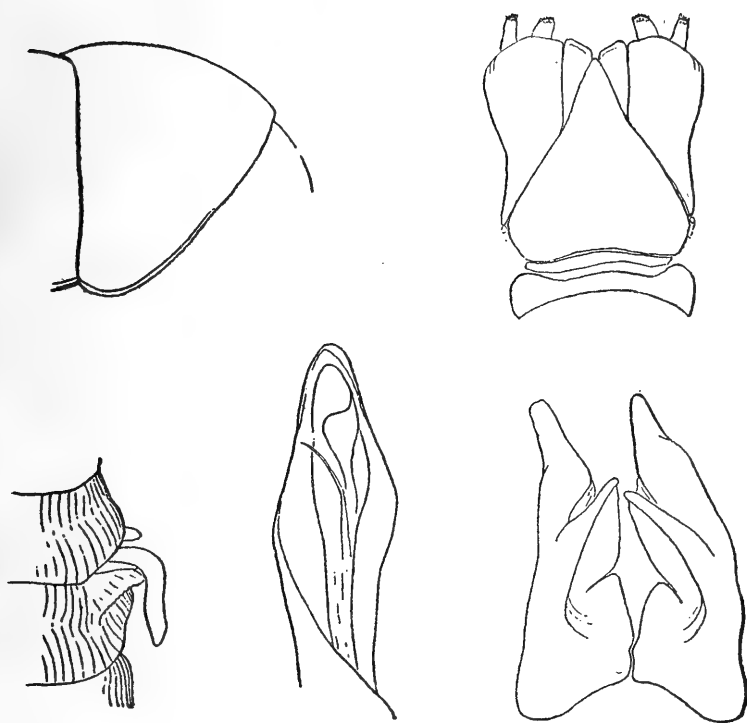
Rhinotus sp.

One female which it seems best not to attempt to place specifically until the male is known.



Phagostrophus riseri, new species.

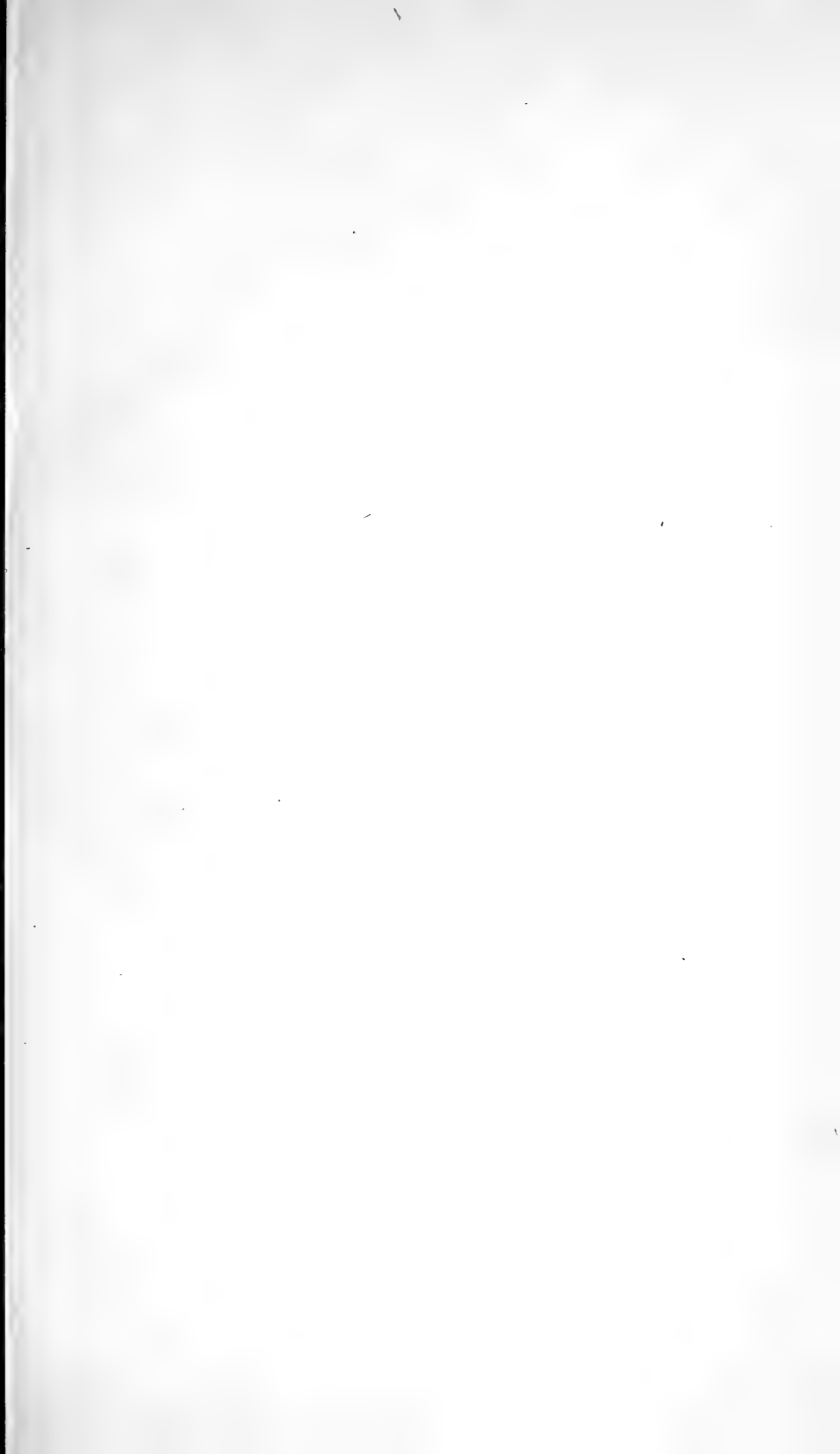
- Fig. 1. Anterior gonopods, cephalic aspect.
- Fig. 2. Third leg of male, showing coxal prominence.
- Fig. 3. Anterior gonopods, caudal aspect.
- Fig. 4. Right posterior gonopod, caudal view.
- Fig. 5. Lower part of collum of male in outline, lateral view.
- Fig. 6. The same of female.

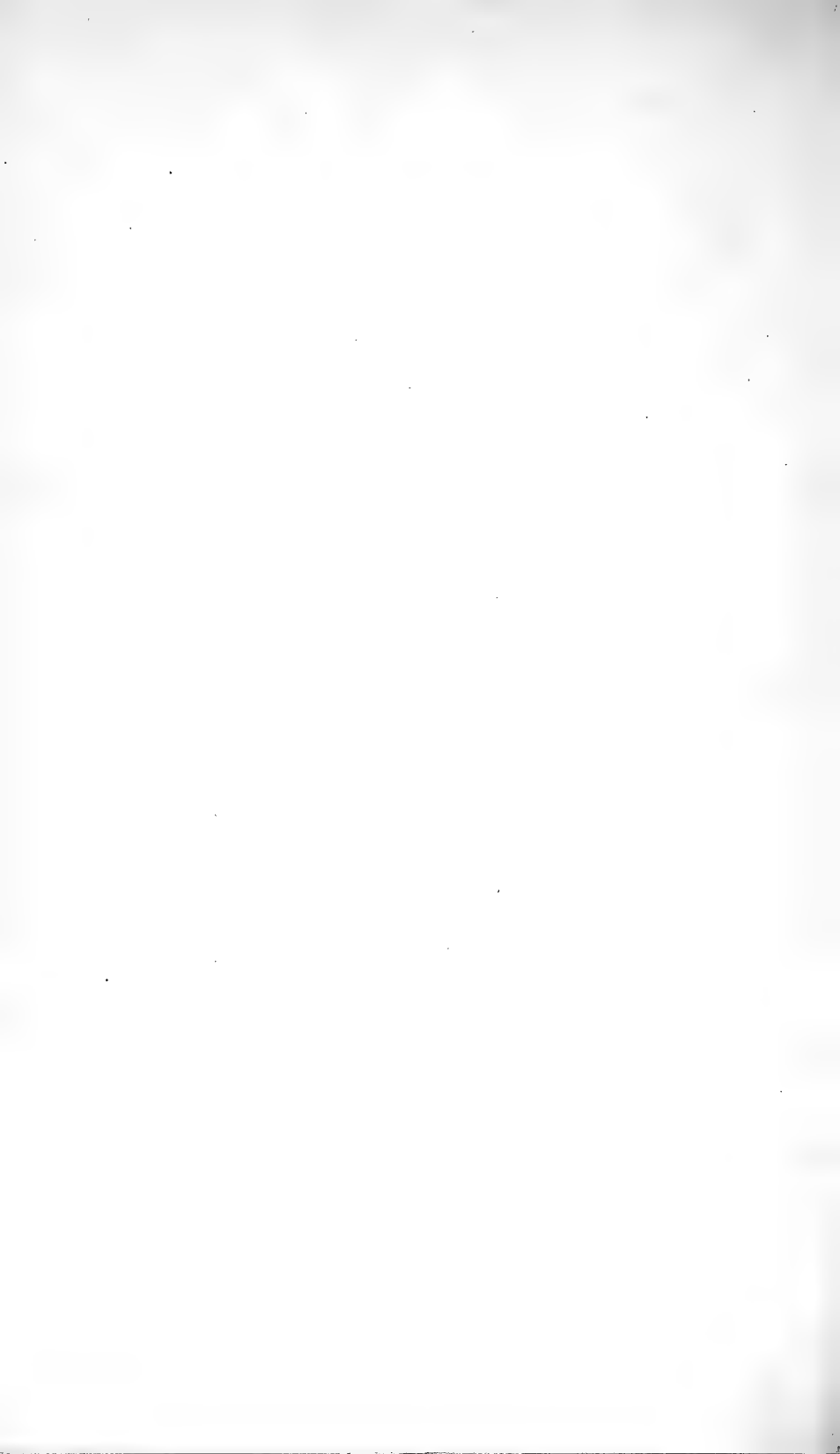


Saipanella marianna, new species.

- Fig. 1. Collum of male in outline, lateral view.
 Fig. 2. Gnathochilarium.
 Fig. 3. Right anterior gonopod in situ, lateral view, the adjacent legs omitted.
 Fig. 4. Telopodite of right anterior gonopod, ventral view, with posterior gonopod shown in situ against it.
 Fig. 5. Anterior gonopods, anterior view.

I





PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONTHE IDENTITY OF *DESMOGNATHUS PHOCA*
(MATTHES) AND OF *DESMOGNATHUS MONTICOLA*
DUNN.BY ARNOLD B. GROBMAN,
Biological Laboratories, University of Rochester.

The completion of a study on *Desmognathus*, which I had previously mentioned (1944:265), being indefinitely postponed, it has been deemed desirable to present specific (or species group) accounts whenever these could be organized. Of the forms in this genus at least one, it appears to me, requires a nomenclatorial change.

The salamander referred to by the Check List (Stejneger and Barbour, 1943: 15) and by Dr. Bishop's Handbook (1943:206) as *Desmognathus phoca* (Matthes) was actually first described by Dunn (1916: 73) as *Desmognathus monticola* which name was later synonymized by him (1923: 39) with *Salamandra phoca* Matthes at a time when the present distributional data were not available.

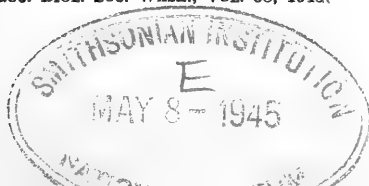
Matthes' type specimen is not known to exist (Dunn, 1926: 73). More recent information is contained in a letter (October 21, 1944) from Dr. Dunn concerning the present point, "When I was in Vienna in 1929, I ran into a Matthes' salamander, an *Ambystoma texanum*, probably one of his two cotypes; but no others."

In the original description of *phoca* (Matthes, 1855: 273) the account of the teeth, "Zähne bestehen aus einer vordern Querreihe und einer Längsgruppe", applies equally well to adult females of both *Desmognathus f. fuscus* and *Desmognathus monticola*, to the majority of the adult *monticola* males, and to a few adult *fuscus* males.

The pattern, as described by Matthes, is duplicated in many individuals of both *monticola* and *fuscus*.

The measurements given in the original description (total length approximately 110 mm.) would fit adults of both *monticola* and *fuscus*.

The remainder of the characters mentioned by Matthes are apparently of generic or more inclusive rank and are consequently applicable to both species mentioned above.



Since the type specimen is not available and the original description is inadequate for a definite allocation of names, the location of the type locality is here a matter of prime importance. Fortunately it was very accurately given by Matthes in these words: "... unter einem kleinen flachen Stein dicht neben dem Taylors-Creeck in Kentucky unweit New-Port." The Miami River flows southward through Hamilton County, Ohio, to empty into the Ohio River. One of the former's westward-flowing tributaries near its mouth is Taylor's Creek. The topographic map of the region shows a settlement, near the juncture of the creek and the river, called Taylor's Creek, which is opposite the town of Miami on the western banks of the Miami River. This area, which is about fourteen miles northwest of Newport, Campbell County, Kentucky, undoubtedly represents the type locality of *phoca*.

Thus, *phoca's* type locality, represented on the accompanying map by a solid triangle, is more than 100 miles from the nearest *monticola* localities (represented by circles on the map. Solid circles represent specimens examined; hollow circles, literature records.) Ralph Dury and others from the Cincinnati region have collected actively in the general vicinity of the type locality of *phoca* and have been unable to find any specimens they would identify as the form being considered here.

Of the three major physiographic divisions in eastern United States, only certain provinces of the Appalachian Highlands harbor *monticola*. The form is not known from the Atlantic Coastal Plain (cf. below) to the east and south and only questionably from the Interior Plains (cf. below) to the west. The type locality of *phoca*, however, is in the Interior Plains. The dashed line on the accompanying map approximates the division between the Appalachian Highlands and the Interior Plains.

For the following reasons, therefore, it seems best to the present writer to consider *Salamandra phoca* Matthes a synonym of *Desmognathus fuscus fuscus* (Rafinesque) and to regard *Desmognathus monticola* Dunn as the valid name for the salamander currently recognized under the name *Desmognathus phoca* (Matthes):

1. The type specimen is lost.
2. The original description of *phoca* applies equally well to *fuscus* and to *monticola*.
3. In the vicinity of the type locality subsequent collections have revealed *fuscus* to the exclusion of *monticola*.
4. The nearest known *monticola* records are 100 miles to the east of the type locality of *phoca*.
5. The type locality is in a different major physiographic division from that in which *monticola* appears to be restricted.

It may be pertinent, at this point, to discuss two outlying records (represented on the accompanying map by hollow triangles) whose validity requires consideration. Hibbard (1936:279), in writing of *phoca* in Edmonson County, Kentucky, stated, "Common around springs and rocky streams. This species has been confused with *D. f. fuscus* in this area." Dunn had previously (1926:80) listed a specimen (Museum of

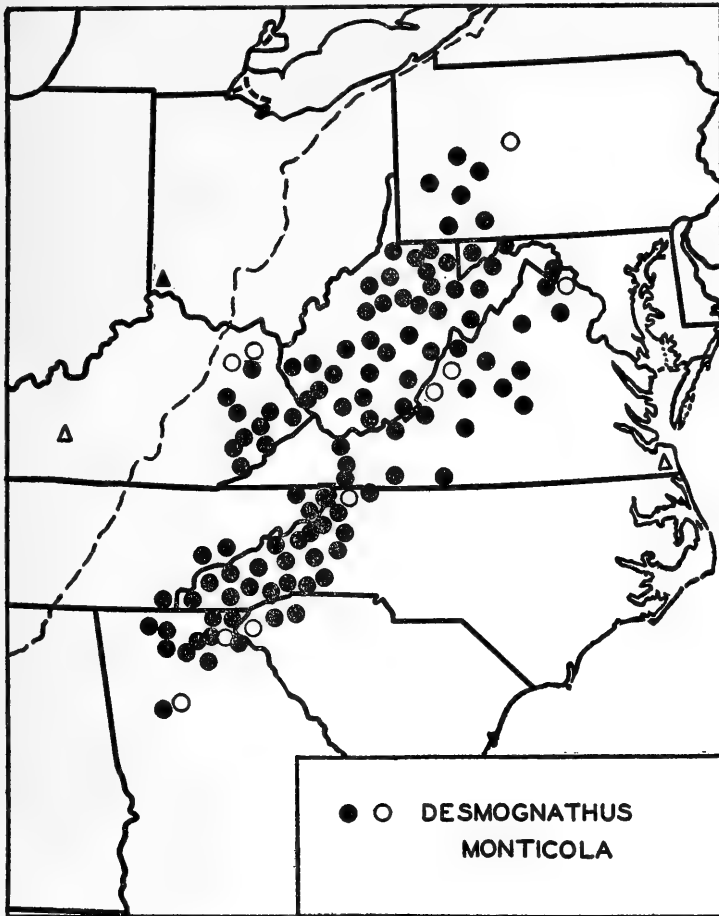
Comparative Zoology No. 2230) from this area, also. The weight of these reports from independent authorities would seem to readily negate any assumption concerning the validity of the records. However the distance between Edmonson County and the records in eastern Kentucky, from which no *monticola* are known, is great. It is desirable to have specimens from the intervening area or, lacking this, to have a reasonable explanation for this unusual distribution before considering our knowledge of the range of this form essentially accurate.

The Atlantic Coastal Plain record of Scharlinski (1939: 57), from Norfolk County, Virginia, requires less comment. Either the material was misidentified or the locality was that of shipment rather than of collection. Without doubt, *monticola* does not occur naturally in Norfolk County, Virginia.

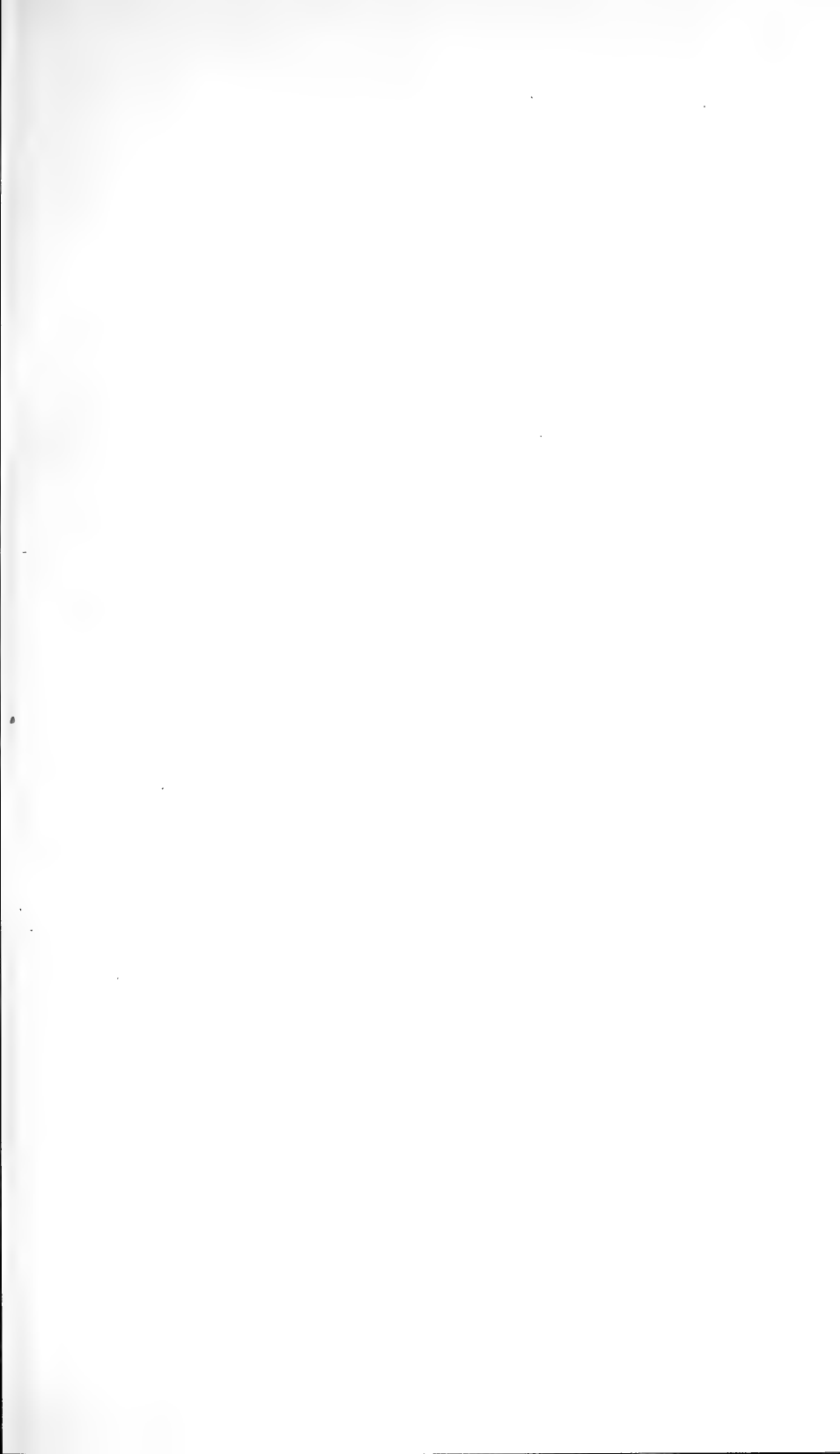
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Distribution of *Desmognathus monticola*. Solid circles represent the specimens examined; hollow circles, the records listed in the Annotated Literature List and reports for Bath and Alleghany Counties, Virginia (from a letter by Richard L. Hoffman dated November 9, 1944); hollow triangles, the outlying records discussed in the text; solid triangle, the type locality of *phoca*; and dashed line, the division between the Appalachian Highlands and the Interior Plains Physiographic Divisions.



574.0673

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SUBSPECIES OF *EUSCARTHORNIS ZOSTEROPS*.

BY JOHN T. ZIMMER.

Several years ago, when working on this species (*cf.* Amer. Mus. Novitates, no. 1066:13-15, May 3, 1940), I had in hand two examples from Palmares, Pernambuco, Brazil, collected by E. Kaempfer for Mrs. E. M. B. Naumburg. These two birds differed appreciably from the rest of the material examined but were not described at the time since it was thought that their discussion might properly be left to Mrs. Naumburg in her current studies of east-Brazilian birds.

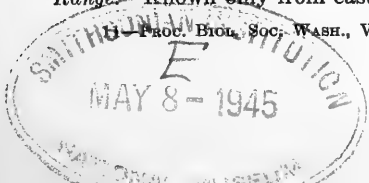
Recently, however, Dr. Herbert Friedmann of the U. S. National Museum, sent me for determination a rather disarranged specimen of the same new form, also from the state of Pernambuco, taken at Recife, not far from Palmares. Since a name is now needed for this subspecies, Dr. Friedmann has suggested that I publish my notes concerning it, and Mrs. Naumburg has kindly concurred. Owing to the better condition of the Kaempfer skins, one of them is taken as the type. I take pleasure in naming the new form for Mrs. Naumburg in recognition of her contributions toward a better knowledge of the birds of Brazil.

Euscarthornis zosterops naumburgae, new subspecies.

Type.—From Palmares, Pernambuco, Brazil; altitude 600 feet. No. 243736 American Museum of Natural History. Adult male collected March 4, 1927, by Emil Kaempfer; original no. 4635.

Diagnosis.—Similar to *E. z. zosterops* of the Rio Negro, Brazil, and adjacent areas, but upper parts lighter, yellow green and belly whitish, not strongly yellow. From *E. z. flaviviridis* of northern Peru it differs by slightly duller or darker upper parts and decidedly more whitish belly. From the intervening *E. z. griseiceps* of the Amazon Valley, it differs by the distinctly olivaceous breast and slightly greenish flanks, although the upper parts are much the same in both forms.

Range.—Known only from eastern Pernambuco, Brazil.



MAY 8 '45

Description of Type.—Top of head noticeably striated, with dark brown shaft-stripes margined with Roman Green;¹ mantle near Roman Green; uropygium slightly lighter. Lores white, finely tipped with blackish; eyelids with a ring of pale buffy feathers; auriculars about like the mantle; chin and upper throat with dusky gray shaft-stripes and whitish or ashy margins; lower throat and breast with similar grayish stripes, but with the margins tinged with Primrose Yellow; sides of breast unstriped Yellowish Olive; belly whitish, faintly tinged with pale greenish yellow, strongest laterally; under tail-coverts pale greenish. Wings blackish brown with very narrow dull greenish outer margins on the primaries, broader on the secondaries especially distally where also they are brighter, and still broader and more whitish on the tertials; two prominent wing-bars Naphthalene Yellow; lesser upper wing-coverts like the mantle; under wing-coverts pale yellow; inner margins of remiges whitish. Tail dark brown with outer margins narrowly greenish; shafts dark brown above, whitish below. Bill (in dried skin) black; feet dull brown. Wing, 50 mm.; tail, 44; exposed culmen, 10.5; culmen from base, 14; tarsus, 14.5.

Remarks.—The comparative material examined has already been listed (*t. c.*: 15) with the exception of the three examples of the new form and need not be repeated here. The citation of the new subspecies may be appended as follows:

Euscarthmornis zosterops naumburgae.—

BRAZIL:

Palmares, Pernambuco, 2 ♂ (incl. type);² Recife, Pernambuco,
1 ♂.³

¹ Colors are capitalized when direct comparison has been made with Ridgway's "Color Standards and Color Nomenclature."

² Specimens in American Museum of Natural History, New York.

³ Specimen in U. S. National Museum, Washington, D. C.

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PROCEEDINGS
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NEW SCINCID LIZARDS OF THE GENERA
TROPIDOPHORUS AND *LYGOSOMA* FROM NEW
GUINEA.

BY ARTHUR LOVERIDGE.

Recently my colleague Captain P. J. Darlington Jr., through the courtesy of the Australian New Guinea Administrative Unit, was enabled to spend his local leave in a brief visit to the little-known Mount Wilhelm, 15,400 feet. With customary zeal Dr. Darlington preserved representatives of the reptiles he encountered. It is hoped to report more fully on his collection at a later date, but as three species of lizards are apparently undescribed and one of them is of a genus (*Tropidophorus*) not known to occur in New Guinea, it seems advisable to publish their descriptions without further delay.

***Tropidophorus darlingtoni* sp. nov.**

Type.—Museum of Comparative Zoölogy, No. 47051, a gravid ♀ taken between 5000–6000 feet on Mount Wilhelm, Bismarck Range, Madang Division, New Guinea, by Captain P. J. Darlington, Jr., October, 1944.

Paratypes.—Museum of Comparative Zoölogy, Nos. 47052–3, being two juveniles with same data as the type.

Diagnosis.—In complete agreement with the generic characters as defined by Malcolm Smith (1935, Fauna of British India, Rept. & Amph. 2, p. 322). Shields and scales smooth, in 34–36 rows around midbody; frontonasal entire; postmental entire; a pair of enlarged preanals. In the following description the paratype variations are given in parentheses.

Description.—Head shields smooth; frontonasal broader than long; prefrontals in contact; combined length of prefrontals and frontal as long as that of frontoparietals and interparietal; a frontoparietal subequal to the interparietal; parietals forming a suture behind the interparietal; supraoculars 6, first largest, last very small, none bordering the eye;



supraciliaries 7 (8); upper labials 5, the fourth below the centre of the orbit, from which it is separated by small suboculars; lower labials 4; tympanum smaller than the orbital opening.

Body-scales smooth, in 34 (36) rows around midbody, dorsals subequal to ventrals; a pair of enlarged preanals; body moderate, the toes of the adpressed hind limb well separated from the fingers of the backward pressed forelimb (overlapping in juvenile paratypes); digits moderate, with smooth lamellae below, 12-13 (12-15) beneath the fourth toe; tail (probably reproduced) stout, very slightly compressed, shorter (longer in one paratype) than the head and body.

Color.—Above, pale brown, heavily speckled and mottled with darker, particularly on head; lips plumbeous spotted with white; flanks paler than dorsum, an ocellus-like spot just above insertion of forelimb (rather more distinct in young than in adult); limbs pale, handsomely variegated with darker. Below, chin and throat to forearms plumbeous, each scale with a small pale spot at its base (white in young with scattered flecks, especially towards the sides); breast and belly immaculate white (pinkish in life in type?); tail anteriorly white heavily speckled with plumbeous, posteriorly wholly plumbeous (not so in young where the entire underside of the tail is like the anterior portion of the adult).

Size.—Total length of ♀ type (M.C.Z. 47051), 116 (63+53) mm., but tail apparently regenerated; of juvenile paratype (M.C.Z. 47052), 92 (42+50) mm., tail intact.

Remarks.—This new lizard, which apparently constitutes the first record of the occurrence of the genus *Tropidophorus* in New Guinea, is not closely related to any of the described forms. In the plumbeous coloring of its throat and lips, especially in the position of the white spots on the labials, *darlingtoni* duplicates the coloring of *rivularis* Taylor. That Philippine species, however, has strongly keeled dorsal scales, whereas *darlingtoni*, in its smooth scalation conforms to the Bornean *beccarii* and *mocquardi* as well as to the mainland *berdmorei* and *laotus*. In this connection it is interesting to note that the halfgrown young are perfectly smooth, for Malcolm Smith (*loc. cit.*, p. 324) says of this genus that: "The young at birth have always keeled scales."

Breeding.—Largest ova in type measure only 2 mm. in diameter.

***Lygosoma (Leiolopisma) prehensicauda* sp. nov.**

Type.—Museum of Comparative Zoölogy, No. 47057, an adult ♂ taken between 7500-8000 feet on Mount Wilhelm, Bismarck Range, Madang Division, New Guinea, by Captain P. J. Darlington, Jr., October, 1944.

Paratype.—Museum of Comparative Zoölogy, No. 47058, an adult ♂ with the same data as the type.

Diagnosis.—Referable to the section *Leiolopisma* as redefined by Malcolm Smith (1937, *Rec. Indian Mus.*, 39, p. 223) in his section B.b., though snout might well be called subacuminate. Related, though not closely except in scale-counts, to *L. anolis* (Boulenger) of the Solomons. *L. prehensicauda* is a larger, stouter species with a blunter, less

acuminate, snout than that of *anolis*; the toes of the adpressed hind limb are widely separated from the fingers of the backward pressed forelimb, certainly not reaching to the elbow as in the slender-limbed *anolis*. The parietals are well separated by the interparietal; there are no definite nuchals; the dorsals are striated, not smooth; and the peculiar subcaudal scalation of *prehensicauda* is lacking in our extensive series of *anolis*. In the following description paratype variations are given in parentheses.

Description.—Head shields rugose; frontonasal broader than long; prefrontals broadly in contact; combined length of prefrontals and frontal greater than that of frontoparietals and interparietal; a frontoparietal subequal to the interparietal, which separates the parietals, which are bordered posteriorly by 2 or 3 irregularly enlarged shields and an elongate upper temporal; no supranasal; nasal entire; a postnasal and an anterior and posterior loreal; supraoculars 4 (5 if a very small anterior one is included); supraciliaries about 7 or 9 (6 or 8); lower eyelid with a transparent disk; upper labials 8 (7–10), the seventh (sixth or eighth) below the center of the orbit from which it is separated only by the granules of the lower lid; lower labials 8–10 (7–8); ear-opening very small, without projecting lobules.

Body scales in 38 rows around midbody, the dorsolaterals finely striated, the 4 dorsal rows enlarged, slightly larger than the smooth ventrals; anals irregularly enlarged; body moderate; limbs short, the toes of the adpressed hind limb widely separated from the fingers of the backward pressed forelimb; fingers moderate or short, toes longer, with smooth lamellae below, 15 (16–17) beneath the fourth toe, the 6 (7–8) distal ones differentiated from those on the depressed basal portion; tail stout, cylindrical, slightly longer than head and body, on the under-side towards the tip are a series of about 28, brown, slightly swollen, transverse shields which, taken in conjunction with the curled tip, suggest that they supplement a grasping organ.

Color.—Above, greenish olive, merging into vivid green on sides of body and underside of tail, which is sepia brown towards the tip. Below, greenish white, except end of tail.

Size.—Total length of ♂ type (M.C.Z. 47057), 141 (69 + 72) mm., of paratype ♂ (M.C.Z. 47058), 125 + (65 + 50 +) mm., but tail regenerating.

***Lygosoma (Leiolopisma) elegantoides lobulus* subsp. nov.**

Type.—Museum of Comparative Zoölogy, No. 47067, an adult ♂ taken from between 7500–8000 feet on Mount Wilhelm, Bismarck Range, Madang Division, New Guinea, by Captain P. J. Darlington, Jr., October, 1944.

Paratypes.—Museum of Comparative Zoölogy, Nos. 47068–82 with same data as the type.

Diagnosis.—Very closely related to *elegantoides* Ahl (nom. nov. for *elegans* Boulenger, preoccupied by *Hinulia elegans* Gray), from which our fifteen specimens differ in having 34–36 rows of scales around mid-

body, and in having the digits uniformly compressed throughout their length, the subdigital lamellae of the distal portion not or but scarcely differentiated from those of the basal.

Dr. Malcolm A. Smith, who has kindly reexamined Boulenger's type, informs me that both it and a second example from Mondo actually have 32 (not 30) midbody scale-rows and 1 or 2 distinct ear lobules. He also says that the degree of differentiation between the subdigital lamellae of the distal portion and those on the basal part is *more marked* than in his (Malcolm Smith, 1937, Rec. Indian Mus., 39, p. 216, fig. f) figure of *Dasia vittata*. In *lobulus* any differentiation there may be is certainly *less marked*. Malcolm Smith places "*elegans*" in his section B. a. described as having "Lamellae beneath the basal phalanges transversely enlarged and differentiated from those on the terminal phalanges (except in *pulchellum*). Snout subacuminate; prefrontals separated from one another; tail? prehensile." Evidently *L. lobulus* furnishes a second exception, and there seems to be no grounds for thinking its tail is prehensile.

The feet of the new species have yellow-green soles, suggesting evidence of affinity with *elegantoides* Ahl and *flavipes* Parker. It agrees with the former, but differs from both the latter and *parkeri* Malcolm Smith in its much longer limbs, the toes of an adpressed hind limb reaching the elbow or axilla. In the following description paratype variations are given in parentheses.

Description.—Head shields smooth; frontonasal broader than long; prefrontals narrowly in contact (separated in 13 of the 15 paratypes); length of frontal equal to (rarely a trifle shorter or longer than) the combined lengths of frontoparietals and interparietal; a frontoparietal is subequal to the interparietal, latter separates the parietals, each of which is bordered externally by 3 enlarged shields, the hindmost being the first of a series (1-3) of paired nuchals; no supranasal; nasal entire; an anterior (horizontally divided on right side only of M.C.Z. 47073) and a posterior loreal, the former being in contact with a prefrontal; supraoculars 4, *only the 2 anterior ones in contact* with the frontal (except in one young paratype (M.C.Z. 47082) where apparently 3 are in contact); supraciliaries 8 (7-8); lower eyelid with a transparent disk; upper labials 7 (constant), the fifth (constant) below the center of the eye; lower labials 7-8 (6-8); ear-opening larger than the palpebral disk, with several (1-3) projecting lobules on its anterior border.

Body scales smooth, in 34-36 rows around midbody, the 2 dorsal rows enlarged, slightly larger than the ventrals; anals irregularly enlarged; body moderate; limbs long, the toes of the adpressed hind limb reaching the elbow (in all adults, whether gravid or otherwise; reaching the axilla in subadult and young specimens); fingers and toes compressed throughout, long, the fourth toe longest, with smooth lamellae below, 24 (19-23) beneath the fourth toe, the distal ones undifferentiated from those on the basal portion; tail moderate, subcylindrical, slightly depressed, tapering, much longer than head and body, not prehensile.

Color.—Above, dark brown; head shields mottled with black; body with numerous pale flecks; a more or less interrupted white stripe from ear-opening to groin forms the lower edge of an indistinct (distinct in young) lateral band; tail with black spots arranged in pairs (frequently forming transverse bars in young). Below, white, scales of chin, throat, and underside of tail more or less flecked with brown.

Size.—Total length of type ♂ (M.C.Z. 47067), 146 (60+86) mm., of ♀ (M.C.Z. 47068), 135 (55+80) mm.





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PROCEEDINGS
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NEW TREE-FROGS OF THE GENERA *HYLA*
AND *NYCTIMYSTES* FROM NEW GUINEA.

BY ARTHUR LOVERIDGE.

In a recent paper (Proc. Biol. Soc. Washington, 58, pp. 47-52) I described three new skinks presented to the Museum of Comparative Zoölogy by Captain P. J. Darlington, Jr., who obtained them during his ascent to the summit (15,400 feet) of Mount Wilhelm, previously climbed, I understand, only by three Australian officials.

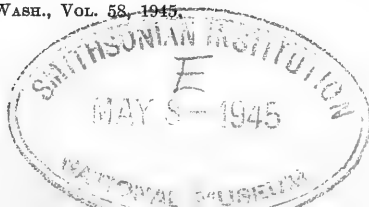
The present article deals with three new hylids collected by Darlington, and two others that had long been in the collection under the wrong names they bore when received in exchange. With these new species I have associated the names of Dr. Darlington and Sergeant William M. Beck, Jr., for to the latter we are also indebted for an extensive Guinean collection. Another frog is named for Dr. L. D. Brongersma, whose painstaking researches have done so much to add to our knowledge of the herpetofauna of Dutch New Guinea from which it comes.

Hyla darlingtoni sp. nov.

Type.—Museum of Comparative Zoölogy, No. 25890, a gravid ♀ from Mount Wilhelm, 5000-8000 feet, Bismarck Range, Madang Division, New Guinea, collected by Captain P. J. Darlington, Jr., October, 1944.

Diagnosis.—Near *H. papuensis* Werner, of the Torricelli Mountains, from which it differs in having the head as long as broad (not a little broader than long); snout twice (not once and a half) as long as the orbital diameter; tympanum seven-eighths (not a little larger than half) the orbital diameter; fingers somewhat less webbed; tibio-tarsal articulation of the adpressed hind limb reaches anterior border of eye (not the snout); back without (not with longitudinal rows of) warts; heels without (not with) a dermal appendage; color entirely different.

Description.—Head as long as broad; snout subacuminate, its length



(to anterior corner of eye) slightly less than the distance separating the anterior corners of the eyes, the distance from its tip to the nostril one-third that between the nostril and anterior border of the eye or one-third the orbital diameter; canthus rostralis obtusely rounded, curved; loreal region oblique, slightly concave; interorbital space nearly twice as broad as an upper eyelid; tympanum large, seven-eighths the orbital diameter; tongue large, subcordiform, distinctly emarginate behind and slightly free; vomerine teeth in two short, juxtaposed clumps between the choanae from which they are separated by a distance equal to one clump.

Fingers two-thirds webbed, the web reaching to the tubercle on first and third, to the disk on second and fourth, though as a narrow margin on the fourth; first finger shorter than second, which is shorter than fourth, which is shorter than the third; disk of third as large as the tympanum; toes webbed to the disks; subarticular tubercles prominent; an oval inner but no outer metatarsal tubercle; tibio-tarsal articulation of the adpressed hind limb reaches to the anterior border of the eye.

Skin above smooth or indistinctly granular; a curved supratympanic fold; a series of tubercles on forearm from elbow to wrist and a dermal ridge along outer edge of fourth finger; no lappet on heel but a dermal ridge from heel along outer edge of fifth toe. Below, chin, throat, breast, belly and thighs granular.

Color in formalin.—Above, blue gray, from snout to lumbar region a narrow, pinkish, vertebral line; from posterior border of eye to above axilla a broad pinkish area speckled with blue gray; groin and thighs, both before and behind but not above, black handsomely variegated with pure white. Below, chin and throat dusky; chest, abdomen, and underside of thighs white; tibia variegated with black and white; feet and hands grayish.

Size.—Length of gravid ♀ from snout to anus 50 mm.

Hyla angularis sp. nov.

Type.—Museum of Comparative Zoölogy, No. 25891, a ♂ from Mount Wilhelm, 5000–8000 feet, Bismarck Range, Madang Division, New Guinea, collected by Captain P. J. Darlington, Jr., October, 1944.

Affinities.—This distinctive *Hyla* does not appear to be closely related to any New Guinean species. In van Kampen's (1923) key it comes near *H. everetti* of Sumba Island, Dutch East Indies from which it differs in many respects.

Apparently referable to this species are nine juvenile frogs (M.C.Z. 25892–9) ranging from a 17 mm. (snout to anus) specimen with tail, and a 21 mm. example without tail, to a 38 mm. frog. The larger ones show well the sharply angular canthus rostralis for which this species is named. Nor do they differ structurally from the type apart from the absence of vomerine teeth in some, the dermal series of tubercles on forearm is undeveloped in a few, and the tibio-tarsal articulation of the adpressed hind limb reaches beyond the end of the snout in two specimens.

Description.—Head longer than broad; snout subacuminate, its length (to anterior corner of eye) equal to two-thirds the distance separating the anterior corners of the eyes, the distance from its tip to the nostril equal to half that between the nostril and anterior border of the eye or three-quarters the orbital diameter; canthus rostralis sharply angular, almost straight; loreal region vertical, scarcely concave; interorbital space nearly twice as broad as an upper eyelid; tympanum moderate, about half the orbital diameter; tongue large, subcordiform, distinctly emarginate behind and slightly free; vomerine teeth in two rather indistinct, oblique groups between the choanae.

Fingers half webbed except the first which is only webbed at base, the web reaching to, or just beyond, the tubercle on the second, third, and fourth fingers; first finger much shorter than second, which is shorter than fourth, which is shorter than the third; disk of third almost twice as large as the tympanum; toes webbed to the disks except the fourth which has the last joint free or narrowly margined with web; subarticular tubercles prominent, an oval inner but no outer metatarsal tubercle; tibio-tarsal articulation of the adpressed hind limb reaches the nostril.

Skin above smooth or indistinctly granular; a curved supratympanic fold; a series of tubercles on forearm from elbow to wrist and a slight dermal ridge along outer edge of fourth finger; though a male the nuptial swelling at base of first finger is unpigmented; no lappet on heel, and a dermal ridge only along the outer edge of the fifth toe. Below, chin and throat smooth; breast, belly, and thighs granular.

Color in formalin.—Above, blue-black, an irregular, broad, pinkish band from end of snout to groin where there is a purplish suffusion extending along anterior side of thigh to tibia; beneath the eye this band is interrupted by a blue-black patch which extends backwards to the angle of the jaw; hinder side of thighs pinkish with irregular dusky markings; upper side of thighs, tibiae, and outer edge of feet white; innermost fingers and toes white, the outer ones dark at base, dusky at tips. Below, white, uniform.

In color the paratypes differ considerably from the type, the heads of the younger are uniformly blue-black, of the larger ones the lips may be edged with white foreshadowing the broad rostralateral band of which there is no trace.

Size.—Length of type ♂ from snout to anus 45 mm.

Hyla becki sp. nov.

Type.—Museum of Comparative Zoölogy, No. 25900-9 an apparently fully adult ♂ taken among rocks beside a brook in the forest on Mount Wilhelm, 7,500-10,000 feet, Bismarck Range, Madang Division, New Guinea, collected by Captain P. J. Darlington, Jr., October, 1944.

Paratypes.—Museum of Comparative Zoölogy, Nos. 25901-9, being thirty-nine frogs, mostly young, with same data as the type.

Diagnosis.—Near *H. vagabunda* Peters & Doria, of Sorong, New Guinea, with which it agrees in size but differs in the snout being once and a half (instead of scarcely longer than) the orbital diameter; canthus

rostralis angular (not more or less rounded); nostril midway between tip of snout and anterior border of eye (not nearer snout); skin warty (not just smooth) above; no white line (either in type or young) from tip of snout along canthus rostralis to tympanum.

The possibility of identifying this species with *Hyllea wollerstorffi* Werner, of New Guinea, has been considered. Werner's 23 mm. holotype, being young, lacked vomerine teeth, so his description was compared with a 23 mm. paratype of *becki* lacking vomerine teeth. It was found to differ in the interorbital space being once and a third (not twice) the width of an upper eyelid; the tympanum being half (not a fifth) of the orbital diameter; disks of toes larger or as large (not smaller than) the tympanum, etc.

Description.—Head as long as (or slightly longer than) broad; snout subacuminate or roundish, its length (to anterior corner of eye) about three-quarters (to seven-eighths in young) the distance separating the anterior corners of the eyes, the distance from its tip to the nostril about equal to that between the nostril and anterior border of the eye or three-quarters the orbital diameter; canthus rostralis angular, straight; loreal region feebly oblique, concave; interorbital space once and one-third as broad as an upper eyelid; tympanum moderate, about half the orbital diameter; tongue large, subcordiform, distinctly emarginate behind and slightly free; vomerine teeth in two oblique groups between the posterior borders of the choanae from which they are well separated.

Fingers free; first much shorter than second, which is slightly shorter than the fourth, which is shorter than the third; disk of third much larger than the tympanum; toes two-thirds webbed except the first which is scarcely webbed to the tubercle, the others webbed just beyond the tubercle and thereafter only as a narrow seam sometimes reaching to the disk; subarticular tubercles prominent; an oval inner but no outer metatarsal tubercle; tibiotarsal articulation of the adpressed hind limb reaches well beyond end of snout (in paratypes to between eye and nostril or beyond end of snout).

Skin above smooth with conspicuous tubercles on hinder portion of eyelids, flanks, and forelimbs; a curved supratympanic fold; a few scattered tubercles forming an ill-defined series on outer edge of forearm; though a male the nuptial swelling at base of first finger is scarcely pigmented; no lappet on heel nor dermal ridge along outer edge of foot. Below, throat slightly granular; breast, belly, and thighs granular.

Color in formalin.—Above, plumbeous; a white patch on upper lip beneath eye; flanks flecked with white; thighs paler than back, faintly flecked with plumbeous. Below, dusky brown or grayish (ranging to whitish in paratypes) more or less flecked or spotted with darker and lighter.

Size.—Length of adult ♂ from snout to anus 38 mm.

Hyla brongersmai sp. nov.

Type.—Museum of Comparative Zoölogy, No. 15203, an adult ♂ from

Parana Valley, central Dutch New Guinea, collected by Dr. P. Wirz, 1925.

Diagnosis.—This frog, originally received from the late Dr. Jean Roux as *H. arfakiana* Peters & Doria, has little in common with that 70 mm. species, for it is adult (by dissection) at 24 mm. Nor is it closely related to the 52 mm. *H. wirzi* Roux (1927) taken by Wirz at Sentani.

H. brongersmai belongs to that group of dwarf species which never acquire vomerine teeth. It is apparently related to *chloronota* (Boulenger) of the Arfak Mountains, Dutch New Guinea, from which it differs in the snout (to eye) being much longer than (not as long as) the orbital diameter; tympanum about three-quarters (not about half) the orbital diameter; outer fingers half (not a third) webbed; apparently a large external (or internal) vocal sac on hinder part of throat; upper side of thighs spotted (not narrowly striped with green), etc.

Description.—Head as long as broad, snout blunt, its length (to anterior corner of eye) about two-thirds the distance separating the anterior corner of the eyes, the distance from its tip to the nostril slightly more than half that between the nostril and anterior border of the eye or slightly more than half the orbital diameter; canthus rostralis obtusely angular, almost straight; loreal region vertical, not or but slightly concave; interorbital space once and a half as broad as an upper eyelid; tympanum large about three-quarters the orbital diameter; tongue moderate, subcordiform, distinctly emarginate behind and slightly free; vomerine teeth absent (though frog adult).

Fingers webbed, outer half-webbed, rest barely to tubercle on one side only; first finger much shorter than second, which is slightly shorter than fourth, which is shorter than third; disk of third as large as the tympanum, as large as that of fourth but much larger than those of first and second; toes webbed to the disks except the fourth which has the last joint free, and the first, which is webbed only to the tubercle; subarticular tubercles prominent, an oval inner but no outer metatarsal tubercle; tibiotarsal articulation of the adpressed hind limb reaches end of snout.

Skin above smooth or indistinctly granular; a curved supratympanic fold; no dermal ridge or series of tubercles on forearm; being a male there is a partly pigmented nuptial swelling at base of first finger; no lappet on heel nor dermal ridge along outer edge of foot. Below, throat smooth, breast, belly, and thighs granular.

Color in alcohol.—Above, plumbeous, paling towards the dark brown flanks and thighs which are spotted with lighter; tibia, feet, and forelimbs brown with indistinct lighter markings. Below, lips brown blotched with white; chin dark brown; throat, breast, and belly yellowish; underside of limbs pale brown more or less flecked with lighter.

Size.—Length of adult ♂ from snout to anus 24 mm.

Nyctimystes milneana sp. nov.

Type.—Museum of Comparative Zoölogy, No. 11652, a gravid ♀ from Milne Bay, Eastern Division, Papua. Collector unknown.

Remarks.—This frog, received twenty years ago in exchange, was labeled *Hyla montana* Peters and Doria. On comparing it with a good series of that species collected by Captain P. J. Darlington, however, it is seen to have little in common with that species. Nor does it seem referable to any known *Hyla*.

Though the pupil of the eye is fully dilated there is a basal nick indicating that it would be vertical when contracted, moreover, on being compared with *Nyctimystes papua* (Boulenger) and *N. montana* Parker, it shows unmistakable affinities. When describing *montana* Parker (1936, *Ann. Mag. Nat. Hist.* (10), 17, p. 77) furnished a key to the five species which he recognizes, and it would appear as if the new form might possibly be a subspecies of his *semipalmata*.

Diagnosis.—Near *N. semipalmata* Parker, from which it differs in having the vomerine teeth in two clumps forming an almost straight line with the posterior edges of the choanae; tympanum moderate, about two-thirds the orbital diameter; tibio-tarsal articulation of the adpressed hind limb reaching to between eye and end of snout; no lappet distinguishable on heel.

Description.—Head slightly longer than broad; snout depressed, its length (to anterior corner of eye) greater than the distance separating the anterior corners of the eyes, the distance from its tip to the nostril twice that between the nostril and anterior border of the eye; canthus rostralis obtusely angular, curved; loreal region obliquely concave; interorbital space narrower than an upper eyelid; tympanum moderate, about two-thirds the orbital diameter; tongue large, subcircular, slightly emarginate behind, scarcely free; vomerine teeth on two raised bones, forming an almost straight line with the posterior borders of the choanae.

Fingers about half-webbed (*cf.* Parker, fig. 5), the larger disks slightly smaller in width than the height of the tympanum; first finger much shorter than second, which is slightly shorter than the fourth; toes webbed to the disks; subarticular tubercles prominent; a small oval inner but no outer metatarsal tubercle; tibio-tarsal articulation of the adpressed hind limb reaches to halfway between eye and end of snout.

Skin smooth above; a curved supratympanic fold; a series of tubercles on forearm from elbow to wrist; no trace of a lappet on heel but a dermal ridge feebly indicated along outer edge of foot. Below, throat smooth, breast, belly, and thighs granular.

Color in alcohol.—Above, pinkish brown, the upper lip edged with white. Below, creamy white, the throat microscopically speckled with black, otherwise uniform.

Size.—Length of gravid ♀ from snout to anus 48 mm.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW SPECIES OF AEADES FROM THE
CAROLINE ISLANDS.(Diptera, Culicidae)¹D. S. FARNER, LIEUTENANT (JG), H(S), USNR.²

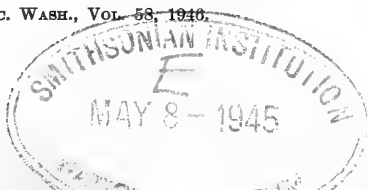
A collection of mosquitoes from the Ulithi Islands, western Caroline Islands, contains, in addition to a large number of specimens of *Culex jepsoni* Theobald, a number of specimens of a previously undescribed species of *Aedes* belonging to the *scutellaris* group of the subgenus *Stegomyia*.

Aedes (*Stegomyia*) *hensilli*, new species

Male.—Length about 3 mm., wing about 2 mm. Vertex covered with broad appressed scales with median broad stripe and with two lateral white stripes. Torus with white scales around entire circumference forming a conspicuous broad inner patch. Clypeus bare. Proboscis dark; palpus about length of proboscis, segments with basal white patches, those on apical segments reduced. Anterior pronotal lobe with many white broad appressed scales; posterior pronotum with dark narrow curved scales and a patch of white broad scales opposite anterior pronotal lobe. Scutum with median white stripe narrowing posteriorly and forked in the prescutellar area with an indistinct short posterior submedian line and a shorter marginal line of white scales over the wing base. Scutellum with white broad appressed scales on all three lobes, a few dark scales on apex of mid lobe. Pleuron with white scales arranged more or less in two parallel lines and scattered spots. Coxae with patches of white scales; inner surfaces of femora with broad pale longitudinal stripe interrupted subapically on hind leg; each femur with a white knee spot; tibiae with dark scales, occasionally with a few apical pale scales. Front and mid tarsus dark usually with small basal patches of white scales on segments I and II; hind tarsal segments with basal pale bands interrupted on inner side of segment I and usually narrower on inner side of the other segments; width of basal white band on outer side of

¹ The author wishes to thank Dr. Alan Stone, Division of Insect Identification, U. S. Department of Agriculture, for his helpful suggestions and assistance.

² Preventive Medicine Division, Bureau of Medicine and Surgery, Navy Department.



segment I $1/5$ to $1/4$ length of segment, always completely interrupted on inner side; width of basal white band on outer side of II $1/5$ to $1/4$ length of segment, width on inner side $1/10$ (or a few pale scales) to $1/4$ length of segment; width of basal white band on outer side of III $1/5$ to $1/3$ length of segment, width on inner side $1/10$ (or a few pale scales) to $1/3$ length of segment; width of white basal band on outer side of IV $1/3$ to $1/2$ length of segment, width on inner side $1/5$ to $1/3$ length of segment; width of basal white band on outer side of segment V about $1/2$ length of segment, width on inner side $1/10$ to $1/2$ length of segment, occasionally completely interrupted by dark scales. Wing with dark scales. Abdominal tergite II with lateral subbasal white spots; abdominal tergites III to VII with subbasal white bands, that on VII sometimes interrupted; abdominal tergite VIII usually with large spot of pale scales. Sternites II to VI with broad subapical bands broadening ventrally and basally; sternite VII dark. Genitalia with basal lobe of basistyle simple and folded similar to *guamensis* Farner and R. Bohart (figures 5 and 6, p. 122, Proc. Biol. Soc. Washington, vol. 57, 1944, or figures 10 and 11, p. 40, U. S. Nav. Med. Bull., vol. 44, 1945) but apparently with thickened bristles extending more basad; dististyle long, curved and somewhat swollen subapically.

Female.—Markings about as in male. Palpus about $1/5$ length of proboscis, apical segment mostly white.

Fourth Instar Larva.—Length about 6 mm. Head slightly broader than long; antenna slender, scarcely tapering, length about one-third width of head; no spicules; a single antennal hair slightly beyond middle of antenna. Clypeal spines very slender, curved downward; anteantennal hair (A) double; lower head hair (B) and upper head hair (C) usually single, occasionally bifid, both anterior to hair A; hair C well behind hair B; postclypeal hair (d) a tuft of 10 to 11 hairs arising at the same level from a common stem; sutural hair (e) and transsutural hair (f) both very fine, single. Thorax: Prothoracic submedian hairs 2 tufts of 3 hairs each, one directly anterior to and smaller than the other; mesothoracic and metathoracic pleural hair tufts each with a very short basal spine. Abdomen: Lateral tuft of first segment of 4–5 hairs; of second, 2–3; of segments 3–5 double; of 6 single; of 7 double. Comb scales of eighth segment 8–14, each with a single sharp apical spine and a basal lateral fringe of fine hairs on each side; eighth segment with 2 siphonal tufts, one of 3–4 hairs, one single; 2 subsiphonal tufts, one single, one with 4–7 hairs; one anal tuft of 3–5 hairs. Siphonal index 2.0–2.6; pecten of variable number (10–16, usually about 14) of evenly spaced teeth with 1–3 lateral spines, occasionally a tooth with two equal spines; a tuft of 2–4 hairs about middle, beyond last tooth of pecten. Dorsal saddle reaching nearly to midline but never fusing ventrally; saddle hair double; dorsal hairs long, one single, one double; gills 4, stout, usually more than twice the length of the anal saddle; ventral brush of about 8 bars with relatively few hairs.

Holotype.—Male, Ulithi Islands, western Caroline Islands, December

1944; George S. Hensill, collector. Paratypes: 5 females, 10 males, same collecting locality, date, and collector.

Type material deposited in U. S. National Museum (Cat. No. 57278).

In addition to the type material, 40 adults and 12 larvae from Ulithi, also collected by George S. Hensill, have been studied.

This species in many respects is intermediate between *marshallensis* Stone and R. Bohart and *guamensis* Farner and R. Bohart although probably much closer to the latter. The basal lobe of the basistyle of *hensilli* is simple and very similar to that of *guamensis* although in the former there appears to be a tendency for the thickened bristles to extend more basad than those of *guamensis*. The basal white bands of the hind tarsi are reduced as in *marshallensis* and, as in this species, the apical half of the fifth tarsal segment is always dark. The tarsal bands approach the interrupted condition of those of *guamensis* in that they are usually narrower on the inside of the leg than on the outside. Occasionally the light bands of segments II-V are interrupted by dark scales on the inside but never as distinctly or completely as in *guamensis*. Abdominal tergites III-VII of *hensilli* have subbasal bands of pale scales although the band on VII is sometimes interrupted; abdominal tergites II-VII in *guamensis* have only basal lateral patches. Although *hensilli* and *marshallensis* can be differentiated sometimes by their tarsal bands, in general these characters are often too variable. However, the highly modified basal lobe of *marshallensis* as compared to the simple corresponding structure in *hensilli* is immediately distinctive. Until a careful study of all the larvae of the *scutellaris* group is made, it will remain difficult to point out distinguishing characteristics of the larvae of individual species. The larva of *hensilli* apparently differs from that of *marshallensis* in having comb scales of the eighth segment with simple teeth and in having a larger number of teeth (8-14 as compared to 7-8) in the pecten. The larva of *hensilli* apparently differs from *guamensis* in having more poorly developed lateral fringes on the teeth of the pecten, and in having fewer branches in the tuft beyond the pecten (2-4 as compared to 5 or 6 in *guamensis*). Furthermore the gills of *hensilli* are usually distinctly longer than those of *guamensis*.

The exact systematic status of *hensilli* cannot be ascertained until materials from other localities in the Caroline Islands are available for examination. Because of the close similarity of the basal lobe of *hensilli* to that of *guamensis*, it is possible that the former is a subspecies of *guamensis*. However, until more material is available and also in view of the differences in tarsal and abdominal banding, it seems best to regard *hensilli* as specifically distinct from *guamensis*.

The notes transmitted by Dr. Hensill indicate that the larvae of *hensilli* were found in empty coconut shells, tree holes, and to some extent in artificial containers such as tin cans as well as discarded drums, barrels, and bottles used by natives. Larvae were not found in leaf axils of pandanus trees or in taro plants. It was also noted that the adults were active primarily at dusk.



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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW TOMOCYCLUS FROM MEXICO.

BY PAUL BARTSCH.¹

A recent sending of Mexican Mollusks to the United States National Museum by Miss Marie E. Bourgeois contains a specimen of *Tomocyclus* collected by Professor Luna at Santecomapan, Vera Cruz, which requires naming. Fischer and Crosse in their *Mission Scientifique au Mexique et dans l'Amerique Centrale*, Volume 2, part 7, page 124, plate 40, figures 11, 11a, list and figure the present species under the name of *Tomocyclus guatemalensis* Pfeiffer. The specimen which they figure was collected by A. Boucard at San Martin Tuxtla, Vera Cruz, a locality nearby the present gathering. I take pleasure in naming it for Professor Luna.

Tomocyclus guatemalensis (Pfeiffer) came from Alta Vera Paz, Guatemala, and while small and with narrow peristome like the present form, is much stouter and has the whorls much higher than the present species.

***Tomocyclus lunai*, new species.**

Shell small elongate-turritid with pale brown periostracum. Early whorls decollated in the type. The whorls remaining are well rounded and marked by incremental lines only. Suture strongly constricted. Periphery well rounded. Base short, strongly rounded, openly narrowly umbilicated, marked by weak axial ribs. Aperture almost circular; peristome double, the inner moderately exerted, the outer peristome comparatively narrow and very much so on the parietal wall which bears the characteristic notch of the genus.

The type (U.S.N.M. Cat. No. 573547) has 5.5 whorls remaining and measures: Height 25.3 mm., Diameter 11.0 mm.

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PROCEEDINGS
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TWO RATS FROM MOROTAI ISLAND.

BY REMINGTON KELLOGG.*

Among the mammals recently submitted to the U. S. National Museum for identification are two apparently undescribed rats. These are characterized as follows:

Rattus concolor solatus, subsp. nov.

Type locality.—Morotai Island, Gilolo Group, Moluccas, Netherlands East Indies.

Type specimen.—Male adult, skin and skull; No. 277317, U. S. National Museum; collected October 23, 1944, by J. F. C. and R. M. R.; original number 4.

Distribution.—Known only from type locality.

General characters.—Mammae, 2-2=8. Pelage of upperparts stiff and harsh. Tail equal to or shorter than head and body. Rows of scales on tail 12 to 13 per 10 mm. Hind foot (c. u.) equivalent to about 20 percent of head and body length. Palate extending behind M³. Teeth like *Rattus concolor*, well cusped. M¹ with five roots. M³ not strongly reduced. Upper molar row equivalent to about 17 percent of condylobasal length. Bullae about 18 percent of occipito-nasal length.

Color (terms after Ridgway, Color Standards and Color Nomenclature, 1912).—General color of upperparts near grizzled olive brown, but darker on back than on sides. Hairs on back and sides drab colored, except for short light colored tip which varies from pinkish buff to cinnamon. Spines on back and sides blackish on apical 3 mm. and light colored for remainder of length. Interspersed with hairs and spines are long black overhairs. No underfur. Hairs on underparts olive buff with dusky bases. Upper surfaces of hands and feet whitish. Tail dark, unicolored.

Pelage.—Stiff and harsh on back and sides. Black overhairs on upperparts up to 18 mm. in length. Noticeable admixture of flattened channeled spines on back and sides, each about 11 mm. in length. Hairs on underparts soft. Hairs on hands and feet short, 1.5 to 2 mm. in length and light colored. Tail moderately haired, the majority of these bristle

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hairs being as long as or only slightly shorter than the length of two scales. Tail moderately scaled, 12 to 13 rows of scales per 10 mm. Ears brownish black, sparsely covered with short hairs externally and short, about 14.5 mm. in length from notch (dried).

Skull.—Similar to that of *Rattus concolor ephippium*, but rostrum more robust and slightly wider at level of maxillo-premaxillary suture. Supra-orbital ridges distinct, extending backward from interorbital constriction along orbital borders of frontals and lateral surfaces of parietals to interparietal. Anterior edge of zygomatic plate (external to infraorbital foramen) straight and not projecting farther forward than in *ephippium*. Bullae narrow, moderately inflated and about 18 percent of occipito-nasal length. Incisive foramina elongated, extending backward to or behind level of front of anterior root of M^1 , widened medially and posteriorly, but attenuated anteriorly. M^3 varying from 1.2 to 1.3 in length. A minute antero-external cusplet on M^2 . Upper incisors smooth, rounded in front, and not retroflected like in *ephippium*, although this difference may be attributable to differences in wear.

Measurements.—*Type*: Total length, 260 mm.; tail, 130; hind foot (c. u.), 25. One male and two female topotypes, respectively: Total length, 240, 248, and 206; tail, 120, 118, and 100; hind foot (c. u.), 25, 25, and 25.

Skull (type and one female topotype): Greatest length, 33, 32.3; condylobasal length, 32.4, 30.4; zygomatic width, 16.1, 15.5; interorbital width, 5.6, 5.5; length of nasals, 11.9, 12.1; palatilar length, 15.7, 15.4; anterior palatal foramina, 6.4, 5.7; length of bulla, 5.9, 5.6; length of upper molar row, 5.1, 4.8; length of mandible, 18.6, 16.9.

Remarks.—According to the description published by Allen,¹ the Buru Island *Rattus burensis* has a pale rufous-brown coloration, spineless pelage, and silvery gray underparts, and thus is quite unlike *solatus*. Examination of the type of *buruensis*, however, revealed that the hairs on the underparts are dark basally and washed terminally with either whitish or ivory yellow. Flattened channeled spines are present in the mid-dorsal region. The general coloration of this rat is also much darker and much more spiny than *Rattus raveni* on Celebes and the rats referred to *Rattus concolor ephippium* on Java and Borneo. The darker and more olive-brown coloration will also distinguish the Morotai rat readily from *Rattus todayensis* and *Rattus vulcani* on Mindanao, Philippine Islands.

Specimens examined.—Total number, 5, from the type locality.

Rattus morotaiensis, sp. nov.

Type locality.—Morotai Island, Gilolo Group, Moluccas, Netherlands East Indies.

Type specimen.—Male adult, skin and skull; No. 277312, U. S. National Museum; collected October 26, 1944, by J. F. C. and R. M. R.; original number ♀.

¹ Allen, J. A., Bull. Amer. Mus. Nat. Hist., vol. 30, p. 336. December 21, 1911.

Distribution.—Known only from the type locality.

General characters.—Mammae, 2-2=8. Pelage excessively spiny, above and below. Tail normally longer than head and body. Rows of scales on tail 8 to 9 per 10 mm. Hind foot (c. u.) equivalent to about 18 to 22.7 percent of head and body length. Palate extending behind M^3 . Molar teeth well cusped. M^3 with five roots. A distinct cinguloid-ridge on anterior border of M^1 . M^3 not strongly reduced. Upper molar row equivalent to about 15.5 percent of condylobasal length. Bullae about 14.6 percent of occipito-nasal length.

Color.—General color of upperparts coarsely grizzled olive brown; somewhat lighter in worn pelage. Underparts cream buff, heavily spotted with russet on breast, throat and chin. In some specimens, the cream buff hairs on inguinal and abdominal regions have lighter russet tips. Upper surfaces of hands and feet near wood brown; toes lighter in color. Tail black, unicolored.

Pelage.—Excessively spiny, above and below, except for the rather soft hairs on the chin. No underfur; basal hairs short and sparse. Black overhairs on upperparts up to 35 mm. in length. Spines on back about 16 mm. in length, black on apical 4 mm. or with 1 mm. light tip. Individual spines channeled lengthwise on one side and convex on the other. Flattened hairs on hands and feet short, about 2 mm. in length, and light colored except for dark sub-basal band. Tail scantily haired, almost bare in old adults, but with 3 hairs per scale in immature individuals, the majority of these bristle hairs being slightly longer than the length of one scale. Tail coarsely scaled, 8 to 9 rows of scales per 10 mm. Ears black, sparsely covered with short hairs externally and short, about 15 mm. in length from notch (dried).

Skull.—Rostrum relatively slender; braincase normal; supraorbital ridges distinct from origin on frontals to about 5 mm. behind frontoparietal suture, without postorbital projections, and extending backward on parietals to interparietal in varying degrees of development. Infra-orbital foramen rather wide above; anterior edge of zygomatic plate (external to infraorbital foramen) nearly straight and either vertical or slanting backward (in contrast to the concave or forward slanting anterior edge in the case of *Rattus ringens coenorum*). Zygomatic plate projects distinctly forward in *coenorum* and scarcely at all in this rat. Bullae moderate in size, about 14.6 percent of occipito-nasal length. Incisive foramina elongated, narrow, not noticeably expanded medially and extending backward to or almost to level of anterior end of M^1 . M^3 varying from 1.6 to 1.7 mm. in length. A distinct antero-external cusplet on the M^2 and M^3 of two skulls (Nos. 277310 and 277315); this cusplet is vestigial on the other skulls. Upper incisors smooth, rounded in front, and not unusually deep antero-posteriorly; lower incisors slenderer and anteriorly lighter in color than upper incisors.

As compared with *Rattus ringens coenorum*, this rat has a much smaller skull, the greatest length averaging somewhat shorter, the rostrum is slenderer, the incisive foramina are less widely expanded medially and

posteriorly, the upper tooth row is shorter, and the zygomatic plate does not project forward dorsally.

Measurements.—*Type*: Total length, 405 mm.; tail, 213; hind foot (c. u.), 41. Three male and two female topotypes, respectively; Total length, 375, 383, 437, 397, and 344; tail, 208, 200, 216, 213 and 186; hind foot (c. u.), 38, 38, 40, 38, and 35.

Skull (type): Greatest length, 42.6; condylobasal length, 41.7; zygomatic width, 21.2; interorbital width, 6.4; length of nasals, 15.3; palatilar length, 21; anterior palatal foramina, 7; length of bulla, 6.5; length of upper molar row, 6.4; length of mandible, 25. Three male and two female topotypes, respectively: Greatest length, 42, 45, 44.3, 42.4 and 37.7; condylobasal length, 41.5, 42.7, 44, 41.7, and 35.9; zygomatic width, 22.3, 23.2, 23.4, 21.7 and 19; interorbital width, 6.2, 6.8, 6.7 and 5.6; length of nasals, 15, 16.2, 16, 16 and 13.3; palatilar length, 22.4, 21.7, 22.7, 22 and 18; anterior palatine foramina, 8, 7.5, 8.6, 8 and 7.2; length of bulla, 6.0,—, 6.1, 6.4 and 5.5; length of upper molar row, 6.4, 6.3, 6.2, 6.5 and 6.5; length of mandible, 26.8, 26.5, 27, 27 and 22.

Remarks.—This rat appears to be related more closely to the *Rattus ringens* group of New Guinea than to either the *Rattus rajah* group or other East Indian rats. Although the hind foot averages shorter than that of *Rattus ringens coenorum*, the lengths of head and body and of the tail are similar for adults. As regards cranial measurements, the occipito-nasal length of the skull and the upper tooth row of *coenorum* are somewhat greater than those of the Morotai rat. Furthermore, the rats of the *ringens* group do not have a pelage as spiny as that of the Morotai rat.

Specimens examined.—Total number, 7², from the type locality.

² Skull only.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW AUSTRALIAN NAKED-TAILED RAT
(MELOMYS).

BY REMINGTON KELLOGG.*

Further study of the rodents collected in Australia by Mr. Charles M. Hoy and presented to the United States National Museum by Dr. William L. Abbott has resulted in the discovery of a form which does not appear to have been previously described.

Melomys cervinipes albiventer, subsp. nov.

Type locality.—100 miles south of Port Darwin, Northern Territory, Australia [camp located near either Brocks Creek or Douglas River].

Type specimen.—Male adult, skin and skull; No. 237782, U. S. National Museum; collected October 20, 1920, by Charles M. Hoy; original number 861.

Distribution.—Known only from the type locality.

General characters.—The general coloration is much lighter and duller than the cinnamon-brown *Melomys cervinipes eboreus*, and the hairs of the underparts are pure white to the base in contrast to the slate basal color in *eboreus*. Mammae (inguinal) 0-2=4. Pelage of upperparts soft and dense. Tail longer than head and body. Rows of scales on tail 10 to 12 per 10 mm. Hind foot (c. u.) equivalent to about 21.5 to 24 percent of head and body length. Palate terminating near level of middle of M^2 . Teeth similar to *Melomys cervinipes cervinipes*. M^1 with four roots. M^3 is strongly reduced. Upper molar row equivalent to 18.5 to 20 percent of condylobasal length. Terminal heel of M_1 and M_2 large, equivalent to about half the width of corresponding molar. Bullae strongly reduced, about 15 percent of occipito-nasal length.

Color (terms after Ridgway, Color Standards and Color Nomenclature, 1912).—General color of upperparts light tawny-brown, duller in worn pelage; sides lighter, washed with cinnamon buff. Hairs on back and sides slate color on at least the basal half, with 3 to 4 mm. buffy sub-apical band, and tawny-brown tip. Overhairs dark brown. Hairs

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on underparts white to base, sometimes faintly washed with ivory yellow. Upper surfaces of hands and feet light colored, the individual hairs near dull white. Tail bicolored, darker above and lighter below.

Pelage.—Rather soft and dense. Dark hairs on upperparts measuring up to 12 mm. in length. Hairs on back and sides averaging about 10 mm. in length. Hairs on hands and feet short, not constituting a dense covering. Tail scantily haired, the bristle hairs light to dark colored, generally 3 in a cluster, and less than the length of a scale. Tail with 10 to 12 rows of scales per 10 mm. Ears brownish, sparsely covered with short hairs externally and about 15 mm. in length from notch (dried).

Skull.—Similar to that of *Melomys cervinipes eboreus*, but somewhat smaller, the greatest length (31 to 32.6 mm.) averaging somewhat shorter than *eboreus* (33.7 to 36 mm.); the rostrum is shorter and more robust; and the interparietal tends to be less expanded antero-posteriorly. Supraorbital ridges absent or weakly developed. Anterior edge of zygomatic plate (external to infraorbital foramen) nearly straight and not projecting farther forward than in *eboreus*. Bullae small, about 15 percent of occipito-nasal length. Incisive foramina short, similar to those of *eboreus*, and not extending backward to level of M¹. Small posterior palatine foramina situated at level of transverse maxillo-palatine suture. Zygomatic arches less widely spreading than in *eboreus*. M³ varying from 1.2 to 1.3 mm. in length. Upper incisors smooth, rounded in front, and retroflected to the same degree as in *eboreus*.

Measurements.—*Type*: Total length, 301 mm.; tail, 165; hind foot (c. u.), 31. One male and two female topotypes, respectively: Total length, 300, 258, and 249; tail, 161, 133, and 133; hind foot, 30, 28, and 28. Skull (type): Greatest length, 31.5; condylobasal length, 30.7; zygomatic width, 17; interorbital width, 5; length of nasals, 11; palatilar length, 14; anterior palatine foramina, 5.1; length of bulla, 4.6; length of upper molar row, 5.8; length of mandible, 20. One male and two female topotypes, respectively: Greatest length, 32.6, 31.8, and 31; condylobasal length, 31.8, 29.7, and 29.3; zygomatic width, 16.2, 15.2, and 15.9; interorbital width, 5, 5, and 4.8; length of nasals, 11.8, 11, and 11; palatilar length, 14.5, 14, and 14; anterior palatine foramina, 5, 5, and 5.2; length of bulla, 5, 4.5, and 4.9; length of upper molar row, 5.9, 6.1, and 5.7; length of mandible, 18.5, 17.6, and 17.6.

Remarks.—The four skins referred to this form have been compared with a series of eight *Melomys cervinipes eboreus* obtained by Hoy on the Atherton Tableland, 9 miles south of Ravenshoe. All of these specimens from the Atherton Tableland have the slate basal coloration showing through on the underparts, the individual hairs being slate color on about the basal three-fourths and tipped terminally with whitish or pinkish buff. The pure white coloration of the underparts of *albiventer* is thus quite unlike that of both *cervinipes* and *eboreus*. On the other hand the external dimensions of *albiventer* are quite similar to *eboreus* and *cervinipes*. The skull of the white-bellied *Melomys banfieldi* is much larger than that of *albiventer* and the hind foot of the white-bellied

Melomys murinus is considerably smaller. Both *Melomys littoralis* and *Melomys australis* have a smaller hind foot than *albiventer*. The form here described is referred to the *cervinipes* group chiefly on account of skull and tooth characters as well as similar external dimensions.

Specimens examined.—Total number, 7,¹ from the type locality.

¹Two represented by skulls only.



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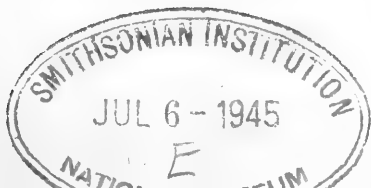
NOTES ON FISHES IN THE ZOOLOGICAL MUSEUM
OF STANFORD UNIVERSITY.

XVIII.—TWO NEW SPECIES OF TAMANKA, WITH
A KEY TO THE SPECIES FROM THE PHILIPPINES
AND CHINA.

ALBERT W. C. T. HERRE.

The genus *Tamanka* which I established in 1927, includes those medium sized to very small gobies which are especially distinguished by the presence of many small cycloid scales on the opercles, while the rest of the head is naked. This is in marked contrast to the large assemblage of small gobies which I include in the genus *Vaimosa*, particularly distinguished by having a small number of large ctenoid scales on the opercles, the rest of the head being naked. Other characters of *Tamanka* are the comparatively numerous scales, 38 to 54 in a lateral series, and the increased number of small predorsal scales. The body may be thick and robust, or laterally compressed and slender, with a large broad head, usually flattened on top. The vertical fins are small and low, the dorsals well separated; the broad rounded caudal is usually shorter than the head, with numerous accessory spines which extend upon the caudal peduncle; the oblique terminal mouth has thick lips, with 4 or 5 rows of minute teeth in the lower jaw and 3 or 4 rows in the upper jaw, with an outer row of slightly larger teeth; no canines; gill openings wide, with broad isthmus; no free silky rays on the pectoral. Dorsal VI-I-7 to 8; anal I-7 to 9.

Most of the species live in mangrove or nipa swamps, or in tidal creeks, where the water is more or less brackish. One species, *Tamanka siitensis*,



JUL 6 '45

the type of the genus, lives in fresh water crater lakes on the island of Jolo, and also in streams on Mindanao. So far as known, it is the only fish occurring in the crater lakes of Jolo. In general the species of *Tamanka* are inconspicuous little fishes, overlooked by collectors and scientific students as they live in places little visited or known. Apparently they are rare, with the exception of *Tamanka siitensis*, which swarms in the waters it inhabits. Probably collecting at a different time of year in proper localities would show the species of *Tamanka* to be as abundant as other small gobies, such as *Vaimosa*.

KEY TO THE SPECIES OF TAMANKA KNOWN FROM THE PHILIPPINES AND CHINA.

- A. Scales 38 to 46.
- B. With 2 longitudinal dark brown bands*T. bivittata*
Habitat: Hainan Island and Kwangtung Province, China.
- BB. No longitudinal dark bands.
- C. Body dark brown.
- D. Uniform dark brown, without markings;
lateral scales 38; transverse 12*T. umbra*
Habitat: Palawan, P. I.
- DD. Dark brown with 9 vertical black bands;
lateral scales 44-46; transverse 14.....
T. talavera
Habitat: Near Capiz, Panay, P. I.
- CC. Ground color pale tan with brown cross bands.
- E. Lateral scales 38, transverse 12,
predorsal 16, opercular 24.....*T. mindora*
Habitat: Southwestern Mindoro, P. I.
- EE. Lateral scales 44, transverse 18,
predorsal 24, opercular 40.....
T. philippina
Habitat: Mangarin, Mindoro, P. I.
- AA. Scales 52-54.
- F. Body robust, uniform brown to black; predorsal scales 20-24*T. siitensis*
Habitat: Jolo and Mindanao, P. I.
- FF. Body slender, brownish yellow, with 10 vertical cross bars; predorsal scales 25-30.....*T. tagala*
Habitat: Luzon, and Sitankai, Sulu Islands, P. I.

Tamanka mindora Herre, new species.

Dorsal VI-I-7; anal I-7; scales in lateral series 38; transverse series 12; predorsal scales 16; opercular scales 23 or 24.

The body is rather stout with very gently convex back, the ventral profile horizontal; the depth is 5.1, the head 3.5, the caudal 3.8 times in the length. The oblique mouth is broad, the posterior angle of the maxillary beneath the anterior margin of the pupil; the tip of the tongue is truncate when viewed from above, but is slightly indented when seen from below; the minute teeth are typical of the genus; the eye is in the front half of the head, dorso-lateral in position, 4.4 times in the head, and slightly exceeds the convex broadly rounded snout; the flat interorbital equals the eye; the postorbital is 56% of the length of the head. The vertical fins are small, the dorsals far apart; the tips of the first dorsal spines are filiform, the third spine longest, 2.2 in the head; the second dorsal and anal equal the first dorsal in height and fall far short of the caudal base when depressed; the pointed pectoral is 4.25 times in the length, the pointed ventral 4.6, extending about half way to the anal origin; the least depth of the caudal peduncle is 2.1 in its own length.

The color in alcohol is very pale yellowish tan, largely concealed by 9 or 10 dorsal cross bands of brown and a median row of 8 brown spots along the side; the head is mottled with brown, a darker spot on the opercle; 2 small dark brown spots on the caudal base; the upper half of the first dorsal, except the white thread-like tips, is black; the second dorsal and anal are mottled with brown; the anal and central part of the ventrals are brown; the pectoral is clear or nearly so.

Described from the type, a male 23 mm. long, collected from a brackish water mangrove swamp at Hacienda Waterous, Mangarin, Mindoro, P. I. A juvenile male taken with the type was not used in writing the description.

Tamanka philippina Herre, new species.

Dorsal VI-I-8; anal I-9; lateral scales 44, in transverse series 18; predorsal scales 24; opercular scales 40.

The slender body is laterally compressed, the head broader than the trunk, the dorsal profile nearly horizontal, the ventral outline gently convex; the depth is 5.1, the head 3.5, the damaged caudal 4.4 times in the length; the breadth of the head is 1.6 times in its own length; the eye is high up, dorso-lateral, in the anterior half of the head, 4.2 times in the head; the broad blunt convex snout equals the flat interorbital, 5.25, the postorbital 1.75 times in the head; the oblique mouth is terminal, the angle of the maxillary beneath the anterior third of the eye; the minute teeth are typical of the genus; the truncate tongue is broad at the tip. The vertical fins are all low, the first dorsal with filiform tips, none of them reaching the second dorsal when depressed; the second spine is longest, 2.1 in the head or 7.33 in the length; the middle rays of the second dorsal are highest, equal to the second spine of the first dorsal; the posterior anal rays are highest, a little less than the longest dorsal rays; the

second dorsal and anal fall far short of the caudal base when depressed; the pectorals have been damaged but equal the ventrals, 1.5 in the head or 5.2 times in the length; the ventrals reach little more than half way to the anal origin; the least depth of the caudal peduncle is 1.6 times in its own length.

The color in alcohol is pale whitish tan, with 8 anastomosing brown stripes forming a network over the back and on the sides, and on top of the head; two diagonal stripes from the eye across the preopercle and a similar stripe from the angle of the mouth to the front margin of the opercle; a blue-black spot below the middle of the opercle, just behind its front margin; a white basal band on the first dorsal, and a median black band, the first spine and the tips of the others all white; 3 blackish brown spots on the second dorsal base and a median brown band on the posterior half; a heavy dark brown band on the caudal base, the rest of the fin barred and spotted with brown; the other fins colorless or nearly so.

Described from the type and only specimen, a male 22 mm. long, taken from brackish water at Hacienda Waterous, Mangarin, Mindoro, P. I.

The scalation of this little fish is entirely different from that of any of its congeners.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONNOTES ON FISHES IN THE ZOOLOGICAL MUSEUM
OF STANFORD UNIVERSITY.XIX.—TWO NEW PHILIPPINE GOBIES, WITH KEY
TO THE GENERA OF GOBIES WITH VOMERINE
TEETH.

ALBERT W. C. T. HERRE.

While in charge of fishery investigations in the Philippines, I was compelled to take up the study of gobies because of the great economic importance of certain species at the mouths of streams in northern Luzon. The study soon spread to gobies in general, and during the subsequent years the collection, observation in the field, and critical examination of gobies has continued. The gobioid fishes present problems of great interest and intriguing possibilities to the field naturalist who will pursue them on the coral reefs, in the mangrove swamps, and along the streams and lakes of the oriental tropics especially. Those interested in geographical distribution, variation, adaptation, physiological phenomena, and evolution in general, could find no better vertebrate organisms to work with than some of the gobies (*sensu lato*). Such studies should be carried on chiefly with living material, the investigator working with them in their native habitat.

Some of the gobies present very singular or bizarre variations, often tangential to the ordinary goby structure. One of the remarkable variations, and one which has been forced upon my attention, is that presented by the gobies with teeth on the vomer. These teeth may vary from those rather small in size, and more or less concealed, to those which are relatively of gigantic size. The vomerine teeth of gobies hitherto known are all set transversely on the vomer; they may be widely spaced, but more often their inner edges touch. In those species with the largest and best developed teeth they are firmly united to form a single large chisel-like organ. In one of the new species here presented the arrangement of the

teeth is quite different; the vomerine teeth are small and set one behind the other on the median line of the vomer.

Two new genera and two new species of gobies with vomerine teeth are here presented, together with a key to the genera thus far known of this peculiar section of gobies. Nine genera and 14 species of gobies with vomerine teeth are now known, all but one of which have been discovered by me. Ten of the species are thus far known only from the Philippines; two are known from reefs at Singapore, one from the Pelew Islands, and one from Apia, Samoa. Such a distribution indicates that not only the East Indies but also the whole vast Indo-Pacific tropical area must contain many more gobies with vomerine teeth. The number now known is probably less than half of those actually living on the coral reefs of the tropical Indo-Pacific.

KEY TO THE GENERA OF GOBIES WITH VOMERINE TEETH.

- A. Vomerine teeth set one behind the other on the median line; 3 flaps on inner edge of shoulder girdle; opercle with numerous small scales; a pair of post-symphysial canines in lower jaw.....

Calamiana

One species from Busuanga Island, P. I.

- AA. Vomerine teeth set side by side, across the vomer; no flaps on shoulder girdle, opercle not as above; no post-symphysial canines in lower jaw, as far as known.

B. Scales ctenoid, 40 or less.

- C. No predorsal scales; lateral series about 24....*Coronogobius*
One species from Busuanga, Is., P. I.

CC. Predorsal scales present.

D. Predorsal scales 6; lateral series about 26.

- E. Head and body scaled; no ridges or rows of sensory papillae on head....*Macrodontogobius*
One species from Gorrer, Pelew Islands.

- EE. Head naked with many ridges and sensory papillae; median lateral scales with vertical rows of papillae.....*Intonsagobius*
One species from Jolo, Sulu Islands, P. I.

- DD. Predorsal scales 14-16; lateral series 38-40; head naked; mouth little inclined; sensory papillae scarcely evident; lateral recurved canines in lower jaw.....*Mindorogobius*
One species from southwestern Mindoro, P. I.

BB. Scales 40 or more, cycloid or ctenoid.

- F. Scales more or less ctenoid, at least posteriorly.

- G. Scales 40–50, more or less cycloid on anterior half, posterior scales enlarged, mouth nearly vertical, chin prominent; no conspicuous lines of papillae on cheeks.....

Mangarinus

One species from Mangarin, Mindoro, P. I.

- GG. Scales 60–65, all ctenoid, or only on posterior half; mouth moderately oblique; head with many conspicuous lines of sensory papillae....

Mars

One species from Samoa and two from the Philippines.

- FF. Scales all cycloid, 60 or more.

- H. Lower jaw projecting, maxillary extended back on preopercle, scales about 60; predorsal area, a strip back to second dorsal, and area below a diagonal from pectoral axil to anus all naked....

Myersina

One species from Culion, P. I.

- HH. Maxillary not extended backward, jaws equal; scales 70 to 85; no scales before line from first dorsal to ventral base; upper lip lined with dense papillate fringe.....

Smilogobius

2 species from the Philippines and 2 from Singapore.

Calamiana Herre, new genus.

Two small incisor-like teeth on the median line of the vomer, one in front of the velum and the other behind it, the teeth well separated. The teeth in the jaws are small to minute, those of the upper jaw in two rows at the front, with a third row of larger teeth some distance behind; lower jaw with two or three rows of teeth, and a pair of symphyseal canines behind them. The tongue has a broad, free, lunated tip. There are 3 small fleshy flaps on the inner margin of the shoulder girdle.

The form is wedge-shaped, the trunk laterally compressed, the head large, broad, with blunt rounded snout and large oblique mouth, the maxillary reaching beyond the eye; physiognomy peculiar, a wide deep groove separating the maxillary from the overlapping snout flap and

suborbital; anterior nostril in a projecting tubule which hangs down over the maxillary; eyes small, in the anterior half of the head. The fins are small to medium, the dorsals well separated, the second dorsal and anal not reaching the caudal base when depressed; the caudal is bluntly rounded. The gill openings are a little wider than the pectoral base, the isthmus broad.

Dorsal VI-I-7; anal I-6; scales in lateral series 86 to 40, in transverse series 12; predorsal scales 12 to 15; head naked, except opercles which are covered with small scales; all scales before a perpendicular from the first dorsal cycloid, the rest ctenoid; abdomen and preventral region scaled.

Type of the genus *Calamiana magnoris* Herre, new species. *Calamiana*, from the Calamianes, a group of Philippine Islands. Busuanga, and Culin, with their adjacent islets, are called collectively the Calamianes.

***Calamiana magnoris* Herre, new species.**

Dorsal VI-7; anal I-6; scales in lateral series 38, transverse 12; predorsal scales 14, the anterior one largest and projecting into the interorbital space; opercular scales about 18; pectoral base covered with very small scales.

The form is as given in the generic description, the depth 5.35, the head 3.2, the caudal 3.75, the pectoral 4.28 times in the length. The head is broad, with bulging cheeks, its width 1.5 in its own length; the eye is 5.16, the snout 4.2, the maxillary, which extends almost to the posterior angle of the preopercle, 1.6 times in the head; the postorbital is more than half of the head length; the interorbital is 1.8 times in the eye. The third and fourth spines of the first dorsal are longest, 3.1 in the head or 10 times in the length; the second dorsal and anal are of equal height, their posterior rays longest, 1.86 in the head or 6 in the length; the short wide ventral is 6.66 in the length. The female genital papilla is thin, with lunate tip. Other characters are given in the generic diagnosis.

The color in alcohol is very pale tan, each scale stippled with minute brown dots; a brown stripe runs from the lower margin of the eye across the preopercle and opercle; the dorsals have a few dark spots basally, then a white longitudinal bar, the balance reddish brown; the other fins are all more or less reddish brown.

Described from the type and sole specimen, a female 30 mm. long, collected by me at Coron, Busuanga, July 1, 1940. This is a unique species; its combination of vomerine teeth one behind the other, symphyseal canines in the lower jaw, fleshy flaps on the inner edge of the shoulder girdle, and numerous small opercular scales, set it apart from all other gobies. *Magnoris*, big mouth, from *magna*, large, and *oris*, mouth.

***Coronogobius* Herre, new genus.**

Dorsal VI-I-8 or 9; anal I-7 or 8; scales in longitudinal series 22 to 26, in transverse series 7 to 9; head naked except for a strip of small cycloid scales above the opercle and preopercle, without sensory papillae; all other scales ctenoid except the preventral ones, which are very small and cycloid.

Body laterally compressed, fins low, the ventrals fragile and their frenum very delicate. The eyes are very high up and close together; the chin is prominent, the mouth strongly oblique, the teeth small; the upper jaw has an outer row of enlarged teeth with 2 or 3 rows of minute teeth behind it; in the lower jaw the outer row has larger teeth than in the upper jaw, with a small posterior canine, and three inner rows of minute teeth; on the vomer is a pair of enlarged incisor-like teeth which are not fused or united; the tongue is small, free, its tip rounded. The gill openings are wide, the isthmus broad; no free silky rays on the pectoral.

Type of the genus *Coronogobius striatus* Herre, new species.

Named for the little town of Coron, Busuanga Island, Philippine Islands, where the specimen was obtained.

Coronogobius striatus Herre, new species.

Dorsal VI-I-8; anal I-7; 24 scales in a longitudinal series, plus 1 on the caudal base, and 8 in a transverse series; no predorsal scales, but small scales extend forward on the side above the opercle nearly to the eye.

The body is laterally compressed, the dorsal profile gently arched, the ventral profile a little more arched, the depth almost 4 times (3.96) in the length; the round-pointed caudal equals the compressed head, 3.5 in the length; the large eye is 3 times in the head, dorso-lateral in position, projecting above the dorsal profile, the interorbital very narrow, 7.66 times in the eye; the short broad snout is 2.3 times in the eye; the chin is prominent, the mouth strongly oblique, the angle of the maxillary beneath the anterior fourth of the eye; the first dorsal spines have filiform tips, the longest about 5 times in the length, reaching to the base of the second ray of the second dorsal when depressed; the posterior second dorsal rays are longest, 6 times in the length, the posterior anal rays a very little shorter, both anal and second dorsal falling far short of the caudal when depressed; the pectoral and ventral are equal, 3.88 in the length; the frenum of the ventrals is very thin and delicate, and the ventrals have been torn apart, the whole ventral structure being fragile.

The color in alcohol is pale tan, each scale stippled with minute darker dots; faint traces of darker cross bars on the caudal, and of duskiness on the second dorsal and anal; the head is marked with longitudinal pale stripes as follows: One from the tip of the snout over the rim of the eye to the predorsal region; two from the eye to below the first dorsal origin; a broader one from the snout across the lower margin of the eye to the opercle and upon the pectoral base; a still broader one from the tip of the chin and across the angle of the mouth to the hind margin of the opercle, where it connects by a broad arm with the stripe above, and on back across the pectoral base; a sixth stripe runs from the chin back along the under side of the head as far as the ventral origin.

Here described from the type and only specimen, 21 mm. long, standard length, which I secured among the coral heads of the little dock at Coron, Busuanga Island, Philippine Islands. This is a unique goby, unlike any previously known to me.

(*Striatus*, striped.)





PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW ANT-THRUSH FROM VENEZUELA

By HERBERT FRIEDMANN*.

The new species described below was discovered while studying the collection of birds made in the Upper Orinoco and upper Rio Negro by Holt, Blake, and Agostini in 1930 and 1931. My own suspicions regarding it were more than corroborated by Dr. John T. Zimmer, to whose expert eyes the specimens were shown. The bird may be known as

Myrmeciza disjuncta sp. nov.

Type: U. S. Nat. Mus. 328955, immature male, collected at Cerro Yapacana, Upper Orinoco, Venezuela, April 10, 1931, by Holt, Blake, and Agostini on the National Geographic Society's Brazilian-Venezuelan boundary expedition.

Description: Forehead, crown, occiput, nape, scapulars and interscapulars blackish mouse gray with a faint brownish tinge; back, rump, and upper tail coverts similar but without the brownish tinge; the bases of the upper back feathers and of some of the interscapulars white forming a large concealed patch of that color; lesser and median upper wing coverts black narrowly tipped with white; the greater ones without the terminal spots; remiges between dark fuscous and fuscous black; rectrices fuscous black; lores, auriculars, and cheeks neutral gray; chin white; throat and breast white suffused, especially on the sides of the throat and all of the breast, with ochraceous buff to pale ochraceous tawny; sides and flanks ochraceous buff, mixed, especially posteriorly, with blackish mouse gray; middle of abdomen white, thighs and under tail coverts deep mouse gray somewhat mixed with ochraceous buff on the thighs and around the vent; under wing coverts blackish mouse gray; maxilla (in dried skin) entirely blackish; mandible pale yellowish cream buff; tarsi and toes slightly darker than maxilla.

Measurements of type: Wing 58.1; tail 47.9; culmen from base 20 tarsus 29 mm.

The type is molting to some extent and the new, adult feathering is very similar to the older, supposedly immature plumage. An adult

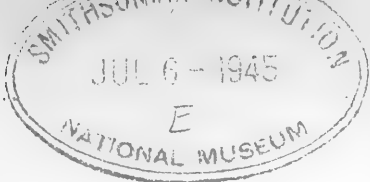
*Published by Permission of the Secretary of the Smithsonian Institution.



female collected at the same locality agrees closely with the type but has the under tail coverts ochraceous buff with no deep mouse gray admixture, and has the lesser and median upper wing coverts narrowly tipped with dusky ochraceous buff. Its measurements are—wing 62; tail 44; culmen from base 21; tarsus 27.1 mm.

Known only from the type locality.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE TAXONOMIC STATUS OF SOME CHIPMUNKS
OF THE GENUS EUTAMIAS IN SOUTHWESTERN
UTAH.

By ROSS HARDY, *Dixie Junior College, Saint George, Utah.*

When Howell published his "Revision of the American Chipmunks" (1929, U. S. Dept. Agric. N. Amer. Fauna, No. 52:1-53) he assigned specimens in winter pelage from the Pine Valley Mountains and some in summer pelage from the "Parawan" Mountains of Southwestern Utah to the race *Eutamias quadrivittatus inyoensis*. He had only summer pelage of *Eutamias adsitus* from the Beaver Mountains for comparison. Burt (1931, Jour. Mammal. 12:298-301) later named the race *E. q. nevadensis* from the Sheep Mountains of Southern Nevada.

A series of both summer and winter pelage of *E. adsitus* topotypes and of similar Pine Valley Mountain material as well as summer skins from Duck Creek on the Markagunt Plateau (the "Parawan" Mountains of Howell) have been collected by the writer since the summer of 1939. This material sheds new light upon the probable relationship of *Eutamias* populations of Southwestern Utah. I wish to thank Dr. S. B. Benson of the California Museum of Vertebrate Zoology and Dr. H. H. T. Jackson of the U. S. Fish and Wildlife Service for the use of comparative material. Color terms capitalized are as in Ridgway (1912, Color Standards and Color Nomenclature).

When adult chipmunks from Pine Valley, Washington County, Utah, are compared with adults in similar pelage of topotypes of *inyoensis*, *nevadensis*, and *adsitus*, using characters mentioned by Howell (*op. cit.*:85) and Burt (*op. cit.*:299), the following may be noted:

1. *General color of upperparts*: Material from Pine Valley is very little darker than *inyoensis* topotypes in summer pelage, but winter specimens are more pallid for some (as #1937 Hardy coll.) are nearly indistinguishable from *nevadensis* topotypes. In summer pelage, some specimens are paler than *adsitus*.
2. *Median pair of light stripes*: The amount of tawinness mixed with the

5

light stripes is greater in Pine Valley summer material than in *inyoensis*, but the winter pelages show no important difference. In 5 of 13 winter specimens from Pine Valley, these light stripes are a lighter gray than the rump as in *nevadensis*. When compared with *adsitus*, there is no appreciable difference in winter, but in summer most have stripes less mixed with tawny.

3. *Outer pair of dark stripes*: In summer pelage, the outer dark stripes in Pine Valley material is much mixed with tawny as in *inyoensis*. Compared with summer *adsitus*, these stripes are less blackish except for #1550 from Pine Valley in which they are as dark as in most *adsitus* and except for #1712 from the Beaver Mountains in which the stripes have much Tawny admixture. In winter the stripes are not as dark as in *adsitus* topotypes.

4. *Short external stripe*: There was a short dark stripe external to the posterior part of the outer light stripes in 5 of 15 *adsitus* topotypes. It was absent in the *inyoensis* and *nevadensis* topotypes. In Pine Valley specimens it was faintly suggested in 9 of 24. In Duck Creek material it was faintly suggested in 2 and present in 3 of a total of 9.

5. *Grayish head*: In summer, Pine Valley material is the same as *inyoensis* topotypes in quality and amount of gray color of the head, but in winter the top of the head is a clearer gray than in either *adsitus* or *inyoensis*, being like *nevadensis*.

6. *Postauricular patches*: About the same size as in *inyoensis* except they are somewhat smaller in a few Pine Valley specimens, being more like *adsitus* in these individuals.

7. *Amount of tawny in dorsum of tail*: At all seasons, the tail is less Tawny than in *inyoensis* and has about the same amount of black and Tawny as *adsitus*.

8. *Color of ventral surface of tail*: The undersurface of the tail (discounting edgings) is uniformly Tawny in 17 topotypes of *inyoensis*. Topotypes of *nevadensis*: Cinnamon Buff, 5. Topotypes of *adsitus*: Tawny, 9; Cinnamon Buff, 2; intermediate between Tawny and Cinnamon Buff, 4 (includes 3 immature). Pine Valley specimens: Tawny, 11; Cinnamon Buff, 4; intermediate, 18 (includes 16 juvenile). Duck Creek specimens: Tawny, 8; Cinnamon Buff, 1.

9. *Color of edging of tail*: Pine Valley animals have the edging Tilleul Buff in 15 specimens while it is intermediate between this shade and Tawny in 18 (includes 16 juvenile). In 17 topotypes of *inyoensis*, the tail edging is Tawny. In 5 *nevadensis* it is Tilleul Buff which looks almost grayish against the dark background. In 12 *adsitus* topotypes, it is Tilleul Buff.

10. *Size of ears*: There is no difference in size of ears between Pine Valley animals and *adsitus* topotypes when fresh specimens are measured in the flesh.

11. *Facial markings*: In Pine Valley material, facial markings are prominent in most individuals, but in #1937 and #1765 they are less distinct, including the almost invisible submalar, as in *nevadensis*.

12. *Color of feet*: The feet are a "lighter clearer gray" as in *nevadensis* in 5 out of 13 winter specimens from Pine Valley.

13. *Interorbital width of skull*: The interorbital width is greater than in *inyoensis* in Pine Valley material measured, being like *nevadensis* and *adsitus*.

Specimens from Duck Creek:

When specimens from Duck Creek are compared, in addition to the characters noted above, they are seen to be almost like topotypes of *adsitus* except for the darker tail with darker and more nearly Tawny edgings, which, however, are not as dark as in *inyoensis*. The outer pair of dark stripes are less Tawny and more nearly black as in *adsitus*. The dark buffy edging of the tail may indicate relationship to the buffy-edge tailed *E. q. hopiensis* or *E. q. quadrivittatus* found farther east instead of to the western *inyoensis*. Howell stated that animals from the Henry Mountains show affinities with typical *quadrivittatus*.

Conclusions:

In view of these variations, it is believed that *Eutamias* from the Markagunt Plateau and the Pine Valley Mountains, while showing affinities to *inyoensis*, represent intergrades between *nevadensis* and *adsitus*, being closer to the latter. Because of these intergrades, *adsitus* should be regarded as conspecific with *nevadensis* and *inyoensis*. They are considered at present as races of *quadrivittatus* because of Howell's statement that there are intergrading characters in the Henry Mountains population of Southeastern Utah. Although material from this range has not been examined, it is unlikely that the Henry Mountains population can longer be considered as *inyoensis*, hence the name *Eutamias quadrivittatus inyoensis* should be deleted from the list of mammals occurring in Utah. The name *Eutamias quadrivittatus adsitus* should be used for the chipmunks of the Beaver Mountains, the Markagunt Plateau, and the Pine Valley Mountains although the animals from the last two areas are intergrades.

Specimens examined:

In addition to 17 topotypes of *inyoensis* and 5 topotypes of *nevadensis* the following 57 specimens of *Eutamias quadrivittatus adsitus*: UTAH, BEAVER COUNTY, Brigg's Meadows and adjacent areas in the Beaver Mountains, 15. KANE COUNTY, Duck Creek, 9. WASHINGTON COUNTY, at various points in the Pine Valley Mountains (6,500 to 10,000 feet altitude), 33.



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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES.

NOTES ON *CEMOPHORA COCCINEA* (BLUMENBACH) IN MARYLAND AND THE DISTRICT OF COLUMBIA VICINITY.

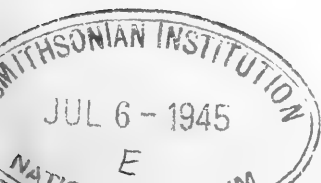
Stejneger (1905, Proc. Biol. Soc. Wash. 18: 73) added the Scarlet Snake, *Cemophora coccinea* (Blumenbach) to the list of snakes known to occur in the District of Columbia. The basis for this addition was a specimen in the United States National Museum (No. 35308) collected in 1893 in the vicinity of Anacostia. Previously, in 1862, Prof. A. Wyatt collected this snake from Baltimore, Maryland. This specimen is now No. 750 in the Museum of Comparative Zoology at Harvard College. This was apparently the initial Maryland record for this snake. Another early Maryland record for this species was collected at St. Margarets, Anne Arundel Co., in 1891. Cope (1900, Ann. Rept. U. S. Nat. Mus. 1898, p. 930) mentions this specimen which was sent alive to the Museum but which later escaped.

The present paper lists the subsequent records for *C. coccinea* from Maryland and the District of Columbia vicinity, together with comments on its distribution. These notes were prompted by the recent discovery of another Scarlet Snake in the local region. This new specimen was made available to the writer through the efforts and cooperation of Mr. D. W. Willingmyre and Dr. Martin H. Muma. These subsequent records are as follows:

MARYLAND:

Wicomico Co., Salisbury; collected by J. P. Brown, April 5, 1923 (Univ. of Md. No. 1).

Prince Georges Co., Brandywine (McCauley, 1940, unpublished PhD. thesis, Cornell Univ.—on the basis of a photograph in the possession of C. S. East).



This snake has also been reported from Severn, Anne Arundel Co., and St. Denis, Baltimore Co., by Kelley, Davis, and Robertson (1936, *Snakes of Maryland*, p. 68).

VIRGINIA:

Fairfax Co., Mt. Vernon (Dunn, 1936, *List of Virginia Amphibians and Reptiles*, Haverford, Pa., mimeographed, p. 5). This specimen is now in the University of Michigan Museum of Zoology (No. 56260).

The recently discovered specimen, which prompted this report, was collected in the basement of a house at Lanham, Prince Georges Co., Maryland, on September 13, 1944. It measured 14 inches in length, while the average for this species is 16 inches (Conant and Bridges, 1939, *What Snake Is That?*, p. 85).

Thus from the time that the initial specimen of *C. coccinea* was collected from Maryland in 1862 to the present, this snake has only been recorded on nine different occasions. The apparent scarcity of this species is probably correlated both with its secretive habits and with its greater abundance in the more southern parts of its range. In this latter connection it is of interest to note that the specimens mentioned by Stejneger (loc. cit.) from the District of Columbia and Maryland were at that time the most northern records for this essentially southern snake. Since that time, however, the range of this snake has been extended to New Jersey (Kauffeld, 1935, *Copeia*, No. 4, p. 191). The present distribution, as given by Stejneger and Barbour (1943, *Check List of North American Amphibians and Reptiles*, 5th Ed., p. 152), is thus from southern New Jersey to Alabama, Louisiana, Oklahoma, and Florida.

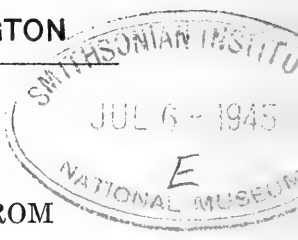
So far as the distribution of *C. coccinea* in the New Jersey, Maryland, and District of Columbia portion of its range is concerned, all of the localities are, with one exception, in the Coastal Plain. The single exception is the specimen collected from Baltimore in 1862 for which there is not sufficient data to determine its exact physiographic affinity. In Virginia, on the other hand, although most of the material is also from the Coastal Plain, there are a few records for the occurrence of this snake in the Piedmont Plateau, and one record from west of the Blue Ridge in the Valley and Ridge Province.

The apparent limitation of *C. coccinea* to the Coastal Plain in New Jersey, Maryland, and the District of Columbia, as compared with its more widespread occurrence in Virginia and other parts of its range, is of considerable interest. This type of distribution is thus shown by other southern species of both amphibians and reptiles which, as they extend their ranges northward, tend to become associated with the Coastal Plain. Moreover, such species usually occur no farther north than either Maryland or New Jersey in the eastern United States. Some of these species, and the State in which they reach their northernmost distribution, are as follows: *Gastrophryne carolinensis* (Md.), *Cnemidophorus sexlineatus* (Md.), *Leiopisium unicolor* (N. J.), *Elaphe guttata* (N. J.), *Pituophis m. melanoleucus* (Rockland Co., N. Y.), and *Lampropeltis g. getulus* (N. J.).

J. A. FOWLER.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



NEW AND INTERESTING SPIDERS FROM
MARYLAND¹

By MARTIN H. MUMA.

The following descriptions and records of spiders collected in Maryland supplement those that appeared in the American Museum Novitates No. 1257. They are composed chiefly from material collected since June, 1943. A total of twenty-seven species are recorded. Unless otherwise noted the collections were made by the author.

Seven new species are described and figured. With the exception of *Phrurolithus pipensis* n. sp. and *Neoantistea gertschi* n. sp. which are described from the female only, both sexes are represented. A description of the female of *Theridion reticulateum* Muma is also included. Types and paratypes are deposited in the American Museum of Natural History in New York City. Some paratypes are retained in the author's collection.

Acknowledgements are due Dr. W. J. Gertsch of the American Museum of Natural History for assistance and advice. Dr. Walter F. Jeffers of the University of Maryland collected many of the species included.

ULOBORIDAE.

Uloborus octonarius n. sp.

	<i>Male</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....		2.1 mms.	1.3 mms.
Abdomen.....		1.5 mms.	1.2 mms.
Over All.....		3.2 mms.	

Leg Formula 1423. First pair of legs nearly twice length of third.

Leg measurements; first leg, femur 2.28 mms., patella .60 mm., tibia 1.95 mms., metatarsus 1.83 mms., tarsus .87 mm.; fourth leg, femur 1.50 mms., patella .45 mm., tibia 1.11 mms., metatarsus 1.08 mms., tarsus .51 mm.

¹Article No. 35, Contribution No. 1970, of the Maryland Agricultural Experiment Station, Department of Entomology.

Cephalothorax subovate in outline and flattened dorso-ventrally, with a deep furrow extending backward from the transverse cervical groove to the posterior margin. Dorsum of cephalothorax brownish grey marked by three light yellow stripes, two marginal extending forward from the posterior margin two-thirds length of cephalothorax and one occupying the longitudinal furrow. Sternum dusky brown, seamed with black. Cephalothorax clothed with prostrate pale hairs.

Eyes all on black spots and all pearly white. Eye area occupies less than $\frac{1}{4}$ of length of cephalothorax. Anterior medians about one diameter apart and removed from the anterior laterals by about twice the diameter. Anterior laterals one-fourth size of anterior medians. Eyes on posterior row subequal and about one-third size of anterior medians. Posterior medians twice as far from each other as from the posterior laterals. Clypeus less than the diameter of the anterior medians. Details of palpi are shown in figure 1.

Legs armed with scattered spines except for dorsal surfaces of the anterior tibiae which bear two rows of closely spaced spines. Legs pale yellow with dusky bands that are most prominent on the anterior femora and tibiae.

Abdomen elongate gradually tapering toward the posterior end. Color of abdomen greyish brown marked with a darker median longitudinal band that is margined with pale yellow. Venter dusky outlined-rectangularly with a narrow pale band. Spinnerets dusky yellow. Abdomen clothed with short pale prostrate hairs.

<i>Female</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....	1.9 mms.	1.2 mms.
Abdomen.....	5.3 mms.	2.5 mms.
Over All.....	6.3 mms.	

Female similar to male in structure and color except for the following characters.

Abdomen bears four pairs of small tubercles on the dorso-median stripe.

Anterior tibiae not armed with a double row of spines.

Leg measurements: first leg, femur 2.94 mms., patella .84 mm, tibia 2.58 mms., metatarsus 2.21 mms., tarsus 1.02 mms.; fourth leg, femur 2.10 mms., patella .63 mm., tibia 1.62 mms., metatarsus 1.44 mms., tarsus .90 mm.

The calimistrum, a single row of curved spines borne on the dorso-lateral surface of the posterior metatarsi at the proximal ends, extends more than half the length of the segment.

Details of epigynum are shown in figure 2.

Ecology.—All specimens were taken from webs in barns and sheds.

Records.—College Park, July 7, 1943, seven females and two males by W. F. Jeffers and M. H. Muma (male holotype, female allotype and paratypes). Salisbury, July 16, 1943, four females by W. F. Jeffers (paratypes). Salisbury, May 29, 1944, four males and one female by W. F. Jeffers (paratypes).

Remarks.—This species differs from other American forms in that the abdomen of the female bears four pairs of tubercles; it also differs in details of the genitalia.

DICTYNIDAE.

Dictyna bostoniensis Emerton.

Dictyna bostoniensis Emerton, Trans. Conn. Acad. Sci., 1888, Vol. VII, p. 447, pl. ix, fig. 3.

Ecology.—One female was collected under a board on a beach.

Record.—Ocean City, July 9, 1944, one female by W. F. Jeffers and M. H. Muma.

Dictyna savanna Chamberlin and Ivie.

Dictyna savanna Chamberlin and Ivie, Bull. Univ. Utah, 1944, Vol. 35, No. 9, p. 121, figs. 161-169.

Ecology.—One pair was swept from a low swampy field.

Record.—Denton, August 11, 1944, one female and one male.

MICRYPHANTIDAE.

Grammonota texana (Banks).

Acartauchenius texana Banks, Proc. Ent. Soc. Wash., 1899, Vol. IV, p. 192.

Ecology.—Several specimens were collected in a dry open field.

Record.—Salisbury, August 11, 1944, two males and one young male.

Sciastes mossi n. sp.

	<i>Male</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....		.48 mm.	.36 mm.
Abdomen.....		.54 mm.	.42 mm.
Over All.....		1.02 mms.	

Cephalothorax obovate in outline, narrowed at eye region and high arched. Color of dorsum dusky yellow with a light shield-shaped area immediately behind eyes. Margins seamed with black. Dorsum naked except for two widely spaced long thin spines on the longitudinal middle line. Sternum, labium and endites dusky yellow somewhat darker than dorsum.

Anterior eye row straight, posterior row lightly procurved. Eyes of posterior row subequal. Anterior medians only one-half size of anterior laterals. Median ocular quadrangle longer than wide and narrowed in front. Area enclosed by eyes, black.

Height of clypeus about twice diameter of anterior lateral eyes. Details of the palpus are shown in figures 3 and 4.

Legs moderately long and armed with weak spines. Except for dusky coxae all legs are light yellow. Measurements of first leg; femur .306 mm., patella .126 mm., tibia .288 mm., metatarsi .225 mm., tarsi .234 mm.; fourth leg, femur .315 mm., patella .126 mm., tibia .288 mm., metatarsus .225 mm., tarsus .234 mm.

Abdomen oval in outline, uniformly colored a dark grey, and sparsely clothed with pale erect hairs. Spinnerets concolorous with abdomen.

<i>Female</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....	.49 mm.	.34 mm.
Abdomen.....	.54 mm.	.42 mm.
Over All.....	1.03 mms.	

Female similar in color and structure to male. Details of epigynum are shown in figures 5 and 6.

Leg measurements: first leg, femur .306 mm., patella .135 mm., tibia .270 mm., metatarsus .180 mm., tarsus .198 mm.; fourth leg, femur .315 mm., patella .135 mm., tibia .270 mm., metatarsus .180 mm., tarsus .198 mm.

Ecology.—All specimens were sifted from sphagnum moss in a small swamp.

Record.—Branchville, March 12, 1942, several males and females by K. E. and M. H. Muma (male holotype, female allotype, paratypes both sexes). Branchville, October 29, 1944, several males and females by W. F. Jeffers and M. H. Muma (paratypes).

Remarks.—This species is comparable in size to *Sciastes acuminatus* Emerton and *Sciastes vicosanus* Bishop and Crosby. It differs from the latter in having the abdomen dark grey in color; details of the genitalia distinguish it from both.

AGELENIDAE.

Agelenopsis jeffersi n. sp.

<i>Male</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....	5.5 mms.	3.7 mms.
Abdomen.....	7.0 mms.	3.5 mms.
Over All.....	11.6 mms. (not including spinnerets)	

Leg Formula 4123.

Structure of cephalothorax typical of genus; subovate in outline, narrowed at head region, and arched highest at eye area. Eye area and clypeus armed with several long curved spines. There is also a row of spines extending along the median line halfway to the cephalic furrow. Height of clypeus about twice diameter of anterior lateral eyes. Upper and lower margins of chelicerae armed with three teeth. Details of palpi shown in figures 7 and 8. Color of cephalothorax light yellow darkening to orange on head region with two longitudinal dusky stripes formed by wedge-shaped spots. Dorsum clothed with pale prostrate hairs except over the dark spots where the hairs are erect and dark. Chelicerae reddish brown, endites and sternum orange with the latter having the anterior and posterior margins dusky.

Eyes typical of genus with anterior medians almost twice the size of posterior medians.

Legs moderately long bearing scattered long slender spines. Color of legs light yellow banded with intermittent dusky bars. Measurements of first leg; femur 3.78 mms., patella 1.56 mms., tibia 3.72 mms., meta-

tarsus 3.90 mms., tarsus 1.89 mms.; fourth leg, femur 4.17 mms., patella 1.44 mms., tibia 3.72 mms., metatarsus 4.86 mms., tarsus 2.07 mms.

Abdomen elongate oval in outline. Spinnerets typical for genus. Abdomen light yellow marked with a light red basal lanceolate bar and a pair of dusky undulate longitudinal stripes. Area between stripes pinkish. Sides and venter sprinkled with small dusky spots. On venter spots tend to form two longitudinal rows extending from spinnerets to epigastric furrōw. Spinnerets pinkish yellow. Abdomen clothed with short pale prostrate hairs and scattered erect long dark spines.

	Female	Length	Width
Cephalothorax.....		6.0 mms.	3.8 mms.
Abdomen.....		7.0 mms.	4.0 mms.
Over All.....		12.2 mms.	

Structure and color of female similar to that of male. All markings darker and more distinct on female than on male.

Measurements of first leg; femur 3.30 mms., patella 1.50 mms., tibia 3.00 mms., metatarsus 2.94 mms., tarsus 1.59 mms.; fourth leg, femur 3.78 mms., patella 1.65 mms., tibia 3.21 mms., metatarsus 3.81 mms., tarsus 1.80 mms.

Details of epigynum shown in figure 9.

Ecology.—Both sexes have been taken from webs on shrubbery and the sides of houses in one locality.

Records.—Salisbury, August 29, 1943, two males and two females (male holotype, female allotype, paratypes). Salisbury, August 31, 1943, one young male and two young females (paratypes). Salisbury, September 10, 1943, two males and two females (paratypes). Salisbury, August 29, 1942, three young females (paratypes). Salisbury, October 1, 1944, three males and five females (paratypes). All specimens were collected by Dr. Walter F. Jeffers.

Remarks.—This species differs from the other representatives of the subgenus *Barronopsis* Chamberlin and Ivie in the bifid tip of the embolus of the male palpus. There is a wide variation of size within the species.

Calymmaria cavicola (Banks)

Tegenaria cavicola Banks, Rept. Ind. Geol. Surv., 1896, Vol. XXI, p. 202.

Ecology.—This species has been taken under stones on a mountain side and on the ceiling of a cave in partial darkness.

Records.—Allegany County, Dans Rock, April 7, 1944, two females. Loch Lynn, Sand Cave, April 8, 1944, one female.

THERIDIIDAE.

Conopistha nephilae (Taczanowski).

Argyrodes nephilae Taczanowski, Horae Soc. Entom. Ross., 1872, Vol. IX, p. 51.

Ecology.—One female was collected from woodland undergrowth by beating.

Record.—Darnestown, August 30, 1944, one female.

Dipoea buccalis Keyserling

Dipoea buccalis Keyserling, Spinnen Amerikas, Theridiidae, 1886, Vol. II, p. 42, pl. xii, fig. 157.

Ecology.—One male was taken by beating brush in open woodland.

Record.—Beltsville, August 31, 1944, one male.

Dipoea quinquemaculata (Banks)

Euryopis quinquemaculata Banks, Can. Ent., 1900, Vol. 32, p. 97.

Ecology.—Young specimens have been sifted from hardwood litter.

Records.—College Park, March 25, 1943, one young pair. Berwyn, October 22, 1944, one young male.

Theridion ambitum Barrows.

Theridion ambitum Barrows, Ohio Jour. Sci., 1940, Vol. XL, No. 3, p. 132, fig. 5, 5a.

Ecology.—All specimens were found under stone or wood piles.

Records.—Cranberry, September 1, 1944, one male. Lanham, September 21, 1944, one male. Berwyn, September 23, 1944, one female.

Theridion intervallatum Emerton.

Theridion intervallatum Emerton, Trans. Conn. Acad. Sci., 1915, Vol. XX, p. 136, fig. 1-1c.

Ecology.—Two specimens were taken by sweeping in open woodland.

Records.—Berwyn, August 4, 1944, one female. Berwyn, September 3, 1944, one male.

Theridion reticulatum Muma.

Theridion reticulatum Muma, Amer. Mus. Novit., 1944, No. 1257, p. 7, figs. 9, 10.

<i>Female</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....	.60 mm.	.54 mm.
Abdomen.....	.90 mm.	.87 mm.
Over All.....	1.41 mms.	

Leg Formula 1423.

Measurements of first leg; femur .92 mm., patella .27 mm., tibia .74 mm., metatarsus .77 mm., tarsus .42 mm.; fourth leg, femur .79 mm., patella .27 mm., tibia .58 mm., metatarsus .62 mm., tarsus .36 mm.

Female similar to male in structure and color. All markings are more distinct especially the median longitudinal stripe on the cephalothorax and the dorsal abdominal folium. Chalky spots on the venter behind epigastric furrow larger in female. An additional pair of spots occur adjacent to the spinnerets on each side.

Abdomen globose.

Details of epigynum are shown in figure 10.

Ecology.—All specimens were taken by sweeping fields and open woodland.

Records.—Rutledge, October 5, 1943, one male by E. Beardsley. Salisbury, August 11, 1944, one female (allotype). Beltsville, August 26, 1944, one female (paratype).

Remarks.—The female of this small species is described here for the first time. One female is dark colored and appears closely related to or identical with *Theridion rabuni* Chamberlin and Ivie.

THOMISIDAE.

Philodromus montanus Bryant.

Philodromus montanus Bryant, Bull. Mus. Comp. Zool., 1933, Vol. LXIV, No. 6, p. 182, figs. 20, 26.

Ecology.—One male was collected under a stone.

Record.—Rush, May 21, 1942, one male.

GNAPHOSIDAE.

Drassyllus creolus Chamberlin and Gertsch.

Drassyllus creolus Chamberlin and Gertsch, Amer. Mus. Novit., 1940, No. 1068, p. 13, fig. 26, 27.

Ecology.—One female was found under a board.

Record.—Linkwood, May 25, 1944, one female.

Drassyllus fallens Chamberlin

Drassyllus fallens Chamberlin, Proc. Biol. Soc. Wash., 1922, Vol. XXII, p. 166.

Ecology.—One female was collected under trash.

Record.—Berwyn, July 23, 1937, one female by W. F. Jeffers.

Zelotes duplex Chamberlin.

Zelotes duplex Chamberlin, Proc. Biol. Soc. Wash., 1922, Vol. XXII, p. 164.

Ecology.—One female was taken by sifting leaves.

Record.—College Park, March 25, 1943, one female.

CLUBIONIDAE.

Castianeira alata n. sp.

	Male	Length	Width
Cephalothorax.....		2.4 mms.	1.6 mms.
Abdomen.....		2.6 mms.	1.4 mms.
Over All.....		5.0 mms.	

Leg Formula 4123.

Structure typical of genus.

Cephalothorax subovate, narrowed at head region. Clypeus more than three times diameter of anterior median eyes in height. Dorsum and sternum of cephalothorax dark reddish brown with the dorsum thinly

clothed with short white hairs. Chelicerae, labium and endites concolorous with cephalothorax. Palpi dark reddish brown except for light yellow distal end of tarsi. Details of palpal bulb shown in figure 11.

Both anterior and posterior eye rows procurved. Eyes subequal in size with those of the anterior row being slightly larger.

Legs moderately long and armed with stout spines. Anterior tibiae armed below 2-2-2 with distal spines weak. Anterior metatarsi 2-2-0. Measurements of first leg; femur 1.50 mms., patella .57 mm., tibia 1.35 mms., metatarsus 1.29 mms., tarsus .90 mm.; fourth leg, femur 1.92 mms., patella .75 mm., tibia 1.01 mms., metatarsus 2.10 mms., tarsus .96 mm. Femora of all legs dark reddish brown. Patellae, tibiae, metatarsi and tarsi of first and second legs light yellow. Patella, tibiae and metatarsus of third leg dusky, tarsus light yellow. Fourth leg dark except for tarsus, proximal end of patella and proximal and distal ends of tibia.

Abdomen elongate oval, widest behind the middle. Color of dorsum dark reddish brown, clothed with bands of easily rubbed white hairs as shown in figure 13. Venter lighter brown than dorsum and margined with a pair of light longitudinal stripes. Spinnerets concolorous with abdomen.

<i>Female</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....	3.8 mms.	2.6 mms.
Abdomen.....	5.5 mms.	3.2 mms.
Over All.....	9.3 mms.	

Leg Formula 4132.

Color and structure of female similar to that of male.

Measurements of first leg; femur 1.95 mms., patella .81 mm., tibia 1.65 mms., metatarsi 1.50 mms., tarsi 1.05 mms.; fourth leg, femur 2.10 mms., patella .86 mm., tibia 2.16 mms., metatarsi 2.64 mms., tarsi 1.11 mms.

Details of epigynum are shown in figure 12.

Ecology.—Two specimens were found in a house; two under leaves on the ground.

Records.—College Park, June 14, 1943, one female by K. E. Muma (allotype). College Park, May 18, 1944, one young female by K. E. Muma (paratype). Berwyn, June 15, 1944, one male (holotype). Berwyn, October 10, 1944, one young female (paratype).

Remarks.—This species is quite closely related to *C. longipalpus* (Hentz). It may be easily distinguished by the distinctive abdominal markings. There are also slight differences in the palpus and epigynum.

Clubionaalachua Gertsch.

Clubionaalachua Gertsch, Amer. Mus. Novit., 1941, No. 1148, p. 4, fig. 4.

Ecology.—One female was collected from tall grass in an open field.

Record.—College Park, June 11, 1944, one female.

Clubionajohnsoni Gertsch.

Clubionajohnsoni Gertsch, Amer. Mus. Novit., 1941, No. 1148, p. 14, figs. 43, 44, 45.

Ecology.—One male was found under a stone.

Record.—Rush, May 28, 1944, one male.

Micaria quinquenotata Emerton.

Micaria quinquenotata Emerton, Trans. Conn. Acad. Sci., 1909, Vol. XIV, p. 215, Plate X, figs. 1-1e.

Ecology.—Specimens have been found running actively on the ocean beach.

Records.—Ocean City, July 9, 1944, one male and two females by W. F. Jeffers and M. H. Muma. Ocean City, July 18, 1944, one male by W. F. Jeffers.

Phrurolithus divinulus Gertsch.

Phrurolithus divinulus Gertsch, Amer. Mus. Novit., 1941, No. 1147, p. 6, figs. 7, 8, 9.

Ecology.—One male was taken under a stone.

Record.—Cumberland, September 16, 1943, one male.

Phurolithus goodnighti n. sp.

	<i>Female</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....		.84 mm.	.81 mm.
Abdomen.....		1.17 mms.	.84 mm.
Over All.....		2.11 mms.	

Leg Formula 4123.

Structure typical.

Cephalothorax nearly circular in outline, narrowed slightly in head region. Color of dorsum dark reddish brown with a reticulation of dusky lines. Margins of cephalothorax black. Area enclosed by eyes black. Chelicerae, labium, endites and sternum yellowish brown. Sternum margined with black. Palpi dusky yellow. Cephalothorax clothed with scattered erect dark hairs and several spines on cephalothorax.

Eyes subequal in size. Anterior row procurved, posterior row straight. Clypeus slightly more than diameter of anterior laterals in height.

Legs moderately long, tibiae and metatarsi of first two legs armed below with long stout spines as follows: tibia 1(2-2-2-2), metatarsus 1(2-2-2-1), tibia 2(2-2-2-2), metatarsus 2(2-2-2-1). Legs light yellow and marked as follows: femora of first two legs darker at proximal ends and dusky on anterior and posterior faces; femur of third leg with dusky stripe on anterior and posterior face. Tibiae of third and fourth legs with dusky stripe on anterior face. Proximal ends of tibia of first two legs with dusky spots. Posterior proximal face of fourth femora dusky.

Leg measurements: first leg, femur .60 mm., patella .18 mm., tibia .48 mm., metatarsus .51 mm., tarsus .30 mm.; fourth leg, femur .66 mm., patella .21 mm., tibia .60 mm., metatarsus .66 mm., tarsus .42 mm.

Abdomen oblong and widest behind middle. Color dark grey marked with a light transverse basal band that is continuous with the light

venter, a light transverse wing-shaped band that is connected at the apex with the basal band, and several indistinct chevrons behind the middle. There are two white spots near the ends of the first chevron. Spinnerets light and encircled with dark grey. Abdomen clothed with pale prostrate hairs.

Epigynum as shown in figure 16.

<i>Male</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....	.75 mm.	.69 mm.
Abdomen.....	.87 mm.	.57 mm.
Over All.....	1.62 mms.	

Similar in structure and color to female except that the eye area is concolorous with cephalothorax and the basal abdominal band is indistinct. Palpi as shown in figures 14 and 15.

Measurements of first leg: femur .60 mm., patella .18 mm., tibia .54 mm., metatarsus .45 mm., tarsus .30 mm.; fourth leg, femur .66 mm., patella .21 mm., tibia .54 mm., metatarsus .60 mm., tarsus .45 mm.

Ecology.—Specimens have been collected by sifting leaves.

Records.—Washington, D. C., May 1, 1924, one female (paratype), no collector. Gillespie, Illinois, August 15, 1941, one male and one female (male allotype, female paratype) by C. J. and M. L. Goodnight. Gillespie, Illinois, August 15, 1941, one female (female holotype) by C. J. and M. L. Goodnight. College Park, March 10, 1942, one female (paratype). Piatt City, Illinois, May 1943, three females (paratypes) by C. J. and M. L. Goodnight. Berwyn, March 26, 1944, one female (paratype) by W. F. Jeffers and M. H. Muma.

Remarks.—This species is closely related to *Phrurolithus similis* Banks and allied forms. It may be distinguished by details of the genitalia.

Phrurolithus pipensis n. sp.

<i>Female</i>	<i>Length</i>	<i>Width</i>
Cephalothorax.....	.86 mm.	.65 mm.
Abdomen.....	1.15 mms.	.72 mm.
Over All.....	1.90 mms.	

Leg Formula 4123.

Cephalothorax subcircular and narrowed at head region. Clypeus height little more than diameter of anterior lateral eyes. Eyes typical of genus. Cephalothorax yellowish brown marked with dusky radiating reticulations and seamed with black. Cephalothorax naked except for several spines on clypeus. Sternum, labium and endites light yellow, with chelicerae slightly darker. Face of each chelicera armed with a thin spine. Palpi light yellow, dusky on the sides of the femora, patellae and tibiae.

Legs moderately long. Armature of tibiae and metatarsi below of first two legs as follows: tibia 1(2-2-2-2-2), metatarsus 1(2-2-2-1), tibia 2(2-2-2-2-1), metatarsus 2(2-2-2-1).

Measurements of first leg: femur .72 mm., patella .29 mm., tibia .72

mm., metatarsus .63 mm., tarsus .42 mm.; fourth leg, femur .75 mm., patella .29 mm., tibia .66 mm., metatarsus .75 mm., tarsus .47 mm. Legs light yellowish brown. Femora of the first three legs marked with dusky bars on the sides.

Abdomen oblong, dark grey above and marked with a wide white chevron just in front of the middle. Behind the wide chevron are several obscure chevrons and there is a white spot just over the spinnerets. Venter white and immaculate except for a dark grey band continuous with the dorsal color that encloses the spinnerets. Spinnerets light yellow. Abdomen clothed with pale prostrate hairs.

Details of the epigynum are shown in figure 17.

Ecology.—One female was collected under a pile of logs.

Record.—Berwyn, September 10, 1944, one female (holotype).

Remarks.—The distinctive epigynum of this species distinguishes it from all other members of the genus.

Phrurotimpus subtropicus Ivie and Barrows.

Phrurotimpus subtropicus Ivie and Barrows, Bull. Univ. Utah, 1935, Vol. 26, No. 6, p. 24, fig. 66.

Ecology.—One female was found under a stone.

Record.—Cumberland, September 16, 1943, one female.

Phrurotimpus certus Gertsch.

Phrurotimpus certus Gertsch, Amer. Mus. Novit., 1941, No. 1147, p. 17, figs. 47, 48.

Ecology.—Cumberland, September 16, 1943, one female.

Record.—One female was found under a stone.

SALTICIDAE.

Icius formicarius Emerton.

Icius formicarius Emerton, Trans. Conn. Acad. Sci., 1891, Vol. VIII, p. 235, pl. xviii, fig. 6.

Ecology.—Two females were collected from foliage.

Records.—Keedysville, June 29, 1944, one female by W. F. Jeffers, Beltsville, August 26, 1944, one female.

HAHNIIDAE.

Neoantistea gertschi n. sp.

	Female	Length	Width
Cephalothorax.....		1.1 mms.	.9 mm.
Abdomen.....		1.5 mms.	1.0 mms.
Over All.....		2.4 mms.	

Leg Formula 4123.

Measurements of first leg: femur .84 mm., patella .33 mm., tibia .66 mm., metatarsus .51 mm., tarsus .45 mm.; fourth leg, femur .90 mm., patella .33 mm., tibia .75 mm., metatarsus .84 mm., tarsus .51 mm.

This species is almost identical in structure and coloration with *N.*

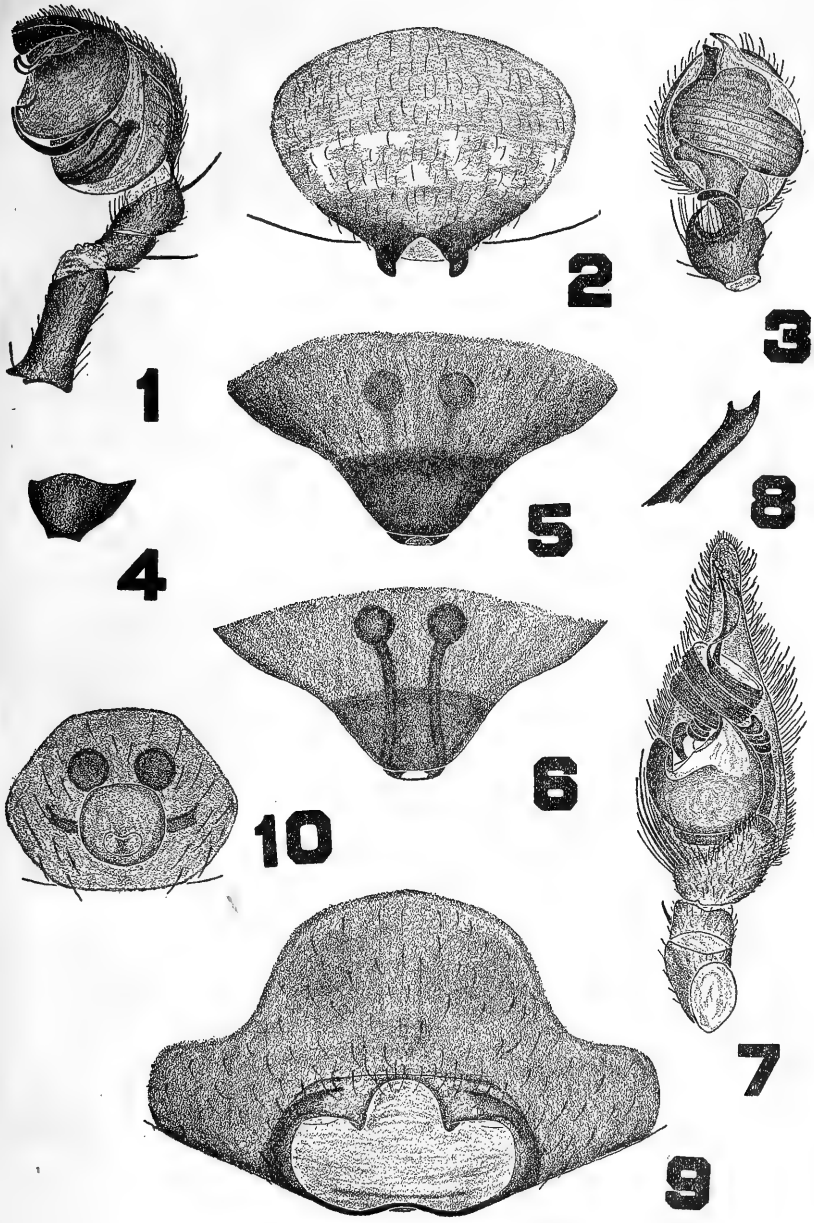
agilis Keyserling. It may be separated from the latter by differences in the details of the epigynum. Figure 18 shows the epigynum from below; figure 19 shows the epigynum from below after clearing in dioxan and clove oil.

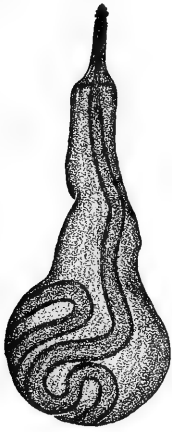
Ecology.—Most of the specimens were sifted from leaves or moss in moist woodland. One female was found under a board.

Records.—Berwyn, September 23, 1944, one female (holotype). Berwyn, October 28, 1944, one female (paratype) by W. F. Jeffers and M. H. Muma. College Park, March 10, 1942, one female (paratype). Branchville, October 22, 1941, one female (paratype). Salisbury, May 8, 1944, one female (paratype) by W. F. Jeffers.

EXPLANATION OF FIGURES.

1. *Uloborus octonarius* n. sp.—Lateral view of left palpus.
2. *Uloborus octonarius* n. sp.—Ventral view of epigynum.
3. *Sciastes mossi* n. sp.—Ventral view of right palpus.
4. *Sciastes mossi* n. sp.—Dorso-lateral view of tibia of right palpus.
5. *Sciastes mossi* n. sp.—Ventral view of uncleared epigynum.
6. *Sciastes mossi* n. sp.—Ventral view of cleared epigynum.
7. *Agelenopsis jeffersi* n. sp.—Ventral view of right palpus.
8. *Agelenopsis jeffersi* n. sp.—Latero-ventral view of tip of embolus.
9. *Agelenopsis jeffersi* n. sp.—Ventral view of epigynum.
10. *Theridion reticulateum* Muma—Ventral view of epigynum.
11. *Castianeira alata* n. sp.—Ventral view of bulb of right palpus.
12. *Castianeira alata* n. sp.—Ventral view of epigynum.
13. *Castianeira alata* n. sp.—Dorsal view of male.
14. *Phrurolithus goodnighti* n. sp.—Lateral view of left palpus.
15. *Phrurolithus goodnighti* n. sp.—Ventral view of tibia of palpus.
16. *Phrurolithus goodnighti* n. sp.—Ventral view of epigynum.
17. *Phrurolithus pipensis* n. sp.—Ventral view of epigynum.
18. *Neoantistea gertschi* n. sp.—Ventral view of uncleared epigynum.
19. *Neoantistea gertschi* n. sp.—Ventral view of cleared epigynum.





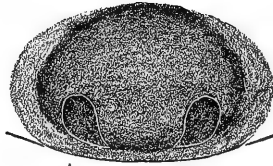
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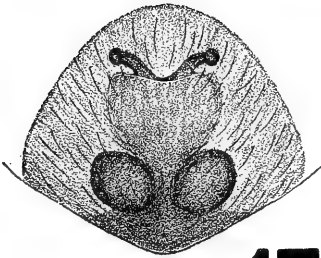
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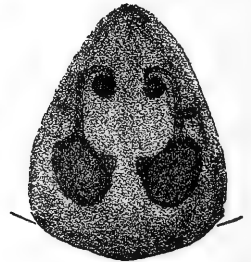
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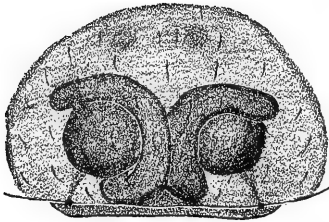
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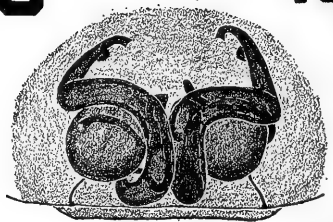
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PROCEEDINGS
OF THE
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A NEW CACOMISTLE FROM GUERRERO.

BY E. A. GOLDMAN.

The range of the cacomistles of the genus *Bassariscus* is confined in Mexico mainly to the high interior plateau, extending down into the upper part of the Tropical Zone along the slopes of the mountains. The genus appears to be absent in the tropical lowlands. A single specimen from the Sierra Madre del Sur of Guerrero presents characters beyond the usual range of individual variation and seems to represent a new race south of a barrier formed by the low broad valley of the Rio Balsas. For the privilege of describing this animal I am indebted to Mr. Benjamin P. Bole and Dr. Harry C. Overholser, of the Cleveland Museum of Natural History.

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

Bassariscus astutus boleii, subsp. nov.

Guerrero Cacomistle.

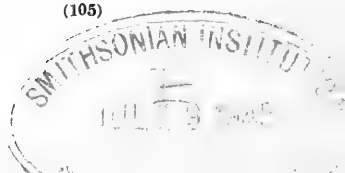
Type locality.—Chilpancingo, Guerrero, Mexico.

Type specimen.—Male adult, skin and skull; Cleveland Museum of Natural History; collected by W. W. Brown, February 16, 1940; field number, 551.

Distribution.—Known only from the type locality on the slope of the Sierra Madre del Sur of Guerrero.

General characters.—A small, pale grayish subspecies with light dentition. Most closely allied to *Bassariscus astutus consitus* of Michoacan, but color paler and grayer, the back less profusely overlaid with black, and the hind feet whiter; cranial details, especially lighter dentition, distinctive. Similar in general to *Bassariscus astutus astutus* of the vicinity of the Valley of Mexico, but smaller, and differing otherwise in about the same characters as from *consitus*.

Color.—*Type*: Ground color of upper parts in general pale gray, the



top of head, middle of neck and back thinly overlaid with black, the dark hairs thinning out along sides and over thighs; sides, and rump suffused with "pale pinkish buff"; face with the usual light and dark markings, the sides of muzzle blackish confluent with blackish orbital rings and small black areas at base of supraorbital vibrissae, in contrast with white patches above and below eyes; lips and chin white; throat, inner sides of limbs and under parts in general buffy white, except irregular patches across abdomen where the under color is "pale smoke gray", showing through indistinctly; ears blackish on basal half externally, becoming whitish toward tips, and thinly clothed with whitish hairs internally; outer sides of forearms mixed buffy grayish and dusky; fore feet whitish; hind feet blackish along outer sides, becoming white on toes; tail with seven alternating white and black rings and a black tip, the white rings confluent along the median line below.

Skull.—Similar in size and general proportions to that of *consitus*, but interorbital region narrower; auditory bullae flatter, less inflated and projecting below level of basioccipital; dentition lighter, maxillary tooth-row shorter, the individual teeth distinctly smaller. Compared with that of typical *astutus* the skull is decidedly smaller and differs in about the same structural details as from *consitus*.

Measurements.—*Type*: Total length, 850 mm.; tail vertebrae, 420; hind foot, 80. *Skull (type)*: Greatest length, 84.8; condylobasal length, 84.5; zygomatic breadth, 56.5; breadth of rostrum (over root of canine), 16.7; interorbital breadth, 16; maxillary toothrow (alveoli), 31.7; upper carnassial, crown length (outer side), 7, crown width, 5.1.

Remarks.—*B. a. bolei* appears to be most closely allied to *consitus*, but probably intergrades directly with typical *astutus* to the eastward in southern Puebla and northern Oaxaca. It represents an extension of the known range of the group toward the southwest. The subspecies is named for Mr. Bole in recognition of his interest in the mammals of Middle America.

Specimens examined.—One, the type.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW *Eptesicus* FROM JAMAICA

BY H. HAROLD SHAMEL.

A series of 27 *Eptesicus* collected on the Island of Jamaica, July 11, 1932, and preserved in alcohol apparently represent a new species.

Eptesicus lynni sp. nov.

Type.—Adult female in alcohol, with skull removed, No. 258488, U. S. National Museum; collected July 11, 1932, by W. Gardner Lynn. Original number B25.

Type locality.—A cave east of Montego Bay, Jamaica.

Diagnostic characters.—Color rich reddish brown with the underparts of the same hue but paler. Occasional light individuals are either entirely pale flaxen or this paler color may be present as spots on red individuals. It is distinguished from other West Indian *Eptesicus* by having a smaller skull and in this respect agrees with the *brasiliensis* group occurring in South and Central America.

Color.—The color is more reddish brown than *E. fuscus*. The under surface of body is the same color as the back but paler. Membranes dark brown throughout. The fur of the back is unicolor to its base. There are two color phases. The typical phase is reddish brown and the other phase is a much paler brown which grades into a pale flaxen, almost white in certain individuals. Of 8 specimens taken from alcohol and dried, two were typical, one was typical except for a light spot on shoulder and breast and 5 were paler, from pale brown to pale flaxen. In some of the pale individuals the coloration of the belly is similar to that of the red form.

Measurements.—Type: head and body, 55.0; tail, 36.0; forearm, 44.5; tibia, 16.1; foot, 9.5; ear from notch, 13.0. Skull: greatest length, 16.8; condylobasal length, 15.0; interorbital constriction, 4.2; breadth of braincase, 8.0; depth of brain case, 6.5; upper tooth row, c-m¹, 6.0; lower row, 3-mm, 6.2.

Specimens examined.—27, all in alcohol including the type.

Remarks.—This bat from Jamaica is the only form in the West Indies that belongs to that group of *Eptesicus* which I designate as the *brasiliensis* group, and which is restricted mainly to Central and South America. The other forms of *Eptesicus* in the West Indies belong to the *fuscus* group of North America.



In studying this bat I have examined and compared the *Eptesicus* specimens from Central and South America and the West Indies in the U. S. National Museum collection. I find that this genus may be divided into three groups: first, the *fuscus* group comprising the large *Eptesicus* of North America, the West Indies and northern South America as far as Merida, Venezuela (*E. fuscus pelliceus*). In the West Indies members of this group are found in Cuba, Dominican Republic and Haiti, the Bahama Islands and Puerto Rico. The second is the *brasiliensis* group to which most of the South and Central American forms belong. The third section, which may be known as the *diminutus* group contains three species and is confined to South America. I have seen no specimens of the species referred to this group.

The skull of the *fuscus* group is distinguished from the skull of the *brasiliensis* group, by its larger size, and furthermore, the apex of the second triangle of the third upper molar is less than half the height of the anterior side of the first triangle. In the *brasiliensis* group the skull is smaller and the apex of the second triangle is at least half the height of the anterior side of the first triangle.

I take pleasure in naming this bat after the collector W. Gardner Lynn.

The groups are characterized as follows:

1. *fuscus* group: greatest length of skull, 17.6–21.2; greatest breadth of brain case, 8.6–9.6; forearm, 46.0–50.2. Members of this group range from Southern Canada to Venezuela (*Eptesicus fuscus pelliceus*) in South America. It is the dominant group in the West Indies.

Eptesicus fuscus (Beauvois) 1796 (including all the subspecific forms of North, Central and South America)—forearm, 46.0–50.2

Eptesicus fuscus cubensis (Gray) 1837—forearm, 46.0–48.2 Cuba

Eptesicus fuscus bahamensis (Miller) 1897—forearm, 44.0–46.2 Bahamas: New Providence.

Eptesicus fuscus hispanolae (Miller) 1918—forearm, 46.5 Dominican Republic: Constanza

Eptesicus fuscus wetmorei (Jackson) 1916—forearm, 46.0 Puerto Rico: Maricao

2. *brasiliensis* group: greatest length of skull, 15.6–17.3; greatest breadth of brain case, 7.2–8.2; forearm, 27.5–48.5. Widely distributed in South America, Central America, and Mexico as far north as Tabasco, Campeche and Yucatan; the Island of Jamaica.

Eptesicus brasiliensis (Desmarest) 1819—forearm, 40.6 Brazil

Eptesicus propinquus (Peters) 1872—forearms 39.0–41.2 Guatemala: Santa Isabel.

Eptesicus furinalis (d'Orbigny and Germais) 1847—forearm, 39.0–41.2. Argentina: Corrientes

Eptesicus andinus J. A. Allen 1914—forearm, 39.0–42.5 Colombia: Valle de las Papas, Central Andes, Huila

Eptesicus chiriquinus Thomas 1920—forearm, 45.5 Panama: Boquete, Chiriqui

Eptesicus montosus Thomas 1920—forearm, 43.0 Bolivia (highlands): Choro, north of Cochabamba

Eptesicus chapmani J. A. Allen 1915—forearm 39.0–40.0 Brazil:
Lower Rio

Eptesicus inca Thomas 1920—forearm 46.0 Peru: Cuzco

Eptesicus argentinus Thomas 1920—forearm, 43.0–45.5 Argentina:
(open country, pale representative of *brasiliensis*)

Eptesicus innoxius (Gervais) 1841—forearm, 37.5–39.0 N., W. Peru:
Amotape, Piura.

Eptesicus lynni Shamel 1945—forearm, 44.5–48.5 Jamaica: Montego
Bay

Eptesicus melanopterus (Jentink) 1904—forearm, 39.0–40.0 Dutch
Guiana: Surinam, Paramaribo. (Probably the same as *V. auripendulus* shaw 1800 from Cayene, French Guiana, through Shaw's description is not adequate for specific identification.)

Eptesicus auripendulus (Shaw) 1800—forearm, no measurements
French Guiana: Cayenne

Eptesicus magellanicus (Philippi) 1866—forearm, 44.5 Straits of
Magellan.

Eptesicus chiralensis Anthony 1926—forearm, 39.9–41.0 Ecuador:
Prov. del Oro

Eptesicus hilarii (Is. Geoffroy) 1824—forearm 36.8 Inhabits “la
capitainerie de Goyar et la province des Missions” (Goyaz,
Brazil?, and Misiones, northeast Argentina).

3. *diminutus* group: greatest length of skull, 13.9–14.1; greatest breadth
of brain case, 7.1–7.3; forearm, 34.0–35.7. Restricted to South America.

Eptesicus punicus Thomas 1920—forearm, 35.0 Ecuador: Puna
Island, Gulf of Guayaquil

Eptesicus fidelis Thomas 1920—forearm, 34.0

Eptesicus diminutus Osgood 1915—forearm, 35.7 Brazil: Rio Preto,
Bahia



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The pagination at the top of Muma's paper
should read, pp. 91-104 instead of 91-102.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW BLIND SNAKE (*TYPHLOPS TOVELLI*) FROM
DARWIN, AUSTRALIA.

BY ARTHUR LOVERIDGE.

Among those who have taken advantage of the opportunity afforded by world conditions to extend our knowledge of the fauna in distant places, is Gunner G. T. R. Tovell of the Australian Forces. At the conclusion of hostilities it is hoped to publish a full report on the material he has so generously contributed. The present paper deals only with an addition to the Australian herpetofauna, with which I am glad to associate the discoverer's name by calling it

Typhlops toveli sp. nov.

Type.—Museum of Comparative Zoology, No. 48,844, from Koonowarra Sports Ground, about five miles south of Darwin, Northern Territory, Australia, collected by G. T. R. Tovell, 1944.

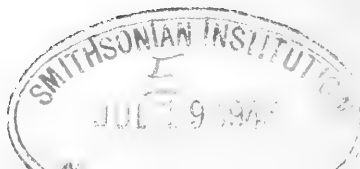
Paratype.—Museum of Comparative Zoology, No. 48,845 with same data as the type.

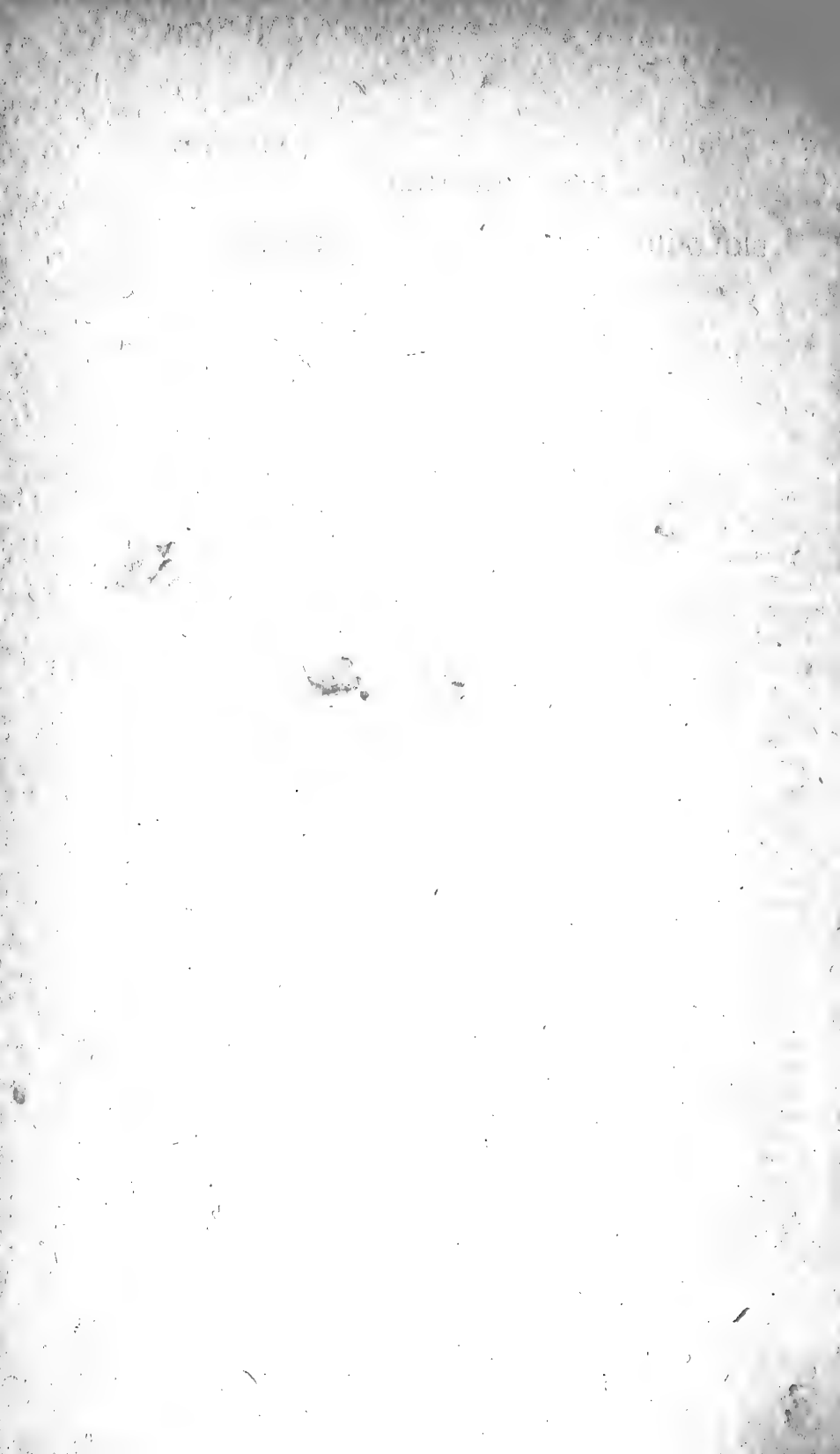
Diagnosis.—Closely related to *T. broomi* Boulenger, of Muldiva, northeast Queensland, of which it may be a subspecies, as it differs only from the description of *broomi* in its semidivided (not divided labial). It has less in common with *T. diversus* Waite, of Mowen, Queensland, whose body diameter is included 67 times in total length.

Description.—Snout rounded, moderately projecting; rostral nearly half the width of the head, extending almost to the level of the eyes; nostrils lateral; nasal *semidivided*, the cleft proceeding from the preocular; preocular narrower than the nasal or ocular, in contact with the second and third labials; eyes distinct; upper head scales distinctly enlarged; upper labials 4. Midbody scales in 20 rows; body diameter 40 (36 in paratype) times in total length; tail as long as broad, ending in a point.

Color.—Above, brown, the center of each scale darker and resulting in a series of lines. Below, pure white, the junction with the darker dorsal coloring very irregular.

Size.—Total length of type, 122 (118.5+3.5) mm., of paratype, 73 (70.5+2.5) mm., their diameters being 3 and 2 mm. respectively.





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PROCEEDINGS
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TWO NEW BIRDS FROM THE UPPER RIO NEGRO,
BRAZIL.

BY HERBERT FRIEDMANN *

1. A new Barbet of the *Capito auratus* group.

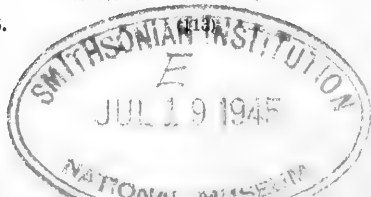
Chapman's paper on "Mutation in *Capito auratus*" (Amer. Mus. Novit. no. 335, 1928) brought out very clearly the fact that the color variations distinguishing the numerous races of this bird were geographically so interspersed as to suggest very strongly a mutational rather than a gradual, cumulative, environmentally induced origin for the various subspecies. Study of the barbets collected by the National Geographic Society's expeditions to the Brazilian-Venezuelan border reveals still another, hitherto undescribed, race of this highly plastic species, and one whose characters bear out the mutational origin suggested by Chapman. It is one of the scarlet-throated races but comes from the upper Rio Negro, geographically between two yellow-throated forms—*aurantiicinctus* to the north of it, and *hypochochriacus* to the south of it. It may be known as

Capito auratus transilens, subsp. nov.

Type: U. S. Nat. Mus. 326032, adult ♂, collected at Santa Isabel, Rio Negro, Amazonas, Brazil, October 16, 1930, by E. G. Holt, E. R. Blake, and C. T. Agostini.

Subspecific characters: male similar to that of *Capito auratus amazonicus* (nearer to this form than to any other of the species) from Tefe, on the Amazon, but differs from it by having the forehead and crown more streaked and suffused with ochraceous orange to xanthine orange, less yellowish, and with the two large yellowish stripes on the interscapulars and upper back primuline to light cadmium yellow, as opposed to strontian to lemon yellow in *amazonicus*, and with the sides and flanks more

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heavily flecked with blackish. Female very similar to that of *C. a. amazonicus* but with the forehead and crown very slightly more orange, less yellow, the margins of the lesser upper wing coverts darker—bright cinnamon rufous instead of zinc orange. Females of the two forms are not different enough to warrant separation; the race is based on the plumage characters of the male.

Measurements: Four males—wings 82–83 (type 82.2); tail 47.2–50.5 (type 50.5); culmen from base 23–23.5 (type 23); tarsus 23.5–24 (type 23.5 mm.). One female—wing 84, tail 50, culmen from base 23.7; tarsus 22.4 mm. Two males of *C. a. amazonicus* have the following dimensions—wing 81–84; tail 46.2–49; culmen from base 22.3–22.8; tarsus 22.3–23 mm.; two females—wing 82–83; tail 47.4–50; culmen from base 22.6–23; tarsus 22.5–22.8 mm.

Chapman (loc. cit. p. 5–6) writes that his series of toptotypical *auratus* from the Ucayali, “. . . . varies more widely than any other seen. With the exception of females from Tonantins (*C. a. nitidior*) every other red-throated race can be matched, or nearly matched, by this Sarayacu series” It would seem from this that the species is still unstable in its characters in the terra typica of its nominate form. No such variability is present in the present series from the upper Rio Negro, and it may be that some of the apparent variability of the Ucayali *auratus* may be an approach to the contiguous race *C. a. novaolindae*.

I am indebted to Dr. John T. Zimmer of the American Museum of Natural History for the loan of specimens of *C. a. amazonicus* in the present connection. I have also examined material of the following races in this study—*aurantiicinctus*, *insperatus*, *punctatus* and *novaolindae*.

2. The Geographic Races of the Golden-winged Paroquet, *Brotogeris chrysopterus* (Linnaeus).

A study of the geographic variations of the little golden-winged paroquet, *Brotogeris chrysopterus*, reveals that in addition to the four forms currently recognized, there is a fifth one inhabiting the basin of the Rio Negro. This one may be known as

Brotogeris chrysopterus tenuifrons subsp. nov.

Type: U. S. Nat. Mus. 325937, ad. ♂, collected at Santa Isabel, Rio Negro, Amazonas, Brazil, October 13, 1930, by E. G. Holt, E. R. Blake, and C. T. Agostini; original no. 3808.

Subspecific characters: agrees with *B. c. twipara* of the south bank of the lower Amazon in having the chin spot orange (not brownish as in the nominate form) but differs from that race in having practically no frontal band and what little there is, is not orange (as in *twipara*) but brownish, almost as in *chrysopterus*. (The fourth race, *chrysosema* of the Rio

Madeira and Matto Grosso, has a broad light yellow frontal band). In other words, *tenuifrons* resembles *tuipara* below and *chrysopterus* above. From the description of *solimoensis* it differs in having the chin spot brighter, as in *tuipara*, and appears to be a smaller bird as well.

Description of type: narrow frontal fringe cinnamon brown; crown and occiput between porcelain green and deep porcelain green; nape, interscapulars, back, lower back between grass green and cedar green, paling on rump, upper tail coverts, scapulars, and inner lesser and median upper wing coverts to spinach green; outer lesser and median upper wing coverts grass green suffused, especially on their inner webs with dark bluish; outer greater upper wing coverts capucine yellow to orange, edged and tipped with light cadmium; remiges dark blackish blue edged and tipped with dark yellowish green; median pair of retrices dark yellowish green, the lateral ones similar on their outer webs but pyrite yellow to warbler green on their inner webs; lores, cheeks and auriculars grass green slightly tinged with porcelain green; chin between orange and orange rufous; sides of throat, of breast, and sides and flanks of body pale grass green paling to cource green on the mid-throat and upper breast, and to grass green with a slight yellow-green tinge on the abdomen, vent, thighs, and under tail coverts; under wing coverts bright grass green; under surface of remiges largely dusky squill blue.

Measurements of type: wing 109.2, tail 59.2; culmen from cere 17.2 mm. Two other males measure—wing 107.2–109.8; tail 52+ —59.1; culmen from cere 16.3–16.5; while one female—wing 111, tail 56.8, culmen from cere 16 mm. There is no appreciable difference in dimensions between *tenuifrons* and *chrysopterus*. The race *tuipara* has slightly longer wings (113–119 mm.) in the material examined.

Range: known only from the Upper Rio Negro (Santa Isabel, and at the mouth of the Rio Cauabury).

Material examined: *B. c. chrysopterus* 5 from British Guiana; *B. c. tuipara* 2 from lower Amazonia; *B. c. chrysosema* 1 from Bolivia; *B. c. tenuifrons* 4 from the Upper Rio Negro.

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PROCEEDINGS
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THE GENUS NYCTIPROGNE.

BY HERBERT FRIEDMANN *

The genus *Nyctiprogne* was established by Bonaparte in 1854 for the species *leucopyga* and has been considered as a monotypic group ever since. The very small bill with somewhat concealed nostrils is the criterion of the genus. Study of new and more extensive material of this group, always rather uncommon in collections, reveals that it contains not one but at least three forms, two of which are herein described for the first time. The characters of these forms, especially when taken into consideration along with their geographic occurrence indicates that for the present, at least until more data are forthcoming, it may be advisable to consider them as of two distinct, but obviously related, species. We may start with the one already known, the one called in books "small-billed nighthawk" *Nyctiprogne leucopyga* (Spix) which ranges from the Orinoco eastward to Cayenne and southward to southwestern Matto Grosso. To date no one has attempted to divide it into local races, but a study of a series from the extreme upper Orinoco and the northern Brazo Casiquiare reveals that the birds of that area are darker and smaller than examples from the Amazon River and also have the remiges less extensively freckled externally. Inasmuch as the type locality of *leucopyga* is the "wooded shores of the Amazon" it follows that that smaller, darker Venezuelan population is the one that needs a name. It is proposed to call it

Nyctiprogne leucopyga exigua subsp. nov.

Type: U. S. Nat. Mus. 328356, adult ♂ in breeding condition, col-

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lected on the right bank of the Upper Orinoco opposite Corocoro Island, Venezuela, May 12, 1931, by E. G. Holt, E. R. Blake, and C. T. Agostini.

Subspecific characters: similar to *N. l. leucopyga* of the Amazon River but smaller (wings 128.2–136.4 as against 139–142 mm.) and darker, the upper parts with the blackish marks larger, and with the pale buffy marks on the outer webs of the remiges and rectrices much reduced in size and frequency.

Measurements: 3 males, including the type, wing 131–136.4 (132.8); tail 83.1–84.1 (83.3 mm.); 1 female—wing 128.2, tail 83.1 mm. (an unsexed *N. l. leucopyga* has a wing 142; tail 93 mm.; another example marked “♂ [♀]” wing 139; tail 86.4 mm.).

Range: the upper stretches of the Rio Orinoco (opposite Corocoro Island) south to the northern part of the Brazo Casiquiare (at the mouth of the Rio Pacila), extreme southern Venezuela.

Just to the south of the range of *N. l. exigua*, along the more southern stretches of the Brazo Casiquiare, is another population of which I have seen a good series of specimens. As far as known there are no barriers to effect any spatial isolation between these birds and *exigua* and it may well be that future collecting will find their ranges to overlap. It is partly for this reason, and partly because of the number of characters by which it differs from *N. leucopyga* and also because it looks as though it should be an extreme variant of that species but is geographically in between typical *leucopyga* and *exigua*, that I provisionally treat it as a distinct species. It is, admittedly, close to *N. leucopyga*. This bird may be known as

Nyctiprogne latifascia sp. nov.

Type: U. S. Nat. Mus. 326844, ad. ♂ in breeding condition, collected at Raudal Quirabuena, Brazo Casiquiare, Venezuela, February 5, 1931, by E. G. Holt, E. R. Blake, and C. T. Agostini.

Specific characters: similar to *N. leucopyga exigua* in size (very slightly larger, the females more noticeably so) but the remiges and rectrices with no buffy transverse marks on their outer webs, the dark terminal area of the tail (from the white band to the tip of the tail) much broader (47–51 as opposed to 30–40 mm. in *exigua*), and coloration above and below much darker, more blackish, less vermiculated with tawny buff, the crown, occiput, and upper back practically solid fuscous black.

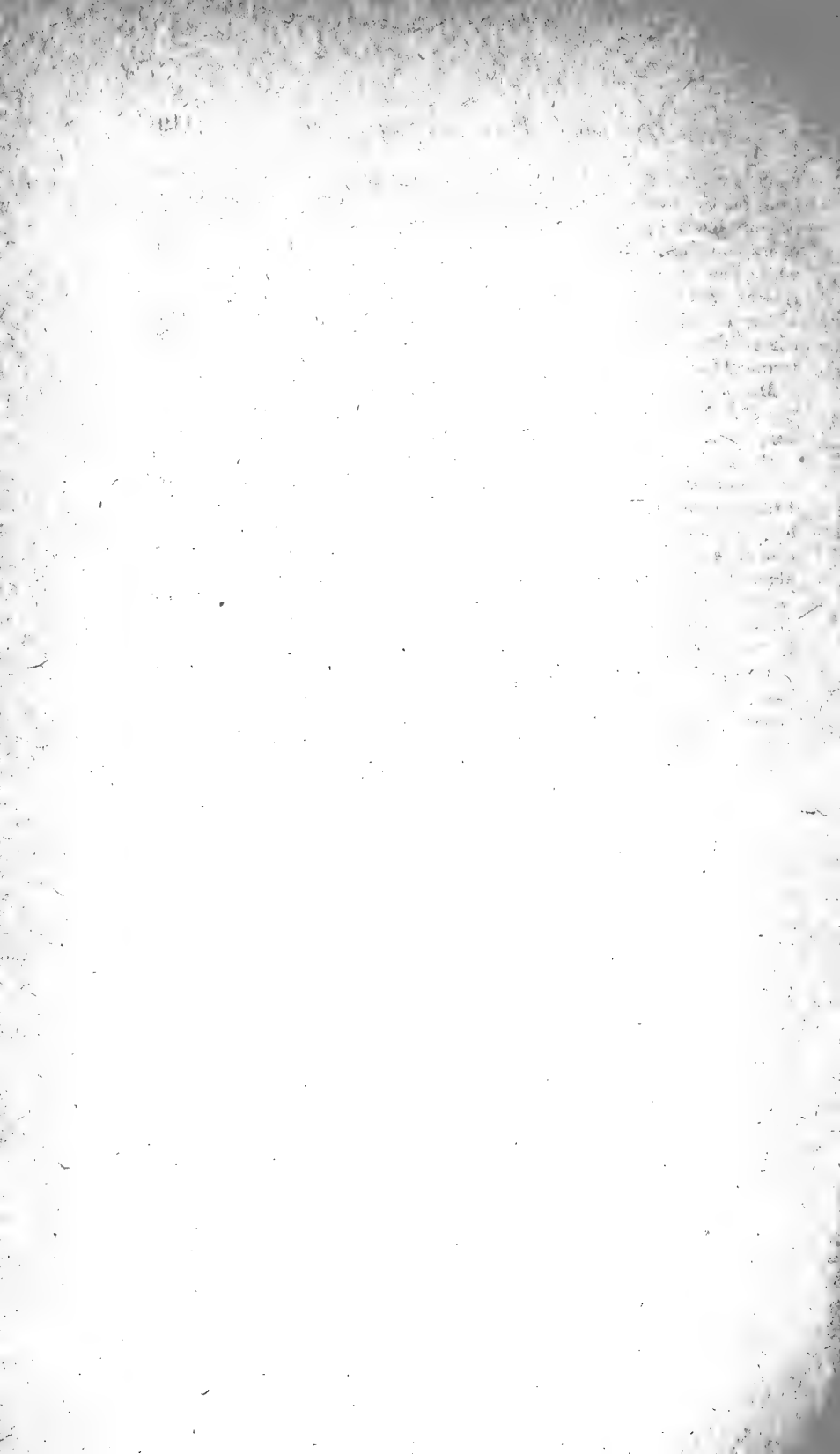
Description of type: forehead, lores, crown, and occiput fuscous black; nape similar but the feathers with faint, very small and narrow tips and sparse transverse frecklings of Dresden brown; interscapulars and upper back like the nape but with fewer of the pale markings; scapulars dark fuscous black (almost black) externally edged with pale cinnamon buff; upper wing coverts fuscous black, the median and greater ones with small terminal spots of cinnamon buff; primaries and outer secondaries between clove brown and fuscous, paler basally along the outer margins of the inner webs, the inner secondaries transversely flecked and incompletely barred with pale buffy grayish; lower back like the upper back; upper tail coverts fuscous black; rectrices fuscous black, crossed by a broad

band of white (the white band about 10–12 mm. wide) about 50 mm. from the tips of the feathers; chin, throat, cheeks, auriculars, and breast fuscous black the feathers tipped and transversely flecked with pale ochraceous tawny; abdomen, sides, and flanks fuscous black barred with white, the white bars narrower than the blackish interspaces and sometimes tinged with buffy; under tail coverts similar but with the pale bars wider, usually not narrower than the dark interspaces; under wing coverts fuscous black barred with whitish; wing 134, tail 91.8; width of terminal tail band 47.1 mm.

Measurements: 5 ♂s including the type—wing 133–137.4 (134.7); tail 87.4–95.9; width of terminal tail band 47.1–51 (49.1 mm.); 2 ♀—wing 135.2–137.1; tail 83–93.4; width of terminal tail band 47.5–50 mm.

Range: known only from extreme southern Venezuela, from San Carlos on the uppermost reaches of the Rio Negro to Raudal Quirabuena on the Brazo Casiquiare. As stated above the distinction between the ranges of *latifascia* and of *exigua* is hard to account for except by the accident of collecting. I know of no other bird whose range terminates anywhere along the Casiquiare only to have another closely related form “take up” where it leaves off. It is for this reason that I suspect that eventually *N. leucopyga exigua* and *N. latifascia* may be found together, and this, in turn, necessitates treating the latter as a species.

It may be pointed out that there may be still another undescribed subspecies of *N. leucopyga* in the southern part of its range. Thus, Naumburg (Bull. Amer. Mus. Nat. Hist., lx, 1930, p. 138) writes of a specimen from Villa Bella de Matto Grosso as “remarkably large but not otherwise different,” from Amazonian examples.



PROCEEDINGS
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TWO NEW PHILIPPINE RODENTS.

BY REMINGTON KELLOGG*

Two apparently undescribed rodents are included in a collection of mammals recently submitted to the U. S. National Museum for identification. These are characterized as follows:

Rattus rattus umbriventer, subsp. nov.

Type locality.—1 mile southwest of Progreso, Mindoro Island, Philippine Islands. Altitude about 20 feet.

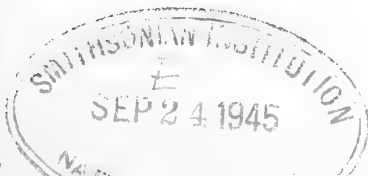
Type specimen.—Male adult, skin and skull; No. 277675, U. S. National Museum; collected May 31, 1945, by Arthur L. Gordon; original number 69.

Distribution.—Known only from southeastern Mindoro Island.

General characters.—Mammae, 2-3=10. Pelage of upperparts not harsh and rather thick. Tail in adults equal to or slightly shorter than head and body. Rows of scales on tail 8 to 9 per 10 mm. Hind foot (c.u.) equivalent to about 18.2 to 22.8 percent of head and body length. Palate extending behind M^3 . Teeth like other members of *Rattus rattus* section, well cusped. M^1 with five roots. M^3 not strongly reduced. Upper molar row equivalent to about 17 to 18 percent of condylobasal length. Bullae about 18 percent of occipito-nasal length.

Color (Terms after Ridgway, Color Standards and Color Nomenclature, 1912.).—Light ticking of upperparts rather conspicuous, resulting from the intermixture of hairs with light colored bands and unicolored black overhairs, and the showing through in the median dorsal region of the blackish plumbeous basal portions of the hairs. Dark tipped hairs of black and sides have a 3 to 7 mm. light buff to cinnamon buff subapical band, which on the sides is often lighter than in mid-dorsal region. Hairs on chin and throat white to base. Hairs on underparts in front of fore legs dusky basally but with whitish tips. On each side in pectoral region is a white area on which the hairs are white to base as are also the hairs on inside of fore limbs to wrists. Hairs on remainder of underparts,

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with exception of inguinal region, dusky at base with whitish or ivory yellow tips. Hairs on inguinal region lighter, some white to base. Hairs on fore and hind feet near deep mouse gray basally and with whitish tips, but often darker on median metapodials; ends of toes white. Tail unicolored, dark to tip.

Pelage.—Hair on upperparts not harsh. Black overhairs on upperparts about 25 to 30 mm. in length. Hair on underparts soft. Hair on fore and hind feet short, 2.5 to 3 mm. in length. Tail moderately haired, the majority of the bristles as long as or only slightly shorter than the length of two scales. Tail with 8 to 9 rows of scales per 10 mm. Ears blackish, sparsely covered with short hairs externally and about 23 mm. in length from notch (alcoholic specimen).

Skull.—Similar to that of *Rattus rattus mindanensis*, but interpterygoid fossa and interorbital constriction narrower. Supraorbital ridges distinct, extending backward from interorbital constriction along orbital borders of frontals and lateral surfaces of parietals to or beyond level of squamosal-parietal suture. Anterior edge of zygomatic plate (external to infraorbital foramen) essentially the same as in *mindanensis*. Bullae narrow, moderately inflated and about 18 percent of occipito-nasal length. Incisive foramina elongated, extending backward behind level of front of anterior root of M¹ and moderately widened behind the middle. A minute antero-external cusplet present on M² and M³ in about half the specimens. M³ varying from 1.8 to 2 mm. in length. Upper incisors smooth, rounded in front, and retroflected to the same extent as in *mindanensis*.

Measurements.—*Type*: Total length, 422 mm.; tail, 211; hind foot, 40. Five male topotypes, respectively: Total length, 409, 398, 374, 372, 366; tail, 195, 197, 190, 184, 178; hind foot, 39, 38, 38, 38, 37.

Skull (type): Occipito-nasal length, 40.9; condylobasal length, 40.2; zygomatic width, 20.85; interorbital width, 5.45; length of nasals, 13.85; palatilar length, 20.2; incisive foramina, 7.9; length of bulla, 7.8; length of upper molar row, 7.4; length of mandible, 24.5. Five male topotypes, respectively: Occipito-nasal length, 42.3, 42.4, 39.6, 39.3, 39.4; condylobasal length, 41.4, 41.1, 38.7, 39.3, 38.75; zygomatic width, 20.9, 21.1, 19.8, 20.2, 20.2; interorbital width, 5.85, 5.6, 5.5, 5.8, 5.2; length of nasals, 15.1, 14.4, 13.85, 13.8, 13.6; palatilar length, 20.2, 20, 19.4, 19.5, 19.25; incisive foramina, 8.5, 8.0, 8.15, 7.6, 7.8; length of bulla, 8.0, 8.0, 7.4, 7.85, 7.3; length of upper molar row, 7.25, 7.35, 6.9, 7.2, 7.1; length of mandible, 24.15, 24.3, 24.6, 24.6, 23.

Remarks.—This rat is readily distinguished from other rats in this section of the genus by the coarse ticking of the upperparts and the color pattern of the underparts. A similar distribution of light and dark areas on the underparts occurs occasionally in other members of the *Rattus rattus* section.

Specimens examined.—Total number, 29, all from Mindoro Island, as follows: Progreso, 17; San Jose, 12.

Chrotomys whiteheadi mindorensis, subsp. nov.

Type locality.—3 miles south-southeast of San Jose (Central), Mindoro Island, Philippine Islands. Altitude, 200 feet.

Type specimen.—Male adult, skin and skull; No. 277639, U. S. National Museum; collected May 7, 1945, by Robert M. Roecker; original number 54.

Distribution.—Known only from type locality.

General characters.—Upperparts characterized by two black stripes and a prominent pinkish-cinnamon stripe which extend forward to forehead; muzzle long; ears medium; pollex with a short rounded nail; other digits, including hallux, with well-developed, little curved claws. Skull differs from typical race *whiteheadi* by having a slightly longer upper molar row (5.7 mm. as compared to 5.1, 5.2 and 5.3, respectively, for three specimens of *whiteheadi*), the posterior palatine foramina extend forward beyond level of the transverse maxillo-palatine suture, and M^3 is larger (0.8 x 1.1 as compared to 0.6 x 0.75 and 0.6 x 0.8 for two specimens of *whiteheadi*).

Color (Terms after Ridgway, Color Standards and Color Nomenclature, 1912).—Ground color of sides and adjacent portion of back tawny-olive. A well defined pinkish-cinnamon longitudinal median stripe extending from middle of face nearly to base of tail, bordered on each side by a blackish stripe of varying width. The black stripes merge anteriorly at about middle of face with black nose and extending backward through eyes and internal to ears are attenuated posteriorly at hinder end of longitudinal median light stripe; black stripes rather sharply delimited posteriorly and not merging imperceptibly into ground color above base of tail; sides of face and below eyes slightly lighter in tone than sides. Undersurface slaty-buff, not sharply defined from sides; upper surfaces of fore and hind feet tawny-olive, but digits are lighter. Tail blackish above and paler below.

Pelage.—Fur on upperparts soft, thick and straight; underparts less densely haired. Hairs on fore and hind feet short. Tail relatively short, well haired, the longest bristles slightly longer than the length of three scales; 21 rows of scales per 10 mm. Ears dark brown, sparsely covered with short dark hairs externally, those on margins of ears whitish.

Skull.—Rostrum elongated; nasals wider anteriorly and projecting farther forward than in *whiteheadi*; infraorbital foramen narrow, not noticeably widened dorsally; anterior edge of zygomatic plate (external to infraorbital foramen) nearly straight and vertical; braincase rather broad; supraorbital ridges indistinct. Incisive foramina short, equivalent in length to slightly more than one-fourth of the diastema and situated about half way between front of molar series and the incisors; hinder edge of palate slightly behind level of front of M^3 . Pterygoids large, projecting downward considerably below level of either molars or bullae; bullae small, moderately inflated, and about 14.3 percent of condylobasal length. Upper incisors ivory-colored, moderately broad,

and strongly pro-odont; lower incisors much lengthened. Mandible with slender recurved coronoid process and with condyle bent abruptly inward.

Measurements.—*Type*: Total length, 306 mm.; tail, 120; hind foot, 40. Skull (*type*): Occipito-nasal length, 39.3; concylobasal length, 42; zygomatic width, 22.3; interorbital width, 7.5; length of nasals, 13.2; palatilar length, 20.6; incisive foramina, 4.2; length of bulla, 6; length of upper molar row, 5.7; length of mandible, 26.8.

Remarks.—The type specimen has been compared with three specimens of typical *Chrotomys whiteheadi* which were collected by John Whitehead in February, 1895. One of these specimens came from Lepanto Province and the others from the mountains of northern Luzon.

Specimens examined.—One from type locality.

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A NEW RACE OF PENELOPE ARGYROTIS FROM
COLOMBIA.

BY BOARDMAN CONOVER

In a small collection of birds recently received from Colombia there are two specimens of *Penelope argyrotis* from Santander del Norte. Except for examples from the Santa Marta region, a "Bogota" skin in the British Museum is the only other specimen of the species recorded from Colombia. Therefore the two were compared with series from Santa Marta, Venezuela and Ecuador. Since they proved to be quite different, they are described below.

I am indebted to Mr. W. H. Phelps of Caracas for the loan of his type of *P. a. albicauda* and to Mr. John T. Zimmer of the American Museum of Natural History for specimens of the typical race.

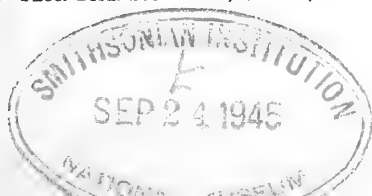
Penelope argyrotis mesaeus subsp. nov.

Type from Pamplona, Santander del Norte, Colombia, elevation 4800', No. 16071, adult female in the Conover Collection, Chicago Natural History Museum. Collected October 23, 1944, by Kjell von Sneidern.

Characters.—General appearance much darker, more olivaceous than in the other known races.

Nearest in coloration to *P. a. barbata* but upper parts darker more olive greenish less copperish and upper throat unfeathered as in typical race. Also has the light edgings to the feathers of the back of the neck practically obsolete, but the upper wing coverts are narrowly edged with white. On the top of the head the light edgings are white not gray and confined to the forehead and the superciliary stripe is very narrow and rather indistinct except behind the eye. Underneath the white edgings are not as heavy especially on the flanks and the lower belly and crissum are duller less rufous.

Differs from the typical race by having the dorsal surface darker, an olive rather than a bronze green. The underparts are also darker especially the chest and upper breast.



Differs from the type of *P. a. albicauda* in the same way as it differs from the typical race and in addition has the white edgings to the feathers of the mantle practically obsolete and the tip of the tail light cinnamon rufous instead of pale buffy.

Differs from *P. a. colombiana* by being darker more olivaceous throughout; by having the light edgings to the feathers of the upperparts restricted to the forehead and upper wing coverts, by having the sides of the face white, not gray, and the feathers of the crest broader and blunter.

Because of Mr. Todd's absence from the country I have been unable to make comparison with examples of *P. a. olivaceiceps*. However the original description of that race states that it is like the typical form but with the crest darker, olivaceous black, less brownish. Therefore, *mescus* should differ from it in the same manner as it differs from the nominate form, except for the color of the crest which must be very similar in the two races.

Remarks.—This new race is intermediate in character between the typical race from northeastern Venezuela and *barbata* from southwestern Ecuador. Like the former it has the upper throat unfeathered, while in its generally darker coloration and reduction of the pale margins to both upper and under parts it resembles the latter. The dark coloration of *mescus*, however, is even more olivaceous than in *barbata*.

The male of the pair from Pamplona is in a rather worn and faded plumage. Because of this it has a less olivaceous more coppery sheen to the upperparts. However, even in this faded condition it is darker than the darkest specimen in unfaded plumage from the Andes of Venezuela.

SPECIMENS EXAMINED.

Penelope argyrotis mesceus.—2: Colombia (Pamplona, Santander del Norte, 2).

Penelope argyrotis argyrotis.—8: Venezuela (Capas, Merida, 3; La Azulita, Merida, 3; Valencia, Carabobo, 2).

Penelope argyrotis albicauda.—1: Venezuela (La Sabana, Rio Negro, Perija, 1).

Penelope argyrotis colombiana.—2: Colombia (Vista Nieve, Santa Marta, 2).

Penelope argyrotis barbata.—5: Ecuador (Malacatos, Loja, 4; Huaico, Loja, 1).

PROCEEDINGS
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TWO NEW SPECIES OF CIRSOTREMA (EPITONIIDAE) FROM FLORIDA¹

BY HARALD A. REHDER,

Associate Curator, Division of Mollusks, United States National Museum.

In the course of determining an *Epitonium* from Florida, sent to the U. S. National Museum by Prof. T. Van Hyning, it became evident that the American group of species placed under *Cirsotrema* were in need of revision. This paper, therefore, arose out of the critical examination of these West Atlantic forms.

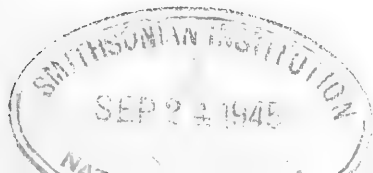
The type species of *Cirsotrema* Mörch 1852² by monotypy is *Scalaria varicosa* Lamarck, which Sowerby (Thes. Conch., vol. 1, pt. 4, 1844, p. 103) cites as coming from the Philippines. Species closely related are *C. multiperforata* Sowerby 1874 from Mauritius (also recorded from Singapore by Bavay), *C. bavayi* de Boury 1912 from New Caledonia, *C. plexis* Dall 1925 from Japan, and an undescribed species from the Hawaiian Islands.

Thiele in 1928 (Zeitschrift f. wiss. Zool., vol. 132, 1928, p. 92) erected the section *Cirsotremopsis* for *Scalaria cochlea* Sowerby 1844 from Loanda, West Africa, basing this separation on radular differences. There are other differentiating characters in the shell, among which may be mentioned the greater angularity of the whorls and deeper suture in the West African shell.

A species from Floridian and West Indian waters has long been known under the specific name *cochlea* Sowerby, but it differs from this form in several ways and is receiving a distinct name below. A closely related complex of species belonging to this same subgenus comprises *Cirsotrema pallaryi* De Boury 1912 from Algerian waters, *C. pumicea* Brocchi from the Italian and Algerian Pliocene, as well as several other fossil species found in the Mediterranean basin from the Helvetian (Mid-Miocene) onward, and a living Floridan form described below.

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² *Catalogus Conchyliorum* . . . Comes de Yoldi, fasc. 1, p. 49.



We may, therefore, restrict the Subgenus *Cirsotremopsis* Thiele to forms living in the Atlantic, or found fossil from the Middle Miocene to the Pleistocene in the lands bordering the Atlantic waters. Typical *Cirsotrema* occurs apparently only in the Indo-Pacific region.

The species *ranellina* Dall and *octolineata* Conrad, from the Jackson Eocene of Alabama and Mississippi, are probably not typical *Cirsotremas* and neither are the forms from the West Coast of North America listed as such by Durham (*Journal of Paleontology*, vol. 11, 1937, pp. 491-493). The species from the older Tertiary formations of Europe placed under *Cirsotrema* by Cossmann (*Essais de Paleconch. comp.*, vol. 9, pp. 51-52) likewise must be separated from the true *Cirsotremas*.

***Cirsotrema (Cirsotremopsis) dalli*, new species.**

Shell, rather large, slender, turriculate, white. Nuclear whorls decolated, remaining whorls 7.5, sculptured with crowded, slightly sigmoid, axial ribs which are about as broad as the interspaces and composed of compressed, rather wavy, lamellae. In the interspaces obscure broad spiral cords are visible, which are also noticeable on the aboral side of the varices, of which there are two to three on each whorl. The axial ribs have an increasing tendency to form an angle at the upper portion of the whorl, which gives the later whorls an angular appearance below the suture. The axial ribs are fused together at the prominent basal cord, but resumed, though narrower, in the narrow channel that separates the basal cord from the columellar cord. The suture is deep, and the aperture is subcircular, surrounded by a stout varicial lip.

The type, U.S.N.M. No. 515240, measures: Height, 41 mm.; breadth, 14.1 mm. It was dredged by the Bureau of Fisheries at Sta. 2373 in the Gulf of Mexico, off Cape San Blas, Florida, in 25 fathoms on coral bottom. U.S.N.M. No. 93710 contains another specimen from the same station.

A third specimen is in the collection of Dr. T. Van Hynning and was collected by Mr. J. C. Russell on Bush Key, Dry Tortugas, Florida. It measures: Height, 42.7 mm.; breadth, 16.5 mm.

This species is closely related to *Cirsotrema (Cirsotremopsis) cochlea* Sowerby from Loanda, West Africa, which, however, is a more loosely coiled shell, with a deeper suture, and a resultant subdisjunct aperture. The shell which Dunker described and figured from Loanda, West Africa (*Index Moll. Guineam coll. Tams*, 1853, p. 18, pl. 2, figs. 46-48) is apparently a different species.

***Cirsotrema (Cirsotremopsis) arcella*, new species.**

Shell of medium size, turritid, moderately solid, chalky white. Nuclear tip broken off, remaining nuclear whorl smooth; postnuclear whorls $7\frac{1}{4}$ to $7\frac{1}{2}$, sculptured with spiral cords crossed by separated axial riblets which in subsequent whorls become broader, being composed of many compressed wavy lamellae. The ribs finally fuse together, leaving only axial rows of small suboval openings. In the third whorl, the riblets begin to become shouldered which soon becomes very prominent, giving

the last four whorls a strongly shouldered appearance, the shoulder planate, with the edge tufted or subdenticulate, later on nodose. The whorls show two or three varices on each whorl, and a broad basal cord with a narrower cord in the umbilical region along the inner edge of the aperture. Mouth suborbicular, outer lip with a varix.

The type, U.S.N.M. No. 83725, measures: Height, 16.4 mm.; breadth, 7.2 mm., and was collected by the Bureau of Fisheries at Station 2602 in 124 fathoms, 36 miles southwest of Cape Hatteras, North Carolina. Other lots in the collection of the U.S. National Museum are from 20 to 30 fathoms off Miami, Florida, and Key West, Florida.

This species differs from *Cirsotrema* (*Cirsotremopsis*) *dalli* in being smaller, and in having the shoulder more strongly angulate, and flattened horizontally above, giving the spire a sharply terraced outline; the sculpture is more obviously reticulate. It is similar to *Cirsotrema pallaryi* De Boury (Journ. de Conch., vol. 60, p. 172, pl. 8, fig. 3, 1912) from Algeria.

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GENERAL NOTES.

RANGE EXTENSION FOR *EUMECES INEXPECTATUS* TAYLOR.

Since the publication of Dr. Edward H. Taylor's description of *Eumeces inexpectatus* (1932), there have been surprisingly few published references to the species. Most of these have been listed by Taylor in his review of the recent *Eumeces* literature (1943), and only a few relate to the distribution of *inexpectatus*.

Specimens available to Taylor when he monographed *Eumeces* were from localities, which, when plotted on a map, indicated that *inexpectatus* covered a decided lowland range which coincided roughly with the Coastal Plain physiographic province. Richmond and Goin's material from New Kent County, Virginia (1938), extended the range northward in the Atlantic Coastal Plain approximately sixty miles; and King (1939) listed specimens from Twenty Mile Creek, Swain County, North Carolina, in the southern Blue Ridge. The latter locality is the farthest inland and highest from which the species is known, in addition to being the first reported record for a mountainous area.

In the latter connection it may be of interest to put on record another montane locality for this lizard. On the afternoon of April 22, 1945, an adult female was collected about a mile northwest of Clifton Forge, Alleghany County, Virginia. The specimen was found under a rotting board in a cultivated field; the soil under the board was moist humus, and there was a colony of termites at one place. The weather was very hot and dry. The collection point is in a small narrow valley, with the adjacent forest cover mostly pine.

The lizard presents the following features: snout to vent, 60 mm; axilla to groin, 35 mm; snout to ear, 12 mm; dorsals, 55; scale rows at midbody, 31; supralabials, 7-7. The arrangement of the head shields

is in accord with Taylor's excellent description (1936, p. 225). Sublateral lines may be traced and become quite distinct in the axillae and groins. The tail is 67 mm in length, but about half is regenerated. The median row of subcaucals is slightly wider than in specimens from Florida.

The Alleghany County specimen extends the known range of *inexpectatus* approximately 33 miles farther north, and 167 miles west, of the previous terminal in New Kent County. The fact that the new locality is in the Valley and Ridge physiographic province indicates a unique distributional situation. As a general rule the ranges of lowland forms tend to become coastally restricted near their northern limits. Alleghany County, however, is about 200 miles from the coast and the elevation where the skink was found is 1150 feet, one of the highest at which *inexpectatus* is known.

The likelihood of extending the range into Maryland is questionable, since the species has not been found there despite the considerable collecting by members of the Natural History Society of Maryland, and other workers. However, since such species as *Abastor erythrogrammus* and *Diadophis p. punctatus* have been only recently discovered in Maryland, the possibility that *inexpectatus* may eventually be discovered in that state cannot be precluded. If the montane localities for the species are due to migration, it is likely that the James River in Virginia provided the route by which *inexpectatus* arrived in Alleghany County.

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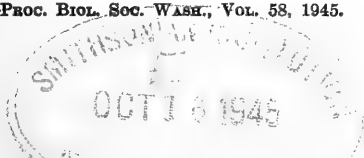
THE CIXIINI OF THE LESSER ANTILLES
(HOMOPTERA : FULGOROIDEA).

BY R. G. FENNAH.

In the Lesser Antilles the tribe Cixiini (Cixiidae) includes only members of the subtribe Cixiina: these fall into three groups, one of which has been given generic status by Uhler under the name *Vincentia*, on the basis of a single female which forms the type of *interrupta*, while the others fall into *Oliarus* Stål as currently recognized. One of the latter is not congeneric with the Philippine genotype of *Oliarus* (*Cixius walkeri* Stål) and is separated below as a new genus; the other agrees approximately with the genotype in general facies but differs in the shape of the areolets of the vertex and in tegminal venation and is here considered as a new subgenus pending a comparison of all generic structures with those of *walkeri* Stål.

The characters used in the separation of genera are sufficiently obvious in the generic descriptions given below. Here it is enough to draw attention to the value of the shape of the system of areolets developed between the disc of the vertex and the frons, the concavity or convexity of the frons in relation to its lateral margins, the proportions of the vertex, the length of the rostrum, the size and degree of prominence of the median ocellus, the position of the fork of Sc and R in the tegmina, the degree of tuberculation of the veins, the shape of the apical areoles in the wing (with due allowance for variation), the shape of the anal segment in the female, together with that of the first valvulae and of the hind margin of the eighth sternite. The anal segment of the male is of value in the case of the species discussed below, but may prove to be unreliable for generic segregation, as on the whole it is a rather plastic structure in the Cixiidae.

The genus *Vincentia* Uhl. has been placed by Muir (*Pan-Pacific Ent.* 1925, 1,3:100) in synonymy with *Cixius* Latreille. This is incorrect as



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Vincentia has a much narrower and longer vertex, a much narrower discal area on the pronotum, a short, broad and convex female anal segment, as opposed to the narrow and parallel-sided anal segment of *Cixius*; *Vincentia* is moreover quinquecarinate, though in the type the intermediate carinae are very obscure. The genus *Paracixius* erected by the writer with *armiger* as its haplotype (*Am. Mus. Novit.* 1944, 1265:1) is preoccupied by *Paracixius* Wagner, proposed as a subgenus of *Cixius*. *Paracixius* Fenn. is accordingly here replaced by the new name *Oliarissa*.

The writer is indebted to Mr. W. F. China for comparing Lesser Antillean specimens with material in his charge, and for making a drawing of the male genitalia of *Oliarus concinnulus* Fowl. from the type: this has been included in plate XII for general information.

The types of all species described as new have been deposited in the U. S. National Museum.

In the genus *Vincentia* species differ in the shape of the armature of the aedeagus in the male, and in the arrangement of sclerotised plates in the outer portion of the genital chamber in the female. In order to determine whether in each species the aedeagal processes fit during copulation into a perfectly corresponding series of notches and protuberances in the genital chamber, dissections were made of pairs of *V. christopheri*, *V. hewanorrae*, and *V. grenadana* (all described below) taken and immediately killed while *in copula* (see figures 48, 49 and 50). It was found that with the exception of a slight catch (Fig. 50, A) formed by a simple median prominence, which is present in all species examined near the external opening of the genital chamber, no mechanism exists for locking or positioning the aedeagal processes during mating. It was noted that in one female taken *in copula* and in several others which had laid their eggs that the plates could scarcely be differentiated from the remainder of the wall without staining, and were equally flexible. Moreover, it was seen that even in a single species, represented by material collected within a radius of 400 yards, the aedeagus is not always inserted to exactly the same extent in different mating pairs (in a series of nine): the determining factor appears to be the point at which the first and second valvulae of the ovipositor are compressed between the proximal portion of the genital styles and the medioventral process of the male pygofer (see figure 51); if it is half-way from their base, for instance, the aedeagus is inserted farther than it could be if the distance were two-thirds. The variation observed in this respect was not large but in view of the multiplicity of shapes assumed by the aedeagal processes would be sufficient to preclude any close mutual adaptation of sclerotised parts in the genital chamber, even if provision for such could be detected. In the writer's opinion the aedeagal processes in this and in certain other families of Fulgoroidea serve to dilate the walls of the genital chamber; they may also lend a certain rigidity to the aedeagus and in a few cases form a very simple type of locking device.

KEY TO WEST INDIAN CIXIINA.

- (1) (2) Tegmina with M3+4 forking near to main fork of media, M 1+2 forking much farther from main fork..... *Mnemosyne* Stål.
- (2) (1) Tegmina with fork of M 1+2 nearer to main fork of M than is the fork of M 3+4..... (3)
- (3) (4) Rostrum with subapical joint attaining hind trochanters, species 7 mm. or more in total length.....
Cyclopolarus gen. nov.
- (4) (3) Rostrum with subapical joint not reaching to hind trochanters, species 6 mm. or less in total length..... (5)
- (5) (6) Apex of rostrum surpassing hind trochanters, anal segment of female ovate, that of male not forming a deflexed medial point distally..... *Vincentia* Uhler
- (6) (5) Apex of rostrum scarcely attaining hind trochanters, anal segment of female broadly triangular, that of male distally forming a median deflexed point.....
Oliarus Stål, subgen. *Melanoliarus* nov.

CYCLOPOLIARUS, new genus.

Vertex oblong, not much produced before eyes, width across basal angles to length along one side 1:1.8, disc hollowed out, sometimes a short median carina present basally, anterior margin truncate, lateral margins straight, diverging basad, posterior margin rectangularly excavate, transverse carina arising one-third from apex, areolet small, broadly quadrangular, a quadrate cell medially 1.5 times as long as broad; frons with lateral margins expanding to below level of antennae then incurved, lateral margins expanded laterad or antero-laterad, median ocellus present, median carina percurrent on frons and clypeus, broadly forked at extreme base, rostrum long, subapical segment attaining hind trochanters, apical segment at least overlapping base of fifth sternite in living material. Pronotum short, a carina on each side following hind margin of eyes, posterior margin excavate in an obtuse angle; mesonotum broader than long with five carinae, the intermediate carinae extending from basal margin to one-third from apex; hind legs slender. Tegmina with Sc+R 1.2 to 1.5 times length of Sc between fork of Sc+R and branch to stigma, M forked at M—Cu cross-vein, basad of stigma, Cu 1^r forking somewhat basad of Sc+R fork, six subapical areoles, R usually with three branches at margin, M1 with two, M2 simple, M 3+4 forked once, Cu 1a and Cu 1b simple. Wings with R forked rather widely at apex, M with a narrower fork about a third longer. Anal segment of female about as long as preceding three tergites, broader than long (1.9:1), margins almost straight, strongly converging distally. Ovipositor with broad portion of first valvulae occupying two-thirds to three-quarters of total length of first valvulae. Anal segment of male ovate in dorsal view. Pygofer with lateral angles bluntly rounded, medioventral process acutely triangular. Genital styles each consisting

of a straight limb terminating in a quadrate lobe, with a triangular flange or a curved spine on inner face.

Genotype, *Oliarus biperforatus* Fenn. Proc. U. S. Nat. Mus., Vol. 95, p. 419, 1945.

KEY TO SPECIES OF CYCLOPOLIARUS

- (1) (2) Lateral margins of frons foliately expanded antero-laterad, M 1+2 about a quarter or one-fifth length of M 3+4.....(3)
- (2) (1) Lateral margins of frons expanded laterad, not foliate.....(7)
- (3) (4) M 1+2 one-quarter length of M 3+4, tegmina not infusate at margin.....*naparimae* n. sp.
- (4) (3) M 1+2 one-fifth length of M 3+4, tegmina brown at margin.....(5)
- (5) (6) Clypeus, labrum, and disc of frons piceous.....*biperforatus* Fenn.
- (6) (5) Sides of labrum, a spot on frons at each side of middle at level of median ocellus piceous.....*omani* Metcalf
- (7) (8) Median carina of frons forked one-third from base.....
atkinsae Myers
- (8) (7) Median carina of frons forked one-seventh from base.....(9)
- (9) (10) Ovipositor with first valvulae broad for three-quarters of length, a tooth on sternite at base on outer side of each valvula.....*montserratensis* n. sp.
- (10) (9) First valvulae broad for six-sevenths of length, tooth scarcely visible.....*yamaicensis* n. sp.

Cyclopoliarus naparimae, new species.

(Figs. 20, 22-25, 64)

Male. Length, 6.5 mm.; tegmen, 7.3 mm. Female. Length, 7.1 mm.; tegmen, 7.7 mm. Reddish-brown, legs testaceous; tegmina hyaline, stigma pallid except for a fuscous line on distal margin, veins reddish-brown basally, testaceous at middle, fuscous distally, the distal transverse veins clouded with brown; both tegmina and wings slightly tinged with brown near apical margin.

Anal segment asymmetrical in type specimen, tectiform, subovate in dorsal view tapering to a blunt point directed obliquely to left. Pygofer with lateral margins subangulately rounded; medioventral process acutely triangular. Aedeagus tubular, a slightly sinuate spine arising at base on left, directed posteriorly, a shorter spine on right side one-third from base directed obliquely anteriorly; a small sclerotised plate at base of flagellum ventrally, from which arise a long stout S-shaped spine on right side and a broad stout limb directed obliquely to left, which gives off a long stout spine curving mesad, forward and laterad through 180°, a small spine posterior to this directed mesally, and a very long spine curving mesally and anteriorly, then curving sharply to point posteriorly in its distal half; flagellum with two parallel curved callused ridges on its upper surface, the dorsal ridge smaller than that on which it rests, pointed at one end.

Ovipositor with broad basal portion of first valvulae occupying rather more than half of total length of valvulae. Margin of eighth sternite at base of first valvulae not pointed, protruding in a rounded lobe.

Described from one male and one female collected by P. L. Guppy at La Advenance, Princetown, Trinidad, B.W.I. (June 5, 1912) on cacao. This species is readily distinguished by the genitalia and by its smaller size and sparser marking from *omani* and *biperforatus*. This section of the genus, apart from being distinguished by the antero-oblique dilation of the lateral margins of the frons, appears to include species in which the predominant colour is brown, varied with ochraceous in some species, the colour including the tegminal markings and the veins, while in great dilution it sometimes suffuses the whole tegmen. The second section of the genus seems to include only species which are dorsally deep fuscous to piceous, apart from reddish-brown marginal tints, and which have clear wings, occasionally marked with deep fuscous, and a very dark stigma. If, with the addition of new species to the genus, this correlation holds good two subgenera will need to be recognised.

Cyclopoliarus montserratensis new species.

(Fig. 43).

Female. Length, 5.9 mm.; tegmen, 6.9 mm.

Piceous; lateral margins of vertex, frons, clypeus, a patch below fenestrae, second segment of rostrum, carinae of pronotum, legs except femora pallid testaceous, lateral and intermediate carinae on mesonotum reddish brown; tegmina hyaline, veins, stigma, apex of cell Cu1b and sutural margin from base to junction with claval vein fuscous.

Ovipositor with broad basal portion of first valvulae extending for three-quarters length of second valvulae. Hind margin of eighth sternite produced in a point at base of each first valvula.

Described from one female taken by the writer at 1,000 ft. in the drier type of rain-forest, Central Range, Montserrat, B.W.I. (February 20, 1940). This species is distinguished by its genitalia and colouration; it is rather larger than the following, which it most nearly resembles. The rostrum in the type reaches to the seventh sternite but can only be compared with that of the same sex in other species, as in all near-oliarine genera this organ shows sexual dimorphism in regard to length.

Cyclopoliarus jamaicensis, new species.

(Figs. 14-19, 21, 53.)

Male. Length, 4.7 mm.; tegmen, 5.0 mm. Female. Length, 5.0 mm.; tegmen, 5.4 mm. Tegmina hyaline with a fuscous band at base between Sc+R+M and first claval vein, a second band at middle between forks of Sc+R and Cu 1.

Brownish-testaceous on ventral surface; vertex and frons fuscous to piceous, carinae pale, remainder of dorsum dark reddish-brown, legs pale.

Aedeagus with two long straight spines arising at base on left side directed posteriorly, a long stout spine arising near base of flagellum on

left, curved and directed anteriorly, a small spine ventrally at base of flagellum directed to left, a long slightly curving spine arising ventrally on left side of aedeagus near base directed posteriorly; flagellum with two small spines near apex on outer margin, a long sickle-shaped spine on inner margin. Genital styles narrow at middle in side view, large and subquadrate distally with a narrow, almost spinose, curved lobe on inner face.

Ovipositor with broad basal portion of first valvulae not quite four-fifths of total length of valvulae. Hind margin of eighth sternite not or scarcely pointed at base of each first valvula.

Described from two males and two females collected by the writer near Mona House, near Liguanea, Jamaica (November 25, 1940) on logwood and *Agave* sp. This species is distinguished by the colouration and by the male and female genitalia. The rostrum in the female is as long as in *montserratensis*.

VINCENTIA Uhler.

Uhler 1895 *Proc. Zool. Soc. Lond.* : 67. Genotype, *V. interrupta* Uhler *loc. cit.*

Vertex along one side 1.4 times longer than wide between basal angles, anterior margin transverse, lateral margins diverging slightly basad, posterior margin subrectangularly excavate, transverse carina arising two-thirds from base of lateral margin, joining a small quadrangular cell medially at apex, disc hollowed out, devoid of a median longitudinal carina; frons slightly curved in profile, lateral margins expanded laterally, median carina slightly broadened rather than forked at base, percurrent through clypeus, median ocellus very obscure, not half as large as lateral ocelli. Tegmina with veins distinctly granulate, Sc+R at least 1.3 times as long as Sc between Sc+R fork and stigmal fork. Wings with apical fork of R enclosing an areole one-third length of that enclosed by apical fork of M. Anal segment of male broadly ovate in dorsal view, widest distad of middle, apical margin slightly reflexed. Pygofer with lateral angles subacute, medioventral process with parallel horizontal ridges. Genital styles broad at base, strongly tapering at middle, expanded apically in a subovate lobe, with a flange of varying shape on inner face. Anal segment of female with sides deflexed, lateral margins as seen in dorsal view convex; not large, rounded-quadrate as seen from above. Hind margin of eighth sternite not produced in a point at base of first valvulae. Ovipositor with broad basal portion of first valvulae extending for about three-quarters of their total length. Egg bluntly ovoid, smooth. The sclerotised parts of the body of all known species are pale, testaceous, or reddish or sepia brown, not piceous.

Vincentia interrupta Uhler.

(Figs. 35-37, 42, 54.)

Male. Length, 3.6 mm.; tegmen, 3.7 mm. Female. Length, 4.1 mm.; tegmen, 4.9 mm. Aedeagus tubular, flagellum curved to left and

bent anteriorly in its distal half; ventrally three long spinose processes arising near base, that on left slender, tapering, slightly curved, middle process swollen at base, then straight to its distal point where it becomes swollen and bent through 90° and again through 75° to point obliquely anteriorly, the spine on right stout, tapering, subangulately bent at middle; the sclerotised support of left side of aedeagus with a short curved prominence; flagellum with a curved spine on outer side at middle and a longer straight spine at apex.

Redescribed from three males and five females taken at Three Rivers Settlement, St. Vincent, by the writer (August 23, 1941). Mr. China has kindly compared a male specimen with Uhler's female type. The species is distinguished by the shape of the aedeagal armature: it would seem that Sc is proportionately longer in relation to Sc+R than in other species, but a longer series is required to settle this point.

Vincentia hewanorrae, new species.

(Fig. 26-30, 46, 47, 49, 50, 55, 63.)

Male. Length, 3.5 mm.; tegmen, 3.7 mm. Female. Length, 4.1 mm.; tegmen, 4.9 mm. Aedeagus tubular, flagellum curved to left and bent anteriorly in its distal half; at base a sclerotised plate expanded in unequal pointed lobes; ventrally two long spinose processes arising near base, that on left side bent through 90° , the other forming an abrupt loop through 225° to point anteriorly; sclerotised support of left side of aedeagus with its upper edge produced distally into a straight spine and a stout, small, curved hook; flagellum with a broad curved spine on inner edge and two spines on outer margin at apex, the longer curved mesally, the shorter not more than half as long as preceding, directed anteriorly. Genital styles with upper margin of distal lobe subangulately bent.

Described from 11 males and 19 females collected by the writer on shrubs of drier type rain-forest, Morne Fortunée, St. Lucia, B.W.I. on Feb. 3, 1940 and on various dates in 1941 and 1943. The species is distinguished by the shape of the angles on the basal flanges of the aedeagus, and by that of the aedeagal armature, as well as by the shape of the upper margin of the distal lobe of the genital styles, which is subangulate in this species and rounded in *interrupta*. The specific name is taken from the Indian name for St. Lucia, in which the species is apparently endemic.

Vincentia christopheri, new species.

(Figs. 31-34, 41, 52.)

Male. Length, 3.5 mm.; tegmen, 3.5 mm. Female. Length, 3.2 mm.; tegmen, 4.5 mm. Brown; disc of mesonotum and clypeus distinctly ochraceous, lateral margins of vertex, frons, and clypeus, a patch below fenestrae, second segment of rostrum, legs and abdominal sternites at middle pallid yellow. Tegmina hyaline with testaceous veins, forks of Sc+R, and Cu1, transverse veins, stigma and sutural margin near junction with claval vein fuscous.

Aedeagus tubular, flagellum curved to left and bent anteriorly in its distal half; at base a sclerotised plate produced on right into a small decurved hook, on left into a lobe with four distal teeth; ventrally two long spinose processes arising near base, the spine on left side bent through 75° in its apical third, the other swollen distally and bent through 270° to point to right; sclerotised support of left side of aedeagus with its upper edge forming a short ridge and a short stout curved hook; flagellum with a short broad spine at its base, a spine on outer margin at middle and a longer spine arising on inner margin two-thirds from base, lying obliquely across flagellum, apex of flagellum pointed. Genital styles tapering to middle then expanding into an ovate lobe flattened on its outer margin, a prominent triangular flange on its inner face.

Described from 12 males and 13 females collected by the writer at Old Road, St. Kitts, B.W.I. (Jan. 23, 1942) on *Coccoloba wifera* and *Acacia* sp. This species is distinguished by the shape of the aedeagal armature.

Vincentia grenadana, new species.

(Figs. 38-40, 48, 51.)

Male. Length, 3.7 mm.; tegmen, 3.7 mm. Female. Length, 4.1 mm.; tegmen, 5.0 mm.

Brown; lateral margins pallid yellow.

Aedeagus tubular with flagellum bent strongly to right and expanded distally, ventrally near base a short rectangulate spine directed posteriorly; dorsally, arising from base a long sinuate spine overlying aedeagus for its whole length, looped through 180° at its apex; laterally a long stout spine curved through 180° below aedeagus and recurved at apex; flagellum expanded distally, apical margin truncate with a slender sinuate spine. Genital styles narrowed to middle, expanding distally into a lobe curved anteriorly at tip, with a large triangular flange, almost as large as the lobe itself, on its inner face.

Described from 4 males and 7 females collected by the writer on *Miconia*, *Inga* and low bushes at Mardi Gras, Grenada (October 20, 1943). This species is distinguished by the shape of the aedeagal armature and by the shape of the genital styles.

Vincentia substigmatica (Leth.), new combination.

Diacira substigmatica Lethierry, 1881 *Ann. Soc. Ent. Belgique* 25: 13.

The size (5 mm.), reddish-brown colour and paler legs support the view that *substigmatica* must be placed in *Vincentia*. The species is probably endemic in Guadeloupe and the inclusion of the distribution in the original description must be considered of importance in fixing the species for subsequent recognition.

OLIARUS Stål.

Stål 1862 *Berl. Ent. Zeit.* 6: 306. Genotype, *O. walkeri* Stål 1859 *Eugen. Resa*: 272. Distant 1906.

Melanoliarus, new subgenus.

Vertex narrow, length of one side 1.3 times width across basal angles, disc hollowed out, devoid of a longitudinal median carina, transverse carina arising two-thirds from base joining a small quadrate cell before anterior margin; frons with disc slightly sloping away from median carina, lateral margins not foliate, produced laterally, median carina broadly forked at basal seventh, median ocellus distinct; rostrum not attaining posterior trochanters. Pronotum with lateral carinae following hind margins of eyes; mesonotum quinquecarinate, less obviously so in the female. Hind tibiae relatively short and stout with a minute spine basally, a larger spine at middle and a large tooth and four small teeth at apical border. Anal segment of male with apical margin strongly deflexed, forming a point below telson. Pygofer with posterior margin angularly convex with a slight indentation medially. Genital styles in side view narrowest at middle, expanded into a lobe distally that curves anteriorly at apex, a stout, subacutely pointed lamina on its inner face. Anal segment of female very broadly triangulate. First valvulae of ovipositor with broad basal portion extending posteriorly for less than half of total length. Tegmina with Sc+R four times as long as Sc between Sc+R fork and stigmal fork, Sc in this distance shorter than stigma, Sc with two branches at margin, R with two, M with five, Cu 1 with two. Wings with first apical cell of R subequal to first apical cell of M, both shortly triangular.

Type of subgenus, *Oliarus maidis* Fenn. 1945. *Proc. U. S. Nat. Mus.*, Vol. 95, p. 423.

Oliarus (*Melanoliarus*) *maidis* Fenn.

(Figs. 4-13, 45.)

Aedeagus broad, tubular; an unarmed sclerotised plate forming a flattened sheath for apodeme of penis in its basal half, and extended laterally into a thin transverse plate in its distal half; apodeme of penis passing distally into a stout oblique sclerotised tube, armed at its distal edge with two strongly curved spines rotating in the same plane, and a long shallowly curved spine directed anteriorly.

Material of this species is to hand from Grenada (five males, three females, October 19-21, 1943), St. Vincent (three males, three females, August 20, 1941), and St. Lucia (18 males and 24 females, March 20-23, 1939 and on various dates 1940-44) all taken by the writer on maize, on the edge of woodland, or at light.

Oliarus (*Melanoliarus*) *campestris*, new species.

(Figs. 1-3, 44, 62.)

Male. Length, 3.2 mm.; tegmen, 3.3 mm. Female. Length, 3.2 mm.; tegmen, 3.5 mm. Piceous; margins and carinae of frons and pronotum, apex of scutellum, base of procoxae, femora at apex, tibiae externally and metatarsi pallid yellow.

Aedeagus broadly tubular, with a broad sclerotised plate ventrally in

its basal half bordered distally by a thick transverse ridge which bears at one end a straight stout spine directed laterally, and at the other end a slightly longer spine curved mesad, a twisted fold on right side of ventral plate in basal half; apodeme of penis passing distally into a stout sclerotised oblique cylinder which bears a short sinuate spine dorsally at its base, and two spines distally, one short and curved through 180° the other long, slightly sinuate and directed anteriorly.

The writer has collected this species in Jost Van Dyke, B.V.I. (one male, Feb. 18, 1944), Antigua (three males, one female, August 3, 1943), St. Kitts (nine males, thirteen females, on beans, September 7, 1943), Nevis (two males, four females, January 16, 1942), Hope, Jamaica (one male, one female, November 15, 1940).

Subtribe Myndina.

PARAMYNDUS Fenn.

Fennah 1945 *Proc. U. S. Nat. Mus.*, Vol. 95, p. 424. Genotype, *P. cocois* Fenn. *ibid.*

To this genus must be added the closely allied *Myndus crudus* Van Duzee from Jamaica (*Bull. Buff. Soc. Nat. Sci.* 1907, 8: 33), which in a comparison of two series of eight and thirteen males appears to differ from *cocois* constantly in the shape of the aedeagal armature and that of the hind margin of the pygofer, as shown in figures 65, 66, 67, and 68. *Paramyndus* differs from *lata musiva* Germar, the Old World genotype of *Myndus* Stål, in having the frons more dilated distally, its lateral carinae not so obliquely raised, the median ocellus very obscure, no distinct median transverse carina on vertex, the eyes strongly excavate below, the vertex 4.5 times the length of the pronotum in middle (3.0 times in *musivus*), the vertex covering the pronotal disc entirely, the tegmina with Cu forking basad of Sc+R fork, Sc+R forking six-sevenths of distance from basal cell to stigma, the greatest width of the tegmen scarcely four-fifths of length between Mf and apex of tegmen (equal in *musivus*), the wing with the first marginal cell of M 1.5 times as long as its stalk (about 5 times in *musivus*). From *Nymphocixia* V. D. it differs markedly in the form of the head and in the carinae of the frons.

TRIBE BOTHRIOCERINI.

BOTHRIOCERA Burm.

Burmeister 1835 *Handb. Ent.* 2 (1):156. Genotype, *B. tinealis* Burm., *ibid.*

Bothriocera eborea Fenn.

(Figs. 60, 61)

Fennah 1943, *Psyche*, 1, 2 : 14.

In the mount from which the original illustration of the aedeagal flagellum was made the apical spine was twisted to face mesally instead of postero-laterally. The flagellum of a specimen from Jost Van Dyke is figured to show the normal position of the flagellar appendages. In

addition to the localities already given this species has been collected by the writer in the following: Martinique, F.W.I. (one male, Fort de France, March 1944), Tortola, B.V.I. (two males, eight females, February 15-17, 1944), Jost Van Dyke, B.V.I. (three males, four females, February 18, 1944).

Bothriocera bicornis (F.)

Fabricius 1803 Syst. Rhyng.: 101.

One male and three females collected by the writer in Maracas Valley, Trinidad (January 21, 1945). The genitalia and pigmentation of the tegmina agree well with those of the species figured by Metcalf as *bicornis* (F.).

EXPLANATION OF PLATES.

PLATE XI.

1. *Oliarus campestris* Fenn., aedeagus, ventral view (St. Kitts).
2. *O. campestris* Fenn., aedeagus, left side (shown with ventral surface uppermost).
3. *O. campestris* Fenn., antero-apical portion of left wing.
4. *Oliarus maidis* Fenn., aedeagus, dorsal view (St. Vincent).
5. *O. maidis* Fenn., aedeagus, right side.
6. *O. maidis* Fenn., anal segment of female, dorsal view.
7. *O. maidis* Fenn., anal segment of male.
8. *O. maidis* Fenn., medioventral process of pygofer and left genital style, ventral view.
9. *O. maidis* Fenn., anal segment of male, right side.
10. *O. maidis* Fenn., apical margin of anal segment of male, posteroventral view.
11. *O. maidis* Fenn., right genital style, side view.
12. *O. maidis* Fenn., right tegmen.
13. *O. maidis* Fenn., head and left half of thorax.
14. *Cyclopoliarus jamaicensis* Fenn., left genital style, lateral view.
15. *C. jamaicensis* Fenn., anal segment of male, left side.
16. *C. jamaicensis* Fenn., aedeagus, dorsal view.
17. *C. jamaicensis* Fenn., diagram of aedeagus viewed from right side.
18. *C. jamaicensis* Fenn., anal segment of male, dorsal view.
19. *C. jamaicensis* Fenn., left genital style, ventral view.
20. *C. naparimae* Fenn., aedeagus, dorsal view.
21. *C. jamaicensis* Fenn., anal segment of female.
22. *C. naparimae* Fenn., left genital style, side view.
23. *C. naparimae* Fenn., diagrammatic posterior view of left genital style.
24. *C. naparimae* Fenn., apical portion of anal segment of male.
25. *C. naparimae* Fenn., lateral margin of pygofer, left side.
26. *Vincentia hewanorrae* Fenn., left genital style, side view.
27. *V. hewanorrae* Fenn., lateral margin of pygofer, left side.
28. *V. hewanorrae* Fenn., anal segment of male, dorsal view.
29. *V. hewanorrae* Fenn., anal segment of male, right side.
30. *V. hewanorrae* Fenn., aedeagus, dorsal view.

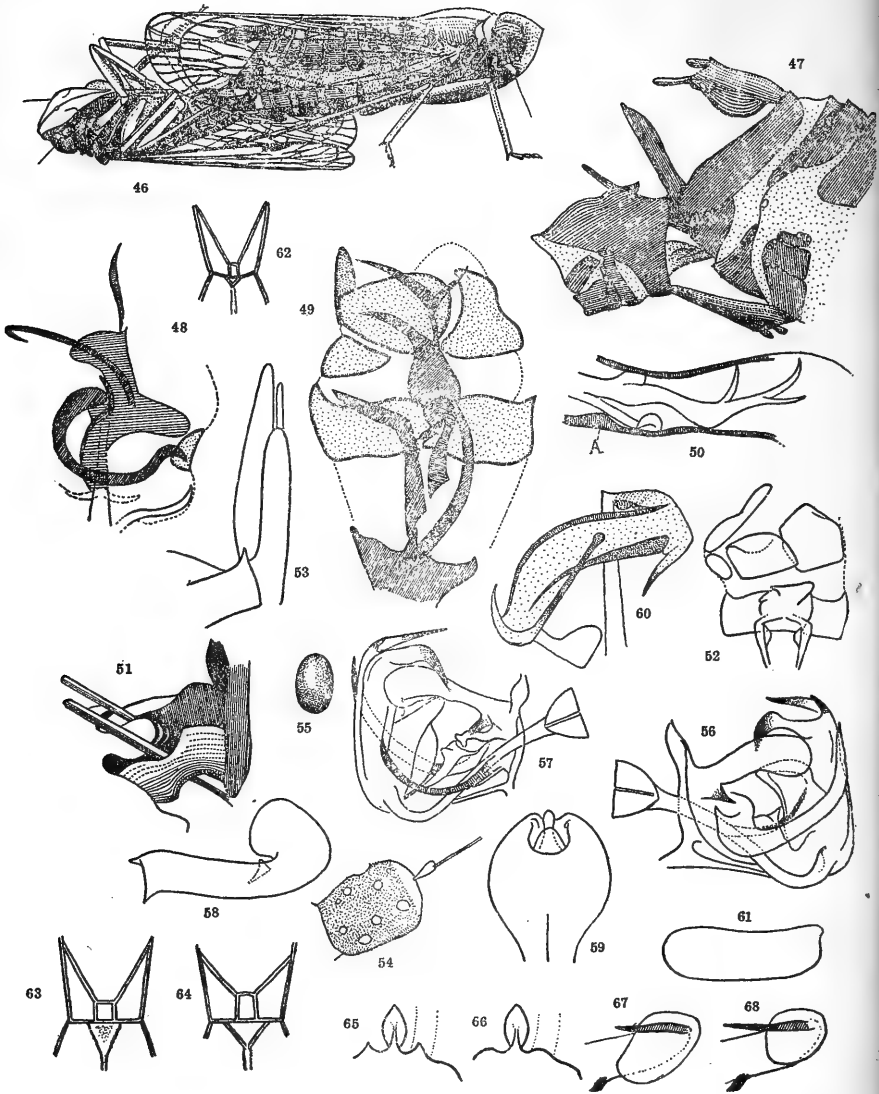
31. *V. christopheri* Fenn., right genital style.
32. *V. christopheri* Fenn., aedeagus, ventral view.
33. *V. christopheri* Fenn., aedeagus, dorsal view.
34. *V. christopheri* Fenn., anal segment of male, right side.
35. *V. interrupta* Uhl., left genital style.
36. *V. interrupta* Uhl., aedeagus, ventral view.
37. *V. interrupta* Uhl., valvulae of left side, ventral view.
38. *V. grenadana* Fenn., left genital style, side view.
39. *V. grenadana* Fenn., aedeagus, dorsal view.
40. *V. grenadana* Fenn., aedeagus, right side.
41. *V. christopheri* Fenn., apical portion of left wing.
42. *V. interrupta* Uhl., head and thorax.
43. *Cyclopoliarus montserratensis* Fenn., head and thorax.
44. *Oliarus campestris* Fenn., posterior margin of pygofer, lateral view.
45. *O. maidis* Fenn., egg.

PLATE XII.

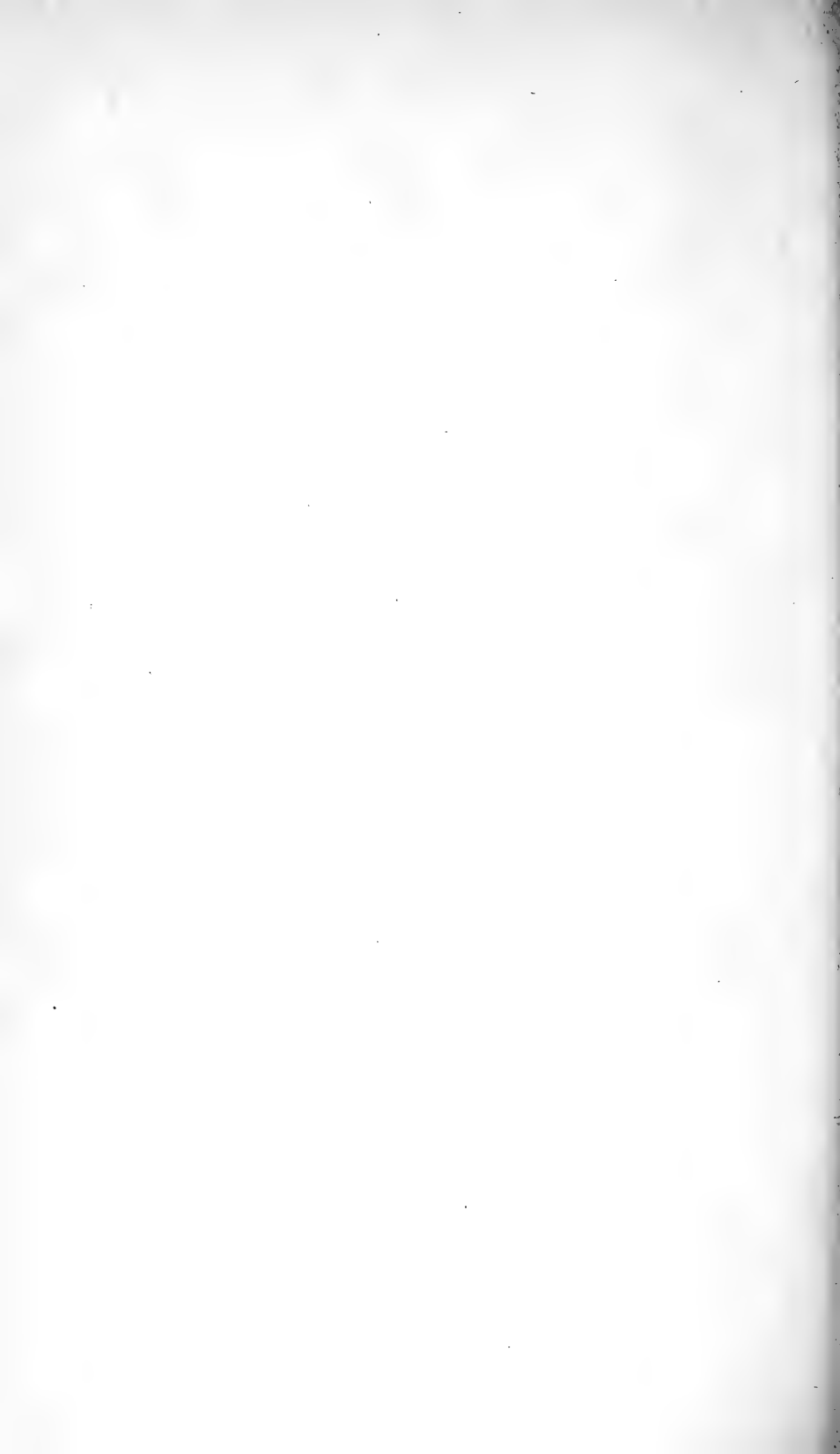
46. *Vincentia hewanorrae* Fenn. *in copula*.
47. *Vincentia hewanorrae* Fenn., position of genitalia during copulation.
48. *V. grenadana* Fenn., aedeagus extended in genital chamber, dorsal view.
49. *V. hewanorrae* Fenn., aedeagus extended in genital chamber, dorsal view.
50. *V. hewanorrae* Fenn., diagrammatic lateral view of aedeagus in genital chamber, shown upside down.
51. *V. grenadana* Fenn., semi-diagrammatic view of genital styles, medioventral process and first and second valvulae during copulation.
52. *V. christopheri* Fenn., outer portion of genital chamber, dorsal view, showing sclerotised areas.
53. *Cyclopoliarus jamaicensis* Fenn., valvulae, left side.
54. *Vincentia interrupta* Uhl., antenna, ventral view.
55. *Vincentia hewanorrae* Fenn., egg.
56. *Oliarus concinnulus* Fowl., aedeagus (from drawing made by W. E. China from type).
57. *Oliarus concinnulus* Fowl., aedeagus (ditto).
58. *O. concinnulus* Fowl., left genital style (ditto).
59. *O. concinnulus* Fowl., anal segment of male (ditto).
60. *Bothriocera eborea* Fenn., aedeagus, dorsal view.
61. *B. eborea* Fenn., egg, side view.
62. *Oliarus campestris* Fenn., apex of vertex and base of frons.
63. *Vincentia hewanorrae* Fenn., ditto.
64. *Cyclopoliarus naparimae* Fenn., ditto.
65. *Paramyndus crudus* (V. D.), medioventral portion of pygofer.
66. *Paramyndus cocois* Fenn., ditto.
67. *Paramyndus crudus* (V. D.), apex of aedeagus.
68. *Paramyndus cocois* Fenn., ditto.



Details of Lesser Antillean Cixiini.



Details of Lesser Antillean Cixiini.



74.0673

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE STATUS OF *THAMNOPHIS BUTLERI* COPE,
AND A REDESCRIPTION OF *THAMNOPHIS*
BRACHYSTOMA (COPE).

BY ALBERT G. SMITH.

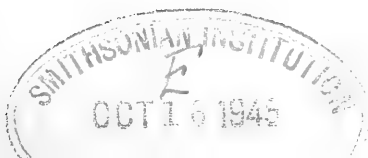
The rather consistent reduction of scale rows in specimens of *Thamnophis butleri* from New York and Pennsylvania, together with a smaller number of labial scales, has induced me to examine the available material from throughout the range of this species. *Thamnophis butleri* has had an interesting history. Cope described a specimen from Richmond, Rush County, Indiana, as *Eutaenia butleri* in 1888, and in 1892, he described *Eutaenia brachystoma* on the basis of a specimen from near Franklin, Venango County, Pennsylvania. Although noting the decided reduction in scutellation of the Pennsylvania specimens, Ruthven (1908) did not have sufficient specimens for proper analysis, and included *brachystoma* in the synonymy of *butleri*. Blanchard (1925) possibly because of the similarity between *butleri* and *radix*, considered *butleri* a subspecies of *radix* in his key. In 1932, Davis showed the validity of considering *butleri* a species. In view of the present study, as will be shown, it seems advisable to resurrect Cope's "*Eutaenia brachystoma*" and to recognize both *butleri* and *brachystoma* as valid species.

Thamnophis butleri (COPE)

Eutaenia butleri, 1888, COPE, Proc., U. S. Nat. Mus., 11: 399.

Thamnophis butleri, 1908, RUTHVEN, Bull., U. S. Nat. Mus., 61: 87 (in part).

Type:—A specimen taken near Richmond, Rush County, Indiana. The actual specimen seems to have been part of a collection sent to Cope for study from Purdue University. The specimen was not returned to Purdue, and has not been found in any of the known Cope collections.



OCT 16 1945

Diagnosis.—A small *Thamnophis* in which there are 19 scale rows, and normally 7 upper labials.

Description.—A small *Thamnophis* with the scales arranged in 19–19–17 rows. Four Ohio and three Michigan specimens have the scales in 17–19–17 rows. One Ohio specimen has 19–17–17 rows, and one Michigan 17–17–15. The lateral scales are wider than the dorsal and all scales are keeled. The lateral stripe occurs on the 2nd, 3rd, and 4th rows. The inter stripe blotches are not the same size as occurs in *radix*. The upper labials are normally 7, frequently 6, but very rarely 8. There are normally 8 lower labials, although 9 are frequent. An occasional specimen may have 7 or 10 lower labials. There is one pre-ocular and normally 3 post-oculars, although 2 post-oculars are common. There is one temporal in the first row, and there may be either one large and one small, or just one large temporal in the second row. The anal plate is not divided. The head plates are normal as in the genus; the eye is in contact with the 3rd and 4th upper labial, and the loreal is present. The ventrals in 119 males range from 132 to 147, mean 141; in 104 females they range from 129 to 146, mean 139. The caudals in 91 males¹ vary from 57 through 71, mean 64; while in 97 females they vary from 51 to 63, mean 55. In 91 males the tail/total length ratio is from .219 to .265, mean .250; in 97 females from .200 to .244, mean .222. The largest specimen examined was a male from Middlesex County, Ontario, (R. O. M. Z., no. 5527), with a total length of 573 mm., tail, 130 mm.

Range.—The snake occurs in glaciated territory in southeastern Wisconsin and southern Michigan, through Indiana (east of the dunes), and Ohio, and in southwestern Ontario. It is frequently found near water or in moist situations.

Material examined:²—

WISCONSIN (24 ♂, 15 ♀) *Dodge County*: Atwater; *Milwaukee County*: Bay View, Milwaukee, Wauwatosa; *Racine County*: Corliss; *Waukesha County*: Big Bend, Menominee Marsh, Nashotah, Upper Nemahbin Lake.

MICHIGAN (37 ♂, 51 ♀) *Eaton County*: Olivet; *Huron County*: Sand Point, Stoney Island, Bay Port, Saginaw Bay; *Ingham County*: East Lansing; *Livingston County*: Brighton, Byron; *Monroe County*: Point Place; *Oakland County*: Pontiac; *Shiawassee County*; *Washtenaw County*: Ann Arbor, Chelsea, Ypsilanti; *Wayne County*: Northville Hatchery.

OHIO (42 ♂, 17 ♀) *Champaign County*: Brush Lake; *Crawford County*: Cranberry Twp.; *Cuyahoga County*: East Rockport; *Erie County*: Sandusky; *Franklin County*: Columbus; *Greene County*: near Xenia, Miami Twp.; *Hardin County*: near Mt. Victory; *Huron County*: Greenfield Twp.; *Richmond Twp.*; *Logan County*: West Liberty; *Lucas*

¹ The difference in numbers of specimens used was occasioned by the number of incomplete tails.

² Numbers after state names refer to numbers of specimens seen from these areas.

County: Bono, Reno Beach, Toledo; Marion County; Montgomery County: Dayton; Ottawa County: East of Bono, Erie Twp., Port Clinton; Portage County: Hiram; Richland County: Jackson Twp., Plymouth Twp.; Seneca County: Venice Twp.; Wayne County: Wooster.

INDIANA (3 ♂, 1 ♀) DeKalb County: Waterloo; Kosciusko County: Turkey Lake; Marion County; Marshall County: Lake Maxinkuckee; Porter County: near Valparaiso; Rush County: Richmond.

ONTARIO (15 ♂, 25 ♀) Middlesex County: near Newbury; Kent County: Rondeau Park.

THAMNOPHIS BRACHYSTOMA (COPE).

Eutaenia brachystoma, 1892, COPE, Amer. Nat., 26: 964-5.

Thamnophis butleri, 1908, RUTHVEN, Bull., U. S. Nat. Mus., 61:87 (part).

Thamnophis radix butleri, 1927, BISHOP, N. Y. State Mus., handbook 3: 91.

Type:—An adult male, A. N. S. P., 10751, taken on the Alleghany River, near Franklin, Venango County, Pennsylvania, by Miss Anna M. Brown, in 1891 (?).

Diagnosis:—A small *Thamnophis* in which the scale rows are normally 17 and the upper labials 6.

Description:—A small snake in which the scales are almost always arranged in 17-17-17 rows. Four Pennsylvania specimens, including the type, have 17-19-17 rows, and one New York specimen has 19-19-17 rows. The lateral scales are the widest. All scales are keeled, with the exception that the scales bordering the ventrals may be lightly keeled or not at all. The stripes are on the 2nd, 3rd, and 4th rows anteriorly always; posteriorly it may be on 2 and 3. The dorsal stripe is always present, though tending to disappear. The blotches between stripes are much reduced, mostly to such an extent that they appear more as a stripe border, or they may be absent. Generally, this snake tends to be darker than *butleri*. The head is not definitely distinct from the neck. The oculars are normally 1-3, but may be 1-2. The temporals are usually 1-2, with one large and one small in the posterior row. The head plates are normal for the genus; the loreal is present; and the eye is in contact with the 3rd and 4th upper labials. The upper labials are normally 6, very rarely they may be 7. The lower labials are normally 8, sometimes 7 or 7-8, but are never 9. In 117 males, the ventrals vary from 134 to 146, mean 140, while in 107 females they range from 132 to 146, mean 139. The caudals in 103 males are from 57 to 72, mean 67; in 98 females, they vary from 51 to 64, mean 59. The tail in 103 males has a total length ratio of from .207 to .276, mean .246; in 98 females, from .198 to .246, mean .222. The largest specimen examined was a female (C.M. 9503) from near Tionesta, Forest County, Pennsylvania, with a total length of 506 mm., tail, 118 mm.

Range:—This species at present is known from areas in southwestern

New York and in northwestern Pennsylvania within the upper Alleghany River drainage. It occurs both in glaciated and unglaciated areas.

Material examined:

NEW YORK (78 ♂, 74 ♀) *Cattaraugus County*: Lillibridge Creek, near Limestone; *Chataqua County*: Poland Center, near Randolph.

PENNSYLVANIA (37 ♂, 32 ♀) *Clarion County*: Cooksburg; *Forest County*: 12 miles NE of Tionesta; Brookston; *McKean County*: Port Alleghany; *Mercer County*: Sandy Lake; *Venango County*: near Wesley, near Franklin; *Warren County*: near Warren.

VARIATION:—There is a decided difference in scale rows between the two species. The scales of *Thamnophis butleri* are normally arranged in 19-19-17 rows, while those of *T. brachystoma* are arranged in 17-17-17 rows. In the 7 specimens of *butleri* having a 17-19-17 pattern, an additional row begins near the 25th ventral and continues to near the 100th. In the specimen having the 19-17-17 pattern, the 4th row is dropped at the 40th ventral. Some of the Wisconsin specimens show the 21 rows, characteristic of *Thamnophis radix*, in the neck region. In the specimens of *Thamnophis brachystoma* with a pattern of 17-19-17 rows, the extra row is added, as in *butleri*, near the 25th ventral and continuing to the 100th. In the one New York specimen showing 19-19-17 rows, the 4th row is dropped at the 105th ventral.

There is no appreciable difference in the number of ventral scales between the two species. The ventral count is slightly higher in the case of some Wisconsin *butleri*. However, *T. brachystoma* has a slightly higher mean number of caudals than does *T. butleri*; in *T. brachystoma* the range is 53 to 71, mean 67, while in *T. butleri* the range is 52 to 70, mean 66.

The difference in upper labials, though not as marked as the scale rows, is a distinguishing character. *T. brachystoma* has 6 upper labials, only 6 (.04%) having 7. In *T. butleri*, however, the upper labials number 7 in 57% of the specimens and 6 in 39%. In the remaining 4% the upper labials number 8. The lower labials of *T. brachystoma* never exceed 8, but in *T. butleri* 21% of the specimens have 9 lower labials.

Males of *Thamnophis butleri* measured from 250 mm. to 540 mm., with the tail being 23 to 26% of the total length. The males of *T. brachystoma* measured from 290 mm. to 440 mm., the tail being 24 to 28% of the total length. Females of *T. butleri* measured from 260 mm. to 560 mm., the tail being 20 to 24% of the length, while females of *T. brachystoma* measured from 250 mm. to 506 mm., the tail being 21 to 25% of the length. The head size of both species was checked, and the difference in size of the head is so small that it is hardly recognizable as a distinguishing character.

Both *Thamnophis butleri* and *brachystoma* are derived from *Thamnophis radix*, from which species they may be distinguished by the differences in position of the lateral stripe, by the higher mid-body number (21) scale rows of *radix*, and by the higher number of labials, ventrals, and caudals of *T. radix*.

DISTRIBUTION:—As has been shown, *Thamnophis brachystoma* is

restricted to a few areas in New York and Pennsylvania. It seems reasonable to assume that *T. brachystoma* was derived from a pre-Wisconsin stock of *T. radix*, which may have extended its range during interglacial periods much further to the east than we now know it. The stock could conceivably been isolated by the advent of the Wisconsin glacier, and been able to survive in the Upper Allegheny drainage pattern (originated in pre-Wisconsin times) from which it is now moving northward into suitable areas within the glaciated territory.

From this, it must be surmised that *T. butleri* originated from a later stock of *T. radix* which moved eastward in post-Wisconsin times. The particular type of habitat desired by both species, draws me inevitably to the conclusion that *butleri* was able to establish itself and to succeed in living in a habitat distinct from a "Prairie Peninsula" type of habitat. The finding of *T. radix* in isolated patches of "Prairie Peninsula" in Ohio recently, supports this conclusion. Assuming then that *butleri* does not succeed well in a "Prairie Peninsula" type of habitat, the isolation of this species in Wisconsin is readily understandable. The Prairie Peninsula as outlined by Transeau (1935) gives an ecological reason for the isolation. The plotting of records on the master map used was done as accurately as the data available permitted. It will be seen on the map, that *Thamnophis butleri* generally is not found within known "Prairie Peninsula" types of habitat. Since such is the case, the species is isolated in Wisconsin because it cannot survive in a "Prairie Peninsula" type, and not because *T. radix* gradually excluded it from the Chicago Region as Davis (1932) suggested. This reason would also explain its rather spotty distribution in Indiana, where the "Prairie Peninsula" type of habitat is still fairly prominent, as well as its comparatively abundant distribution throughout the rest of its range, in which the particular prairie type of habitat is thinly spotted or absent.

Thamnophis brachystoma is separated from *T. butleri* by a minimum distance of 70 miles between the two closest records. In this region, northeastern Ohio, several collectors have failed to find either *brachystoma* or *butleri*.

SUMMARY:—*Thamnophis brachystoma* is recognized as a valid species because of the lower number of scale rows and upper labials, as well as by reason of its restricted range in New York and Pennsylvania. *Thamnophis butleri* is isolated in Wisconsin because it prefers a non-"Prairie Peninsula" type of habitat.

I wish to express my sincere thanks to the following persons and institutions for the loan of specimens and for their help: Dr. Howard K. Gloyd, Chicago Academy of Sciences; Dr. Emmett R. Dunn, Academy of Natural Sciences at Philadelphia; Messrs. Karl P. Schmidt and Clifford H. Pope, Chicago Museum of Natural History; Dr. Helen T. Gaige, Museum of Zoology, University of Michigan; Dr. E. B. S. Logier, Royal Ontario Museum of Zoology; Dr. Doris M. Cochran, United States National Museum; Dr. Charles M. Bogert, American Museum of Natural History; Dr. Sherman C. Bishop, University of Rochester; Mr. W. E. Dickinson, Milwaukee Public Museum; and to many others who

have given me aid, particularly in collecting. My special thanks are due to Mr. M. Graham Netting, Carnegie Museum, and Mr. Roger Conant, Philadelphia Zoological Society, for their invaluable aid during this study; and to my wife, Mrs. Ellen M. Smith, for examining specimens and helping with clarifying data.

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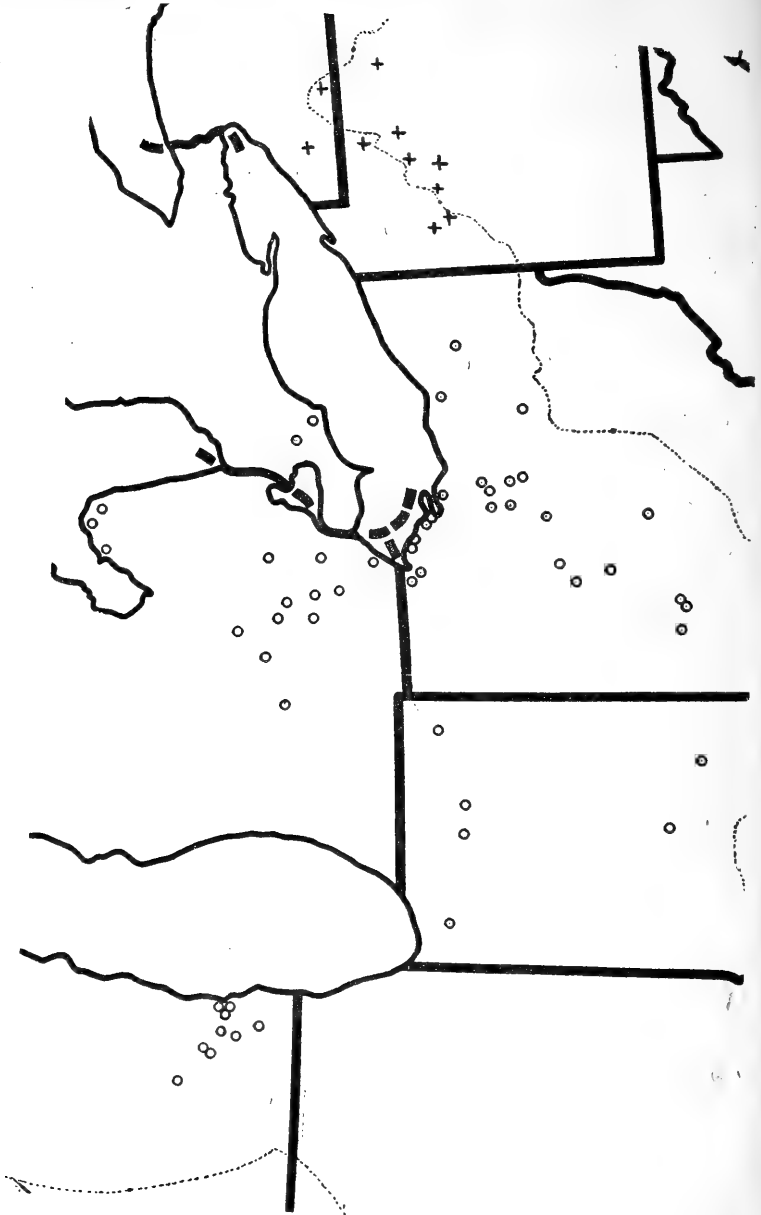
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Map showing the localities of *Thamnophis butleri* (circles) and *Thamnophis brachystoma* (crosses). The terminal moraine is outlined.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONFURTHER NOTES ON THE AEADES SCUTELLARIS
GROUP (DIPTERA, CULICIDAE)BY ALAN STONE¹ AND D. S. FARNER²

For some time it has been known that the *scutellaris* group of *Aedes* (*Stegomyia*) was represented in the Philippine Islands, but until males were received it was impossible to be certain of the species. The recent arrival at the U. S. National Museum of males from the Philippine Islands showed that, not one, but two species are involved, in both the newly received material and among the previously collected females. One is the widespread *Aedes hebrideus* Edwards; the other, the new species here described and named in honor of the collector. We have also been fortunate in being able to obtain from the British Museum, through the kindness of N. D. Riley and John Smart, a number of males of this group. These specimens give additional information on the systematics and zoogeography of the group. Because additional adult characters have been discovered in the group and in order to facilitate determination, a tentative key to the known species is included.

***Aedes* (*Stegomyia*) *paullusi*, new species**

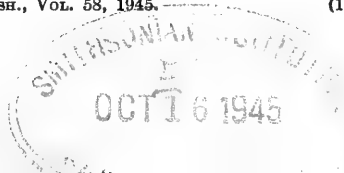
Aedes (*Stegomyia*) *variegatus* (Doleschall), Bonne-Wepster and Brug, 1932, *Geneesk. Tijdschr. v. Nederland.-Indie* 72 (Bijblad 2): 87 (in part).

Aedes (*Stegomyia*) *scutellaris* (Walker), Bonne-Wepster and Brug, 1937, *Geneesk. Tijdschr. v. Nederland.-Indie* 77 (9/10): 544 (in part).

Male.—Length about 3.5 mm., wing about 2.5 mm. Vertex with broad

¹ Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture.

² Lieutenant H (S), USNR, Preventive Medicine Division, Bureau of Medicine and Surgery, Navy Department. The opinions expressed in this article are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or of the Naval Service at large.



appressed scales, with median broad white stripe and with two lateral white stripes on each side. Torus with white scales around entire circumference and forming a conspicuous broad inner patch. Clypeus bare. Proboscis dark except for a stripe of pale scales extending almost entire length of ventral surface; palpus about length of proboscis (the latter incomplete in holotype) with dorsal patch of pale scales on base of second segment, pale ring on base of third segment, and extensive pale ventral patches on bases of fourth and fifth segments. Anterior pronotal lobe with many broad appressed white scales continuing the lateral line of vertex; posterior pronotum with some narrow curved dark scales and an elongated patch of broad appressed white scales continuing the white line of vertex and anterior pronotal lobe. Scutum covered with narrow brown scales, with median broad white stripe narrowing posteriorly and faintly forked in the prescutellar area, with indistinct posterior submedian line of narrow yellowish scales, with a patch of broad appressed white scales over wing base, and with an anterior marginal line of white scales (figure 2). Scutellum with appressed broad white scales on all three lobes, and a few dark scales on apex of midlobe. Pleuron with white scales arranged more or less in two parallel lines and scattered spots. Coxae with patches of white scales. Ventral surface of front femur with somewhat interrupted line and apical patch of white scales, posterior surface with a broader, uninterrupted stripe of white scales broadening apically; anterior surface of midfemur with distinct line of white scales separated from apical white patch by dark scales, posterior surface with slightly narrower white line extending to apex; anterior surface of hind femur with broad white longitudinal stripe, widest at base, only slightly interrupted by dark scales from apical white patch, posterior surface with more or less distinct line of white scales, broadest at base, and extending to apex. All tibiae dark. Front tarsi and midtarsi dark with basal white patch on segments I and II; hind tarsal segments I to IV with basal white bands, the band on I from $1/4$ to $1/3$ length of segment and interrupted by dark scales on inner surface, on II about $1/3$ length of segment, on III about $1/2$ length of segment, IV about $2/3$ length of segment; V completely white. Wing scales dark. Abdominal tergite I with lateral sub-basal white spots; abdominal tergites II to VI with sub-basal white bands narrowed dorsally and turning abruptly forward at lateral margin, that on II interrupted (markings on VII and VIII not observed). Sternites II to VI with basal white bands. Genitalia with basal lobe truncate with a ventro-apical area of well-developed setae (figure 1).

Female.—Markings about as in male. Palpus about $1/5$ the length of proboscis with large white patch on dorsal side of apical segment. Proboscis dark with at most a few scattered pale scales on ventral surface. Line of white scales on front femur absent or poorly developed; mid- and posterior femora similar to male. Tergite VII with band broken on either side of a median patch.

Holotype.—*Male*, San Antonio, Samar, Philippine Islands, December 6, 1944, J. H. Paullus, collector. *Paratypes*: 1 male, N'goles, Cali-

coan Island, Philippine Islands, January 27, 1945; 3 females, San Antonio, Samar, December 6, 1944, Baras, Calicoan Island, January 24, 1945, and small island near Calicoan, February 12, 1945, J. H. Paullus, collector; 1 female, Abuyog, Leyte, Philippine Islands, November 1944, O. H. Graham, collector; 2 males, Taroena, Sangir Islands, March 1928.

Type material deposited in U. S. National Museum (Cat. No. 57313); paratypes from Sangir Islands in British Museum.

The holotype and one paratype were collected in small pools of high organic content. The other paratypes from Mr. Paullus were reared from water in coconut shells.

The basal lobe of the basistyle is easily distinguished from that of all other named species of the *scutellaris* group for which the male genitalia have been described. In addition there are other distinctive morphologic characters in both sexes by which *paullusi* is easily separated from other species of the group. *Aedes paullusi* can be separated from other species of the group by the presence of the ventral white stripe on the male proboscis, by the white line on the anterior surface of the midfemur of both sexes, and by the line of white scales on the anterolateral margin of the scutum (these scales may be lacking in worn specimens). In *quasiscutellaris* there is a faint anterolateral line similar in location to that of *paullusi* but composed of very fine yellowish scales as compared with the conspicuously white scales in *paullusi*. It can also be separated from all other species of the group except *quasiscutellaris*, *tongae*, and *horrescens* by the stripe of white scales on the proboscis of the male.

The species described here as *paullusi* is the same as that observed and described by Bonne-Wepster and Brug (2, pp. 42, 43, 87) as an unnamed variety of *Stegomyia variegata* (Doleschall) from Taroena, Sangir Islands. An examination of two specimens from that island presented to the British Museum by S. L. Brug and H. de Rook confirm this, and these two specimens were therefore included in the paratype series. Bonne-Wepster and Brug's figures and descriptions show the anterolateral line on the scutum and describe the ventral white line on the proboscis of the male, but fail to point out the rather striking markings of the femora which are characteristic of *paullusi*. The hypopygium figured by these authors (2, p. 85) is very similar, if not identical, to that of *paullusi*; the statement that the hypopygium of the males from Taroena does not differ from that of males from other localities implies that this type of hypopygium is widespread. Bonne-Wepster and Brug do not, however, give the locality of the specimen from which their drawing was made. In a later paper these authors (3, p. 87) treated the Taroena form as an aberrant form of *scutellaris* (Walker). This raises the possibility that *paullusi* may be a synonym of *scutellaris* (Walker). However, it should be pointed out that Bonne-Wepster and Brug, in indicating that they had observed hypopygia of the type figured (2, p. 85) from several localities, did not include the Aroe Islands, the type locality of *scutellaris* (Walker). Furthermore, it is obvious that these authors were including more than one species in their "*scutellaris*." Because the genitalia of true *scutellaris* from the Aroe Islands have never been described and further because of

the known tendency of the *scutellaris* group to form endemic species, it appears best to regard *paullusi* as specifically distinct from *scutellaris* at least until topotypical material of the latter is available for study. Barraud's description (1, p. 654) of "*scutellaris*" from the Andaman Islands indicates that the basal lobe may be similar to that of *paullusi*. However, since he does not describe any of the distinctive characters of *paullusi*, the systematic placement of the Andamans form must await examination of material from those islands.

Distribution of *Aedes hebrideus* Edwards

The known range of this species has been extended to the Palau Islands, Ceram, and the Philippine Islands by specimens collected on Pulo Anna, Palau Islands, by C. K. Dorsey, March 1945; at Sawaai, Ceram, December 27, 1931, by S. L. Brug and H. de Rook; and on Calicoan Island, Philippine Islands, by J. H. Paullus, January 27, 1945.

Distribution of *Aedes guamensis* Farner and R. Bohart

The known range of this species, known heretofore from the island of Guam, has been extended to Saipan on the basis of a male collected at Marpi Point by J. E. Webb, Jr., October 31, 1944.

Distribution of *Aedes horrescens* Edwards

In a recent revision of the *scutellaris* group, Farner and Bohart (6, pp. 42, 45) gave the distribution of this species as restricted to the type locality, Taveuni. In a personal communication R. A. Lever has kindly brought to our attention the fact that this species has a much wider distribution. In addition to the type locality and Nabavatu (Lau group) cited by Edwards (5, p. 129), it has been recorded by Paine (9, p. 12) from Vanua Levu, Gau, Narai, Naigani, and Naitaubu, and by Lever (8, p. 47) from Suva, Viti Levu.

TENTATIVE KEY TO THE ADULTS OF THE SCUTELLARIS GROUP

The following key is presented, together with a tabulation of geographic distribution, as an aid in preliminary identification of the known species in this group. When the key is used, it must be borne in mind that in several cases externally similar species are easily distinguishable by examination of the male genitalia. This is particularly true in the differentiation of *pernotatus* from *pseudoscutellaris* and *hensilli* from *marshallensis*. No final identifications should be made until the mounts of the hypopygia have been studied and, if possible, compared with the hypopygia of other species of the group. The fact that the *scutellaris* group contains many rather localized species, some probably undescribed, emphasizes the importance of examination of the male genitalia. Apparently *horrescens* Edwards can be distinguished from *pseudoscutellaris* only in the larva and male genitalia. No specimens of *alorensis* Bonne-Wepster

and Brug, *andrewsi* Edwards, or *scutellaris* (Walker) from Aroe Islands have been examined. However, *andrewsi* has been placed in the key on the basis of the original description. The original description of *alorenensis* makes it obviously a distinct species on the basis of the figured basal lobe; however, there is not a description of external morphology sufficient to place it in the key. Likewise, the description of *scutellaris*, also a banded species, is too inadequate to permit placing the species in the key. *Aedes albopictus* (Skuse) and *Aedes gurneyi* Stone and R. Bohart, although not members of the group, have been included in the key because of their morphologic similarity, and because their ranges overlap that of some species of the *scutellaris* group; *Aedes pseudalbopictus* Borel, *novalbopictus* Barraud, *subalbopictus* Barraud, and *flavopictus* Yamada, all members of the *albopictus* group, are not included, since their ranges do not overlap that of the *scutellaris* group. *Aedes galloisi* Yamada, reported only from Japan, was originally described as closely allied to *variegatus* (Doleschall) and *albopictus* (Skuse). It is difficult to place and, since no specimens were available for study, has not been included in the key. The morphology of the tarsi and the basal lobe of the dististyle might indicate a relationship to *marshallensis*, although the pattern of white scales of the pleuron, as described, seems to place it in the *albopictus* group. The hind tarsus is similar to that of *marshallensis* in having a dark tip; however, the basal 2/3 of both segments IV and V of the hind tarsus is white, whereas in *marshallensis* segment V is never more than 1/2 white, and segment IV is about 1/4 white.

1. White scales on pleuron arranged irregularly in patches; white scales of patch on posterolateral margin of scutum usually extending only to anterior margin of wing base..... 2
 - White scales on pleuron arranged in two parallel and almost continuous stripes and some irregular patches; white scales on posterolateral margin of scutum forming a continuous line with dorsal pleural stripe and extending over wing base almost to patch of pale scales on scutellum..... 3
2. Bands on abdominal tergites basal (touching apex of preceding segments)..... *albopictus*
 - Bands on abdominal tergites sub-basal (not touching apex of preceding segment)..... *gurneyi*
3. All white bands of hind tarsus interrupted completely by dark scales on the inner surface *guamensis*
 - At least some complete white bands on hind tarsus..... 4
4. Apical half of segment V of hind tarsus dark. . *hensilli*, *marshallensis*
 - Segment V of hind tarsus completely white except occasionally for a few scattered light brown scales..... 5
5. Basal white band on segment IV of hind tarsus narrowly interrupted by a row of dark scales, several scales in width, on dorsal surface; tergites with white scales restricted to lunate lateral spots..... *andrewsi*
 - Basal white band on segment IV of hind tarsus complete..... 6

6. Basal patches of light scales (white or yellowish) on segments I, II, III, and sometimes on IV and V of fore- and midtarsi; those on IV and V sometimes reduced to a few scales. *pernotatus*
 Basal white patches on fore- and midtarsi restricted to segments I and II. 7
7. Anterior surface of midfemur with distinct line of pale scales extending to or almost to apical patch of white scales; line of white scales on anterolateral margin of scutum (may be lacking in worn specimens). *paullusi*
 Anterior surface of midfemur without distinct line of pale scales; scutum without line of white scales on anterolateral margin (*quasiscutellaris* has a faint line of fine yellowish scales in this position). 8
8. Hind tarsal segment IV with dark band at its widest dimension (inner surface of segment) having a width of more than 1/2 the length of segment. *tongae*
 Hind tarsal segment IV with dark band at its widest dimension having a width of 1/4 to 2/5 (sometimes 1/2 in *horrescens*) the length of segment. 9
9. Proboscis with ventral longitudinal line of pale scales
horrescens
quasiscutellaris
 Proboscis without ventral longitudinal line of pale scales. 10
10. Abdominal tergites usually without complete bands of white scales; tergite IV never with complete band *pseudoscutellaris*
 Abdominal tergites (except I to III) always with bands of white scales; that on tergite IV either complete or narrowly interrupted. (This character is difficult or impossible to ascertain on worn or engorged specimens.) *hebrideus*

Figures of basal lobes of the hypopygia of the species of the *scutellaris* group appear in the literature as follows:

Edwards (4, p. 102): *andrewsi*, *tongae*, *pseudoscutellaris*, *hebrideus*, *quasiscutellaris* (as *variegatus*).

Farner and R. Bohart (6, p. 122): *quasiscutellaris*, *pseudoscutellaris*, *pernotatus*, *guamensis*, *hebrideus*.

Farner and R. Bohart (7, p. 40): *pernotatus*, *pseudoscutellaris*, *quasiscutellaris*, *tongae*, *guamensis*, *marshallensis*, *hebrideus*.

Stone and R. Bohart (10, p. 224); *marshallensis*, *gurneyi*.

Bonne-Wepster and Brug (2): *albopictus* (p. 75), *paullusi* (p. 85 as *variegata*), *alorensis* (p. 93).

Yamada (11, p. 50): *galloisi*.

The basal lobe of *horrescens* has not been previously figured and therefore is here presented (figure 3). That of *hensilli* is apparently indistinguishable from *guamensis*. Male genitalia of *scutellaris* from the type locality have not been described.

Known Distribution of the Species of the Scutellaris Group:³

SPECIES	DISTRIBUTION
<i>pseudoscutellaris</i>	Eastern Polynesia, Samoa and Wallis Islands, Fiji, Ellice Islands
<i>tongae</i>	Tonga, Solomon Islands ⁴
<i>pernotatus</i>	New Hebrides
<i>horrescens</i>	Fiji
<i>guamensis</i>	Marianas Islands
<i>hensilli</i>	Caroline Islands
<i>marshallensis</i>	Marshall Islands, Gilbert Islands ⁵
<i>quasiscutellaris</i>	Solomon Islands
<i>hebrideus</i>	Palau Islands, New Hebrides, Bismarck Archipelago (?), Queensland (?), New Guinea, Moluccas, Philippines.
<i>pauullusi</i>	Moluccas (?), Sangir Islands, Philippines.
<i>scutellaris</i>	Aroe Islands
<i>andrewsi</i>	Christmas Island (south of Java)
<i>alorensis</i>	Lesser Sunda Islands

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³ *Aedes albopictus* overlaps the *scutellaris* group throughout the insular part of the Oriental Region as well as on Saipan and possibly in the Moluccas; *gurneyi* occurs in the Solomons; *galloisi* has been reported for Japan only.

⁴ Reported from Sikiana, Solomon Islands, by Edwards (2, p. 103); possibly an introduction. This material has been examined in the preparation of this paper and the identification seems to be correct.

⁵ This record is based on examination of females only.

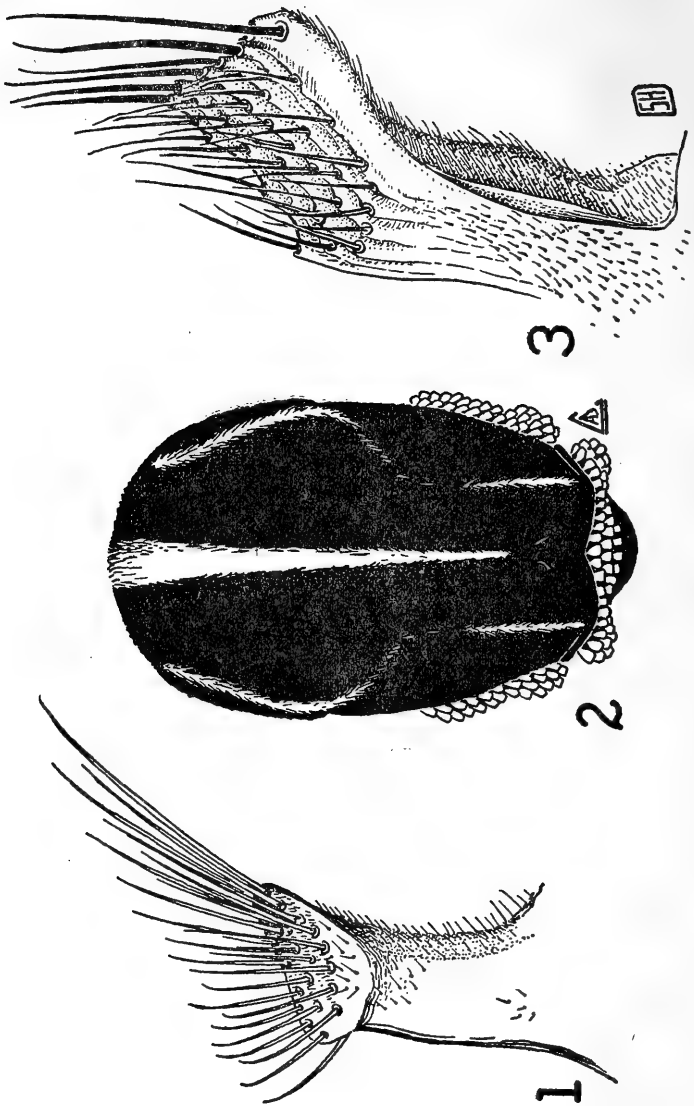


Fig. 1. *Aedes paullusi*, basal lobe of left basistyle, ventral view.

Fig. 2. *Aedes paullusi*, mesonotum, dorsal view.

Fig. 3. *Aedes horrescens*, basal lobe of left basistyle, ventral view.

(Figs. 1 and 2 drawn by Arthur D. Cushman; Fig. 3 by Sara Hoke DeBord).

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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME 59

1946



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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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ERRATA

Plate XIII, page 75, should read Plate VIII.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS

The Society meets from October to May on the second Saturday of each month at 8 P. M. All meetings in 1946 were held in Room 43 of the U. S. National Museum.

January 12, 1946—955th Meeting

President Thone in the chair; 110 persons present.

New member elected: R. H. Baker.

Informal communications: F. Thone, Exhibition of new biological publications; F. R. Fosberg, Exhibition of some publications of *Chronica Botanica*.

Formal communication: William Vogt, A catastrophe year on the Peruvian coast.

February 9, 1946—956th Meeting

President Thone in the chair: 28 persons present.

New members elected: R. I. Cohen, K. L. Knight.

Informal communication: F. Thone, Exhibition of new biological publications.

Formal communication: A. F. Sievers and E. C. Stevenson, Illustrated account of some plants of specific and peculiar interest to man.

March 16, 1946—957th Meeting

President Thone in the chair; 51 persons present.

New member elected: R. M. Bohart.

Informal communications: F. Thone, Exhibition of new biological publications; H. B. Humphrey, Note on the scarcity of gray squirrels in the Cabin John region this winter; E. P. Walker, Note on a method of ascertaining whether natural food for squirrels is running low.

Formal communication: T. P. Dykstra, Some biological and agricultural facts gleaned out of Free China.

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April 13, 1946—958th Meeting

President Thone in the chair; 51 persons present.

Informal communication: Malcolm Davis, Exhibition of a domestic pigeon which had starved to death due to displacement and locking of the mandibles.

Formal communications: Elmer Dorbin, Noises made by fishes and other marine life; F. G. Orsinger, Tongueless toads.

May 12, 1946—959th Meeting

SIXTY-SEVENTH ANNUAL MEETING

President Thone in the chair; 7 persons present.

New members elected: M. S. Briscoe, M. C. Gardner.

The death of T. S. Roberts was noted.

Reports were received from the Recording Secretary, Corresponding Secretary (informal), and Treasurer. The following officers and members of council were elected: President, Joe S. Wade; Vice Presidents, W. L. Schmitt, J. W. Aldrich, F. C. Lincoln, J. E. Benedict, Jr.; Recording Secretary, S. F. Blake; Corresponding Secretary, R. S. Bray; Treasurer, A. J. Duvall; Members of the Council, Malcolm Davis, J. A. Fowler, D. E. McHenry, H. J. Deason, W. Stickel. S. F. Blake and F. C. Lincoln were appointed Trustees of Permanent Funds to succeed J. S. Wade and M. B. Waite.

October 12, 1946—960th Meeting

President Wade in the chair; 38 persons present.

New members elected: R. M. Gilmore, C. O. Handley, Jr., W. V. King, R. T. Peterson, A. R. Phillips.

The death of E. A. Goldman was noted.

Informal communication: E. P. Walker, Note on experiments in making photographs of small mammals in motion.

Formal communications: J. F. G. Clarke, Informal discussion of the present status of European museums; R. A. F. Gohar, Marine biological research on the Red Sea.

November 9, 1946—961st Meeting

President Wade in the chair; 80 persons present.

New member elected: R. D. Van Pelt.

Informal communications: F. Thone, Exhibition of new biological publications; I. N. Hoffman, Note on a species of *Solanum* from Venezuela.

Formal communications: M. A. Elliott, Birds along the way; New York Zoological Society, The flight of the humming bird.

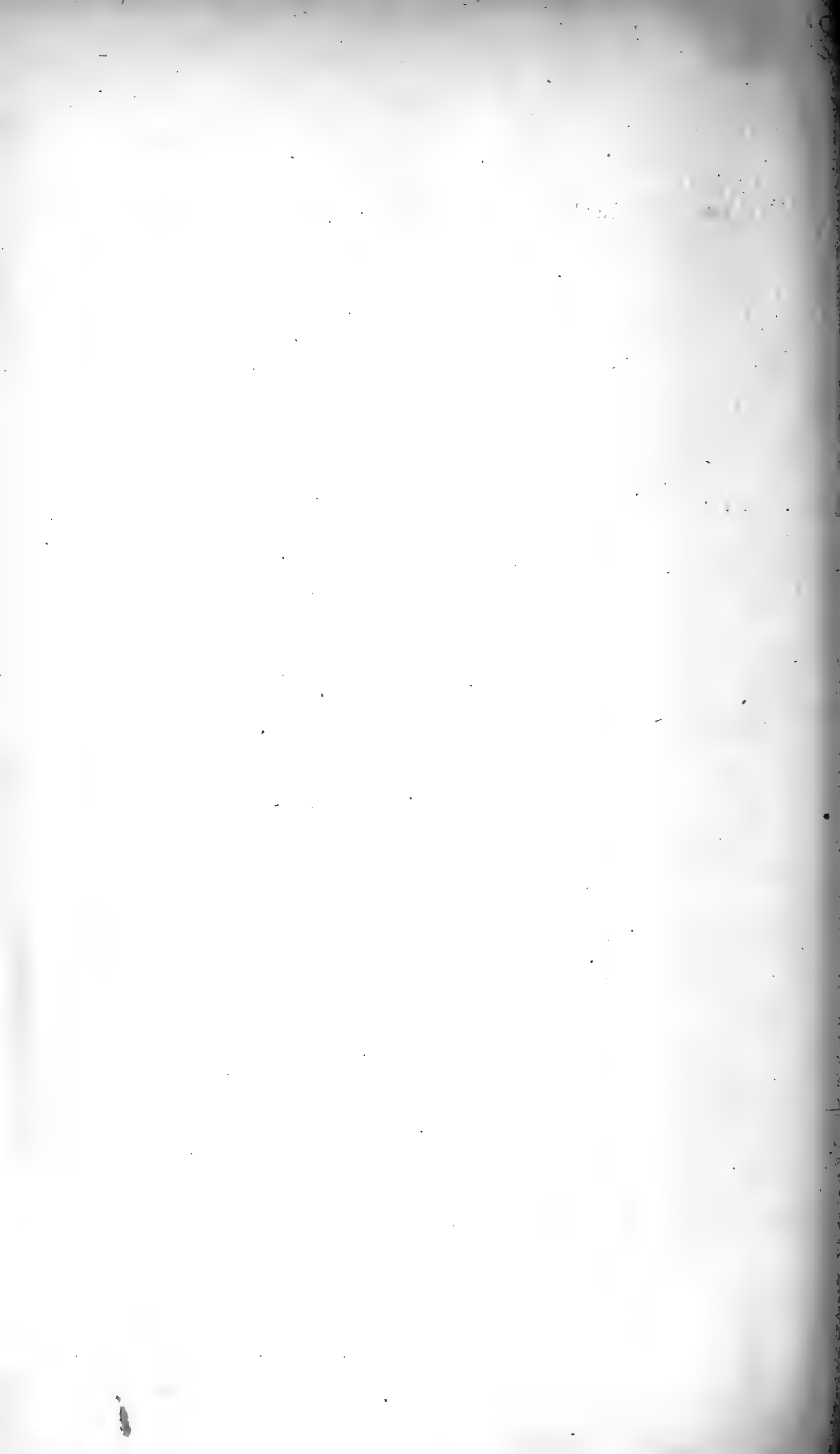
December 14, 1946—962d Meeting

President Wade in the chair; 74 persons present.

New members elected: E. J. Hambleton, H. I. Kleinpeter, III.

Informal communications: H. B. Humphrey, Note on scarcity of gray squirrels and rabbits; T. S. Palmer, Note on the Pinchot Collection of photographs and notes relating to persons connected with forestry, in the Library of Congress.

Formal communication: A. J. Duvall and C. O. Handley, Jr., Land of the Eskimo.



Birds

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



FOUR NEW SPECIES OF DICTYNA.

BY SHERMAN C. BISHOP AND CLAIRE RUDERMAN.¹

The new species here described are from the Cornell University collection and were made available through the courtesy of Dr. Helen Blauvelt. The types will be deposited at Cornell.

These four species are from a series of thirteen described, but not published, several years ago. The remaining nine species of the series have either been described recently by other workers or are in the process of description by Dr. W. J. Gertsch, of the American Museum, who kindly checked our material with his to avoid possible duplication of effort.

Dictyna cornupeta new species.

(Figs. 1-2.)

Male. Length, 3 mm. Cephalothorax with the head relatively broad, light yellow-brown with the radiating lines on the thorax and four longitudinal lines on the head darker. Sternum yellow in some individuals with the margin narrowly black and with a dark median stripe which does not reach the margin either in front or behind. Labium slightly dusky. Endites yellow. Chelicerae light dusky orange, concave, strongly bowed apart in the middle leaving an ovate opening between them closed below by a pair of opposed teeth; lateral ridges at base of chelicerae short, not well developed, not tooth-like. Legs and palpi pale yellow, tarsus of latter dark. Abdomen above pale yellowish with a basal lanceolate dark stripe followed by a diamond-shaped median spot and this by a double row of irregular spots connected by narrow chevrons and to the dark on the sides by oblique lines; venter yellowish or whitish, with two dark spots in front of the epigastric furrow, a dark spot at each end of this furrow, a dusky median area back of it and a dark spot at each end of the spiracular furrow.

Posterior eyes in a gently recurved line, equidistant, separated by

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two-thirds the diameter. Anterior eyes in a straight line, separated by a little less than the diameter and from the lateral by less than the radius.

Femur of palpus short, thicker distally. Patella short and broad. Tibia moderately long, viewed from the side gently convex above, more strongly concave below; viewed from above, the mesal side convex and the lateral side concave, the distal margin obliquely truncate. Tibia armed dorsolaterally at base with a short, stout, erect process bearing at tip two black teeth set in sockets. The embolus arises at the base of the bulb from a moderately swollen base; it is black and is strengthened by three thickened ribs. The conductor lies free from the cymbium for a considerable distance; it ends basally in a black pointed process which is curved around a circular passageway for the tip of the embolus.

Holotype male, Arizona: Texas Pass, Dragoon Mts., Aug. 21, 1917; paratype, Wyoming: Yellowstone Lake, Yellowstone National Park, Aug. 29, 1927, 1 male.

Dictyna tridentata new species.

(Figs. 3-4.)

Male. Length, 2.8 mm. Cephalothorax dark mahogany brown, darker radiating lines on the thorax and longitudinal lines of fine white hairs on the head. Sternum dusky orange, very much darker on margin and posteriorly. Labium nearly black, lighter distally. Endites dark dusky orange. Chelicerae dusky with a tinge of orange showing through, strongly concave and strongly bowed apart in the middle, face of chelicerae flat transversely with mesal and lateral edges clean cut at a right angle, the lateral ridges at base well developed but without a tooth. Legs dull orange with faint, darker annulations on posterior femora and at the ends of the segments. Palpi dull orange. Abdomen reddish orange with distinct black markings; a basal median wedge-shaped mark constricted at posterior third, followed by a series of narrow chevrons connected laterally with a row of irregular spots; venter broadly dark medially, lighter on the sides.

Posterior eyes almost in a straight line, the median separated by more than the diameter and slightly farther from the lateral. Anterior eyes in a straight line, the median separated by nearly twice the diameter and from the lateral by two-thirds the diameter.

Femur of palpus rather stout, from above widened distally, gently curved downward. Patella short and broad. Tibia rather stout, viewed from the side concave below and convex above beyond the process; viewed from above, the mesal side gently convex, the lateral, concave, the distal margin gently concave, the lateral angle widened and produced forward; tibia armed dorsally near base with a stout, flattened, erect process gently curved forward and about three-fourths as long as width of segment, bearing at tip three black teeth in a row set in sockets. The embolus arises on the mesal side of the bulb from a distinctly swollen bulb-like base, passes along the edge of the cymbium to the tip of the bulb where it enters the groove of the conductor. The

conductor lies close to the cymbium throughout its length and ends basally in a narrow sharp-pointed process, finely denticulate at tip.

Holotype male, Wyoming: Summit of the Grand Teton Pass, July 4, 1933.

Dictyna peragrata new species.

(Figs. 5-8)

Male. Length, 2 mm. Cephalothorax chestnut brown with dark radiating lines on the thorax and fainter longitudinal lines on the head. Sternum dark gray over orange yellow, dark at margin and behind. Labium dark at base. Endites yellow suffused with dusky. Chelicerae chestnut brown, strongly concave and bowed apart in the middle, lateral margin convex, the lateral ridges at base well developed. Legs pale yellowish suffused with dusky and with dark annulations at the ends of tibiae and metatarsi. Abdomen light above with a basal dark wedge-shaped mark connected with a broader black spot, followed after an interval by a black chevron and other indistinct markings. Sides of abdomen dark.

Posterior eyes oval, in a straight line, equidistant, separated by a little more than the long diameter. Anterior eyes in a straight line, the median separated by a little more than the diameter and from the lateral by a little less.

Femur of palpus nearly straight and cylindrical. Patella short, as broad as femur. Tibia short, viewed from the side strongly concave below, straight above beyond the two teeth; viewed from above widened distally on the outer angle, the mesal side straight, the lateral, concave, armed near base dorsolaterally with two nearly sessile black teeth set in sockets. The embolus arises from a swollen bulb-like base on the ventral side near base. It is rather stout and jet black. Near the distal end of bulb it enters the groove of the conductor. The conductor lies free from the edge of the cymbium for some distance, basally it is moderately thickened and ends in a narrow, slender slightly curved process, serrated along the inner margin of the tip.

Female: Length 2 to 2.25 mm. Similar to the male in form but generally lighter in color, the cephalothorax dusky orange yellow, the abdomen mottled gray and yellow, the basal mark, when present, brown. Epigynum of adult (Fig. 7) with a triangular median lobe, the apex directed forward and with the margins continued laterally. The openings, in mature individuals, show as dark oval cavities on either side of the median lobe. Posteriorly, the receptacles show through as dark round or oval blotches. In juvenile females (Fig. 8), the openings are indistinct and the receptacles are faintly outlined beneath the surface.

Holotype male. Washington: Edmonds, August 16, 1927; allotype, California: Miranda, June 4, 1936; paratypes, Washington: Friday Harbor, June-July, 1928, 3 males, 3 females; California: Miranda, June 4, 1936, 1 male, 3 females.

***Dictyna francisca* new species.**

(Figs. 9-11.)

Male. Length, 2-2.2 mm. Cephalothorax reddish orange with darker radiating lines to dark brown in preserved specimens, head high and narrow, clothed with five longitudinal rows of white hairs. Sternum dark grayish orange narrowly black at margin. Labium darker, endites a little lighter. Chelicerae dull orange brown, long, concave, bowed apart in the middle, the lateral ridges at base short, thin, forming a small but distinct tooth. Legs and palpi pale orange yellow. Abdomen yellowish white above, with darker reticulations and with a dark median basal mark which is strongly constricted and then enlarged to form a distinct median spot; farther back there is a double row of 3 or 4 dark spots, the last two pairs connected by transverse bars which are sometimes very heavy. Sides of abdomen grayish to blackish, venter broadly pale across the middle, dusky in front and behind. Abdomen clothed with long, white to light brown hairs.

Posterior eyes in a gently recurved line, equidistant, separated by the diameter. Anterior eyes in a gently procurved line, the median smaller than the lateral, separated by one and one-half times the diameter and from the lateral by a little less than the diameter.

Femur of palpus nearly straight and cylindrical. Patella short, strongly convex above. Tibia rather long, evenly convex above and more strongly concave below, viewed from above the mesal side nearly straight with the distal angle cut off, the lateral side concave; ventrolaterally the margin is thinned out and is somewhat widened distally. Tibia armed dorsolaterally at base with two black teeth borne on a very low tubercle. The black, rather stout embolus arises from a rather low quadrate bulb-like base on the mesal side of the bulb near the base. It enters the conductor near the apex of the bulb and divides into three branches which can be seen through its wall. The conductor lies close to the edge of the cymbium throughout its course; it is only moderately thickened basally and terminates in a rather long, nearly straight process which is thin, dorsally black, ventrally colorless and gently spirally twisted, the tip is very finely granulate, bluntly rounded with a point at one side.

Female. Length, 2.1-2.5 mm. Similar to the male in coloration, the pattern on the abdomen in some specimens more distinct. The epigastric plate orange, darker than rest of the venter, the median lobe of epigynum broad, notched posteriorly and limited on each side by a chitenized ridge which is continued laterally. The openings are beneath the anterior edge of the ridges.

Holotype male, allotype female. California: San Francisco, sand dunes, November 11, 1907; paratypes, 1 male, 1 female, same data. California: Christine, May 30, 1936, 1 male; Fort Ross, May 28, 1936, 1 male, 2 females; Gualala, May 29, 1936, 1 male, 13 females.

EXPLANATION OF FIGURES.

PLATE I.

- Fig. 1. *Dictyna cornupeta* n. sp. Right palpus, dorsal view.
- Fig. 2. *Dictyna cornupeta* n. sp. Right palpus, ventral view.
- Fig. 3. *Dictyna tridentata* n. sp. Right palpus, dorsal view.
- Fig. 4. *Dictyna tridentata* n. sp. Right palpus, ventral view.

PLATE II.

- Fig. 5. *Dictyna peragrata* n. sp. Right palpus, dorsal view.
- Fig. 6. *Dictyna peragrata* n. sp. Right palpus, ventral view.
- Fig. 7. *Dictyna peragrata* n. sp. Epigynum, adult.
- Fig. 8. *Dictyna peragrata* n. sp. Epigynum, immature.
- Fig. 9. *Dictyna francisca* n. sp. Epigynum.
- Fig. 10. *Dictyna francisca* n. sp. Right palpus, dorsal view.
- Fig. 11. *Dictyna francisca* n. sp. Right palpus, ventral view.



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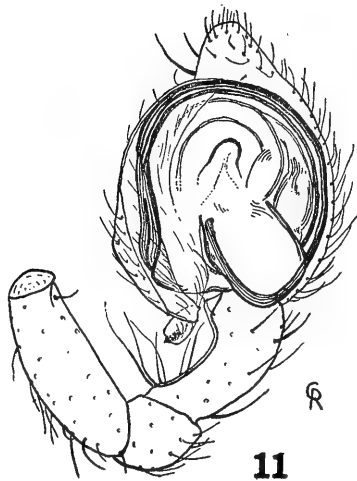
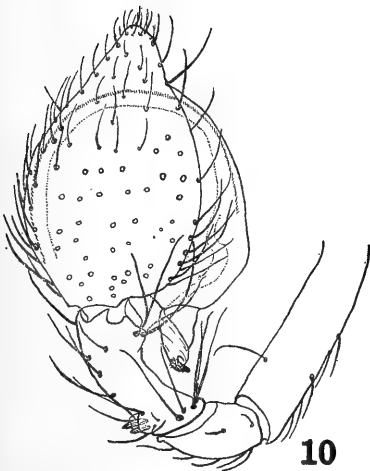
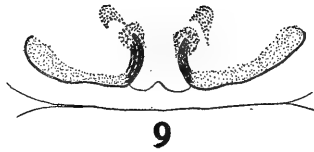
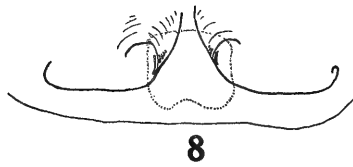
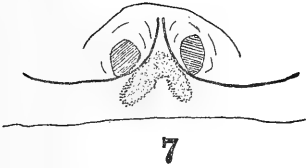
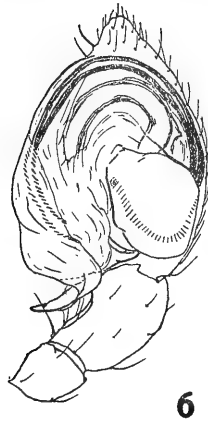
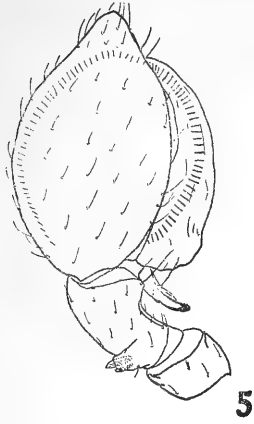
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PROCEEDINGS
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NEW SPECIES AND NEW GENERA OF AMERICAN
TINGIDAE (HEMIPTERA).

BY C. J. DRAKE AND E. J. HAMBLETON.

This paper is based upon lace bugs collected by E. J. Hambleton and some miscellaneous specimens from Central and South America. We are indebted to Mr. W. E. China of the British Museum for comparing the new species of *Leptopharsa* Stål (with transverse fasciae in costal areas) with the type of *L. constricta* Champion from Guatemala. Dr. R. I. Sailer has kindly loaned us the specimens of this group in the U. S. National Museum. The disposition of types is indicated beneath the descriptions of each new species.

Zelotingis, n. gen.

Head very short, the frontal pair of spines short, the others absent; bucculae short, broad, not meeting in front. Rostrum short, extending a little beyond mesosternum; mesosternum longitudinally furrowed so as to form rostral groove, without rostral laminae; metasternum slightly convex, the laminae low, widely separated, cordate, present on sides and behind. Eyes moderately large, transverse, exerted. Orifice distinct, rimmed. Antennae long, longly pilose, slender; segment I moderately long, stouter and more than twice as long as II; III longest, slenderest, slightly tapering apically, truncate at apex; IV extremely long, slightly thickened, about two-thirds the length of III. Antenniferous tubercles represented by broad laminae.

Pronotum moderately convex, pitted, tricarinate, the hind triangular process reticulate; hood moderately large, inflated, projecting over base of head; paranota, carinae, hood and outer margins of elytra beset with long fine hairs, the areolae large; carinae foliaceous, with large areolae, the lateral pair slightly convex within; paranota large, strongly reflexed. Elytra broad, much longer than abdomen, widely reticulate, divided into the usual area, the discoidal area not reaching middle of elytra.



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Legs long, rather slender, beset with long hairs. Body beneath and bucculae moderately hairy.

Generotype, *Zelotingis aspidospermae* (Drake and Hambleton) (= *Stenocysta aspidospermae*).

This genus may be separated from *Stenocysta* Champion by the long fourth antennal segment (attached at the centre of apex of third segment), large areolae, and much shorter discoidal area of elytra.

Zelotingis aspidospermae is represented in our collection by specimens from Minas Gerais, Brasil (types) and Horqueta, Paraguay. It feeds on *Aspidosperma melanocalyx* Muell. Arg.

Vatiga, n. gen.

Elongate, slender, subparallel. Head short, usually with three spines, the front pair atrophied or wanting, sometimes with median wanting. Antennae long, slender, the fourth segment generally as long or longer than one and two conjoined, the first segment usually long. Bucculae contiguous in front. Rostrum extending on mesosternum. Rostral channel deeply, broadly constricted on mesosternum. Pronotum convex, pitted, tricarinate; collar distinct; calli present; paranota narrow, areolate, somewhat rectangular in outline; triangular process well developed, areolate. Orifice distinct. Elytra elongate, divided into usual areas, the discoidal area extending around middle of elytra. Hypocostal ridge present. Hood absent, sometimes the median carina slightly elevated on collar.

Generotype, *Vatiga vicosana*, n. sp.

The name *Vatiga* is an anagram of *Tigava*. The general shape of the insect and the deeply constricted rostral groove on the mesosternum separate this genus from *Tigava* Stål or *Leptopharsa* Stål. *Leptopharsa longula* Drake (1922), *L. manihotae* Drake (1934), *L. illudens* Drake (1922), *L. illudens variantis* Drake (1930), *Tigava cassiae* Drake and Hambleton (1934), *T. lonchocarpa* Drake and Hambleton (1944) and *T. sesoris* Drake and Hambleton (1942) are congeneric and belong to the new genus *Vatiga*. These species are similar in form and have the rostral channel deeply constricted.

Vatiga vicosana, n. sp.

Moderately large, elongate, brown, the carinae, paranota, costal area and cephalic spines testaceous. Head short, smooth; median spine porrect, moderately long; hind pair of spines long, slender, strongly recurved forward, the anterior ends nearly touching or touching surface of head. Antennae very long, indistinctly pilose; segment I rather long, three times as long and considerably stouter than II, the latter short; III very slender testaceous, straight, three times as long as IV; IV moderately thickened, hairy, mostly brownish black. Antenniferous tubercles broad. Rostrum yellowish brown, not quite reaching middle of mesosternum; rostral laminae testaceous, areolate, deeply constricted on mesosternum. Bucculae broad, areolate, margined with testaceous.

Front margin of pronotum testaceous. Body beneath brown, smooth, somewhat shiny.

Paranota moderately transversely convex, deeply pitted, tricarinate; carinae foliaceous, uniseriate, the areolae small; lateral pair slightly divaricating anteriorly, faintly convex within in front, median carina raised on collar; collar distinct, uniseriate; calli deep, dark; paranota testaceous, biseriate in front, narrower and uniseriate behind. Elytra elongate, narrow, slightly constricted behind middle; costal area biseriate, moderately wide, testaceous; discoidal area extending slightly beyond middle, widest near middle, there five areolae deep; sutural areas completely overlapping in repose, the areolae becoming a little larger apically.

Length, 3.00 mm.; width, 1.10 mm.

Type (male), allotype (female) and 5 paratypes, Vicosa, Minas Gerais, Brazil, April 29, 1934, E. J. Hambleton, in Drake Collection.

The lighter color, more foliaceous carinae and narrower paranota separate this species from *V. variana*, n. sp.

Vatiga variana, n. sp.

Head black, short, the hind pair of spines very short, adpressed, testaceous, the others wanting. Bucculae blackish, margined with testaceous. Eyes transverse, black. Rostrum short, brownish, extending on mesosternum. Antennae long, indistinctly pilose; segment I moderately long, black, nearly two and one-half times as long as II; II very short, black, much slenderer; III long, dark fuscous, pale at apex, three times as long as IV; IV hairy, black-fuscous. Body beneath black, rostral laminae testaceous, deeply constricted on mesosternum. Legs slender, brownish testaceous, the tibiae testaceous, the tarsi dark.

Pronotum moderately convex, tricarinate, strongly narrowed anteriorly; carinae distinct, mostly testaceous, dark on disc, low, indistinctly areolate; lateral carinae slightly concave within anteriorly; collar distinct, truncate in front, scarcely elevated at middle. Paranota narrow, narrower than in other species of the genus, uniseriate opposite calli, biseriate in front, the outer margins straight. Elytra moderately broad, with discoidal area moderately broad, biseriate (on one side with two extra areolae in widest part); subcostal area biseriate, narrow; discoidal area reaching middle of elytra, five areolae deep in widest part; sutural area becoming more widely areolate posteriorly.

Length, 3.85 mm.; width, 2.25 mm.

Type (female), Rio Grande do Sul, Brazil, in Drake Collection. Separated from its congeners by the narrower paranota, blackish color and short hind pair of spines. It is most closely related to *V. longula* (Drake) and separated from it by more lacy appearance, much shorter first antennal segment, shorter hind pair of spines and dark color.

Leptopharsa rumiana, n. sp.

Small, slender, whitish testaceous, the head and pronotum black, a transverse band in costal area near base of elytra, discoidal, sutural and

most of subcostal area fuscous to dark fuscous. Head short, often covered with whitish exudations, with five moderately long spines, the three anterior ones black (median longest), and the hind pair brownish. Antennae moderately long, indistinctly pilose, testaceous, the basal two and apical segments slightly darker, usually brown; segments I and II short, moderately thickened, the former longer and slightly thicker; segment III very slender, straight, about three times the length of IV, the latter slightly enlarged. Rostrum brownish, almost extending to end of sulcus; rostral laminae testaceous. Body beneath black; bucculae margined with testaceous.

Pronotum moderately convex, coarsely deeply pitted, the paranota, carinae, hood and most of triangular process testaceous; hood small, inflated; paranota narrow, slightly reflexed, biseriate, the areolae small; carinae foliaceous, uniseriate, the areolae small, the lateral pair distinctly constricted behind disc, the median with a small dark fuscous spot on disc; triangular process areolate. Elytra rather narrow, widest at transverse band, distinctly constricted behind middle; costal area almost entirely biseriate, uniseriate apically; subcostal area narrower, mostly biseriate; discoidal area short, not extending to middle of elytra, with a slightly raised, dark fuscous spot at apex, widest beyond middle, there three areolae deep. Legs very slender, whitish testaceous. Abdomen beneath black.

Length, 2.55 mm.; width, 1.00 mm.

Type (male), allotype (female) and 42 paratypes, taken on fiber plant, *Malvaviscus arboreus* at San Andres, El Salvador, July 21-26, 1944, E. J. Hambleton; 2 paratypes, Finca, Los Cerritos, Guatemala, July 6, 1944, E. J. Hambleton.

This species differs from *L. constricta* Champion in having a smaller, less inflated hood, and the antennae is longer with fourth segment yellowish or brownish instead of black. The elytra are also narrower and less concave along costal margins. Type in Drake Collection. Paratypes in U. S. National and British Museum.

***Leptopharsa machalana*, n. sp.**

Small, moderately elongate, the costal area with a prominent, dark-fuscous band near the base. Pronotum moderately convex, deeply pitted, black, the triangular process, hood, carinae and paranota whitish testaceous; hood small, moderately swollen; paranota biseriate, the areolae small; carinae uniseriate, the areolae very small, the lateral carinae constricted behind disc and slightly concave within on disc; paranota, hood, apical portion of triangular process and carinae whitish testaceous, the median with fuscous spot on disc. Antennae moderately long, indistinctly pilose; segment I short, dark fuscous, slightly stouter and longer than II, the latter testaceous; III testaceous, about three times as long as IV; IV yellowish to pale brown, slightly enlarged, shortly pilose.

Head black, with five moderately long spines, the hind pair brownish,

the others dark, the median longest; eyes reddish brown to dark; elytra very similar in color and markings to *L. rumiana* n. sp. Legs very slender, whitish testaceous. Rostrum extending to base of mesosternum. Body beneath black.

Length, 2.25 mm.; width, 0.85 mm.

Type (male), allotype (female) and 12 paratypes, Machala, Ecuador, September 27, 1944, taken on a species of *Desmodium* by E. J. Hambleton. Akin to *L. rumiana* n. sp. but smaller and with less inflated hood. Type in Drake Collection.

***Leptopharsa machalana vinnula*, n. var.**

Closely allied to *L. machalana* n. sp. from Ecuador in size, form and color, but differs from it in having the first two antennal segments and the apical half of fourth dark fuscous; the hood slightly more tectiform, the nervures infusate. Paranota narrowed anteriorly, the nervelets bordering humeri infusate. Sutural area with three large and two or three smaller areolae before apex hyaline. Rostrum extending to meso-metasternal suture. Legs very slender, testaceous. Antennae moderately long, indistinctly pilose; segment I short, longer and stouter than II, both dark fuscous; III, whitish testaceous, about three times as long as IV, the latter moderately swollen, hairy, the distal half dark fuscous. Other structures and color very similar to *L. machalana*.

Length, 2.20 mm.; width, 0.85 mm.

Type (male), allotype (female) and 32 paratypes, Fort Pierce, Florida, October 7, 1942, W. Mathis; taken on Beggars lice and Caesar's burr. Type in U. S. National Museum.

Distinctly narrower and with the hood much less swollen than in *L. clitoriae* (Heidemann) or *L. constricta* (Champion).

Since writing the above description, numerous specimens, taken on *Desmodium* (Leguminosae), Puerto Barrios, Guat., May 8, 1945, are almost indistinguishable from the Florida examples of *vinnula*, and indicates that *vinnula* is not more than a variety of *L. machalana*. It seems advisable to treat *vinnula* as a variety because of host plants, the wide range or distribution and slight color differences of antennae. More information is needed on the food habits of the *constricta* group of *Leptopharsa*.

***Leptopharsa siderea*, n. sp.**

Very similar to *L. vinnula* n. sp. in size and general appearance, but easily separated from it and other members of the group by the absence of a transverse band in the costal area. Hood, paranota, carinae, apex of hind pronotal process and costal areas of elytra whitish testaceous. Pronotum moderately convex, black, finely pitted; carinae finely uniseriate, the lateral carinae slightly constricted behind. Elytra moderately constricted behind middle; costal area moderately wide, irregularly uniseriate in front, biseriate in widest part; subcostal area triseriate, the nervures brown to fuscous; discoidal area small, not reaching middle of

elytra, triseriate. The nervures also brown to fuscous and with centres whitish; sutural area brown, with three large areolae near the apex clear, the others brown. Antennae moderately long, indistinctly pilose, slender; segments I and II brownish, short, the latter slender and nearly one-half the length of the first; III very long, slender, testaceous, nearly two and one-half times the length of IV, the latter slightly thickened, the apical two-thirds dark brown or fuscous. Rostrum brownish, extending between intermediate coxae. Orifice with prominent, white, projecting margin. Legs slender, testaceous, the tarsi dark.

Length, 2.22 mm.; width, 85 μ m.

Type (female) and allotype (male), taken on undetermined legume, Esquintla, Guat., June 27, 1945, E. J. Hambleton, in Drake Collection. The whitish testaceous costal area without transverse bands separates this species from *C. constricta* Champion and the new species described above.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A SMALL HERPETOLOGICAL COLLECTION FROM
EASTERN PERU.

EMMETT REID DUNN, *Haverford College.*

Dr. Doris Cochran of the United States National Museum recently sent me for identification a Caecilian and twelve snakes from Peru. The material was sent in by Mr. J. G. Sanders in 1944, and bears the data "Fundo Sinchono, 4600-5000 feet, Prov. Loretta, Peru." This cinchona plantation is in the Province of Loreta, in the northeastern part of Peru. The nearest town is Tinga Maria in Huanuco Province over the Andean Divide, 72 Km. to the west.

Caecilia pachynema Gqntner. No. 119008. A specimen 1030 mm. long, with 146 primaries and no secondaries.

Tropidophis taczanowskyi (Steindachner). No. 119009. This seems to be the first South American *Tropidophis* to reach this country, and the seventh to be recorded. It is a female 268 mm. long, tail 33 mm. Dorsals 23-21, keeled save for the lower four rows; ventrals 152; anal single; caudals 27; upper labials 8, third and fourth in orbit on right side, third in orbit on left; lower labials 10, two in contact with genials; suture between internasals very indistinct; two cross rows of plates between internasals and frontal, five in the anterior one (=two loreals and three anterior prefrontals), two in the posterior (=posterior prefrontals); one preocular; three postoculars, the lower almost a subocular; temporals 3-3; parietals entire; rich brown above, yellow below; black markings on temporals and as vague dots on adjacent scales of rows 2-3, 5-7, and vertebrae and paravertebrae (=three vague rows of spots on each side); large circular black blotches below, which may extend onto first scale row; maxillary teeth 18, subequal.

The specimen is unique in having separate loreals (they are fused with the anterior prefrontals in all other known *Tropidophis*). The count of maxillary teeth (18) is distinctly higher than that of Antillean *Tropidophis* (12-15), but agrees with the number (19) given for the only other South American specimen for which this count is recorded (type of *paucisquamis*).

APR 13 1946

Previous reports of *Tropidophis* from South America are as follows: *Ungalia taczanowskyi* Steindachner 1879, Sitz. Ak. Wien 79, p. 522. Two specimens from Tambillo, Peru. I cannot place the locality. A "tambo" was a stopping place on the old Inca road system, and there were many of them. Some of them persist, and some are on maps, some not. A "tambillo" would be an insignificant "tambo". There are at least eleven in Peru. Boulenger (1893, Cat. Snakes British Mus. Nat. Hist., ed. 2, vol. 1, p. 111) records a specimen from Guayaquil, Ecuador.

Ungalia paucisquamis Muller 1901 in Schenskel, Verh. Nat. Ges. Basel 13, pl. 154. A specimen from "South America." Amaral (1930, Mem. Inst. Butantan 4, 1, pl. 5) records a specimen from Santo Armero (near Serra de Parapiacaba), Sao Paulo, Brazil.

Ungalia brasiliensis Anderson 1901, Bih. Svenska Vet. Ak. Handl. 27, p. 4, pl. 1, fig. 1. A specimen from "Brazil."

The scale counts indicate a division on the basis of ventrals and caudals, but not on a basis of dorsals.

<i>T. taczanowskyi.</i>			
Guayaquil	ventr. 149	caud. 25	dors. 23 keeled
Tambillo	150	25	23 " Type
"	160	25	23 " Type
Loreta	152	27	23 "
<i>T. paucisquamis.</i>			
"S. Amer."	178	40	21 smooth Type <i>paucisquamis.</i>
"Brazil	178	37	21 smooth Type <i>brasiliensis.</i>
Sao Paulo	175	32	23 keeled

The closely allied and equally rare genus *Ungaliophis* (one specimen from each of the countries Colombia, Panamá, Costa Rica; several from Guatemala) seems to intervene between the rare *Tropidophis* of South America and the common *Tropidophis* of the Greater Antilles. Whereas in *Tropidophis* the loreal is fused (except in the present specimen) and the prefrontals are much subdivided, in *Ungaliophis* the loreal is retained (sometimes subdivided) and the prefrontals are fused into a single scale.

The single South American specimen of *Ungaliophis* was taken at Andes, Antioquia, Colombia (a town on the east slope of the western Andes at 1357 meters elevation). It had 19 smooth dorsals, 226 ventrals, and 41 caudals. It served as the type of *U. danieli* Prado (1940, Mem. Inst. Butantan 14, p. 35).

Atractus sp. (cf. *badius*). No. 119011. A male with long loreal, long upper second temporal, 7 upper labials, 17 dorsals, 2 postoculars, 4 sublabials in contact with genials, 146 ventrals, and 32 caudals. The markings consist of two-scale light bars separating four-scale darker blotches, both of which fade gradually into the uniform drab of the sides and belly.

The scalation is close to that of typical *badius* (type ventr. 154, caud.

36), whose markings, however, are of equal light and dark crossbands, more prominent anteriorly. I rather suspect that this snake is what has been called "*badius*" from Peru; a very similar if not identical form has been called "*badius*" from the Oriente of Colombia.

Dipsas latifasciatus (Boulenger). No. 119013. A female with 182 ventrals, 90 caudals; nine upper labials, 4-6 entering eye; a small preocular above loreal; two postoculars; temporals 2-3; 14 lower labials, two pairs in contact, five in contact with the first of the two or three pairs of square genaeals.

Dipsas schunkii (Boulenger). No. 119014. A female with 189 ventrals; 93 caudals; eight upper labials, 4-5 entering eye; a small preocular above loreal; a tiny preocular below loreal on left side; two postoculars; temporals 1-2; twelve lower labials, one pair in contact, five in contact with the first of the three pairs of square genaeals.

Xenodon rabdocephalus (Wied). No. 119012. A male with 144+1 ventrals, 45 caudals; 19-15 dorsals; 8 upper labials.

Oxyrhopus petola ssp. No. 119018. A male with 199 ventrals, 104 caudals; 7 upper labials; 17-15 dorsals; 33 black body bars.

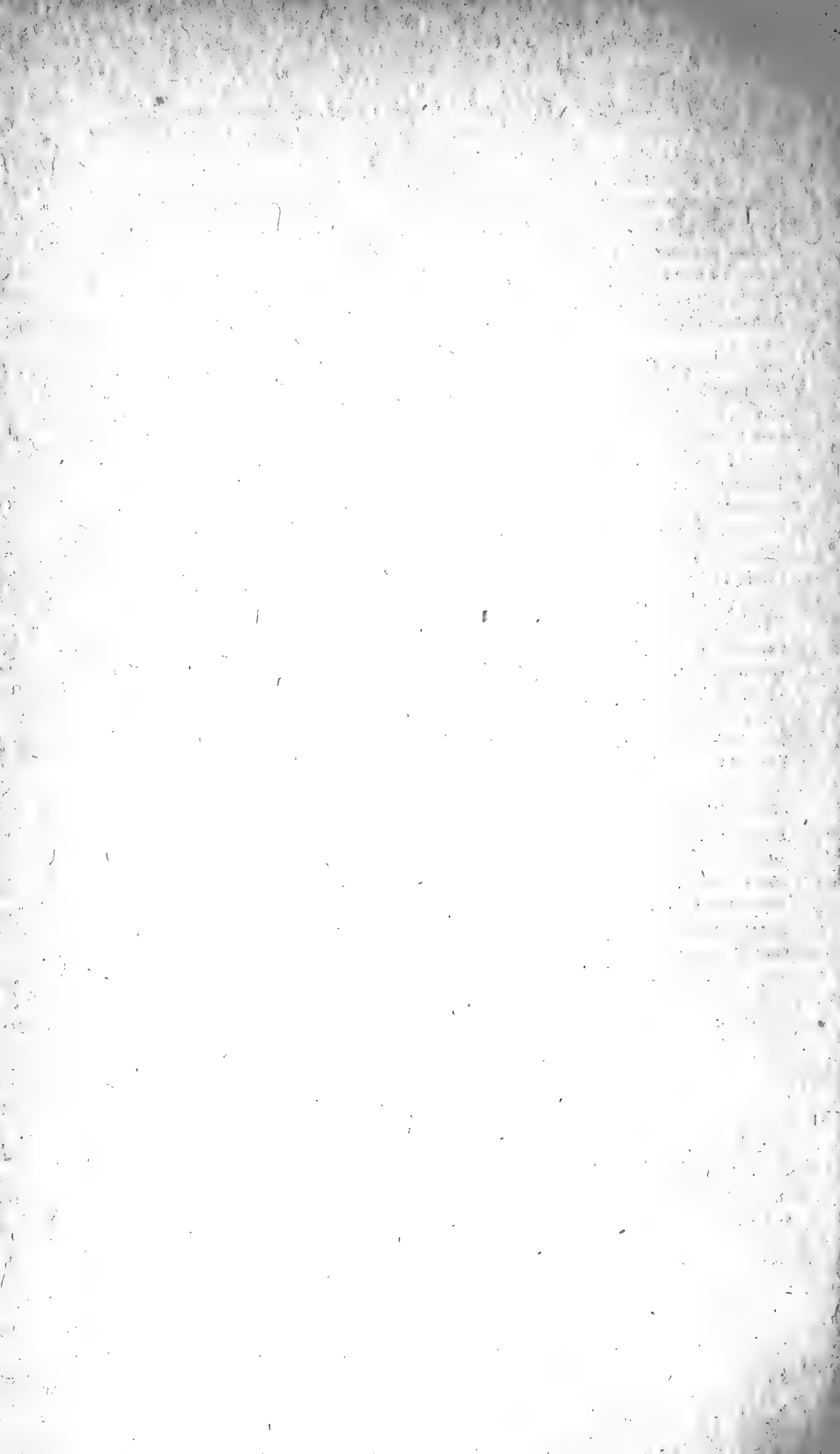
Clelia clelia ssp. No. 119015. A male with 209 ventrals, 91 caudals; 7 upper labials; 19-17 dorsals.

Chironius fuscus ssp. No. 119010. A female with 155+1 ventrals, 122 caudals; 10-10 dorsals; 9 upper labials; probably green in life.

Leptomicrurus narduccii (Jan.) No. 119019. A male with 271 ventrals, 19 caudals; temporals 1-1; 42 light spots on belly.

Micrurus langsdorffii (Wagler). No. 119016-17. The former, a male, has 204 ventrals, 40 caudals; 49 black body bars. The latter, a female, has 216 ventrals, 33 caudals; 61 black body bars. Neither have any light spots on the head. Both belong to the "*annellatus*" type of coloration, with the red rings turned black.

Bothrops oligolepis (Werner) = *chloromelas* Boulenger. No. 119020. A small female, 460 mm. long, has 188 ventrals, 44 caudals; 7 upper labials, the second in the pit; 23 dorsals. Four of the subcaudals are undivided. Werner's *oligolepis* from Bolivia has over ten years priority to Boulenger's *chloromelas* from Huancabamba near Oxypampa, Peru. This report records this species for the third time.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



TAXONOMIC NOTES ON AMERICAN CHIGGERS
(LARVAE OF THE MITE FAMILY TROMBICU-
LIDAE), INCLUDING THE REDESCRIPTION
OF A GENUS AND THE DESCRIPTIONS OF TWO
NEW SPECIES.

H. E. EWING.

In addition to the redescription of the genus *Euschöngastia* Ewing and the description of a new species of *Trombicula* Berlese and *Acomatacarus* Ewing notes are here presented on generic and subgeneric characters and the relationship of *Acariscus flui* (Van Thiel) and *Acariscus hominis* (Ewing).

Generic and Subgeneric Characters in the Family Trombiculidae.

More recent work on the taxonomy of the trombiculid mites, particularly the work done by means of the oil immersion lens and mounting media with better refractive indices than those formerly used has brought to light the fact that many of our generic and specific descriptions made in former years are seriously inadequate and inaccurate. For this reason the present writer is now reviewing the descriptions of all genotypes and many others, noting specific characters, previously neglected, overlooked or improperly described, and listing them for the evaluation of their possible subgeneric or generic value. In giving the description of a species or a genus, often it is of almost as much importance to state the absence of a structure, as it is to describe it fully if present.

The Genus *Euschöngastia* Ewing.

The genus *Euschöngastia* Ewing was established in 1938. The outstanding character of this genus is the peculiar palpal claw. This structure in the type species is strongly bent inward toward the tip and has several accessory prongs grouped together on the outer curve of the claw near its apex. The single included species was described from eight engorged specimens taken from a chipmunk, *Eutamias* sp. at Boise,

Idaho and three partly engorged specimens taken from a "mouse" at San Simeon, California.

Recently several well mounted, undetermined specimens belonging to this genus have come to hand. In studying them it was soon noticed that my former diagnosis needs revision, hence there is here given a formal description of the genus *Euschöngastia*.

1938. *Euschöngastia* Ewing, Jour. Wash. Acad. Sci., vol. 28, p. 293.

Chelicera stout; blade large, broad at base, sharp at apex, toothless or with a minute dorsal tooth, and extending beyond apex of basal segment. Galeal seta simple or branched. Palpus somewhat stout; palpal femur angulate laterally and with posterior margin broadly and deeply incurved; palpal claw with more than three prongs, the accessory prongs frequently being paired. No tracheae or spiracles. Dorsal plate with a large, crescentic ridge in front of each pseudostigma and a single median barbed or branched seta on or near its anterior margin. Antero lateral setae of dorsal plate large, barbed, similar to posterolateral setae; pseudostigmatic organs strongly clavate or capitate. Eyes poorly developed or absent. Abdomen without posterodorsal plates; dorsal setae numerous, humerals not situated in row II, rows II and III each with ten or more setae. Legs of median length; each coxa with a semi-plumose seta; tarsi three-clawed, middle claw being more slender than other two.

Type species.—*Euschnögastia americana* Ewing 1938.

Included species.—Besides the type species this genus includes *Euschöngastia sciuricola* (Ewing) (type host, red squirrel, *Sciurus hudsonicus richardsonii*, type locality, Florence, Montana) and possibly *Neoschöngastia blarinae* (Ewing) (type host, short-tailed shrew, *Blarina brevicauda*, type locality, Washington, D. C. Three partly engorged specimens taken from a "mouse" at San Simeon, California and regarded as being the same as *Euschöngastia americana* have been found to differ slightly from the specimens taken on the type host at the type locality of *Euschöngastia americana*.

Acariscus flui (Van Thiel 1930) and *Acariscus hominis* (Ewing 1933).

A recent study of additional material of *Acariscus hominis* (Ewing 1933) sent in by Lt. Charles D. Michener, Sn. C., shows that this species varies considerably in regard to the number and arrangement of the dorsal setae behind row IV and in the development of the second pair of eyes. In the type material of *hominis* the second eyes are very slightly smaller than the first while in some of the specimens sent in by Lt. Michener they are much smaller. The inner prong of the palpal claw also shows considerable variation being somewhat smaller than in the types.

Of particular interest among the material sent in by Lt. Michener are four specimens taken on grass at Santa Rosa, Colon Province, Panama. Except for an extra seta on one side in row III, the chaetotaxy of the dorsum of abdomen of all four specimens is exactly the same being 2, 8, 8, 8, 6, 4, 2, not counting the posterior marginals. In these specimens from grass the posterior eyes are much smaller than the anterior.

Possibly this material represents *Acariscus flui* (Van Thiel) but the anterior margin of the dorsal plate is incurved on each side of the middle as in *hominis* instead of being outwardly rounded or convex as in *A. flui*.

There is a tendency for the dorsal plate to be more heavily sclerotized in *A. hominis* specimens from the southeastern part of the United States. In some specimens taken from a quail at Savannah, Georgia, this increased sclerotization is so pronounced that an inverted crescentic or angulate line is formed behind the median seta delimiting a distinctive anterior area. Also this increased sclerotization in the specimens from Savannah has resulted in forming an irregular yet more or less distinct bar extending from one pseudostigma to the other.

The variations here noticed in *Acariscus hominis* indicate that there is a rather closely related *flui-hominis* complex which may consist of two closely related species, one of which has two varieties, or that the whole complex consists of three or possibly more varieties of the same species.

A NEW SPECIES OF TROMBICULA BERLESE.

The genus *Trombicula* Berlese (1905) is here considered in a restricted sense to include only those species in which the palpal claw is trifurcate and the abdominal setae usually over thirty.

Trombicula bakeri, new species.

(Fig. 1.)

Chelicera with large basal segment that is rounded laterally and ends dorsally in a stout, hooklike process; piercing apparatus of chelicera a curved blade with a single dorsal tooth and apparently no ventral tooth. Palpus stout; palpal femur somewhat angulate laterally; first seta bilaterally plumose, curved, and extending forward almost to the end of the palpal femur; second seta almost straight, with two lateral branches; palpal claw strongly curved, trifurcate, larger accessory prong almost straight, situated dorsally between the other two prongs and almost reaching tip of main prong, smaller accessory prong also almost straight, situated laterally next to larger prong. Galeal seta simple. Tracheae and spiracles absent. Dorsal plate minutely granular, with anterior margin about straight, the sides slightly diverging posteriorly, and posterior margin evenly rounded; anterolateral seta with lateral branches, when depressed backward reaching beyond base of posterolateral by almost one-third its length; submedian seta similar to antero-lateral and when depressed extending almost to posterior margin of dorsal plate, posterolateral seta similar to anterolateral but somewhat longer; pseudostigmata each situated in front of an oblique slit and on a level with posterolateral setae; pseudostigmatic organ flagelliform, and slightly longer than posterolateral seta, with only two or three short lateral branches. Eyes very large, the anterior and posterior being fused; ocular plate vestigial. Dorsal setae 2, 6, 6, 6, 4, 2, 2, 2 (counting latero-marginals). Ventral setae 2, 2, 8 (or 9), 2, 8, 2, 2, 2. All coxal setae bilaterally subplumose, there being one on each coxa. Tarsal armature as

usual. Length of dorsal plate 0.074 mm.; greatest width, 0.128 mm. Length of unengorged larva, 0.315 mm.; width, 0.238 mm.

Type host.—Larva unattached.

Type locality.—Mount Popocatepetl (about 9,100 feet; west slope), Mexico.

Type slide (holotype).—U. S. National Museum No. 1517.

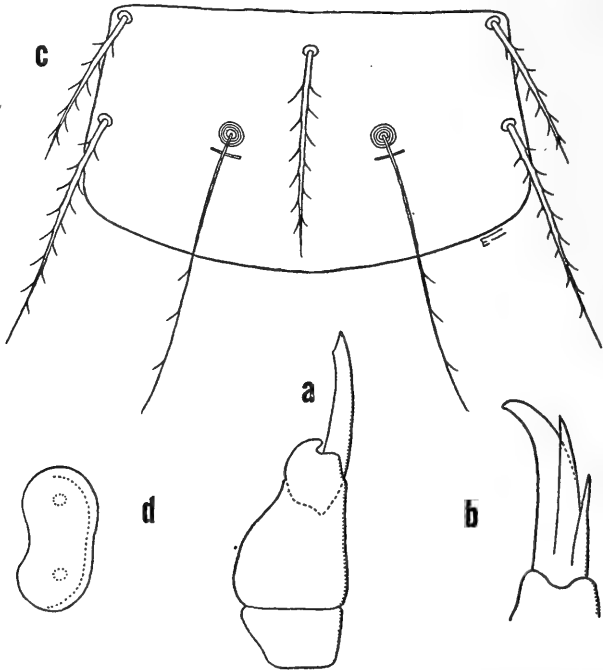


PLATE III—*Trombicula bakeri*, new species; *a*, dorsal view of left chelicera; *b*, dorsal view of right palpal claw; *c*, dorsal plate; *d* right eyes. All greatly but not equally enlarged.

Description based on a single specimen taken along with other mites in moss at type locality, December 29, 1942, by E. W. Baker, for whom the species is named. *T. bakeri* is an unusual species in two respects, in having the anterior and posterior eyes fused and in the arrangement of both dorsal and ventral setae into so many transverse rows. This latter condition is doubtless due to the migration of certain setae from the rows to which they belong phylogenetically. This new species is not closely related to any known species of *Trombicula*.

A NEW SPECIES OF ACOMATACARUS EWING.

The genus *Acomatacarus* Ewing (1942) is a derivative of the old genus *Leeuwenhoekia* Oudemans (1911). It is noted particularly for the presence of tracheae and a pair of spiracles which open laterally in front of the first pair of coxae.

Acomatacarus galli, new species.

(Fig. 2.)

Piercing apparatus of chelicera a broad sharply pointed blade with a single ventral tooth and three minute, appressed dorsal teeth. Palpus not swollen; femur broadly rounded along outer margin; first seta bilaterally semiplumose, curved, extending forward for about one-third its length beyond distal margin of palpal femur; second seta similar to first, situated near middle of patella and extending beyond distal margin of same by about two-thirds its length; palpal claw bifurcate, outer accessory prong conspicuous, curved, slender but falling far short of reaching the tip of primary prong. Galeal seta simple. Tracheae and spiracles present, the latter each with a conspicuous atrium. Dorsal plate large, sides slightly diverging posteriorly and posterior margin angulate; anterior process oval in front, total length of process less than distance from anterolateral seta to submedian seta; anterolateral seta subplumose, when depressed extending backward about to pseudostigma, situated considerably nearer submedian seta than posterolateral seta; submedian seta similar to anterolateral, when depressed extending to pseudostigma; posterolateral seta similar to anterolateral but slightly longer; pseudostigmata each cuplike and slightly in front of a level with posterolateral setae; pseudostigmatic organ fine, threadlike, simple, slightly longer than posterolateral seta. Eyes well developed, posterior smaller than anterior and situated about its diameter from the latter; ocular plate well developed. Dorsal setae very numerous, 80 to 90, few being arranged in rows; no row II or III. All coxal setae semiplumose there being two on coxa I, one on coxa II, and one on coxa III. Tarsal claws as usual.

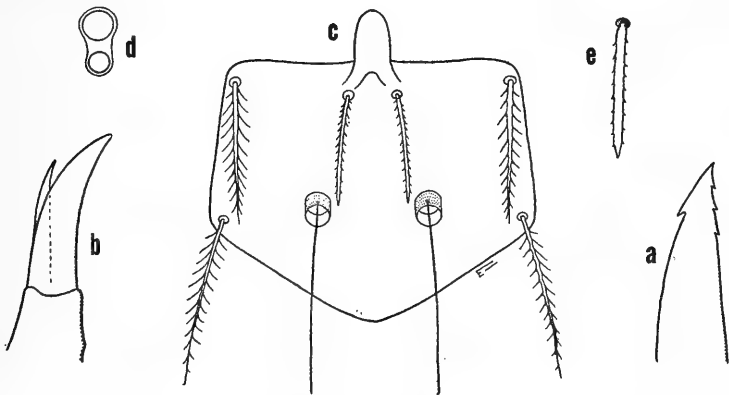


PLATE IV.—*Acomatacarus galli*, new species; *a*, dorsal oblique view of blade of chelicera; *b*, dorsal view of left palpal claw; *c*, dorsal plate; *d*, eyes; *e*, seta from posterior part of dorsum of abdomen. All greatly but not equally enlarged.

Length of dorsal plate (from tip of anterior process to tip of posterior angle), 0.076 mm.; greatest width of dorsal plate, 0.081 mm.; length of partly engorged individual, 0.37 mm.; width, 0.24 mm.

Type host.—"Chicken."

Type locality.—Uvalde, Texas.

Type slide (cotypes).—U. S. National Museum No. 1516.

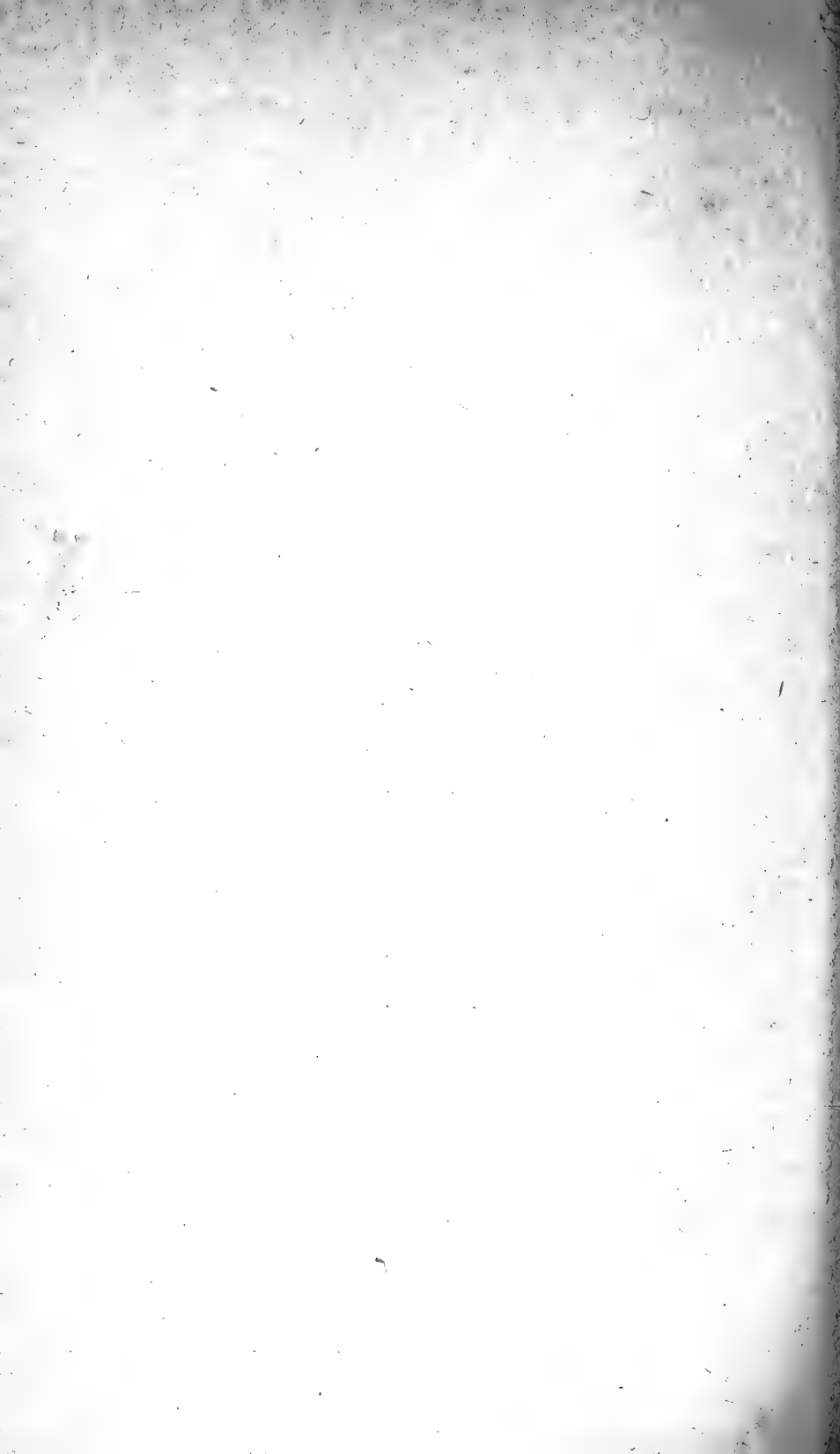
Described from four cotypes mounted on the same slide with two specimens of *Eutrombicula alfreddugèsi* (Oudemans). They were taken from type host at type locality by E. Lester, January 13, 1943.

Only two species of *Acomatacarus* are known from the New World. They are separated by means of the following key:

Dorsal plate with posterior margin broadly rounded; a slightly curved ridge in front of each pseudostigma; first and second palpal setae simple. *A. arizonensis* Ewing 1942

Dorsal plate angulate posteriorly; no ridge in front of each pseudostigma; first and second palpal setae unilaterally semiplumose. . . .

A. galli, new species



PROCEEDINGS
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THE NAME OF THE ROYAL PALM.

FRANCIS HARPER.

A Bartramian name, whose validity has hitherto curiously escaped the notice of both Dr. Merrill (*Bartonia* 23, 1945) and myself, is *Palma elata*. It occurs at three places in the text of William Bartram's *Travels* (1791: 90, 94, 141), in each case without a validating description, and without a reference to the description on pages 115-116, which reads:

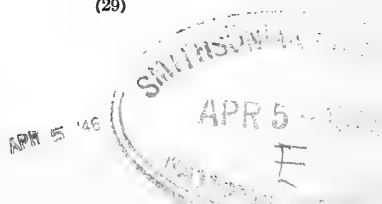
'The Palm trees here seem to be of a different species from the Cabbage tree; their strait trunks are sixty, eighty or ninety feet high, with a beautiful taper of a bright ash colour, until within six or seven feet of the top, where it is a fine green colour, crowned with an orb of rich green plumed leaves: I have measured the stem of these plumes fifteen feet in length, besides the plume, which is nearly of the same length.'

Since this description does not include any technical name, it did not seem possible to connect it definitely with the *Palma elata* referred to above. However, there is one other occurrence of the technical name in an easily overlooked place—page iv of the Contents (part II, chapter V): 'description of the Palma Elate'¹ (misprint, corrected to 'Palma Elata' in the London edition (1794: iv) and perhaps other editions). This unmistakable reference to the description on pages 115-116 validates the name.

This belated resurrection of Bartram's name apparently throws into synonymy *Oreodoxa regia* H. B. K. (*Nov. Gen. et Spec. Plantarum* 1: 305, (1815) 1816), later transferred to *Roystonea* as *R. regia* (H. B. K.) O.F. Cook (*Science* 12 (300): 479, 1900). Subsequently the last-mentioned author (*Bull. Torrey Bot. Club* 28 (10): 554, 1901) distinguished the Florida tree under the name of *Roystonea floridana*, leaving the name *regia* for the Cuban tree; but this distinction has not been recognized by such recent authorities as Small and Bailey.

The name of the royal palm now becomes *Roystonea elata* (Bartr.),

¹ The Linnaean genus *Elate* (1753), based upon an Indian palm, evidently requires no consideration in the present connection.



comb. nov. The original reference is: *Palma Elate* (misprint for *elata*) Bartram, *Travels*: iv, 115-116, 1791. The type locality is the St. John's River between Astor and Lake Dexter, Lake and Volusia Counties, Florida. The species has long since disappeared from this part of Florida.

Swarthmore, Pa.

PROCEEDINGS
OF THE
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TWO NEW SPECIES OF THE MILLIPED GENERA
CHONAPHE AND *ANIULUS*.

BY RALPH V. CHAMBERLIN.

Of the two new species here described, *Chonaphe michigana* is the second species of its genus to be described. The generotype, *C. armata*, occurring in the Pacific Northwest, was described by Harger in 1872 under the genus *Polydesmus*. The new species of *Aniulus* belongs in a group of species including the common *A. venustus* (Wood) and *A. impressus* (Say). The specimens of *C. michigana* were included in a small collection made by Mr. R. R. Dreisbach in Michigan, and those of *A. orthodox* in one made in Illinois, Indiana, and Tennessee by Mr. W. F. Rapp, Jr. The types are retained by the author.

Chonaphe michigana, new species.

Dorsum black, with the carinae and a narrow band across the posterior border of each tergite yellow. Legs yellow. Antennae light brown, excepting last two articles which are darker, nearly black.

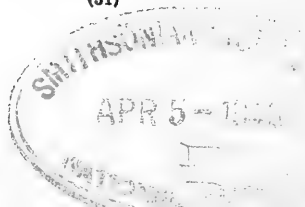
Legs long, without tarsal pads. A transverse series of four widely separated setae across clypeus with an extra seta below and close to the outermost one of these at each end of series. Also two long setae between the antennae and two toward vertex.

Dorsum strongly arched, with the carinae at middle of sides; the carinae of anterior segments nearly continuing the slant of the dorsum, but posteriorly less depressed. The collum a little narrower than the second tergite. Anal tergite with cauda narrow, distally blunt or shallowly notched, curving moderately downward. Dorsum smooth.

Sides smooth except for the pleural keels found on first seven segments.

Characterized by details of the male gonopods, such as the straight spine arising from the mesal corner of the laminate process at middle of the large lobe arising from femur. Gonopodal cavity large, with gono-

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Pods widely separated at base. Details of gonopods as shown in figs. 1, and 2.

Width: 5.5 mm.

Length: About 31 mm.

Locality: Michigan: Midland County, in Midland Cemetery.

One male, the holotype, taken May 7, 1943, and one male, not in full color, taken in the county May 25, 1942, by R. R. Dreisbach.

This is a larger form than *C. armata* (Harger), the generotype, and is readily distinguishable in the details of the male gonopods.

Aniulus orthodoxus, new species.

A species of medium size, color pattern typical. A median dorsal black line distinct, a series of black spots with adjacent light maculae along each side over the repugnatorial glands and a series of less dense dark spots along lower part of each side. Dorsum between spots in some much lighter than sides.

Last tergite with caudal angle acute, produced well beyond the anal valves, the produced portion straight, not at all decurved.

In the male the stipes of the mandible with distocaudal corner produced conspicuously as shown in the figure. The collum of the male is elongate, the lower margin straight with above it a single deep sulcus. (See further, fig. 3.)

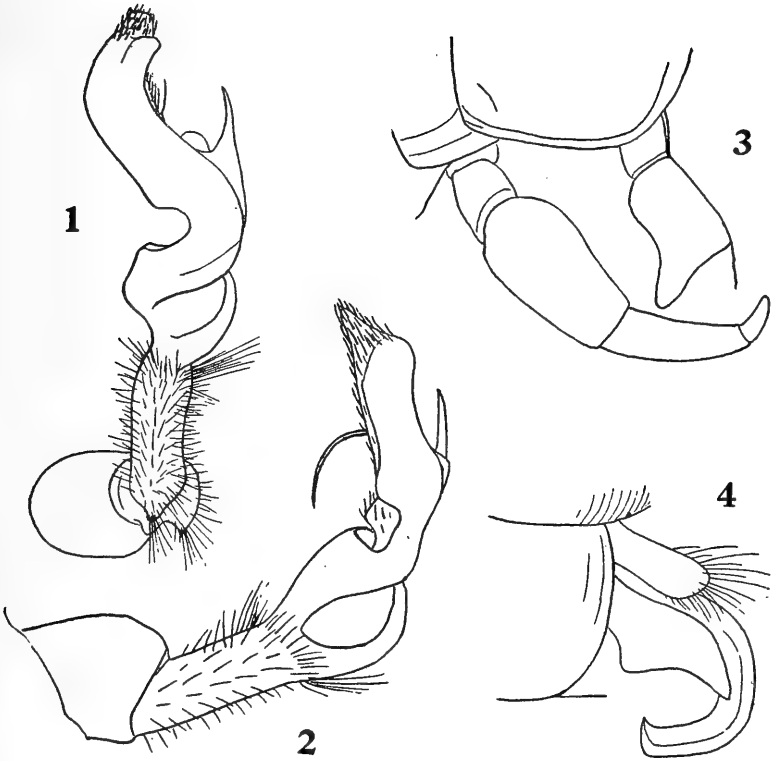
In the male the sternal plate of the eighth segment is but slightly bowed forward at middle, there touching but not overlapping the bases of the posterior gonopods. The form of the divisions of the anterior gonopods (coleopods) as shown in figure 4. Each posterior gonopod above base bent abruptly mesad to meet its mate at the mesal line, next curving caudad in contact with it and then outward and downward, the blade relatively broad. See further, fig. 4.

Length: About 27 mm.

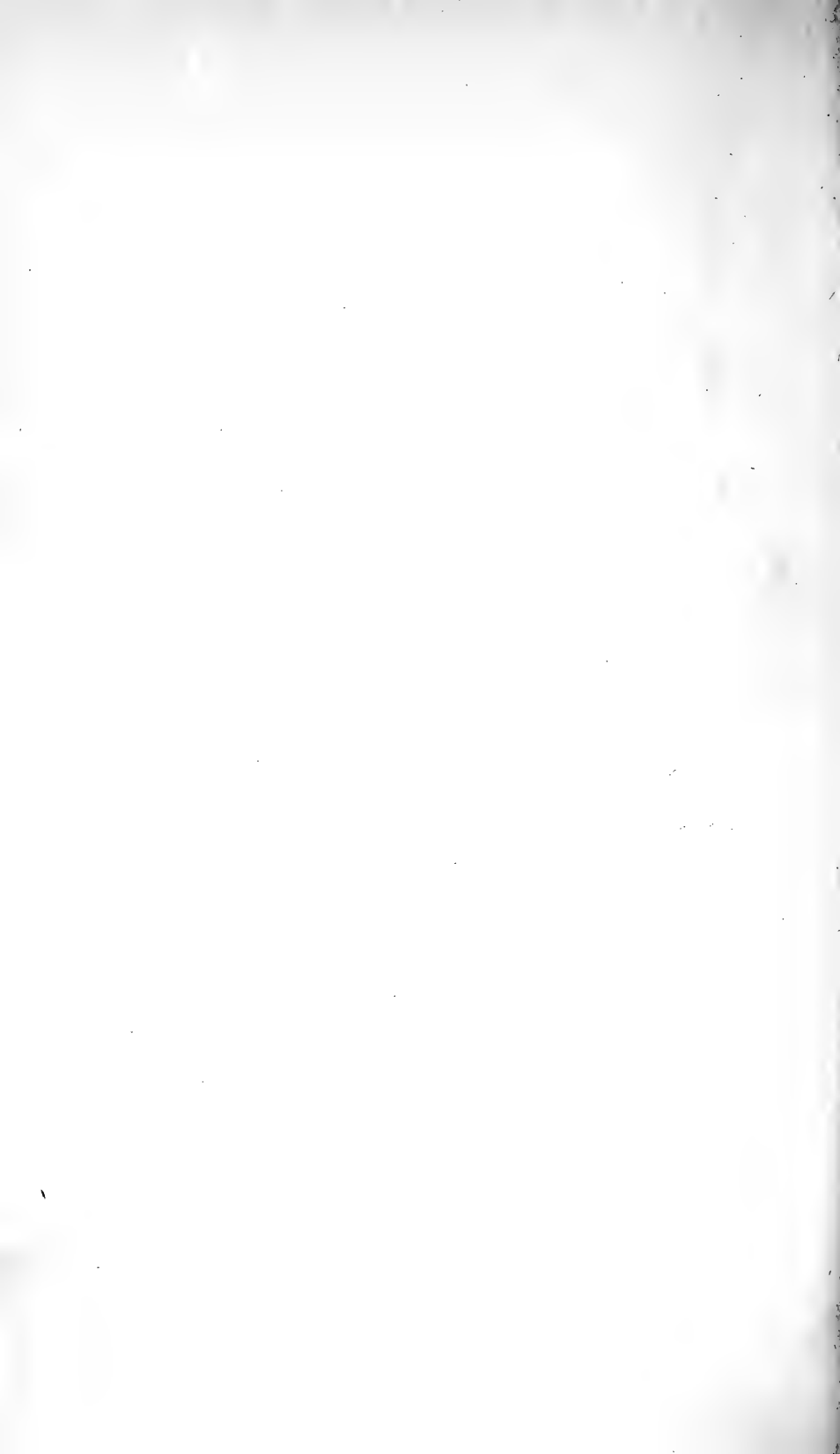
Width: 2.2 mm.

Locality: Tennessee: Reelfoot Lake. One male and three females taken April 12, 1945, by J. and W. Rapp.

Distinct form *A. venustus* in the much broader blade of the posterior gonopods and from *A. impressus* in the form of the coxal lamina of the anterior gonopods as well as in the form and relations of the posterior pair.



New Millipeds of Genera *Chonaphe* and *Aniulus*.



PROCEEDINGS
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A NEW AMERICAN GENUS IN THE CHILOPOD
FAMILY HIMANTARIIDAE.

BY RALPH V. CHAMBERLIN.

The Himantariid genus here established embraces at present three known species,—the generotype, *Stenophilus coloradanus*, described below, *S. californicus*, (Chamberlin), originally described (1930) under the European genus *Meinertophilus*, and *S. audacior* (Chamberlin), placed originally (1909) under *Haplophilus*. The type of the new species is in the author's collection.

STENOPHILUS, new genus.

A genus of Himantariidae. The labrum deeply incised, the incision reaching nearly to the anterior edge. Mandible with teeth up to ten in number and with about six pectinate lamellae. Second maxillae with coxae completely fused, typically with an anterior median notch; claw of palpi straight or nearly so, smooth. Prehensors lacking chitinous lines. Tergites only obscurely bisulcate. No suprascutella or paratergites. No ventral pores present. Coxal pores numerous and uniformly distributed.

GENEROTYPE—STENOPHILUS COLORADANUS, new species.

Differing from the European *Meinertophilus* in lacking ventral pores on the sternites and in lacking chitinous lines on the prosternum of the prehensors.

Stenophilus coloradanus, new species.

Body gradually attenuated forward, more abruptly toward posterior end. Pale yellow in color, the head and antennae not darker. Prehensors also pale excepting the claws, which are light chestnut.

Head of form shown in fig. 1, the frontal plate not discrete. Antennae cylindrical, the articles mostly obviously shorter than in *S. californicus*, with the last article a little surpassing the three preceding taken together. (Fig. 2.)

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Labrum with middle embayment large, armed in type with 13 close-set, large teeth as shown in fig. 3.

The second maxillae with coxae completely fused at middle line, without trace of suture; anterior margin of coxosternum notched as shown in the figure; palpi relatively stout, with claw smooth. (See fig. 4.)

Mandibles with six pectinate lamellae; dentate lamella with six teeth (fig. 5).

Basal plate very short, as wide as the head; overlapped by cephalic plate at middle, anterior border concavely excavated on each side as shown in the figure. (Fig. 1.) Prehensors nearly covered from above; claws smooth, when closed not attaining anterior margin of head; prosternum relatively broad, without chitinous lines, the anterior margin smooth. (See fig. 6.)

Second dorsal plate wide anteriorly and narrowed caudad, the succeeding plates of usual form.

Tergites bisulcate in middle region but absent or obscure in anterior and posterior regions.

Ventral plates smooth, without depressions, no pores detected.

Last ventral plate trapeziform, narrowed caudad. Coxal pores small and very small, numerous but not crowded, present over entire surface.

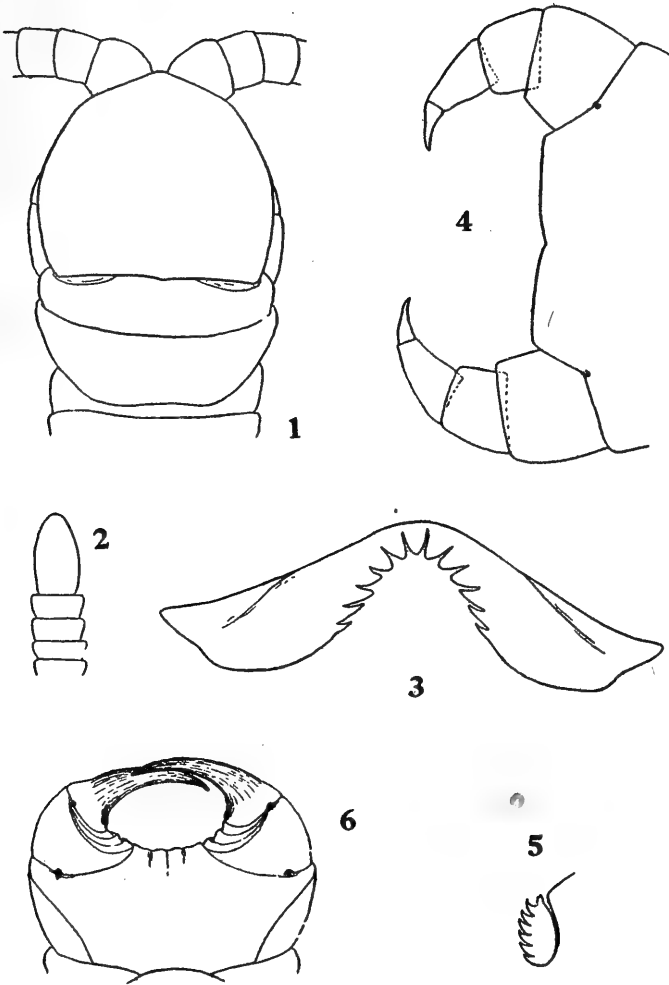
No suprascutella or paratergites. All spiracles circular. Spiraculiferous plates all free from tergites.

Pairs of legs in female holotype, 77.

Length, about 38 mm.

Locality:—Colorado: Mesa Verde. One female taken June 29, 1944, by Professor V. E. Shelford.

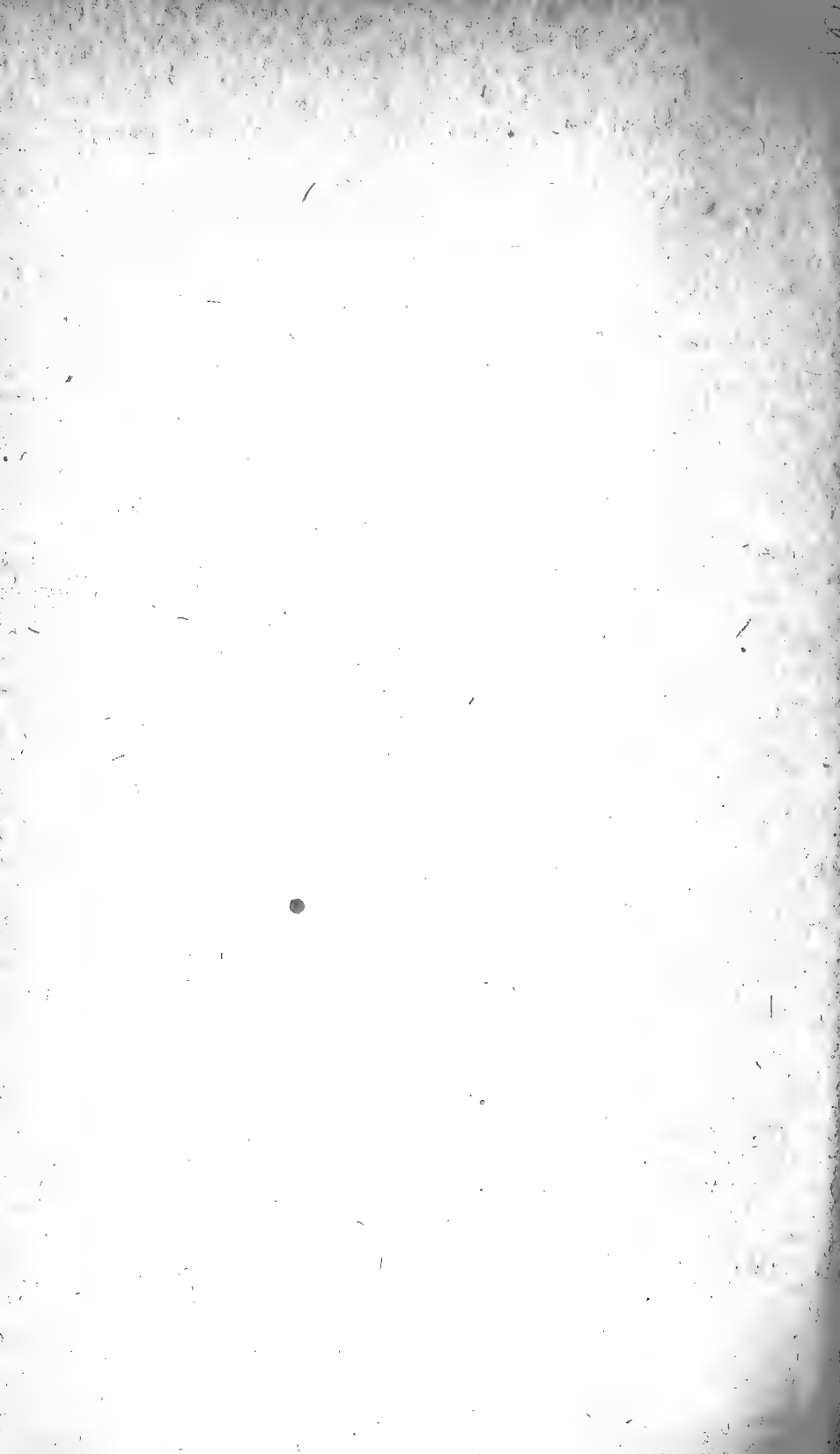
A smaller form than *S. californicus* (Chamberlin), with 77 pairs of legs as against 97, and conspicuously different in the form of the labrum and in its larger and more numerous teeth.



Stenophilus coloradanus, new species.

Fig. 1. Anterior end, dorsal view.
Fig. 3. Labrum.
Fig. 5. Dentate plate of mandible.

Fig. 2. Distal end.
Fig. 4. Second maxillae.
Fig. 6. Prehensors.



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NEW SPECIES OF MOSQUITOES FROM THE
MARIANAS AND OKINAWA (DIPTERA,
CULICIDAE).¹

BY RICHARD M. BOHART, LT., H(S), USNR.²

Four new species are described in this paper so that they can be included in a forthcoming general treatise on mosquitoes of the Marianas Islands and Okinawa.

Aedes (*Finlaya*) *okinawanus*, n. sp.

Male.—Length of body 4.0 mm., wing 3.0 mm. Median area of vertex with pale lemon yellow, narrow curved and upright forked scales, flanked by a large spot of black broad appressed scales and a lateral spot of broad appressed creamy ones; eyes bordered with yellow narrow curved scales along inner half; palpus and proboscis black, palpus about two-thirds as long as proboscis, last segment about as long as its apical bristles. Scutum with distinct lines of pale lemon yellow consisting of a median line forking posteriorly, a submedian line on anterior half of scutum, a line around anterior margin of scutum which bows inward along fossal area and continues to posterior margin as a sublateral line, a few pale scales over wing base; scutellum with black broad appressed scales on mid lobe and with black and yellow narrow curved scales on all lobes; anterior pronotal lobe with whitish broad appressed scales; proepimeron with whitish broadly crescent-shaped scales; pleuron dark brown with several large patches of whitish broad appressed scales. Fore and mid femora with a broad pale line on hind surface, hind femur dark along whole length dorsally but with basal two-thirds pale in front and basal one-half pale on hind surface, a restricted knee spot present on hind femur, very indistinct on other femora; tibiae dark except for a few scales at base beneath and scattered along hind surface; fore tarsus dark, mid and hind tarsi with pale mark at base of first segment, hind tarsus also with pale joint marks over first 3 joints. Wing scales dark, halter

¹ I wish to thank Dr. Alan Stone, Division of Insect Identification, U. S. Department of Agriculture for his suggestions and assistance.

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knob with dark and dull pale scales. Abdominal tergites I-VII with lateral basal silvery spots, sternites with broad pale basal bands. Genitalia as in figures 1-3; basal lobe attached to claspette and with about 7 leaf-like blades, more basally with setiform bristles which extend up harpaginal fold, gradually becoming thicker and flatter; inner margin of basistyle with a group of twisted bristles toward base; basistyle ventrally with a tight clump of about 13 long and rather pale bristles near apex.

Female.—About as in male except for hind tarsi. Palpus all dark and about one-fifth as long as proboscis. Lateral pale spot on vertex enclosing a small dark spot. Scutal lines slightly deeper in color than in male, approaching pale golden. Five-fifths of hind femur pale on posterior surface; tarsal marks more distinct than in male, first fore tarsal sometimes with a few basal pale scales; last hind tarsal with dull white scaling above.

Larva.—About 7 mm. long. Antenna (fig. 5) very slender, about one-half as long as head, a single hair inserted before middle and reaching to apex of shaft, shaft sparsely spiculate; clypeal spines very slender, brown; median hairs of mouth brush with small teeth; head hair A with 8 to 10 plumose branches; B single and very long, one and one-half times as long as head; C slightly posterior and close to B, with 4 or 5 plumose branches which are about half as long as B; d on a line with B, small and with 5 to 7 branches; mentum (fig. 4) subtriangular with about 19 sharp teeth. Shoulder hairs well developed; hair 0 short and bushy, about 25-branched; hairs 1 to 3 moderate in length, hair 1 with 2 or 3 branches, 2 single, 3 with 4 or 5 branches; hair 4 with 3 or 4 moderately long branches; hairs 5 and 7 very long, plumose and triple; hair 6 long and single. Lateral abdominal bristles double on I and II, single and long on III to VII. Comb of about 60 apically fringed teeth in a patch; lateral hair of segment VIII with 3 to 5 plumose branches. Siphon (fig. 6) about 3.5 times its basal diameter, gradually tapering toward apex, acus small, pecten of 22 to 26 teeth of which last 10 are about equal in size, pecten occupying basal half of tube; tuft at apical two-fifths, with 5 to 7 plumose branches, about as long as basal diameter of tube. Anal segment (fig. 6) with a two-thirds complete sclerotized ring which is spiculate along posterior margin, lateral single hair shorter than ring and divided into 3 or more branches at about middle; gills unequal and pointed, longer pair about as long as ring, shorter pair half as long; fan of 10 hair brushes, all in barred area; outer apical bristle (osc) single, inner apical bristle (isc) triple.

Type.—Male (U. S. National Museum No. 57758), Okuma, Okinawa, September, 1945, reared from a treehole (C. L. Harnage).

Paratypes.—Four males and 3 females, same data as type; 1 male and 32 females, Chizuka,³ Okinawa, August to September, 1945, taken

³ Also known as Chijuka and Kizyoka.

biting, resting on vegetation, and reared from treeholes; 1 male, Nago, Okinawa, May 14, 1945, reared from an earthenware jug; 8 larval paratypes on slides, Okuma, Okinawa, from treehole (C. L. Harnage). Other

specimens were collected at Kochiya, Shana Wan, Hentona and Euka. The females bite readily in deep shade during the day.

This species is closely related to *aureostriatus* (Doleschall) of which I have examined New Guinea specimens in the U. S. National Museum. Points of difference are the presence in *okinawanus* of all yellow upright vertex scales and the dark last hind tarsal in the male. The male genitalia have a row of setae on the harpaginal fold which are stouter than in *aureostriatus*, there is a group of twisted bristles at the base of the inner basistyle margin and there is a tight clump of about 13 long bristles near the apex of the basistyle ventrally. The larvae have a somewhat shorter siphon than those of *aureostriatus* but otherwise appear identical.

***Culex (Culiciomyia) ryukyensis*, n. sp.**

Male.—Length of body 3.0 mm., wing 2.5 mm. Vertex with broad median area covered with yellowish white narrow curved scales and brown upright forked ones, vertex laterally with a spot of dull whitish, broad appressed scales continued inward along eye margin; mouthparts dark-scaled, palpus longer than proboscis by one-fourth to one-third of last segment, last two segments sparsely haired (as compared with *pallidothorax* Theobald), first long segment with 3 or 4 short translucent scales projecting downwards. Scutum brown-scaled; pleuron without scales, pale green or pale brown, with a faint dark stripe from anterior pronotal lobe to upper part of mesepimeron, a small dark spot at anterior corner of sternopleuron; 1 lower mesepimeral bristle; legs dark-scaled except for undersurfaces of femora; plume scales of veins 2.1 and 2.2 about 6 times their greatest width. Abdomen with dull pale straight-margined basal bands on tergites II to VII; venter mainly pale-scaled. Genitalia (figs. 7-9) with the 2 black rods of subapical lobe plainly visible in dried specimen (also in all paratypes); lateral arm of paraproct elongate but not enlarged.

Female.—About as in male. Palpus about 3 times as long as clypeus and one-fifth proboscis length. Plume scales of veins 2.1 and 2.2 from 6 to 10 times as long as broad; fork cells one and one-half to twice as long as their stems.

Larva.—About 8.0 mm. long. Antenna (fig. 10) about five-sixths as long as head, tufted at middle, tuft not quite reaching to apex, shaft sparsely spiculate, not much darkened apically, insertions of apical and subapical bristles well separated; clypeal spines very slender and curved; head hair A about 7-branched, B and C with 3 branches reaching a short distance beyond clypeus, d simple; mentum (fig. 11) subpyramidal with about 20 small teeth and 7 larger ones. Shoulder hairs moderate reaching about to middle of head; hairs 1 to 3 on a sclerotized plate, 1 double, 2 single, 3 single or double, 4, 7 and 8 double, 5 and 6 single. Lateral abdominal bristles double on I and II, single or rarely double on III to VI. Comb of about 55 slender and apically fringed teeth without a distinct apical spine, lateral hair of segment VIII with about 7 plumose branches. Siphon (fig. 12) about 6 times its basal diameter, tapering

gradually to a narrow and somewhat upturned apex, with 3 pairs of small sublateral double hairs along apical two-fifths, pecten of 14 to 20 teeth along basal one-fourth of tube. Anal segment (fig. 12) with a complete sclerotized ring which is strongly spiculate along its posterior edge, lateral single hair about as long as ring; gills unequal, shorter pair twice as long as anal ring, fan of 8-hair brushes, all in barred area; outer and inner apical bristles (osc and isc) single.

Type.—Male (U. S. National Museum No. 57759), Chizuka, Okinawa, September, 1945, collected resting on a damp rock (R. Bohart and R. Ingram).

Paratypes.—30 males and 15 females, Chizuka; Okinawa, August and September 1945, collected from damp rocks and reared from rock holes; 9 males, 6 females and 4 larvae (on slides), Koehiya, Okinawa, June 15, 1945, from an earthenware crock in the woods; 1 male, Hedo, Okinawa, September 23, 1945; 6 larvae (on slides), Yaba, Motabu Peninsula, Okinawa, May 1945, from an earthenware crock by the roadside. All paratypes collected by R. Bohart and R. Ingram. Females of *ryukyensis* were not observed to bite.

This species appears to be most closely related to the Indian *bailyi* Barraud which also has an uncrested male basistyle, and reduced pleural markings. It differs from *bailyi*, however, in having the male palpi, extending beyond the proboscis by less than half of the length of the last segment (the whole last segment in *bailyi*), in the darkened anterior corner of the sternopleuron, and in details of the male genitalia (figs. 7-9). The larva (figs. 10-12) checks closely with the description of *viridiventer* Giles given by Barraud (Barraud, P. J., 1934, Fauna, British India, Diptera, vol. 5, Culicidae, p. 379) but differs in having the siphon tufts almost invariably double, in having only 3 or 4 denticles on the pecten teeth instead of 5 to 7, and in the pointed anal gills.

Culex (Lophoceraomyia) tuberis, n. sp.

Male.—Length of body 3 mm., wing 2.5 mm. Vertex covered with pale narrow curved and dark upright forked scales in broad median area, laterally with a large spot of pale broad appressed scales continued inward along eye margin; torus with a pronounced knob at upper inner angle; flagellum with specialized setae on segments VI to X (torus considered as first segment); VI with 7 or 8 yellowish setae of varying lengths, the longest about like those on X; VII to IX with matted and twisted tufts, shortest on VIII; X with 6 slender setae; mouthparts dark, palpus longer than proboscis by about length of last segment, last 2 segments not very hairy, no row of stiff hairs at base of palpus. Scutal integument pale brown with indistinct submedian dark lines and with hair-like brown scales; pleuron almost uniformly pale brown with a few scattered scales, most evident along lower hind margin of sternopleuron, no lower mesepimeral bristle; femora with a line of pale scales beneath, tibiae and tarsi dark. Abdominal tergites dark-scaled, venter with some paler scales. Genitalia (figs. 13-16) with distal division of subapical lobe of basistyle

greatly elongated and hairy, bearing at its base a long blade and at its apex 2 short curved setae and a short blade of distinctive shape; inner margin of basistyle with a row of 6 (7 in one paratype) long curved bristles.

Larva.—A single specimen which is probably this species was found in a seepage pool at Ginka, Okinawa (R. Ingram) in company with *C. (Neoculex) hayashii* Yamada. It appears to be very similar to that of *mammilifer* Leicester according to the characters given by P. J. Barraud (1934, Fauna British India, Diptera vol. V, Culicidae). It has the following salient characters: Antenna tufted at apical two-thirds, only slightly darkened at base and beyond tuft; head hairs B and C fairly long and double; comb about 50 scales in a patch; siphon distinctly but gently curved upwards, about 10 times its basal diameter, with 4 pairs of double hairs which are about as long as diameter of tube subapically, 17 pecten teeth, each with about 7 denticles; anal gills pointed and subequal, longer pair a little longer than anal ring.

Type.—Male (U. S. National Museum No. 57760), Chizuka, Okinawa, September, 1945, reared from larvae collected in a rockhole along a stream (R. Bohart and R. Ingram).

Paratypes.—Two males, same data as holotype.

This species is related to *minor* Leicester, *mammilifer* Leicester, *uniformis* Theobald, *plantaginis* Barraud, *mindinaoensis* Baisas and *nolledoi* Baisas, all of which in the male have a knob on the torus, specialized setae on antennal segments VI to IX or X and an unbanded abdomen. It differs from all of these by the elongate hairy distal division of the subapical lobe of the basistyle. In addition to the length of the distal division, the terminal processes are distinctive (fig. 13). Except in this last character it closely resembles *nolledoi*, of which I have seen paratypes. The scutal integument of *tuberis* is pale brown instead of dark brown as in *nolledoi*, however.

Culex (Culex) litoralis, n. sp.

Male.—Length of body 3.5 mm., wing 2.9 mm. Vertex with median area covered with pale yellowish narrow curved and upright forked scales, a few submedian dark upright scales, vertex laterally with a large spot of dull white, broad appressed scales. Palpus longer than proboscis by the last segment; first long segment (actual II and III) as seen laterally with five bands of about equal length, those of base, middle and apex black, the other two pale yellow; subterminal segment with a narrow basal pale band; terminal segment with narrow basal and apical pale bands; first long segment with a row of short ventral hairs on apical one-half and a lateral row of long hairs on apical one-fourth. Proboscis with a pale ring just beyond middle, taking up one-fifth of proboscis. Scales of anterior pronotal lobe, proepimeron, scutum and scutellum narrow curved and pale yellowish; scutum also with dark curved scales forming a spot in fossal area and a fringe around antescutellar area; scutal scales mostly scimitar-like and imparting a shaggy appearance; pleuron with 3 small spots of pale broad appressed scales, integument

mottled, darkest in postspiracular area and on sternopleuron except in scaled portions. Wing dark-scaled; halter knob entirely pale. Posterior surface of femora mostly pale, anterior surface of fore and mid femora dark and unspeckled, that of hind femur pale on most of basal two-thirds; tibiae dark-scaled; tarsi with narrow pale joint bands. Dorsum of abdomen with broad whitish yellow basal bands on II-VII, the bands occupying one-half or more of each segment, all more or less produced backwards at mid line of body, segment VIII with a lateral spot; venter of abdomen mostly pale-scaled. Genitalia (figs. 17-19) with basal arm of paraproct very small.

Female.—About as in male. Palpus about one-fourth proboscis length, pale at tip; pale ring of proboscis one-fourth to nearly one-third proboscis length; dark scutal areas more distinct than in male. Costa with a line of basal pale scales on its posterior margin above. Pale tergal bands most often produced on II to V, rarely occupying less than half of segment.

Larva.—Head broad; antenna (fig. 20) relatively short and slightly bowed, constricted and tufted at apical third, tuft surpassing antennal apex, basal two-thirds of shaft spiculate; apical third smooth but darkened, apical and subapical bristles arising close together and about equal in length; clypeal spines (fig. 22) very stout and spatulate, light brown in color; head hair A 6-branched, B double, C triple, d simple, e triple, hairs B and C hardly reaching past middle of antenna; mentum (fig. 21) subtriangular with about 15 teeth. Pronotal hairs fine and moderate in length, shoulder hairs (from left to right): 8 small and single, 7 double, 6 to 4 single, 3 to 1 single on a sclerotized plate. Lateral abdominal bristles triple on I and II, double on III to VI. Comb of about 30 apically fringed teeth without a distinct apical spine, lateral hair of segment VIII of about 10 plumose branches, siphon (fig. 23) tapering gradually toward apex, about 3.5 times as long as broad at base, with 8 to 11 long multiple hair tufts arranged in an irregular ventral row along apical three-fourths of tube, 2 pairs of short sublateral posterior tufts, acus well developed, pecten of 12-16 often irregularly placed stout teeth with 2 or 3 large denticles along anterior edge, pecten extending along entire basal third of tube. Anal segment (fig. 23) with a partial sclerotized ring which is apically spiculate, lateral single hair inserted just outside sclerotized area; gills short, rounded bud-like, slightly unequal; fan of 12 hair brushes, all in barred area; outer apical bristle (osc) single, inner apical bristle (isc) double or triple.

Type.—Male, Rota Island (north shore), Marianas Islands, October 26, 1945, reared from brackish coral rockhole (R. Bohart and R. Ingram).

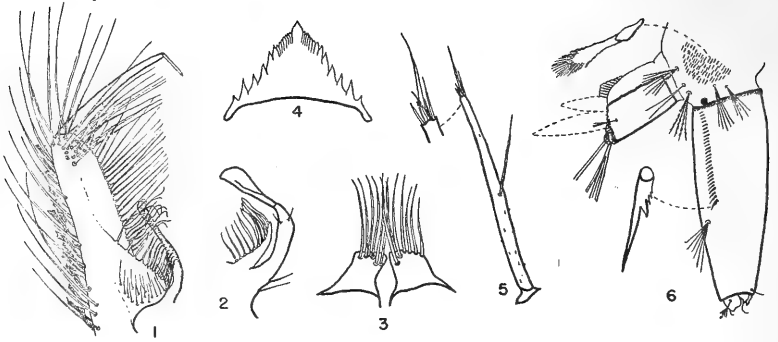
Paratypes.—21 males, 25 females, 10 larvae and 1 pupa (larvae and pupa on slides), same data as type. I have also studied specimens from the islands of Tinian and Guam.

This species was first collected by Dr. S. F. Bailey in the fall of 1945 during the invasion of the island of Tinian. It has since been found on Guam and Rota. It is abundant during rainy spells following periods of unusually high tides, the larvae breeding in brackish water of coral

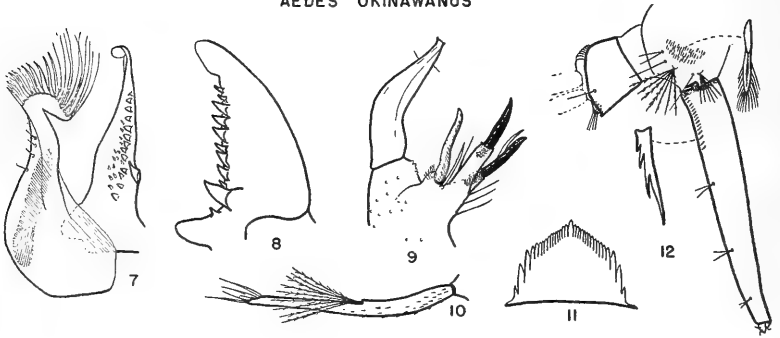
rockholes and artificial containers along the shore. The species is related to *jepsoni* Theobald and *annulirostris* Skuse. From the former it differs by its much paler vertex and scutum, its unspeckled mid femora, and the broader and often produced abdominal bands. From *annulirostris* it differs particularly by the much broader abdominal bands. The larva (figs. 20-23) has bud-like gills as in *jepsoni*, but the pecten teeth are much stouter and with fewer denticles, and the anal ring is incomplete.

EXPLANATION OF PLATE VII.

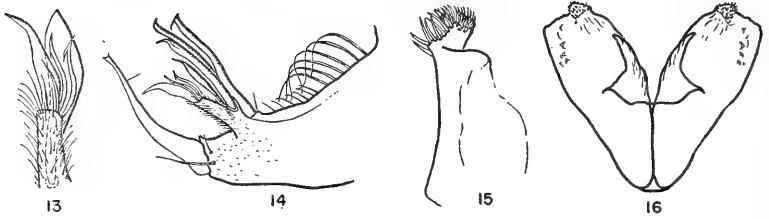
Figures 1-6, *Aedes okinawanus*: 1, basistyle and dististyle (ventral); 2, claspette and basal lobe (lateral); 3, lobes of ninth male tergite; 4, larval mentum; 5, larval antenna; 6, caudal segments of larva. Figs. 7-12, *Culex ryukyensis*: 7, mesosome lobe and paraproct (left, ventral); 8, mesosome lobe (left, inner, lateral); 9, subapical lobe of basistyle and dististyle (inner, lateral); 10, larval antenna; 11, larval mentum; 12, caudal segments of larva. Figs. 13-16, *Culex tubaris*: 13, subapical lobe of basistyle; 14, basistyle and dististyle, showing subapical lobe in slightly different view (inner lateral); 15, paraproct (left, ventral); 16, mesosome (dorsal), Figs. 17-23, *Culex litoralis*: 17, subapical lobe of basistyle; 18, mesosome lobe and part of paraproct (left, ventral); 19, mesosome lobe (left, inner, lateral); 20, larval antenna; 21, larval mentum; 22, larval clypeus; 23, caudal segments of larva.



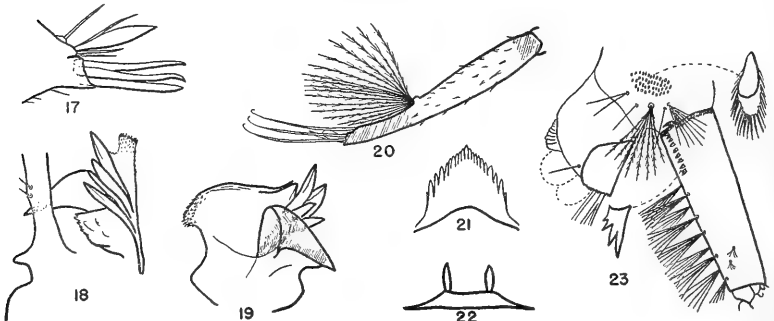
Aedes OKINAWANUS



Culex RYUKYENSIS



Culex TUBERIS



Culex LITORALIS

PROCEEDINGS
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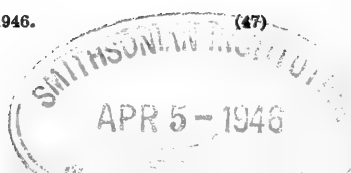
A NEW CHAETOPAPPA FROM THE GUADALUPE
MOUNTAINS OF NEW MEXICO AND TEXAS.

BY S. F. BLAKE.

The following new species of *Chaetopappa* (Asteraceae, tribe Asteroideae) is published here in order that the name may be available for use in a revision of this genus in preparation by Dr. L. H. Shinnars.

***Chaetopappa hersheyi* Blake, sp. nov.**

Perennis caespitosa uncialis; caules paucifoliati monocephali simplices hirsutuli pilis erectis vel erectiusculis; folia inferiora anguste spathulata obtusa setoso-apiculata in basem petioliformem angustata integra subcoriacea laete viridia 1-nervia sparse hispidula vel glabra 3.5-6 mm. longa, 0.7-1 mm. lata, caulina linearia vel inferiora lineari-spathulata acuta setoso-apiculata sessilia 1-nervia sparse hispidula 5-8 mm. longa 0.3-0.5 mm. lata, supremis paullum reductis; pedunculus 1-5 mm. longus; capitulum ca. 12 mm. latum; discus (madefactus) 6 mm. altus 2.5 mm. diam.; flores fem. 10, hermaph. 6; involucri oblongo-cylindrici 4-4.5 mm. alti ca. 4-seriati non conspicue gradati phyllaria ca. 12 lineari-lanceolata acuminata laxe setoso-apiculata subsicca purpurascens linea centrali viridescens margine angusto albo scarioso supra plusminusve lacerato-ciliato 1-nervia glabra v. dorso sparsissime hispidula; receptaculum nudum planiusculum; corollae flor. fem. "bluish, fading to white with age," sicco pulchre purpurascens, tubo glabro ca. 2.5 mm. longo, lamina elliptica 3-dentata 4-nervia 5 mm. longa 2 mm. lata; corollae disci flavae glabrae 4-4.3 mm. longae (tubo 0.5-0.7 mm., fauce anguste obconica 2.8-3 mm., dentibus 5 oblongo-ovatis apice papillosis 0.7 mm. longis); achenia radii submatura lineari-oblonga 3-nervia erecto-hirsuta pilis 1-ocularibus 1.3 mm. longa, ea disci cylindrico-oblonga 0.8-1 mm. longa 5-nervia erecto-hirsuta; pappus e setis 4-5 (6) hispidulis persistentibus 3.8-4.2 mm. longis et squamellis totidem minutis truncatis denticulatis ca. 0.1 mm. longis compositus; flores disci verosim. infertiles, ramis styli 0.8 mm. longis, lineis stigmaticis non valde distinctis 0.3 mm. longis appendicibus triangularibus acuminatis hispidulis 0.5 mm. longis.



NEW MEXICO: Local on barren rocky ledges in canyons, Guadalupe Mts., Eddy Co., altitude about 1525 m., 23 May 1944, *A. L. Hershey* 3532 (type no. 166267, Herb. Nat. Arb.). TEXAS: Shaded bank, McKittrick Canyon, Guadalupe Mts., Culberson Co, 15-17 Aug. 1924, *P. C. Standley* 40551 (U. S. Nat. Herb.).

This species of the Guadalupe Mountains in Texas and New Mexico is well distinguished by habit and pappus. Standley's late-season specimen from Texas bears only a few empty heads with most of the involucre fallen.

One of the rays in the head dissected was bilabiate, and was in fact intermediate between the normal rays and the hermaphrodite flowers. The upper part of the tube was somewhat enlarged. The outer lip was 3-toothed and 4-nerved, essentially as in the normal ray. The inner lip consisted of 2 teeth about 0.5 mm. long, papillose on margin above in the manner of the teeth of the normal disk corolla. The style branches were decidedly unequal, the shorter one essentially glabrous, the larger one hispidulous above somewhat as in the hermaphrodite flowers. There were 3 imperfect stamens, one with free filament, the two others with filaments adnate to the style.

Birds

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NEW FORMS OF BIRDS FROM PANAMA AND
COLOMBIA.

BY ALEXANDER WETMORE.

The following races have been distinguished during study of collections made during two recent field trips, the first in Colombia in company with M. A. Carriker, Jr., and the second in the Pearl Islands of Panamá where J. P. E. Morrison of the U. S. National Museum was my companion.

Family ARDEIDÆ.

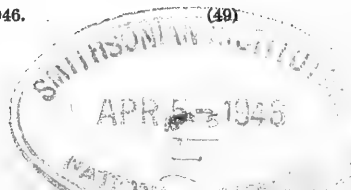
Nyctanassa violacea caliginis subsp. nov.

Characters.—Similar to *Nyctanassa violacea violacea*¹ but with thicker, heavier bill; adult decidedly darker gray. Similar to *Nyctanassa violacea bancrofti*² in size of bill but decidedly darker in color.

Description.—Type, U. S. National Museum No. 376,007, ♂ adult, from Isla San José, Archipiélago de las Perlas, Panamá, February 20, 1944, collected by A. Wetmore and J. P. E. Morrison, original No. 11,998. Throat, head, except as noted beyond, and upper hindneck black; a broad streak from beneath eye back across auricular region pure white; central part of crown broadly white, the tips of the feathers washed with pinkish buff; long nuchal plumes white, edged with black at base; underparts neutral gray, a little paler on under tail-coverts; under wing-coverts deep neutral gray; hindneck and sides of neck deep neutral gray; feathers of back, and scapulars dusky neutral gray centrally, margined broadly with neutral gray; wing-coverts dusky neutral gray, margined widely with light neutral gray; longer inner greater coverts and inner secondaries with an indistinct wash of dark ivy green on the outer webs towards the tips; primaries slate color; edge of wing pinkish buff along alula and distally, and broadly white between these points; rump deep neutral gray; rectrices dark neutral gray, the central pair with a faint wash of olivaceous black. Bill dull black, horn color at tip and on base of mandibular rami;

¹ *Ardea violacea* Linnaeus, Syst. Nat., ed. 10, vol. 1, 1758, p. 143 (South Carolina).

² *Nyctanassa violacea bancrofti* Huey, Condor, vol. 29, May 15, 1927, p. 167 (Scammon Lagoon, Baja California).



front of tarsus and top of toes and nails blackish, the feet elsewhere dull buffy brown (from dried skin).

Measurements.—Males (12 specimens), wing 282–299 (290.1), tail 101.7–116.9 (108.7), culmen from base 67.6–81.3 (73.8), tarsus 87.7–101.3 (92.1), depth of bill at nostril 22.2–25.1 (23.4) mm.

Females (2 specimens), wing 288–291 (289.5), tail 101.1–109.0 (105.0), culmen from base 73.7–74.7 (74.2), tarsus 96.5–97.4 (97.0), depth of bill at nostril 22.2–23.5 (22.9) mm.

Type, male, wing 284, tail 109.4, culmen from base 73.3, tarsus 94.7, depth of bill at nostril 23.4 mm.

Range.—Panamá (Balboa, Taboga Island, Obaldía) including the Pearl Islands (San José, El Rey, Saboga) to the Pacific coast of Colombia (Bahía de Cuvita) and Ecuador (Isla de Jambelí and Vaquería).

Remarks.—Preliminary comparisons of our specimens taken on San José indicated that they were darker in color, but I was uncertain as to the stability of this character until I had examined the series in the Museum of Comparative Zoölogy from Isla El Rey (San Miguel) and Saboga, and found that they were likewise darker. It is interesting to observe that this tendency toward darker color is in the direction of the very dark *N. v. pauper* of the Galápagos Islands. Birds from the Pacific side of Panamá likewise belong with the new race which extends to the mainland of the Pacific coast from Panamá to Colombia and Ecuador. For the privilege of examining specimens from the two latter countries I am indebted to Robert Cushman Murphy.

Family RALLIDAE.

Aramides cajanea morrisoni subsp. nov.

Characters.—Similar to *Aramides cajanea latens* Bangs and Penard³ but with gray of hindneck darker, and also grayer, less brownish; back, wing-coverts and scapulars darker, more olivaceous green.

Description.—Type, U. S. Nat. Mus. no. 376,059, ♂, San José Island, Archipiélago de las Perlas, May 21, 1944, collected by J. P. E. Morrison (orig. no. 160). Forehead and forepart of crown deep mouse gray; posterior half of crown and nape indistinctly olive brown; hindneck and adjacent area of upper back slightly darker than neutral gray; rest of back, scapulars and tertials brownish olive; rump, upper tail-coverts, tail, flanks, abdomen and under tail-coverts dull black, with a wash of olive-brown on rump; primaries and secondaries dull russet, tipped with sepia; outer wing-coverts russet, inner ones brownish olive; sides of head light mouse gray, with an indistinct streak of mouse gray covering lower eyelid and extending to upper edge of gape; chin and throat whitish; foreneck and sides of neck between neutral gray and light neutral gray; breast and sides sayal brown; tibia fuscous black; under wing-coverts sayal brown, barred heavily with dusky neutral gray. Anterior half of bill varying from mignonette green to Krönberg's green, basal part

³ *Aramides cajanea latens* Bangs and Penard, Bull. Mus. Comp. Zoöl., vol. 62, April, 1918, p. 41 (San Miguel = Isla El Rey, Archipiélago de las Perlas, Panamá).

orange cinnamon on culmen, elsewhere honey-yellow; legs varying from vinaceous-rufous to hazel, claws fuscous (from dried skin).

Measurements.—Males (six specimens), wing 165–179 (174.3), tail 54.1–64.2 (58.3), culmen from base 46.8–58.7 (52.5), tarsus 64.2–71.0 (67.6) mm.

Females (six specimens), wing 161–173 (166.5), tail 54.5–56.8 (54.9), culmen from base 48.0–51.9 (49.8), tarsus 62.7–70.0 (66.5) mm.

Type, male, wing 176, tail 54.1, culmen from base 56.0, tarsus 70.8 mm.

Range.—San José and Pedro González Islands, Archipiélago des las Perlas, Panamá.

Remarks.—The series of birds from the two outermost islands, the basis of the present description, has been compared directly with the original specimens of *latens* in the Museum of Comparative Zoölogy. The differences while not extensive are definite, and carry through all of the specimens. The characters marking the subspecies *latens* and *morrisoni* from *Aramides cajanea cajanea*, while warranting the separation, are not great. In size the two former average smaller but with a definite overlap among the larger individuals. The brown on the pileum is slightly duller and grayer, and the greenish olive brown on the back slightly duller. Below most specimens are slightly duller reddish brown, with the foreneck and sides of neck, duller gray, though some individuals may not be distinguished on these characters.

Aramides c. latens is recorded definitely on the island of El Rey, the type locality, and *morrisoni* on San José and Pedro González.

These rails are recorded also from Viveros where, according to Rendahl, Bovallius secured a specimen. It seems probable that this record belongs with *latens* as the island is adjacent to El Rey.

The form is named for Dr. J. P. E. Morrison of the U. S. National Museum in recognition of his work with birds during the investigations.

Family TYRANNIDAE.

Elaenia flavogaster silvicultrix subsp. nov.

Characters.—Similar to *Elaenia flavogaster pallididorsalis* Aldrich⁴ but clearer, brighter yellow on lower breast and abdomen; clearer, less brownish gray on upper breast and foreneck.

Description.—Type, U. S. National Museum no. 376,315, ♂, from Isla San José, Archipiélago de las Perlas, Panamá, collected February 18, 1944, by A. Wetmore and J. P. E. Morrison (original no. 11,980). Crown feathers dark grayish olive centrally, margined with deep grayish olive, the latter color predominating on forehead; a concealed central crown patch of white; hindneck grayish olive; back and scapulars somewhat grayer than citrine-drab; rump and upper tail-coverts citrine drab; lesser wing-coverts citrine-drab with chaetura drab centers; middle and

⁴ *Elaenia flavogastra pallididorsalis* Aldrich, Scient. Publ. Cleveland Mus. Nat. Hist., vol. 7, August 31, 1937, p. 106 (Paracoté, Montijo Bay, one mile south of mouth of Río Ángulo, Veraguas, Panamá).

greater coverts chaetura drab, tipped broadly with pale olive-buff forming two wing bars, primaries and secondaries chaetura drab, the inner primaries and outer secondaries edged externally with dark olive-buff, and the inner secondaries broadly with dull white; rectrices dull hair brown, edged externally with deep olive-buff; throat whitish; sides of head deep olive-gray; foreneck and upper breast smoke gray becoming grayish olive on sides; lower breast and abdomen primrose yellow becoming dark olive-buff on the sides and flanks; under wing-coverts primrose yellow, the outer ones marked with chaetura drab centrally; bend of wing primrose yellow. Bill dusky neutral gray, becoming grayish olive on base of mandible; tarsus and toes blackish brown (from dried skin).

Measurements.—Males (19 specimens), wing 76.5–84.8 (80.2), tail 65.7–78.1 (72.5), culmen from base 12.8–14.7 (13.6), tarsus 18.0–20.8 (19.9) mm.

Females (16 specimens), wing 72.5–82.2 (77.8), tail 65.7–74.0 (70.5), culmen from base 12.5–13.6 (13.1), tarsus 17.5–20.3 (19.2) mm.

Type, male, wing 80.6, tail 72.5, culmen from base 13.6, tarsus 19.9 mm.

Range.—Archipiélago de las Perlas, Panamá (specimens examined from El Rey, Saboga, Pedro González and San José).

Remarks.—The differences that mark this race are easily evident when the island birds are compared with those of the mainland. The brighter colors of the new form stand out as clearly in the specimens collected 40 years ago by W. W. Brown as they do in our fresh material.

Family MNIOTILTIDAE.

Dendroica petechia chrysendeta subsp. nov.

Characters.—Male, similar to *Dendroica petechia erithachorides* Baird⁵ but brown of head and forepart of body decidedly darker, and extended farther down the foreneck; the breast streakings averaging heavier and darker, merging with the brown of the head area; the yellow below averaging deeper and brighter; and the edgings on the middle and greater wing coverts wider and brighter yellow. Similar also to *D. p. paraguanae*⁶ but brown on the foreneck heavier, extending farther down the foreneck, with less tendency toward streaking; chin and throat darker; yellow on middle and greater wing-coverts more extensive.

Description.—Type, U.S. Nat. Mus. no. 369,925, ♂ adult, Laguna de Tucacas, Puerto López, Guajira, Colombia, April 23, 1941, A. Wetmore and M. A. Carriker, Jr. (orig. no. 11561). Entire crown and upper part of hindneck very dark chestnut; throat and foreneck chestnut, shading over on the sides of the head into the much darker color of the crown; feathers of head lemon chrome basally, but this color completely concealed except where it shows indistinctly along the center of the throat;

⁵ *Dendroica erithachorides* (typographical error for *erithachorides*, as indicated on same page and in index) Baird, Rep. Pac. R. R. Surv., vol. 9, 1858, p. 283 (Cartagena, Colombia).

⁶ *Dendroica petechia paraguanae* Phelps and Gilliard, Amer. Mus. Nov., no. 1153, November 26, 1941, p. 10 (La Boca, Adicora, Paraguaná Peninsula, Estado Falcón, Venezuela).

feathers of ear-coverts edged narrowly and indistinctly with sulphine yellow, with faint indication of this same color in nasal tufts and below the rictus; brown of head forming an extensive and sharply delimited hood, covering the entire head, and on the lower surface extending down over most of the foreneck; upper surface between sulphine yellow and citrine, with the rump brighter, nearer sulphine yellow than the back; remiges blackish brown, the primaries and secondaries externally edged with citrine, this changing distally on the secondaries to strontian yellow; tertials with a wide edging of yellowish citrine; lesser wing-coverts yellowish citrine; middle and greater coverts widely edged with strontian yellow; rectrices blackish brown, with external margins above edged with yellowish citrine, inner webs on 5 outermost strontian yellow, except at extreme tip on 3 outermost, and except for the extreme tip and a narrow line along the shaft in the fourth and fifth, the sixth (central) having a very narrow edging only of strontian yellow; sides of neck, adjacent to the brown of head, wax yellow; under surface clear brilliant yellow between lemon chrome and light cadmium, streaked heavily on breast, sides and flanks with chestnut, the streakings heaviest on chest where they expand anteriorly to merge in the chestnut of the foreneck; edge of wing light cadmium; under wing-coverts lemon chrome; inner webs of primaries and secondaries extensively strontian yellow. Bill brownish black, tarsus and toes brown (from dried skin).

Measurements.—Males (11 specimens) wing 65.7–71.7 (68.9), tail 50.2–55.3 (52.2), culmen from base 13.7–14.7 (13.9), tarsus 20.8–22.1 (21.6) mm.

Females (5 specimens), wing 62.5–67.1 (64.5), tail 46.2–53.5 (50.8), culmen from base 12.7–13.6 (13.2), tarsus 20.0–22.0 (20.9) mm.

Type, male, wing 70.7, tail 55.3, culmen from base 14.7, tarsus 22.1 mm.

Range.—The Guajira Peninsula, northeastern Colombia and northwestern Venezuela (Bahía Portete, Puerto López, Castilletes, Paraguipoa).

Remarks.—The present bird, beautiful in the contrast of its rich yellow and deep chestnut markings, represents the maximum in pigmentation among the chestnut-capped group of golden warblers. The deepened color reaches its greatest extent in specimens in the region from Puerto López to Paraguipoa. At Bahía Portete the color lightens toward the condition characteristic of *erithachorides* so that birds from this point must be considered intermediate. There seem to be no records at present for birds of this group between Punto Caimán on Isla Salamanca on the northern edge of the Ciénaga Grande and Bahía Portete, La Guajira. Colonies may exist in this considerable area, but the birds seem to be rare. We searched for it at the mouth of the Río Ranchería at Ríohacha without success.

While the brown-hooded forms of the golden warbler group stand out conspicuously from those with the head and throat yellow, so that for a long period they have been accepted as specifically distinct, in recent years material has come to hand indicating that the two groups merge. The brown-headed subspecies range along both coasts of México, Central America, and northwestern South America, with one outlying population

on the island of Martinique in the Lesser Antilles. This distribution cuts off *Dendroica petechia aureola*, of Cocos Island and the Galápagos, and *D. d. peruana* of southern Colombia, Ecuador and Perú, from the other subspecies to which they appear most similar. In *peruana* we find, however, one approach to the brown-hooded state, as in highly colored males there is often a decided wash of chestnut brown across the cheeks and throat. Proceeding eastward in northwestern Venezuela, males of *D. p. paraguanae* of the Paraguaná Peninsula have the sides of the head yellowish, so that here again there is an intermediate stage. These two separate approaches are so significant as to justify treatment of all of the races under one specific name. Between them it is interesting to note that all male birds are completely hooded, and that in the Guajira Peninsula the brown head attains the deepest, richest color known.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW PITTA FROM THE MALAY PENINSULA.

BY H. G. DEIGNAN.¹

The differences between *Pitta irena* of Sumatra and the population of the same species resident in the Malay Peninsula are so striking and consistent that it is believed no good purpose would be served by further delay in naming the mainland form. I therefore propose

Pitta irena ripleyi, subsp. nov.

Type.—Adult male, U. S. National Museum 333828, collected on Khao Soi Dao (lat. 7° 20' N, long. 99° 50' E), Trang Province, Peninsular Siam, January 1, 1934, by Hugh M. Smith (original number 6826).

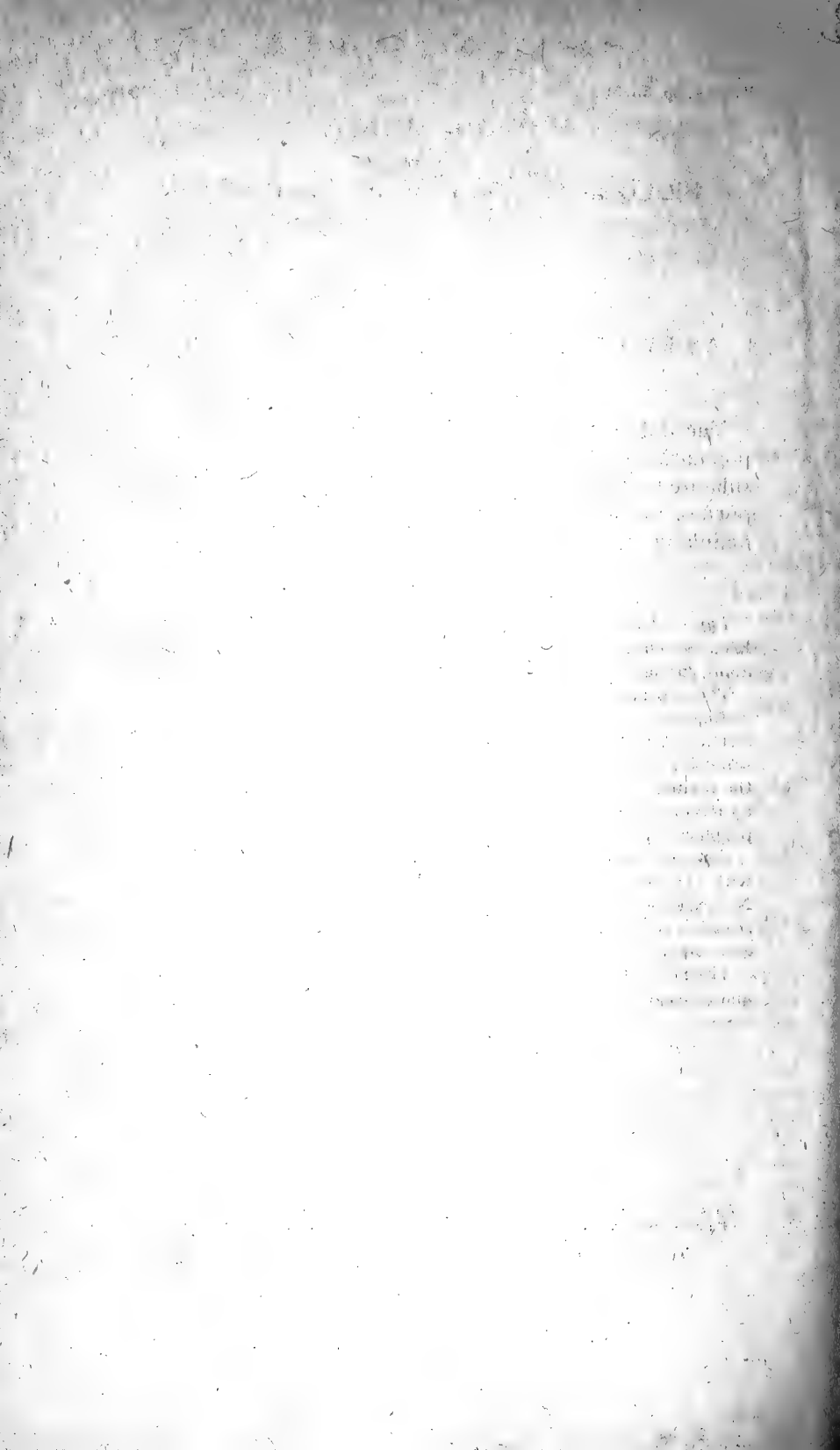
The new race is similar to *P. i. irena* (northern Sumatra), but may be distinguished therefrom, in either sex, by having the flame-scarlet not restricted to the nape, but strongly invading the golden yellow of the supercilia (usually as far forward as the supraocular region); by having the mantle of a paler, less rich, chestnut-brown; and, in the male, also by having the center of the breast and the abdomen of a paler, less rich, purplish blue.

Fourteen males and nine females of *P. i. ripleyi* have been compared with two males and two females of *P. i. irena* from northern Sumatra. No exceptional examples are found in either series. The range of *ripleyi* is the Malay Peninsula from the Isthmus of Kra south to Malacca and Pahang.

The new subspecies is named in honor of S. Dillon Ripley, my friend and colleague at the U. S. National Museum.



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PROCEEDINGS
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THREE NEW MAMMALS FROM THE PEARL
ISLANDS, PANAMA.

BY REMINGTON KELLOGG.¹

During the year 1944, Dr. A. Wetmore, Secretary of the Smithsonian Institution, and J. P. E. Morrison of the Division of Mollusks procured a large number of zoological specimens for the collections of the United States National Museum on San José Island. Ten kinds of mammals were represented in their collections and among these are three apparently undescribed forms.

Mazama permira, sp. nov.

Type locality.—Isla San José, Archipiélago de las Perlas, Golfo de Panama, Panama.

Type specimen.—Male adult, skin and skull; No. 277144, U. S. National Museum; collected September 24, 1944, by C. F. Jones, W. N. Collins and Robert Carder; original number 50.

Distribution.—Known only from the type locality.

General characters.—Ground color of upperparts mixed natal brown and cinnamon, with bone brown streak from shoulders to base of tail; underparts whitish in contrast to reddish or fawn colored chest and anterior part of abdomen of *Mazama sartorii repericia*. Incisive foramina shorter and wider, lachrymal vacuities much smaller and narrower, nasals more noticeably widened laterally above lachrymal vacuities, and skull as a whole smaller and narrower than in *repericia*.

Color (terms after Ridgway, Color Standards and Color Nomenclature, 1912).—Upperparts in general a mixture of natal brown and cinnamon, with broad median bone brown streak from shoulders to base of tail, and grading into wood brown on lower sides; individual hairs light drab at base grading gradually into natal brown, with cinnamon subapical band and blackish tip; broad cinnamon buff streak below eye and wider supraorbital streak of same color extending more than half way to

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ear, and forming lateral border to crown patch; hair on forehead and crown noticeably longer and darker than on sides of head and neck, near bone brown in color, but with hairs on hinder borders of crown broadly tipped with cinnamon or cinnamon buff; upper lip whitish near nasal pad; muzzle covered with short whitish tipped hairs, with small rounded cinnamon buff patch on side adjacent to nasal pad, but becoming darker (near prout's brown) on snout behind nasal pad as well as in front of eyes; sides of face and neck near drab color, the individual hairs having narrow buffy subapical bands; ears dull dark brownish; exposed surfaces of forelimbs similar in color to neck, becoming more mixed with cinnamon buff hairs on lower portions of limbs and with inner surface lighter to base of hoof; exposed surfaces of hind limbs similar in color to forelimbs, the white of underparts extending downward along inner surface of hind limb as a narrow stripe, gradually disappearing below middle of metatarsal; tufts on tarsal glands mixed natal brown and cinnamon, with cluster of shorter white hairs in center; chin whitish grading into light avellaneous on throat; under surface of neck similar in color to sides of face; drab colored bases of the white and cinnamon buff tipped hairs showing through on brisket in front of forelimbs; rest of underparts whitish; upper surface of tail rusty, near hazel in color, above, white below, with white tip.

Skull.—Smaller and narrower than that of *Mazama sartorii reperticia*. Anterior frontal region convex and somewhat elevated; nasals noticeably widened laterally above lachrymal vacuities and but slightly encroached on by these vacuities; lachrymal vacuities small and narrow; incisive foramina short and wide; premaxillary portion of rostrum noticeably attenuated anteriorly; ventral surface of bulla somewhat pyramidal in outline. Width across jugal portion of orbit noticeably less and maxillary tooth row shorter than in *reperticia*.

Measurements.—*Type*: Total length, 1060 mm.; tail, 85; hind foot, 245; height at shoulder, 570; height at hip, 590. A female topotype: Total length, 1000; tail, 80; hind foot, 250.

Skull (type): Greatest length, 178; condylobasal length, 171; width across orbit at fronto-lachrymal suture, 43; maximum width across jugal portion of orbit, 76.8; zygomatic width, 74.7; length of nasals, 53.5; maximum width of nasals posteriorly, 23.2; maximum width of nasals anteriorly, 14.5; maxillary tooth row, 51; maximum distance across maxillary tooth rows (outside measurement), 57; length of mandible, 142.5; lower cheek tooth series, 54.5. One male and one female topotype, respectively: Greatest length, —, 163.3; condylobasal length, —, 157.3; width across orbit at fronto-lachrymal suture, 38, 38.8; maximum width across jugal portion of orbit, 71, 69; zygomatic width, 68.5, 68.5; length of nasals, 43.5, 42.5; maximum width of nasals posteriorly, 22.3, 20; maximum width of nasals anteriorly, 11.5, 11.5; maxillary tooth row, 52.2, 54; maximum distance across maxillary tooth rows (outside measurement), 54.5, 53.5; length of mandible, 129, 128; lower cheek tooth series, 54.7, 56.5.

Remarks.—The specimen selected for the type is an old male, which

apparently suffered severe injuries at one time in fighting with an opponent. Consequently, the skull is not complete. The left antler and its osseous base were broken off, resulting in the destruction of the posterior upper border of the orbit and the adjacent upper portion of the postorbital bar. The wound, however, healed over, leaving a roughened irregular surface on the left side of the skull. The right antler is quite slender and short, not more than 50 mm. in length. The slightly worn permanent dentition is in place and the left upper canine is present. The hinder upper surfaces of the skulls of both adult males are irregularly pitted, which may indicate rickets, resulting from overcrowding or inadequate diet on this small island. The skull of the second male, which likewise has the permanent dentition, lacks both premaxillaries and is incomplete in other respects. The skull of the female may not be fully adult, although the permanent dentition is in place. It will be noted from the measurements that the maxillary tooth row of this female is actually longer than that of either of the males. The coloration of this brocket is quite different from that of *Mazama sartorii* and *M. s. reperticia*, the ground color of the upperparts being natal brown in contrast to these reddish forms. Furthermore, the underparts of *permira* are whitish in contrast to the reddish or fawn colored chest and anterior abdomen of *reperticia* and *sartorii*.

Specimens examined.—Total number, 5 (including 2 fawns), from the type locality.

***Dasyprocta punctata bellula*, subsp. nov.**

Type locality.—Isla San José, Archipelago de las Perlas, Golfo de Panama, Panama.

Type specimen.—Male adult, skin and skull; No. 277152, U. S. National Museum; collected May 11, 1944, by J. P. E. Morrison; original number 29.

Distribution.—Known only from the type locality.

General characters.—Closely allied to *Dasyprocta punctata callida* of Isla del Rey [San Miguel Island], but darker and not so yellowish above (the subapical band on hairs of back and sides varying from mustard yellow to ocher in *callida*) and the hairs on the underparts have grayish white instead of buffy tips. Differs from *Dasyprocta punctata dariensis* on the mainland in smaller size, especially the smaller foot, and the notably duller coloration of the upperparts. Skull and bullae much smaller than in *dariensis* although the transverse diameter of the anterior-most upper cheek tooth is approximately the same in both forms.

Color (terms after Ridgway, Color Standards and Color Nomenclature, 1912).—Hairs on snout and top of head dusky drab basally with subapical warm buff band and black tip; crown of head distinctly darker than snout because of elongation of black tips; hairs on top and sides of neck and shoulders light vinaceous drab basally becoming darker near subapical warm buff band and tipped with black; hairs on mid-back and corresponding area on sides dark vinaceous drab basally with subapical

band varying from pale orange yellow to light orange yellow, and with black tips; hairs on rump near dull purplish black except for the rather long grayish white tips; hairs on upper arms and legs to ankles dark at base with subapical band varying from grayish white to buff. Digits on fore and hind feet blackish; remainder of fore and hind feet grizzled above, the hairs dark basally with short subapical grayish white or buffy bands. Hairs of underside from throat to vent light vinaceous drab basally with grayish white tips. Hairs on chin whitish. Ears sparsely covered with short unicolor hairs externally, but on inside the hairs have short buffy subapical bands.

Pelage.—Stiff and harsh on back and sides. Hairs on rump long, up to 85 mm. in length; hairs on back and shoulders shorter, about 25–30 mm. in length; hairs on underparts 12–14 mm. in length; hairs on hands and feet short. Tail almost bare. Ears sparsely covered with short hairs internally and externally and about 25 mm. in length from notch (dried).

Skull.—Similar to *Dasyprocta punctata dariensis*, but smaller. Bullae somewhat smaller than in *dariensis* and apparently slightly smaller than in *callida*. Nasals variable in width and length, but averaging broader than in *callida*.

Measurements.—*Type*: Total length, 500 mm.; tail, 10; hind foot, 102. Four male topotypes, respectively: Total length, 495, 480, 470, and 460; tail, 10, 10, 33 (tail vertebrae), and 10; hind foot, 100, 102, 102, and 105. Four female topotypes, respectively: Total length, 500, 480, 430, and 430; tail, 10, 10, 12, and 8; hind foot, 99, 102, 100, and 98.

Skull (type): Greatest length, 103.6; condylobasal length, 96.9; zygomatic width, 47.1; least interorbital width, 29.3; length of nasals, 41.2; palatilar length, 38.6; length of bulla, 15.3; crown length of upper molar row, 18.1; length of mandible, 59.9. Four male topotypes, respectively: Greatest length, 101.7, 97.1, 98, and 96.2; condylobasal length, 95.9, 89.3, 92.6, and 90.4; zygomatic width, 47, 44.2, 44.8, and —; least interorbital width, 30.3, 27.5, 28, and 28.8; length of nasals, 38.5, 35.5, 34.5, and 35.8; palatilar length, 39.4, 36.8, 36.7, and 37.4; length of bulla, 16.5, 15, 14.3, and 15.1; crown length of upper molar row, 17.7, 16.8, 18.2, and 17.6; length of mandible, 58.3, 55.3, 55.5, and 55.5. Four female topotypes, respectively: Greatest length, 98.7, 100.6, 90.4, and 89.2; condylobasal length, 91.8, 93.9, 81.5, and 82.3; zygomatic width, 46.2, 46.1, 40.5, and 41.8; least interorbital width, 29, 28, 25.6, and 26.7; length of nasals, 35.1, 38.3, 32.6, and 31.7; palatilar length, 36.8, 38.4, 33.6, and 32.8; length of bulla, 13.8, 14.7, 13.7, and 12.8; crown length of upper molar row, 17.3, 18.3, 18, and 17; length of mandible, 56.7, 58.8, 51.2, and 51.

Remarks.—This series of skins from San José Island are rather uniform in general coloration and are readily distinguishable from related forms by the different coloring of the upperparts and underparts. They have been compared with one topotype of *callida* from the series described by Bangs as well as with specimens representing the races from the adjacent mainland. Both of the two races of agouti which occur on adjacent islands in the Pearl Island group have somewhat smaller skulls and external dimensions than the mainland race *dariensis*. Like *dariensis*,

however, both have white tipped rump hairs but lack the rich orange buffy coloration of the upperparts.

Specimens examined.—Total number, 9 (2, skulls only), from the type locality.

***Proechimys semispinosus ignotus*, subsp. nov.**

Type locality.—Isla San José, Archipiélago de las Perlas, Golfo de Panama, Panama.

Type specimen.—Male adult, skin and skull; No. 277160, U. S. National Museum; collected May 8, 1944, 1945, by J. P. E. Morrison; original number 28.

Distribution.—Known only from the type locality.

General characters.—Like *Proechimys semispinosus burrus*, *P. s. panamensis*, and *P. s. chiriquinus*, but general coloration darker, less reddish and with more pronounced blackish suffusion in color of upperparts. Hind foot apparently larger than in *burrus*. Skull differing from *panamensis* in wider incisive foramina, narrower third upper cheek tooth, and nasals terminating normally anterior to level of front edge of orbit.

Color (terms after Ridgway, Color Standards and Color Nomenclature, 1912).—General color of upperparts much darker than in either *Proechimys semispinosus burrus* or *P. s. panamensis*, and more black lined and less reddish, the black tipped hairs and channeled spines predominating over the cinnamon to tawny subapical bands on the hairs. Hairs on back light drab basally, with subapical cinnamon (rarely tawny) band about 2.5 mm. in width and a black tip. Channeled spines pale ecru drab basally with black tips. Rump coarsely haired, similar in color to rest of back, but with longer black tips on the hairs. Forehead, cheeks and sides of neck as dark as in some specimens of *panamensis*. Outer surfaces of fore and hind limbs similar to sides, but the cinnamon or tawny subapical bands on the hairs are shorter. Upper surface of hands and feet much lighter than upperparts, near cinnamon drab on the darker portions although the hairs have light tips and with whitish hairs projecting from base of the nails. Underparts pure white except for the cinnamon wash on some of the hairs in front of forelimbs. Inner surfaces of fore and hind limbs bare or sparsely covered with white hairs. Tail dark above, lighter below.

Pelage.—Stiff and harsh on back, sides less so; rump and outer surface of limbs without spines. Noticeable admixture of flattened channeled spines on back and sides, each about 20–22 mm. in length. Hairs on upperparts up to 20 mm. in length; hairs on underparts rather soft; hairs on hands and feet short, 3–4 mm. in length and cinnamon drab colored with light tips. Tail moderately haired, the majority of the bristle hairs on basal half of tail being as long as the length of 5–6 scales. Tail moderately scaled, 9–10 rows per 10 mm. Ears normal, sparsely covered with short hairs internally and externally, about 20 mm. in length from notch (dried).

Skull.—Crown length of molar series as well as skull apparently aver-

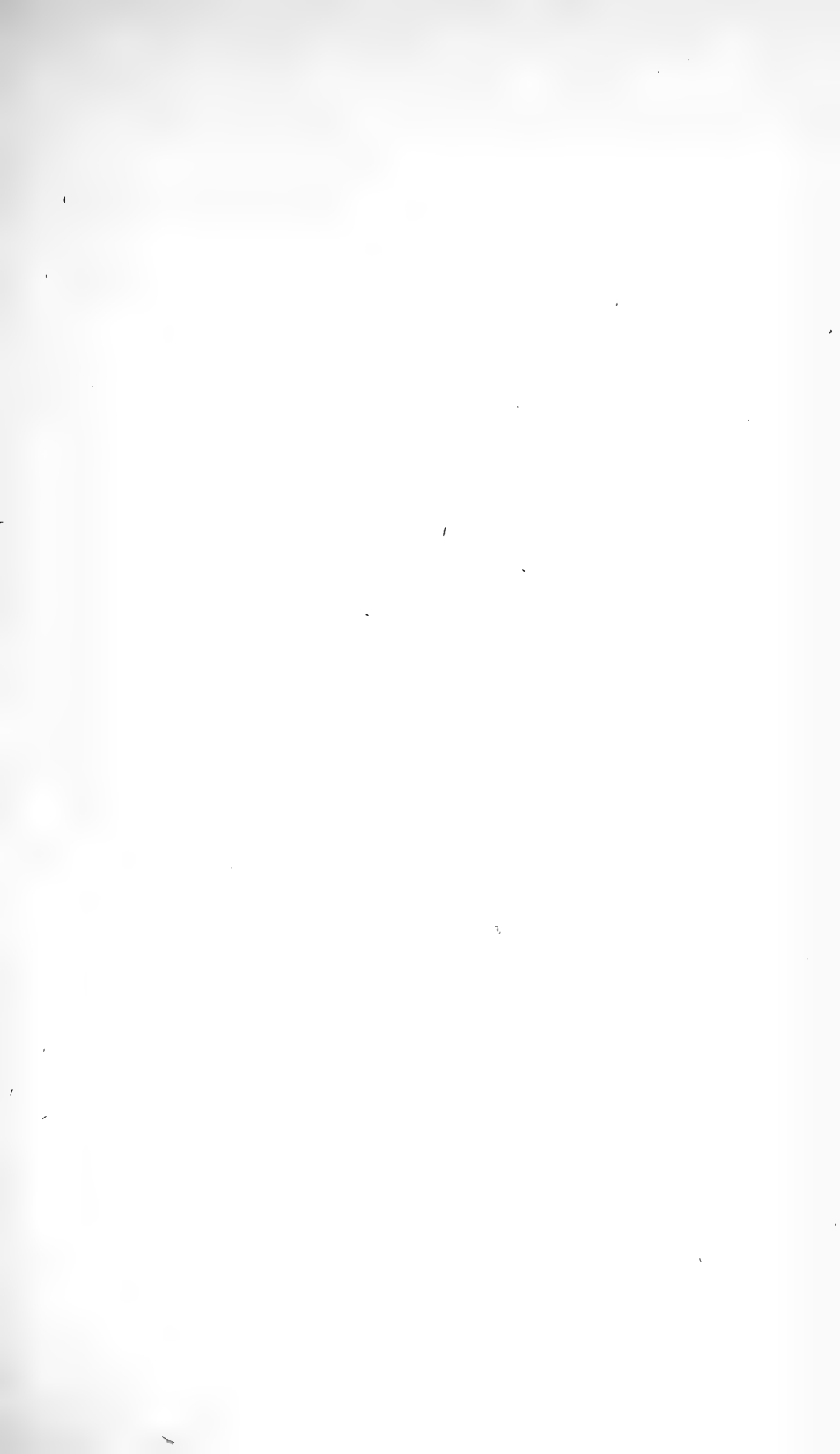
aging larger than in *burrus*. Skull large and robust; nasals long, slightly widened near middle, not markedly attenuated posteriorly, and extending to level of front edge of orbit on only one (type) of nine skulls; supraorbital edges broadly ridged, continuous posteriorly with the somewhat narrower ridges that extend obliquely forward from outer edges of interparietal; incisive foramina wider medially than in *panamensis*; hamular processes of pterygoids broad and spatulate; third upper cheek tooth averaging narrower than in *panamensis*; zygomatic arches and bullae similar to *panamensis*.

Measurements.—*Type*: Total length, 477 mm.; tail, 182; hind foot, 62. Three male topotypes, respectively: Total length, 463, 444, and 420; tail, 182, 180, and 165; hind foot, 62, 61, and 57. Two female topotypes, respectively: Total length, 437, 432; tail, 172, 170; hind foot, 58, 55.

Skull (type): Greatest length, 67.2; condylobasal length, 59.1; zygomatic width, 31; least interorbital width, 13.9; length of nasals, 26.7; palatilar length, 24.2; anterior palatine foramina, 5.8; length of bulla, 11.4; crown length of molar row, 10.6; length of mandible, 35.2. Three male topotypes, respectively: Greatest length, 63.8, 63.1, and 60.1; condylobasal length, 57.2, 56.9, and 54.1; zygomatic width, 29.8, 30, and 29.8; least interorbital width, 13.7, 13.9, and 14.3; length of nasals, 24.4, 25.4, and 23.1; palatilar length, 23.2, 22.2, and 20.8; anterior palatine foramina, 5.5, 5.7, and 5.4; length of bulla, 10.6, 10.1, and 10.2; crown length of upper molar row, 10.2, 10.1, and 9.8; length of mandible, 34.3, 33.9, and 32.3. Two female topotypes, respectively: Greatest length, 61.4, 64.2; condylobasal length, 55.5, 56.8; zygomatic width, 30.1, 30.6; least interorbital width, 14.3, 14.7; length of nasals, 23.7, 24.7; palatilar length, 22.2, 23.2; anterior palatine foramina, 5.3, 5.8; length of bulla, 10.3, 10.7; crown length of upper molar row, 10, 10.1; length of mandible, 33.8, 35.5.

Remarks.—This spiny rat is closely allied to *Proechimys semispinosus burrus*, *P. s. panamensis*, and *P. s. chiriquinus*, but is distinguished by its darker coloration. In color at least, the San José island spiny rat is more noticeably differentiated from the mainland forms than *burrus* on the adjacent Isla del Rey [San Miguel]. Only one of the specimens (No. 271455) taken on San José Island exhibited an approach to the reddish coloration of the above mentioned races. Bangs in describing *burrus* published the measurements of 10 of the 51 specimens captured on Isla del Rey. These 10 selected specimens have an average head and body length of 279.3 mm. (260–305). Since the series from San José Island have a head and body length ranging from 240 to 295, it is quite likely that an equivalent series from this island would closely approximate the average head and body length of *burrus*.

Specimens examined.—Total number, 10 (2, skulls only), from the type locality.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW WOOD-HEWERS OF THE GENUS *DENDROPLEX* FROM VENEZUELA AND COLOMBIA.

BY ALEXANDER WETMORE AND W. H. PHELPS.

Detailed examination of extensive series of *Dendrocolaptes* of the genus *Dendroplex* that have been obtained recently for the Phelps collection from Venezuela, and for the U. S. National Museum from Colombia, indicate two unrecognized forms related to *picrostris*. Their recognition has come during a study of all of the more northern forms of the genus, by which the specific unity of *picrostris* and *picus* has been definitely established through specimens that show graduated stages in intergradation along the lower Río Orinoco between Caicara, Bolívar and Barrancas, Monagas.¹ All forms of these two groups, therefor, are placed under *picus* as the older of the two names.

Descriptions of the two additional subspecies here recognized follow:

***Dendroplex picus choica* subsp. nov.**

Characters.—Similar to *Dendroplex picus picrostris*² but extent of light (Colombia).

color of foreneck restricted distally so that it barely reaches the upper breast; dark markings on sides of head behind the eye averaging heavier, more extensive; light markings on crown and hindneck smaller; light superciliary narrower; slightly smaller.

Description.—Type, Phelps Collection No. 29,106, male adult, in breeding condition, from Borburata, Puerto Cabello, Estado Carabobo, Venezuela, collected May 6, 1945, by W. H. Phelps, Jr. Crown and hindneck sepia, the anterior feathers spotted with pinkish buff, the light spots edged with fuscous black; forehead mainly pinkish buff with little of the darker color; on the posterior part of the crown the spots smaller,

¹ See also Zimmer, Amer. Mus. Nov., no. 753, November 10, 1934, pp. 16-17.

² *Dendroplex picrostris* Lafresnaye, Rev. Zool., vol. 10, March, 1847, p. 76 (Río hacha,

more elongated with little of the dark margin, becoming larger but still elongate on hindneck, and also becoming lighter, cartridge buff, and extending as elongated light streaks, bordered narrowly with fuscous black, on to upper back; rest of upper surface, including wings and tail, russet, slightly lighter on back and rump; sides of head, including superciliary, lighter than cartridge buff; an indistinct line of sepia behind eye; lores pinkish buff to cartridge buff; sides of neck cartridge buff to white, margined with fuscous black; throat and foreneck cartridge buff to white, this color extending to upper breast, where it is margined with fuscous black in distinct squamations, which become indistinct anteriorly, and are very faintly indicated to middle of foreneck; breast tawny-olive lined with light cartridge-buff, margined faintly with fuscous, the light streaks becoming narrower and disappearing toward the lower breast; sides, flanks, and abdomen sayal brown; under tail-coverts snuff brown with somewhat brighter, narrow shaft streaks; under wing-coverts tawny, with the bend of the wing cinnamon; tips of outer primaries clove brown. Bill hair brown, with gonyes, mandibular rami, and sides of maxillae near center pale olive-buff; tarsus and toes chaetura black (from dried skin).

Measurements.—Males (9 specimens), wing 92.0–98.5 (95.7), tail 69.8–81.7 (76.4), culmen from base 27.5–32.6 (29.1), tarsus 21.0–23.0 (21.8) mm.

Females (8 specimens), wing 87.1–98.4 (93.1), tail 70.3–79.5 (76.7), culmen from base 26.9–31.5 (29.3)³, tarsus 21.0–22.3 (21.7) mm.

Type, male, wing 96.8, tail 80.1, culmen from base 29.0, tarsus 21.0 mm.

Range.—Northern Venezuela, from extreme eastern Falcón (Tucacas) eastward, north of the Cordillera de la Costa, through Carabobo (Urama, Puerto Cabello) Distrito Federal (Los Caracas, Río San Julián) and Miranda (Carenero).

Remarks.—This form is quite distinct from typical *picrostris* in the restriction of the light markings on the upper breast, and in the increase in the darker markings on the side of the head and neck. The smaller size is an average character that is evident in series. The increase in dark markings on the side of the head is a slight resemblance to the *picus* group of subspecies from which, however, *choica* is completely separated by the broad range of *phalara*.

Dendroplex picus dugandi subsp. nov.

Characters.—Similar to *Dendroplex picus picrostris* but with feathers of upper breast, lower foreneck, and sides of neck edged with fuscous black, so that the light color is definitely restricted; light superciliary narrower and not extending so far behind the eye; light markings on upper back less extensive; light spotting on crown less extensive, especially on the forehead.

Description.—Type, U. S. National Museum No. 373,327, male adult, from Puerto Sagoc, La Gloria, Magdalena, Colombia, collected May 24,

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW NAME FOR THE DESERT RACE OF THE BAT,
MYOTIS CALIFORNICUS.

BY WALTER W. DALQUEST.

Museum of Vertebrate Zoology, University of California, Berkeley.

Tate (1941, Amer. Mus. Nat. Hist. Bull., vol. 78, p. 547) reduced the genus *Chrysopteron* Jentink to a subgenus of *Myotis*, bringing *Kerivoula pallida* Blyth into the genus *Myotis*. Dobson (1876, Monogr. Asiatic Chiroptera) considered *K. pallida* a synonym of *Vespertilio formosa* (*Myotis formosus*) Hodgson. Tate (ibid.) has restored it as a full species, *Myotis pallidus*. *Myotis pallidus* (Blyth), named from central India in 1863, antedates *Myotis californicus pallidus* Stephens by 37 years. No name seems to be available for the desert race of *Myotis californicus*, currently known as *pallidus*. Therefore this race may be known as:

***Myotis californicus stephensi* new name**

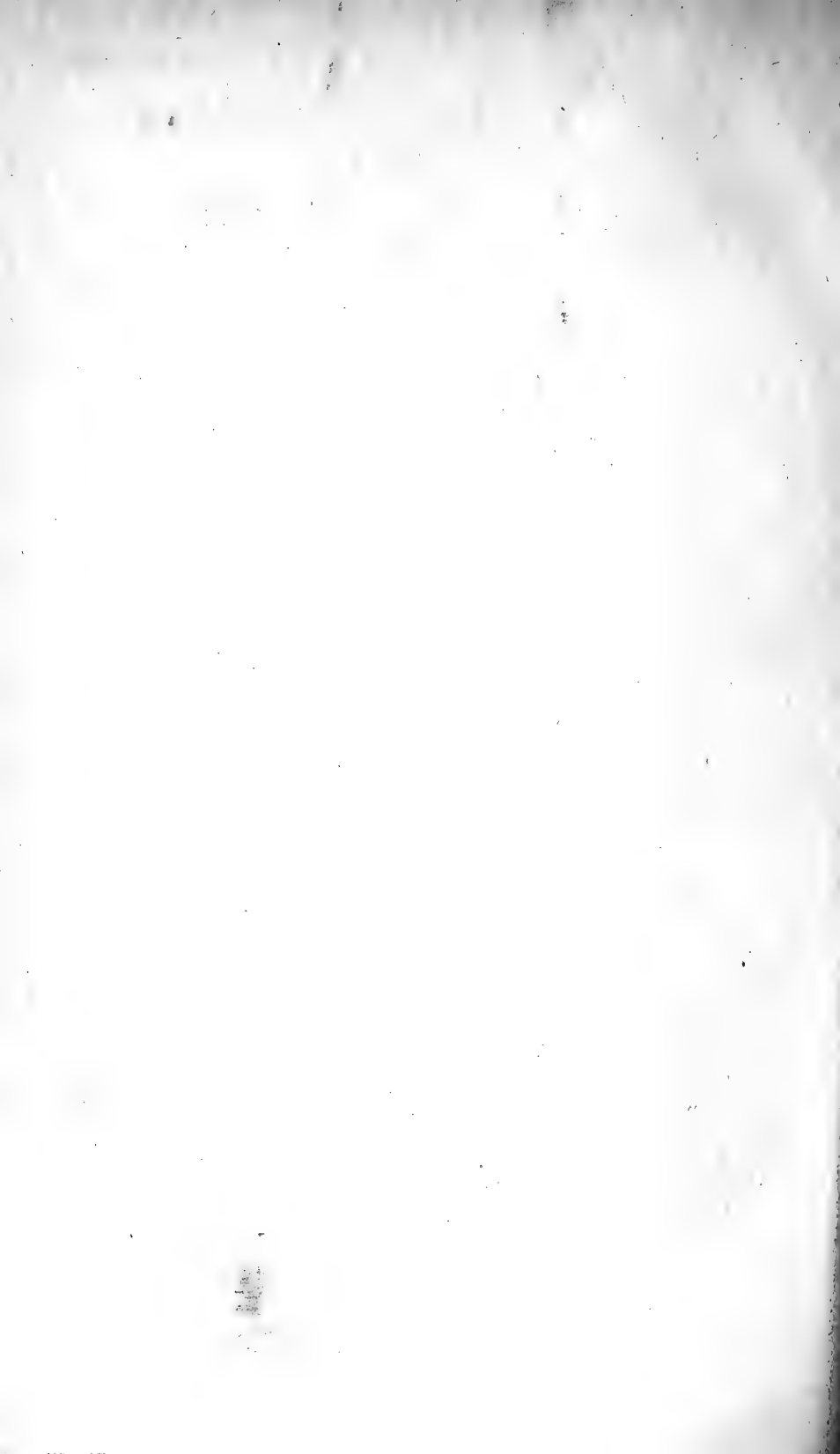
Myotis californicus pallidus Stephens, Proc. Biol. Soc. Wash., vol. 13, p. 153, June 13, 1900 (preoccupied).

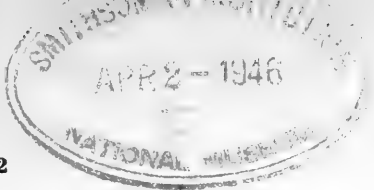
Type.—Adult female, skin and skull number 16657, Mus. Vert. Zool., obtained by Frank Stephens at Vallecito, San Diego County, California, on March 29, 1912; original number 3493.

Diagnosis.—Total length 75–85 mm.; ear short, reaching slightly past nose when laid forward; tragus slim, straight; foot small, about 6 mm.; calcar keeled; forehead abruptly rising.

Comparisons.—Paler and less reddish than *Myotis californicus californicus* and *Myotis californicus caurinus*. Upper parts buffy, yellowish, or whitish. The small foot, keeled calcar, and straight tragus separate it from all bats that occur within its range, save *Myotis subulatus*. From the latter it may be separated by the abruptly rising forehead.

Range.—The interior desert area of the southwestern United States.





PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON THE TAXONOMY OF THREE GENERA
OF TROMBICULID MITES (CHIGGER MITES),
TOGETHER WITH THE DESCRIPTION OF A
NEW GENUS

BY H. E. EWING

In this paper some notes are recorded on the taxonomy of the genera *Trombiculoides* Jacot, *Paraschöngastia* Womersley, and *Neoschöngastia* Ewing of the family Trombiculidae. Also a new genus is described to include a part of *Neoschöngastia* Ewing as originally proposed.

Status of *Trombiculoides* Jacot

Jacot (1938) established the genus *Trombiculoides* on what he regarded as Say's *Trombidium scabrum*. However, he identified as representing *scabrum* a species taken "from under the bark of a large prone oak," near Savannah, Georgia, which clearly is a trombiculid mite. That this identification was correctly made there is reason to doubt, since following Say's original description (Say, 1821) Say stated that his *scabrum* was found: "In forests, on trees, etc.; not uncommon." He made no mention of its occurrence in Georgia or East Florida. This is very significant since this description of *Trombidium scabrum* was given in a paper that had the title, "An account of the Arachnides of the United States." Several species mentioned in this paper evidently were not taken along the Southeastern coast,—for example *Oribata concentrica* Say. Say's statement in regard to this species is merely that it: "Inhabits Pennsylvania."

Three statements in Say's original paper are of special significance, one in his generic description of *Trombidium* that the eyes are pedunculated, and two in the specific description of *scabrum*,—that the hairs are "hardly perceptible" and the eyes are "white". These statements, I believe, definitely eliminate all the trombiculid mites from consideration in connection with his *scabrum*. In the trombiculid mites the eyes are either absent, or there is a poorly developed pair easily overlooked, unless the specimen is cleared and mounted, and the hairs or setae are long and conspicuous.

The present writer believes that Say's description of *scabrum* does fit the species to which the name has been applied by various workers and especially by Howard (1918). Howard reared the larvae and gave a plate of drawings of the species that he regarded as Say's *scabrum*, putting it in the genus *Sericothrombium* Berlese. If Jacot's identification of *scabrum* is incorrect, *Trombiculoides*, according to the rules of nomenclature, probably should be considered a synonym of *Sericothrombium* Berlese.

Paraschöngastia Womersley 1939 = *Neoschöngastia* Ewing 1929

The genus *Paraschöngastia* Womersley 1939 was erected for four New Guinea species described by Gunther in *Neoschöngastia*. Although zoologically this genus is based on good generic characters, unfortunately its type, *Neoschöngastia yeomansi* Gunther, is very closely related to the type of *Neoschöngastia*, *Schöngastia americana* Hirst. In fact *Neoschöngastia americana* (Hirst) is a typical *Paraschöngastia*, as can be seen from a drawing (Fig. 1) here given of the dorsal plate.

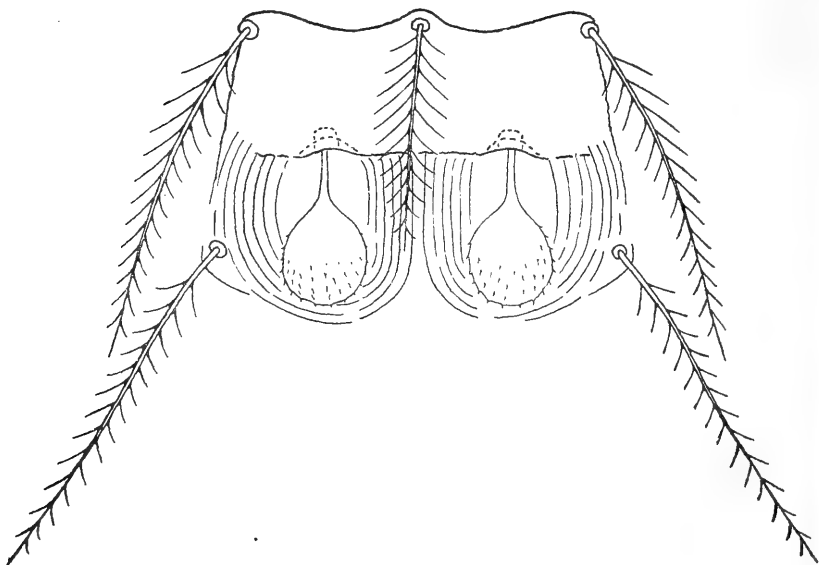


Fig. 1. Dorsal plate of *Neoschöngastia americana* (Hirst), the type species of *Neoschöngastia*.

If this synonymy is accepted, the name *Neoschöngastia* should be restricted to the species that have been placed in *Paraschöngastia*, and the species formerly going in *Neoschöngastia* should be given a new name.

For them the name *Ascoshöngastia* is proposed. It is described as follows:

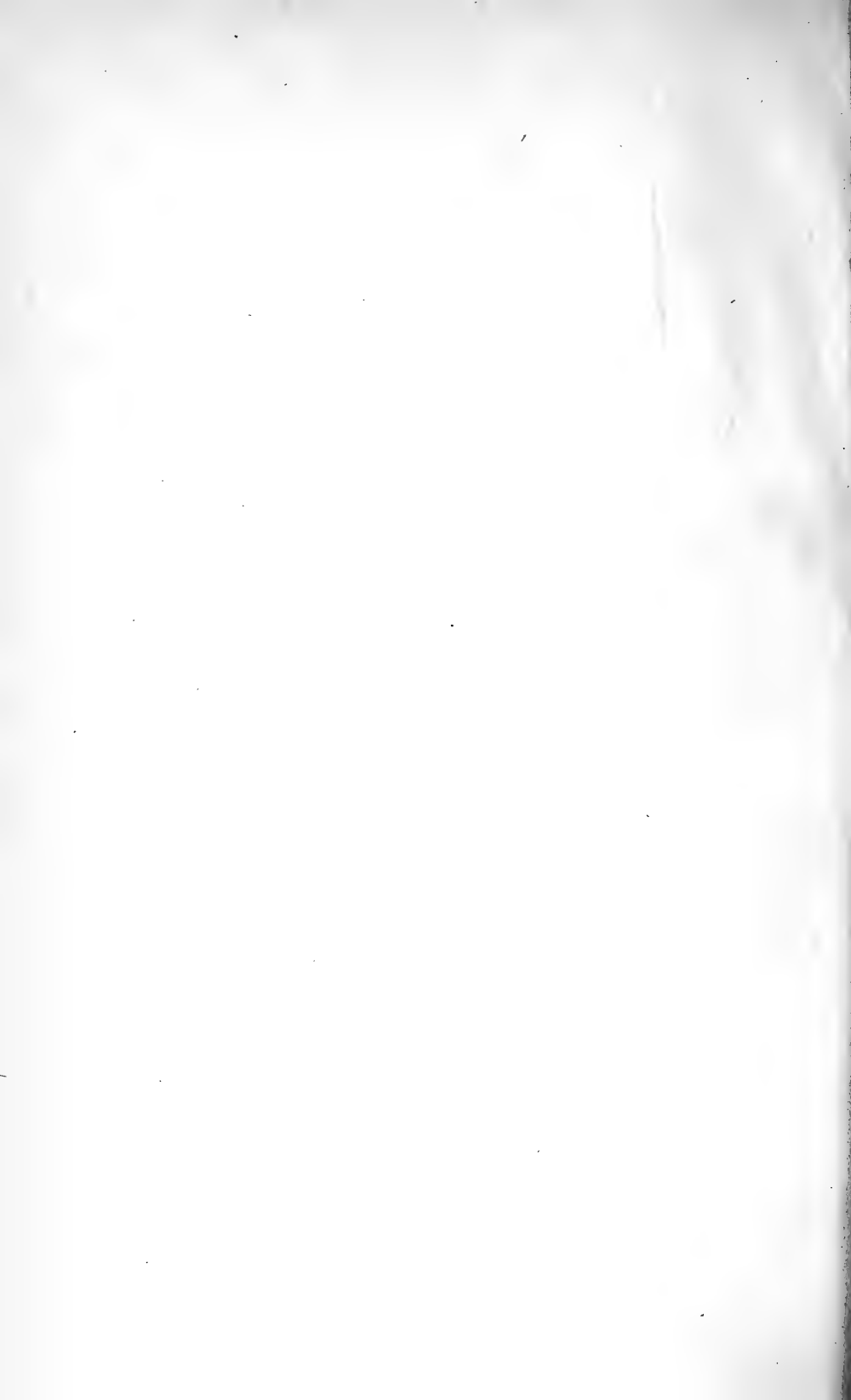
Ascoshöngastia, new genus

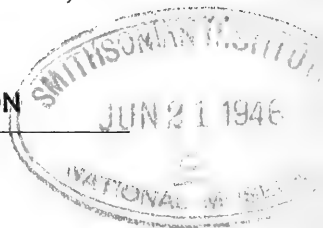
Chelicera stout, bladelike, with a single tooth above and usually one below, and extending beyond apex of basal segment. Palpus rather stout; femur angulate laterally or rounded; palpal claw bifurcate or trifurcate. Tracheae and spiracles absent. Dorsal plate without a raised crest in front of pseudostigmata and posterior half without circular striations. Abdomen without posterodorsal plates; dorsal setae sometimes numerous, humerals not situated in row II. Legs of medium length; coxae III with one or more barbed or branched setae; tarsi three-clawed, middle claw being more slender than the other two.

Type species: Neoshöngastia malayensis Gater 1932.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW WORM-LIZARD (*ANCYLOCRANIUM BARKERI*)
FROM TANGANYIKA TERRITORY.

By ARTHUR LOVERIDGE

Among some reptiles recently presented to the Museum of Comparative Zoölogy by Mr. R. de la B. Barker, is an extraordinary amphisbaenid of a genus hitherto unknown from south of the equator. Not only is it the first member of the peculiar genus to be found in Tanganyika Territory, but its nearest relative occurs nearly a thousand miles to the north at Caitoi in Somalia. The new species was taken by Mr. Barker near the Mbemkuru River (*circa* 9°30' S., 39°40' E.) which empties into Mzungu Bay between the headlands of Ras Mbemkuru and Ras Mawedi on the coast between Kilwa and Lindi, though rather nearer to the latter.

Except for the absence of a well-marked circular fold separating head and body, this new species is referable to the Genus *Baikia* as recently (1941, Bull. Mus. Comp. Zoöl., 87, p. 368) redefined. Two species were referred to Gray's *Baikia* until Parker (1942, Bull. Mus. Comp. Zoöl., 91, p. 57, fig. 7a) proposed *Ancylocranium* for *somalica* (Scorteccei, 1930). The East African lizard was separated from the western *africana* Gray on account of its possessing a bony crest formed by the compressed anterior elements of the skull, and because the extra-columella showed an anterior dilation. Parker's figure of the crested *somalicum* was based on a cleaned skull; that of *africana* on an x-ray of the holotype, as no second specimen has been taken since the discovery of *africana* sixty-five years ago.

That I might ascertain to which of the two genera the new species *barkeri* should be assigned, half-a-dozen x-ray photographs of it were taken through the courtesy of Dr. M. C. Sosman of the Peter Bent Brigham Hospital of Boston. In none of these photographs is the extra-columella sufficient distinct for me to say definitely that it is, or is not, dilated anteriorly. In the matter of the anterior crest, however, three of the photographs undoubtedly conform to Parker's figure of *Ancylocranium*. The other three resemble Parker's figure of *Baikia* in lacking a crest. As all six x-rays are of the same lizard the apparent difference must be due to some slight variation in position at the time the photographs were taken. As it seemed possible that the same might have oc-

curred with Parker's x-ray of *Baikia*, I wrote Parker who (18. ii. 46) assures me that he verified the absence of the crest in *Baikia* by dissection. As the Tanganyika reptile has at least one of the characters of *Ancylocranium*, it is referred to that genus.

On geographical grounds there appears no reason for separating *Ancylocranium* from *Baikia* for other amphisbaenid genera like *Amphisbaena*, *Monopeltis*, and *Dalophia*, have a trans-African distribution.

***Ancylocranium barkeri* sp. nov.**

Type.—Museum of Comparative Zoölogy, No. 48,950, a ♂, from Mbemkuru River, Lindi Province, Tanganyika Territory. Collected by Mr. R. de la B. Barker in 1941.

Diagnosis.—In some ways nearer to *B. africana*, but distinguished from its geographically nearest relative as follows:

A single pair of shields (parietals) on occiput behind rostral; 31 (20 + 11) segments in a midbody annulus; median ventrals in a single transversely dilated series; 222 annuli on body, 5 on tail, but posterior half of tail without annuli; range: Tanganyika Territory *barkeri*
 Two pairs of shields (postfrontals and parietals) on occiput behind rostral; 49-55 (27-32 + 21-24) segments in a midbody annulus; median ventrals in a double series; 186-199 annuli on body, 6-8 on tail extending to the tip; range: Somalia and British Somaliland *somalicum*

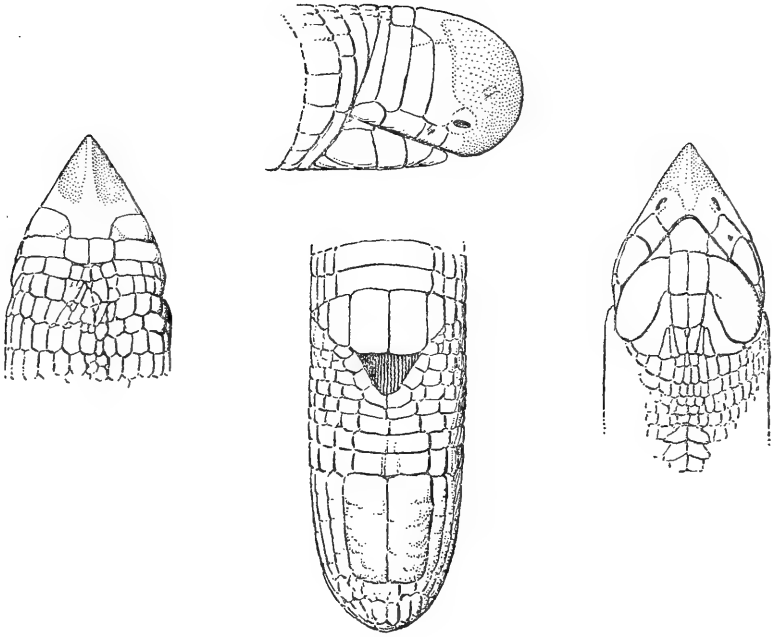
Description.—Rostral enormous, compressed, arched, with sharp cutting edge, nostril pierced in the rostral, slightly above and anterior to the groove separating rostral from first upper labial; neither nasal nor nasal suture; no prefrontal; no frontal; no postfrontals; a single pair of shields (parietals) on occiput behind rostral and immediately above a narrow, vertically-elongate ocular that is preceded by a slightly broader preocular and followed by a similarly vertically-elongate postocular; eye hidden; no temporals; upper labials 3, second largest and immediately below the preocular, the ocular resting in an angle between the second and third labials; two pairs of elongate sublinguals of which the anterior pair (postmentals) are the longer; the posterior pair in contact with the median pair of a row of 6 scales that separate a pair of large, wedge-shaped sublabials; lower labials 3, the second enormous, the third scarcely noticeable.

Body annuli 222 between the 6 scales mentioned above and the 6 enlarged anals, 5 caudal annuli apart from the elongate dome-shaped terminal segment that occupies more than half the length of tail; 31 (20 + 11) segments in a midbody annulus, dorsal segments longer than broad; the median ventral segment resembling the ventral shield of a snake being broader than all the other 10 ventral segments together; 6 anals; no preanal pores.

Color.—In alcohol. Tip of snout horn colored, rest of head and body dirty white (? flesh-pink in life), tip of tail purplish brown.

Size.—Total length of holotype ♂, 193 (185 + 8) mm.

Diet.—Undigested jaws of soldier termites in intestines.



♂ Holotype of *Ancylocranium barkeri* (M.C.Z. 48950). 4.6 x Nat. size.



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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



A NEW RACE OF *RHIPIDURA RUFIFRONS* FROM
ROTA ISLAND, MARIANA ISLANDS.

By ROLLIN H. BAKER, *Lieut. H(S), USNR*¹

A party from the Laboratory of Mammalogy, U. S. Naval Medical Research Unit No. 2, collected vertebrates at Rota Island, Mariana Islands, during the period from October 17 to November 2, 1945. Study of the birds reveals two specimens of a hitherto unrecognized race of *Rhipidura rufifrons*. This new form may be known as

Rhipidura rufifrons mariae subsp. nov.

Type.—No. 384935, U. S. National Museum; adult male; Mariirua Point, Rota Island, Mariana Islands; October 22, 1945; prepared by Odis A. Muennink, collected by David H. Johnson.

Superspecific characters.—Similar to *R. r. saipanensis* Hartert of Saipan and Tinian, but with a richer brown coloring on the breast and belly and darker above, especially the rufous coloring of the rump, basal half of the tail and forehead.

Description of type.—Forehead and anterior crown light "orange rufous" (feathers with black bases); lores and auriculars black; eye ring black; chin, forward part of throat and malar region white (feathers with black bases); a few feathers on the posterior edge of the malar region tipped with "citrine drab"; throat and upper breast black with feathers on the posterior margin edged with white; lower breast, belly, side, flank, tibia, vent and lower tail coverts near "ochraceous-tawny" becoming lighter on the breast, especially in the mid-portion, and slightly grayer on the flanks (feathers with black bases); sides of neck, shoulder and back near "Dresden brown" becoming grayer on the neck and crown where feathers have darker shafts (feathers with black bases); rump and upper tail coverts near "Sanford's brown" (feathers with black bases); basal half of tail near "amber brown" with coloring extending distally on edges of feathers; rest of tail black with ends tipped with white; wings and secondaries dark, edged with coloring similar to back; underwing grayish with axillaries tipped with buffy white; tarsus of dried specimen dark brown with darker toes; bill dark brown with mid-portion basally whitish; eye color not recorded.

Distribution.—Rota Island, Mariana Islands.

Remarks.—The two specimens from Rota have been compared with six topotypes from Saipan and seven birds from Tinian of *R. r. saipanensis* and 20 specimens from Guam of *R. r. uraniae* Oustalet. The Rota birds

¹Research Division, Bureau of Medicine and Surgery, Navy Department.

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have distinctly richer breast and belly coloring than either of these two races. Of specimens from Tinian, two have this coloring quite similar to the Rota birds while the five others are paler. Being situated between the islands of Saipan and Rota, Tinian birds might conceivably show some intergradation between the two races. There is some difference in the extent of white on the chin and throat of birds of these races; however, it is difficult to state with accuracy the differences since the preparation of the skins alters this feature considerably. Specimens of *E. r. saipanensis* have white feathers on the chin and much of the throat to form practically a solid band of white and with a heavy line of white in the malar region. The two birds from Rota have white feathers on the chin and only a small amount on the upper throat and with a somewhat lighter line of white in the malar region. Specimens of *E. r. uraniae* from Guam have a small amount of white on the chin and with a very thin line extending in the malar region. Weights of the two Rota birds are 9.0 (type) and 8.5 grams (No. 384936, U. S. N. M.).

Measurements of adult male birds from the four islands indicate that size differences are not sufficient to distinguish the three races. The measurements of 11 males from Guam overlap the measurements of birds from the other islands with the exception of bill length, the Rota birds having a slightly shorter one. Wing length of the Rota specimens is slightly smaller than that of the birds from Saipan and Tinian and more similar to the length of those from Guam.

	<i>Wing</i>	<i>Tail</i>	<i>Culmen</i>	<i>Tarsus</i>
<i>E. r. saipanensis</i>				
3 males—Saipan	68.0	80.6	13.3	16.8
	(67.8-68.2)	(80.2-81.1)	(13.1-13.5)	(16.2-17.2)
4 males—Tinian	68.8	81.6	13.1	17.7
	(68.2-69.4)	(80.1-83.4)	(13.0-13.3)	(17.2-18.4)
<i>E. r. mariae</i>				
2 males—Rota	66.0	82.3	12.2	17.1
	(65.4-66.7)	(82.2-82.4)	(12.1-12.4)	(17.1-17.2)
<i>E. r. uraniae</i>				
11 males—Guam	66.2	78.5	13.5	16.6
	(64.2-69.2)	(75.3-82.3)	(13.1-14.5)	(15.6-17.2)

The locality for the name, *Rhipidura atrigularis* Reichenow (Journ. f. Ornith., 1885, p. 110), was listed as the Palau Islands, but according to Hartert (Nov. Zool., 1898, vol. V, p. 53) this is probably erroneous and that the correct locality may be Guam or the Mariana Islands. As published the description might fit any of the three races discussed here. Since the type of *R. atrigularis* is not available for comparison and since Hartert found his Guam material to compare favorably with Reichenow's type, this name is apparently a synonym of *E. r. uraniae* and not pertinent to the race from Rota.

The writer is indebted to Dr. Herbert Friedmann of the U. S. National Museum for his helpful suggestions and to Dr. Ernst Mayr of the American Museum of Natural History for the loan of comparative material from Saipan and Tinian. Colors in quotation marks pertain to ones in Ridgway's "Color Standards and Nomenclature," 1912.

Rhipidura rufifrons mariae is named in honor of my wife.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



NECESSARY CHANGES OF NAMES IN THE
COLEOPTEROUS FAMILY SCARABAEIDAE*

By EDWARD A. CHAPIN

Curator, Division of Insects, U. S. National Museum

The following nomenclatorial changes appear to be necessary under the International Rules of Zoological Nomenclature.

Ateuchus Weber

Ateuchus Weber, 1801, *Observ. entomologicae*, p. 10, 37.

Ateuchus Fabricius, 1801, *Syst. Eleuth.*, Vol. 1, p. 54.

Choeridium Serville, 1825, *Encycl. métho.*, Vol. 10, p. 356.

The generic name *Ateuchus* was first proposed by Weber in 1801 for a new species, *A. histeroides*, from North America. At almost the same time Fabricius proposed the same name as new, for a group of 58 species, 44 from the Old World and 14 from the New World. Since both papers are dated 1801, internal evidence of prior publication for one or the other was sought. The following facts were noted: Weber's introduction is dated Aug. 1, 1800 (*Calendis Augusti MDCCC*), that in Fabricius is dated April 10, 1801. Both works were published by the same printing house. This would indicate prior publication for Weber and that prior publication is established by a citation to Weber by page and species number on page 47 of Fabricius' work. Therefore, *Ateuchus* Weber returns to the American list and replaces *Choeridium* Serville 1825.

Kolbeus hornii (Rivers)

Bradycinetus hornii Rivers, 1886. *Bull. Calif. Acad. Science*, Vol. II, p. 61.

Kolbeus minor (Linell)

Bradycinetus minor Linell, 1896, *Proc. U. S. Nat. Mus.*, Vol. 18 (1895), p. 723.

These two species are closely related to *Kolbeus arcuatus* (Bts.). The genus *Kolbeus* was set up by Boucomont, 1911, *Ann. Soc. ent. France*, Vol. 79 (1910), p. 335, for the two species *Bolboceras arcuatus* Bates and *Bolboceras coreanus* Kolbe. As no type was designated, the writer selects *B. arcuatus* Bts., the first of the two, as type of *Kolbeus* Bouc.

Hoplia callipyge Leconte

Hoplia callipyge Lec., 1856, *Journ. Acad. Nat. Sci. Philadelphia*, Ser. 2, Vol. 3, p. 285.

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- Hoplia pubicollis* Lec., 1856, loc. cit., p. 285. Not *Hoplia pubicollis* Küster 1849.)
- Hoplia oregona* Lec., 1856, loc. cit., p. 284.
- Hoplia convexula* Lec., 1856, loc. cit., p. 285.
- Hoplia irrorata* Lec., 1857, Rept. Explor. Survey, IX, no. 1, p. 40. (Not *Hoplia irrorata* Blanch. 1850.)
- Hoplia mutata* Gemminger and Harold, 1869, Catalogus Coleopterorum, Vol. 4, p. 1113. (New name for *irrorata* Lec.)
- Hoplia lecontei* Dalla Torre, 1913, Coleopt. Catalogus (Junk), Pars 50, p. 376 (new name for *pubicollis* Lec.).

The acceptance of *Hoplia oregona* Lec. as the correct name for this species (Boyer, 1940, Microentomology, Vol. 5, Part 1, p. 16) appears to be incorrect under the International Code, in that it disregards the right of a previous reviser. When two or more names are published simultaneously and prove later to be synonyms, the first reviser may select any one of them to stand and, providing the name selected is valid, his decision is final (Article 28). The use of the method of "page priority" in selecting the proper name is not obligatory; it appears in the code as Recommendation "t" under Article 30 "All other things being equal, page precedence should obtain in selecting a type."

Leconte in 1856 proposed four names, *oregona*, *callipyge*, *convexula* and *pubicollis* for what are now considered as four color phases or forms of a single species. In 1880, the same author recognized part of this synonymy and suppressed *oregona* and *convexula* under *pubicollis*. However, as *pubicollis* Leconte 1856 is a homonym of *pubicollis* Küster 1849, his right as first reviser is void and a new selection was necessary. This was done by Dalla Torre in 1913 (Coleopt. Catalogus, Junk, Pars 50, p. 372) who selected *convexula* Lec. for the species with *oregona*, *pubicollis* and others as synonyms. Therefore, in 1940 when Boyer extended the synonymy to include *callipyge*, he had the choice of either *callipyge* or *convexula* as the correct name of the species since *oregona* had already been synonymized. As between those names, the writer selects *Hoplia callipyge* Lec.

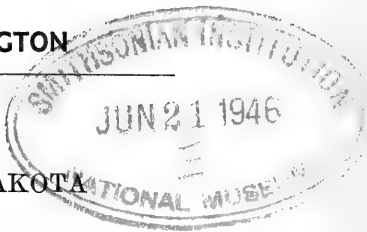
Cotinis palliata (Gory-Percheron)

Gymnetis palliata Gory-Percheron, 1833, Monog. Cétoines, p. 336, Pl. 67, fig. 2.

Cotinis arizonica Casey, 1915, Mem. Coleopt., Vol. 6, p. 287.

Gory and Percheron described the species *Gymnetis palliata* as from California. In 1869, Gemminger and Harold referred it to the genus *Cotinis* and suppressed the name as synonym of *Cotinis sobrina* (G.-P.). Further to confuse the issue, the locality record of California is changed to Mexico. Dalla Torre, in Coleopt. Catalogus (Junk) Pars 72, p. 85, 1921, places both *sobrina* and *palliata* as aberrations of *C. mutabilis* G.-P. and continues to use the false citation of locality. The name is omitted from the Henshaw and Leng check-lists. Casey's *arizonica* appears certainly to be the same as Gory-Percheron's *palliata*.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



A NEW BADGER FROM SOUTH DAKOTA

By VIOLA S. SCHANTZ

In studying the badgers of South Dakota I discovered an unrecognized form in the Badlands area which is described as follows:

Taxidea taxus dacotensis, subsp. nov.

Type.—No. 223233, U. S. National Museum, Biological Surveys collection; male adult (coronal sutures fused), skull only; collected at Folsom, Custer County, South Dakota, September 9, 1916, by T. C. Beach. Original no. 26; Biological Surveys misc. no. 17782X.

Distribution.—Badlands region of western South Dakota. Transition, Upper, and Sonoran life zones. In the Saskatchewan biotic province (Dice).

Diagnostic characters.—A light-colored subspecies, and smaller than *Taxidea taxus taxus*.

Color.—Topotype No. 225838, U. S. National Museum, Biological Surveys collection (skin only) winter pelage: Facial area, including forehead (except median line), around the eyes, and patches on sides of head in front of ears, brownish-black, less accentuated than in *taxus*, irregular white markings of cheeks confluent with white throat; underfur of general dorsal area and sides pale ivory-yellow, though at base a buffy brown; the guard hair basal color also buffy brown, fading into ivory-yellow, and becoming black subterminally and white at the tip; this black band is narrower than in *taxus*, giving *dacotensis* a more yellowish grizzled appearance; general abdominal area uniform ivory-yellow; the white median-line extends from the middle of the face to near the shoulders; chin slightly brownish; ears blackish edged with white; limbs brownish black; upper side of tail grizzled cinnamon buff, under side of tail cinnamon buff.

On several pelages taken late in summer the facial area including the forehead (exclusive of median line), around the eyes and patches on side of head in front of ears are mummy brown (Ridgway); dorsal area hairs are a warm buff becoming dark brown subterminally, tipped with buff, giving them a grizzled brown appearance, while the abdominal area is a warm buff color.

Skull.—The skull is similar to that of *taxus* excepting that it is smaller; however, the teeth P⁴ and M¹ average proportionately as large or larger. In *dacotensis* the condylobasal length of five females measured

from 116 to 123.4 mm., or an average of 119.5; and four males measured from 120.6 to 125.3 or an average of 122.7.

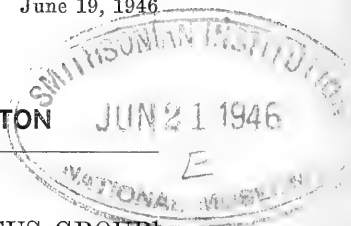
Measurements.—Type: Skull condylobasal length, 120.6; zygomatic breadth, 79.1; breadth of brain case across mastoid processes, 75.2; interorbital breadth, 27.3; least postorbital constriction, 26.5; palatal length, 58.4; palatal constriction, 13; maxillary tooth row (alveoli), 41.5; crown length (outer side) of upper carnassial, 11.9; crown width of upper carnassial, 10.

Remarks.—*Taxidea taxus dacotensis* appears closely allied to the more northern *T. t. taxus* with which it undoubtedly intergrades. In comparison the condylobasal length of four adult male specimens of *T. t. taxus* from North Dakota measured from 128.6 to 132 mm., whereas four adult males of *T. t. dacotensis* from South Dakota measured from 120.6 to 125.3 mm.

Specimens examined.—Total 16 from South Dakota: Badlands, 1 (skull only); Dewey, Custer County, 2 (skulls only); Eagle Butte, Dewey County, 2 (skins and skulls); Faith, Meade County, 2 (1 skull only and 1 skin only); Folsom, Custer County, 8 (1 young skin and skull, 6 skulls only and 1 skin only); White River Valley, 1 (skull only).

Biological Surveys, U. S. Fish and Wildlife Service, Washington, D. C.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



THE AEADES (STEGOMYIA) ALBOLINEATUS GROUP¹
(DIPTERA, CULICIDAE)

By KENNETH L. KNIGHT, Lt. Comdr. H(S), USNR², and LLOYD
E. ROZEBOOM, Lt., H(S), USNR²

Recent collections made by the authors in the Philippine Islands have disclosed 5 new species of the subgenus *Stegomyia* which in general appearance resemble *Aedes (Stegomyia) albolineatus* (Theobald). These, along with *pseudalbolineatus* Brug form a section of *Stegomyia* that is distinct enough to be considered a group of that subgenus.

Edwards³ considered *albolineatus* as a member of the *scutellaris* group. In this group he also included *albopictus* (Skuse) and its related species.

The *albolineatus* group, as based on the species known at present, is characterized by: a diamond-shaped anterior area of narrow white scales on the median portion of the vertex; a single broad longitudinal pleural band of white scales that begins on the propleuron and extends posteriorly across the upper portion of the sternopleuron and the upper mesepimeron; having only the first three tarsal segments of the hind legs marked with basal white areas (a few white scales may occasionally occur on segment IV); the scutum being marked with a conspicuous longitudinal median white stripe; and the dististyle having its appendage well removed from the apex.

Key to Adults of the Albolineatus Group

- | | |
|---|---|
| 1. All three lobes of scutellum largely covered with broad white scales | 2 |
| Only mid scutellar lobe with broad white scales, lateral lobes covered with broad black scales | 5 |
| 2. Median stripe of scutum extending posteriorly to the scutellum (female unknown) | |
| <i>bambusicolus</i> , new species | |
| Median stripe of scutum extending only to level of wing bases | 3 |
| 3. An area of broad white scales on the lateral margin of the scutum just before level of wing base | |
| <i>laffooni</i> , new species | |
| No area of broad white scales on lateral scutal margin | 4 |

¹The collections reported on here were made under the auspices of U. S. Naval Medical Research Unit No. 2. The material was worked up in space furnished by the Division of Insects, U. S. National Museum and by Johns Hopkins University (School of Public Health and Hygiene).

²Division of Research, Bureau of Medicine and Surgery, U. S. Navy Department.
³Edwards, F. W., 1932. Genera Insectorum, Culicidae. Fasc. 173, p. 161. F. Wytzman, Brussels.

4. Only about basal two-fifths of third hind tarsal segment marked with white (female only, male cannot be separated).
arboricolus, new species
 Most, or all, of third hind tarsal segment marked with white
pseudalbolineatus Brug⁴
5. Scales of *apn* and *ppn* all dark.....*albolineatus* (Theobald)
 At least some of the scales of *ppn* pale, usually some pale scales on
apn also 6
6. Median scutal stripe extending posteriorly to scutellum; *ppn* with narrow curved creamy scales only.....*hoogstraali*, new species
 Median scutal stripe extending posteriorly only to level of wing bases; *ppn* with narrow dark scales dorsally and broad white scales below*boharti*, new species

Key to the *Albolineatus* Group Based on Male Genitalia

1. Lateral plate of mesosome with less than 10 teeth..... 2
 Lateral plate of mesosome with more than 10 teeth..... 3
2. Basistyle with 2 distinct prominences and with 4 bladeliike specialized setae near the more basal of these lobes; dististyle appendage at basal one-seventh (Fig. 8).....*bambusicolus*, new species
 Basistyle with one prominence (bears 3-4 very stout short spines) and without bladeliike specialized setate; dististyle appendage inserted just beyond middle (Fig. 21).....*albolineatus* (Theobald)
3. Lateral teeth of mesosome narrow and slender (Fig. 10); dististyle appendage very long and slender (Fig. 20)
hoogstraali, new species
 Lateral teeth of mesosome broad, tapered, blade-like (Fig. 13); dististyle appendage broader and shorter (Fig. 22)..... 4
- 4.⁵ Tips of strongest basal lobe spines reaching level of apex of basistyle; hairs of inner dorsal (before rotation) margin of basistyle with hairs as long as those on basal lobe (Fig. 23)
arboricolus, new species
laffooni, new species
 Tips of strongest basal lobe spines falling well short of level of basistyle apex; hairs of inner dorsal margin of basistyle short, usually conspicuously shorter than those of basal lobe (Fig. 22)*boharti*, new species

Aedes (*Stegomyia*) *albolineatus* (Theobald). 1904.

Entom. 37: 77 (female) (*Scutomyia*). TYPE-LOC.: Kuala Lumpur, Malay Peninsula (Leicester). TYPE: Female in British Museum.

MALE (Philippine specimens). Wing about 2½ mm. *Head*:—Proboscis and palpi black. Palpus approximately one-half to two-thirds (observed range 0.48-0.65) the length of the proboscis, latter about four-fifths the length of the abdomen. Antenna dusky, torus densely clothed on inner aspect with broad white scales. Vertex with a median longitudinal band of broad white scales, widening anteriorly, a broad somewhat diamond-shaped area of narrow white scales wedged deeply into the anterior margin of this band and extending anteriorly between the eyes, laterally these narrow scales extend far enough along the eye margins

⁴We have not seen specimens of this species.

⁵From Brug's description, *pseudalbolineatus* would key here. However, it is not possible to separate it from *arboricolus* and *boharti* on the basis of his description.

so as to cut off the broad white scales and the first of the broad black scales from the eye margins; remainder of vertex covered with broad black scales, except for a line of broad white scales on a level with the lower portion of *apn* (this may be reduced to a few scales or even absent) and a patch of similar scales in the lateral corner; a narrow area of black forked scales on the nape. *Thorax*:—Scutum dark, covered with black narrow scales, a median longitudinal stripe of white narrow scales that widens slightly from the anterior margin to a level with the postspiracular area and then tapers rather abruptly to an end just before the level of the wing bases; a line of short golden bristles over the wing base. Scutellum with mid lobe clothed with broad white scales, frequently a few apical broad dark scales, lateral lobes clothed entirely with broad black scales. *Apn* with sparse narrow black scales, *ppn* with sparse narrow black scales dorsally. Pleuron with a large triangular area of broad white scales on the ventro-posterior portion of the sternopleuron in addition to the dorsal band. Coxae covered with broad white scales. Fore femur dark scaled, a small basal pale area ventrally on the anterior surface, a median longitudinal white stripe on the posterior surface, sometimes a small kneespot present; mid femur dark, a narrow white anterior kneespot, ventral margin marked with white that extends slightly onto the anterior and posterior surfaces; hind femur white scaled, the dorsal aspect black from apex nearly to base, the dark scaling extending subapically onto the anterior surface for a slight distance, the apical half of the posterior surface black, this black extending onto the ventral aspect subapically and occasionally just encroaching on the anterior surface. Tibiae dark, ventro-posterior scales and hairs paler. Fore and mid tarsi dark; hind tarsus with first 2 segments basally banded with white, the bands being about one-fourth the length of the segment and incomplete mesally, occasionally a few white scales basally on III. Halter pale with dark-scaled knob. *Abdomen*:—Tergites black-scaled with large lateral white patches on I-VII (basal on II-VII), becoming subbasal dorsally on II-VII, usually produced on dorsum to form narrow subbasal bands on VI and VII and occasionally on V and even IV. *Genitalia* (Figs. 17 and 21):—Basistyle conical, about 1 by $2\frac{1}{2}$, dorsal surface with several rows of long stout hairs that possess recurved tips; basal lobe with 3-4 stout spines and several slender hairlike setae at apex. Dististyle about half the length of the basistyle, tapering to a curved tip; appendage inserted just beyond middle and extending almost to the tip of the dististyle. Lateral plate of mesosome with a dorsal row of 5-7 apical stout teeth. Tenth sternite armed apically with a short, stout single or double process. Ninth tergite with an irregular row of 3-6 setae on each side.

FEMALE (Philippine specimens). Wing about $2\frac{1}{2}$ to 3 mm. Differs from the male chiefly as follows: Palpus about one-seventh to one-eighth the length of the proboscis. Median scutal stripe slightly broader than in the male. Fore femur occasionally with a few anterior apical white scales; mid tarsus frequently with a few white scales basally on the first 2 segments; hind tarsus with first 3 segments with broad basal white areas, that on II forming a complete band, occasionally a few pale scales basally on IV.

A certain amount of variation occurs in the adults of this species. Specimens were seen from Guadalcanal and New Georgia that differed

from the above description in having some or all of the median upright forked scales on the nape dusky to yellowish in color; in having the scutal stripe of the female wider (about width of median white area on the vertex) and that of the male somewhat narrower; in having a complete subapical black band on the hind femur (occasionally narrowly broken ventrally on anterior aspect); and in having complete or nearly complete bands on abdominal tergites II to VII (occasionally even a few pale scales on I). Specimens from New Guinea also possessed a more or less complete subapical band on the hind femur but otherwise did not appear to differ from Philippine material.

LARVA. The larva of *albolineatus* presents a striking range of variation; in fact, so much variation occurs as to make it almost inconceivable that only one species is present. However, a series of 116 larval skins from Guadalcanal, New Guinea, Morotai and the Philippines have been examined, and in no case was it found possible to detect more than one species in the associated adults. It is not inconceivable, of course, when progeny rearing is done from single egg batches, that it may be found possible to separate *albolineatus* into 2 or more species on the basis of the larva.

For descriptive purposes, the larva of this species has been divided into types. The common type of the Philippines has been described in some detail and is used as a basis for describing the others. On all characters except the number of branches of head hair 6, there seems to be a small amount of intergradation between the types. Two or more of these types may occur in the same breeding spot.

Type A (Series of 10 associated Philippine specimens from Samar and Luzon). *Head* (Fig. 1):—Antenna with a few very fine spicules scattered over basal one-half; length about $7\frac{1}{2}$ -8 times the width; hair tuft inserted slightly beyond middle, 3 branched (range 2-5). Median mouth brush hairs with fine comb-like tips.⁶ Preclypeal spine, pale, elongate and slender. Head hair 4⁷ with 12-20 branches; 5 with 10-20; 6 single, rarely double; 7 with 10-25; 8 single; 9 with 2-4; 12 many-branched; 13 single; 15 with 2-4; 17 with 2-7; 18 with 3-10; 20 with 2-4; hairs 4 and 6 anterior to 7, 5 behind and slightly mesad to 6, position of 4 in relation to 6 apparently variable. Mentum with first 2-3 teeth short and widely spaced, the remainder closely and evenly ranked, 9-12 lateral teeth. *Thorax*:—Integument with minute scattered spicules. Some of the hairs produced into stout stellate tufts, 8-19 branched. Meso- and metapleural hair tufts with a stout basal spine. *Abdomen* (Fig. 4):—Integument with minute scattered spicules. Some of the dorsal and ventral hairs developed into stout stellate tufts, 6-19 branched. Dorsolateral hair of segment I is 3-9 branched, lateral hair single, both hairs on or at the margin of opposite ends of a bar-like plate. Comb scales strongly developed, thorn-like, quite variable in length, a fine fringe present on basal portion of spine, scales arranged in a straight line, 9-12

⁶Unless the mouth brush hairs are completely extruded, this point is difficult to determine. Larval skins seldom have these brushes completely expanded, only about one in ten being so in the authors' collection. Comblike tips were seen on types A and B but not on C and D. However, not enough specimens of the latter were seen to be sure of the validity of this.

⁷In order to have a nomenclature for the ventral head hairs, Marshall is followed in naming the hairs of the head. Marshall, J. F., 1938. The British Mosquitoes. p. 45. British Museum, London.

in number. Siphon smooth, index about 2.4-2.8; detached acus present (rarely a very narrow attachment to the siphon); single subventral hair tuft, attached approximately at middle, 3-5 branched; pecten teeth 3-6 in number, posterior margin fringed, frequently both margins of posterior teeth fringed. Anal plate incomplete ventrally, posterior margin with a fringe of spines; lateral hair stout, single, occasionally 2-3 branched; *isc* 5-8 branched; *osc* single; ventral brush with 10 tufts, of which all but the most anterior two arise from a connected barred area, each tuft with about 5-6 branches; anal gills finger-like, rarely somewhat broadly lanceolate, upper pair slightly longer than the lower pair and about twice the length of the anal plate (observed range 1.6-2.2 times length of plate).

Type A was collected only in the Philippines. However, there is a variant of it that occurs in Gaudalcanal, New Guinea and Morotai. In this, the body integument and siphon are covered with fine pile (visible under low power, 160x); the spines on the anal segment are more strongly produced; and the ventral head hairs tend to have more and stronger branches (thus approaching Type B).

Type B (Series of 10 specimens from New Guinea, Morotai and Luzon). Similar to Type A except as follows: Head hair 5 with 5-11 branches; 9 with 3-4; 15 with 2-8; 17 with 6-12; 18 with 8-16. Body integument and siphon densely covered with stout pile, that on the body being branched. Lateral hair of anal plate 2-4 branched, rarely single; posterior spines strongly produced. Material seen from New Guinea, Morotai, Samar, Balabac and Luzon.

Type C (Series of 10 specimens from Guadalcanal, New Guinea, Morotai, Samar and Luzon). Similar to Type A except as follows: Antenna longer, length about ten times the width, spicules scattered over whole length. Head hair 6 with 6-11 branches; 9 with 2-4 (one had 7). Body integument with fine pile, sometimes nearly invisible at 160x. Siphon with fine spicules or bare. Lateral hair of anal plate 1-4 branched.

Type D (Series of 5 specimens from Morotai, Samar and Luzon). Similar to Type A except as follows: Antenna longer, length about ten times width. Head hair 6 with 7-11 branches; 9 with 3-5; 15 with 3-5; 17 with 8-11; 18 with 8-12; 20 with 3-5. Body integument with prominent branched pile; siphon pilose. Lateral hair of anal plate 2-3 branched; spines on posterior margin of anal plate strongly produced.

Brug (1939)⁸ discusses the variability of the *albolineatus* larva and illustrates the differences of antennal length, of the branching of the dorsal head hairs and of the length of the posterior spines on the anal plate.

This species breeds commonly in tree holes, coconut shells and bamboo stumps, and more rarely in artificial containers and fallen leaves. Bonne-Webster and Brug (1932)⁹ also report it as breeding in leaf axils of sago palms and *Colocasia*; and in a rockhole, lagoon and jungle pool.

PUPA. Figures 11, 12 and 18 illustrate the pupa arising from the Type A larva. Although some variation occurs in number of branches and of position of setae in a series of *albolineatus* pupae arising from

⁸Brug, S. L., 1939. Tijdschr. v. Ent., 82: 102-104.

⁹Bonne-Webster, J., and Brug, S. L., 1932. Geneesk. Tijdschr. v. Nederland.-Indie 72 (Bijblad 2): 63.

the different types of larvae, there appears to be no significant difference between them.

TAXONOMIC DISCUSSION. From Theobald's original description of *albolineatus*, it cannot be told if his type is that species as understood here, or *boharti*. However, a female specimen in the U. S. National Museum collected in the type locality of *albolineatus* possesses only narrow curved black scales on *apn* and *ppn*, and thus agrees not only with the material in the authors' collections, but also with Barraud's (1934)¹⁰ conception of *albolineatus* (Assam). The only published figure of the mesosome of *albolineatus* is that by Brug (1939),⁸ and is presumably of a Ceram specimen. It agrees well with all the material studied.

There are specimens of *albolineatus* in the authors' collection from Guadalcanal, Solomon Islands; Hollandia, New Guinea; Morotai, Moluccas; and Mindanao, Balabac, Samar, and Luzon in the Philippines. Material was examined in the U. S. National Museum from the additional areas of Rendova and Munda Point, (W. G. Downs), Florida (K. L. Knight), Treasury Islands (J. H. Paullus) and Bougainville (A. B. Gurney, C. R. Bruck) in the Solomon Islands; Milne Bay (W. V. King, T. K. Ruebush, W. S. Ferguson, H. R. Roberts, G. H. Bick), Saidor (W. S. Ferguson), Kiriwinia (W. S. Ferguson), Dobodura (B. E. Rees), Finschafen (E. S. Ross) and Toem, east of Sarmi (E. S. Ross), all in New Guinea; Tarakan, Borneo (A. G. Humes); and Kuala Lumpur, Malay Peninsula (A. T. Stanton). This species has also been recorded from New Britain, New Ireland, Riouw, Sangir Islands, Ceram, Saparoea, Krakatoa Group, Indochina, and Assam.

Aedes (Stegomyia) pseudalbolineatus Brug, 1939

Tijdschr. v. Ent. 82: 103 (male and female). TYPE LOC.: Undesignated. Type series from Celebes and Sangir Islands. TYPE: Male in British Museum.

According to Brug the male can be distinguished externally from that of *albolineatus* only by the all white scutellum.¹¹ The genitalia differs in that the hairs on the basal lobe are stout and almost as thick as the 4 spines, and in that the lateral mesosomal plate possesses 14-16 dorsal teeth. The female has the additional character that the third hind tarsal segment is largely white on three sides, leaving only the fore side, and sometimes a narrow apical band, black. The type series was reared from a broken bottle, bamboo stumps and tree holes. Brug states that the larva falls within the range of variability found for *albolineatus*, the only difference he could find being that the outer occipital hair (hair 9) has 6-10 branches as against 2-3 (once 4 and once 5) in *albolineatus*. This number for *albolineatus* also holds for the rather considerable number of specimens (60 examples of hair 9, range in number of branches 2-5) examined by the authors.

Aedes (Stegomyia) arboricolus, new species

MALE. Wing about 2½ mm. Undistinguishable from the type description of the male of *pseudalbolineatus* Brug. Distinct from *albolineatus* on scaling of scutellum and the prothoracic lobes, and on male geni-

¹⁰Barraud, P. J. The Fauna of British India. 5:243. Taylor and Francis, London.

¹¹In a recent communication, Dr. John Smart, British Museum, states that the specimens of *pseudalbolineatus* in their collection have all the scales of *apn* and *ppn* broad white.

talic characters. Palpus approximately three-fifths (observed range 0.54 to 0.66, holotype 0.66) the length of the proboscis. A few narrow curved cream-colored scales on lateral margin of scutum between level of mesothoracic spiracle and of wing base. All three scutellar lobes clothed with broad white scales, the apex of the mid lobe with a few broad black scales, also a few similar apical scales on the lateral lobes. *Apn* with both broad and narrow white scales; *ppn* with sparse narrow black scales dorsally, broad white scales below. Fore and mid tarsi dark; hind tarsus with first three segments basally marked with white, the marking on I incomplete on mesal aspect, that on II about one-half the length of the band on I and narrowly complete mesally, that on III consisting of only a few lateral scales. Abdominal tergites with narrow subbasal white bands on VI and VII. Genitalia (Figs. 14, 19 and 23) with basistyle conical, about $1 \times 2\frac{1}{2}$; inner dorsal surface with several irregular rows of rather long hairs, a number of long stout setae on ventral and outer surface; basal lobe with 3-4 elongate spines (tips reach level of basistyle apex) and several long stout setae with slender curved tips. Dististyle about one-half length of sidepiece, tapering to a blunt point at tip; appendage insertion ranging from just before middle to just beyond, apex of appendage not reaching the tip of the dististyle. Lateral plate of mesosome with row of 13-16 dorsal teeth. Tenth sternite armed apically with a 1-3 lobed process. Ninth tergite with 4-10 hairs on each side.

FEMALE. Wing about 3 mm. Resembles the male in most respects. Similar to type description of *pseudalbolineatus* except for marking of the third hind tarsal segment. Palpus about one-eighth the length of the proboscis. Hind tarsus with first three segments with basal white bands, that on I about one-fourth the length of the segment and incomplete mesally, that on II about two-fifths the length of the segment and complete although narrowed mesally, that on III about two-fifths the length of the segment and incomplete mesally, occasionally a very few basal pale scales present on IV. Abdominal tergites with partially complete subbasal bands on IV and V, complete on VI and VII.

LARVA (Series of 12 associated skins and 2 larvae, all from one collection) (Figs. 2 and 3). Generally similar to Type B. *albolineatus* larva except for the shape of the anal gills: Head hair 5 with 8-13 branches; 9 with 4-8 (once 3); 15 with 3-6; 17 with 11-19; 18 with 12-17; relative position of anterior dorsal head hairs variable. Comb scales strongly developed, thorn-like, smooth, the spine about twice the length of the base, tightly arranged in an even single line, about 12 in number (range 11-16). Siphon index 2.4 to 3.1; 3-5 pecten teeth. Anal plate with posterior fringe of strong spines, the longest at least half the length of the anal plate in length. Anal gills tapered from base, occasionally somewhat lanceolate, dorsal pair just slightly longer than the anal plate (1.05-1.15), ventral pair somewhat shorter than the dorsal pair.

PUPA. Generally similar to that of *albolineatus*. A significant difference appears to occur in the greater number of branches of hair 1 of the seventh abdominal segment (*arboreolus*: 24 examples, range 4-8, average 6.1 branches; *albolineatus*: 155 examples, range 1-3, average 1.8).

TYPES. *Holotype*.—Male, with larval and pupal skins and genitalia (U. S. National Museum Cat. No. 57769). Shohoton Springs, inland on the Basey River, Samar, May 8, 1945 (K. L. Knight), reared from a large

open tree hole. *Paratypes*:—4 males, 7 females, with associated larval and pupal skins, 3 males and 2 larvae without associations, same data as for type. Paratypes deposited in U. S. N. M., Johns Hopkins University and California Academy of Sciences.

TAXONOMIC DISCUSSION. From *pseudalbolineatus* (type description, since no specimens were available for comparison), *arboricolus* is distinct in the female in having only about the basal two-fifths of the third hind tarsal segment marked with white. Brug (1939)⁸ describes *pseudalbolineatus* as having most of the third hind tarsal white on three sides, leaving only the fore side, and sometimes a narrow apical band, black. Apparently neither the male nor the larva are distinct from those of *pseudalbolineatus*. Brug states that the male of *pseudalbolineatus* differs from *albolineatus* only in scutellar and genitalic differences. This would imply that *apn* and *ppn* possess dark scales only, which would furnish a further differentiation point between *arboricolus* and *pseudalbolineatus*.¹¹ In the larva, this species is generally distinct from *albolineatus* on the shape of the anal gills and on the number of branches of head hair 9. However in some cases sufficient variation occurs so as to make identification difficult.

***Aedes (Stegomyia) boharti*, new species**

Aedes (Stegomyia) albolineatus (Theobald), Bonne-Wepster and Brug, 1932, *Geneesk. Tijdschr. v. Nederland.-Indie* 72 (Bijblad 2): 60 (Fig. 14, male genitalia; description of male in part).

MALE. Wing about 2 mm. Closely similar to *albolineatus*, but readily distinguished by the scaling of *apn* and *ppn*, and by the structure of the mesosome. Palpus approximately three-fifths (observed range 0.5-0.7, holotype 0.7) the length of the proboscis. *Apn* usually with narrow black scales and with a variable amount of narrow and broad white scales; *ppn* with narrow dark scales dorsally and broad white scales below, a few narrow white scales generally present along the margin of the white broad scales. Lateral scutellar lobes clothed with broad black scales, median lobe with broad white scales only. Genitalia (Figs. 9, 13 and 22) with basistyle conical, $1 \times 2\frac{1}{2}$, some long stout setae on ventral and outer surface, hairs on inner dorsal surface usually quite short, sometimes nearly as long as in *arboricolus*, basal lobe with three stout spines (tips fall well short of basistyle apex) and a number of shorter setae, those on the upper part of the lobe stout and resembling spines. Dististyle tapering to tip; appendage inserted at, or beyond, middle and extending about to apex of dististyle. Lateral plate of mesosome with a row of 11-16 teeth on dorsal margin. Tenth sternite ending in a blunt, 1-3 lobed process. Ninth tergite with 3-5 hairs on each side.

FEMALE. Wing about $2\frac{1}{2}$ - $3\frac{1}{2}$ mm. Similar to the female of *albolineatus* except for the scaling of *apn* and *ppn* as described for the male.

LARVA. Two main types of larvae give rise to *boharti* adults. These are separable, as with *albolineatus*, on whether head hair 6 is single or multiple.

Type D (Holotype and 7 paratypes, all associated skins, Samar and Luzon):—Apparently not distinguishable from Type D of *albolineatus*, except on shape of anal gills. Inner mouth brush hairs with comblike tips. Antenna 9- $11\frac{1}{2}$ times longer than wide; hair tuft 2-5 branched. Head hair 5 with 12-19 branches; 6 with 4-8; 7 with 10-16; 9 with 2-8;

12 with 11-17; 15 with 1-7; 17 with 10-18; 18 with 10-20. Mentum with 9-14 lateral teeth. Comb scales 8-12 in number, the spines at least as long as the bases; some or all of the teeth may be joined basally. Siphon index approximately 3; 3-6 pecten teeth; hair tuft 2-4 branched. Lateral hair of anal plate 2-4 branched. Anal gills tapered from base, dorsal pair only slightly longer than ventral and about $1\frac{1}{2}$ times longer than anal plate (3 specimens all measured 1.4). A series of unassociated larvae from Luzon have the anal gills broadly lanceolate and subequal to the anal plate in length. An associated specimen each of *albolineatus* and *boharti* was reared from this collection. The gills of the *boharti* specimen are somewhat lanceolate and are slightly longer than the anal plate. This would indicate that the unassociated specimens are possibly *boharti*. However, that gill type was never seen in any of the other associated *boharti* material.

Type B (10 associated skins from Culion, Palawan, Samar and Luzon):—Apparently not distinguishable from Type B of *albolineatus*, except on shape of anal gills. Inner mouth brush hairs with comblike tips. Antenna $7\frac{1}{2}$ -10 times longer than wide; hair tuft 1-4 branched. Head hair 5 with 5-15 branches; 6 single, rarely 2-branched; 9 with 2-6; 15 with 2-6; 17 with 12-19; 18 with 10-17; 20 with 2-5. Mentum with 9-13 lateral teeth. Comb scales 9-16 in number, the spines at least equal to the bases in length, occasionally nearly twice the length of the base, some or all the teeth may occasionally be joined basally. Siphon index approximately 2.5-3.0. Lateral hair of anal plate 2-4 branched; posterior spines about half the length of the anal plate. Dorsal anal gills approximately $1\frac{3}{4}$ times length of anal plate (observed range 1.3-2.2), gills tapered from base, rarely lanceolate.

The larva of *boharti* is apparently not separable from that *arboricolus*.

PUPA. No significant pupal differences can be correlated with the above 2 larval types. Nor can the pupa of this species be separated with certainty from that of *albolineatus*. It is true, however, that in *boharti* hair 1 of the seventh abdominal tergite on the average possesses more branches (33 examples, average 3.5, range 2-6) than that hair in *albolineatus* (155 examples, average 1.8, range 1-3). Similarly, *boharti* differs from *arboricolus* on the number of branches of hair 10 of the second abdominal segment (*boharti*: 25 examples, range 1-5, average 2.8; *arboricolus*: 21 examples, range 3-10, average 5.4).

TYPE. *Holotype*:—Male, with larval and pupal skins, and genitalia (U. S. National Museum Cat. No. 57770), Osmena, Samar, May 15, 1945 (A. E. McMillan and M. J. MacMillan), reared from coconut shell halves in the vicinity of a native habitation. *Paratypes* (34 males, 52 females, all with associated larval and pupal skins, year 1945):—1 male and 2 females, same data as for holotype; 4 females, Osmena, Samar, June and August; 4 males and 5 females, Balinsasayao, Leyte, June; 2 females, 1,000 ft. elevation, slopes of Mt. Lobi, Leyte, August; 1 male and 1 female, Irahuan River, Palawan, June; 1 female, Bacungan, Palawan, June; 1 male and 1 female, Culion Island, June; 2 males, Cape Melville, Balabac Island, June; 13 males and 15 females, Subic Bay, Luzon, June, July and August; 10 males and 14 females, San Ramon, Mindanao, September; 2 males and 7 females, Zamboanga, Mindanao, September. The paratype series was collected by D. R. Johnson, Jean Laffoon, A. E. McMillan, L. E. Rozeboom, K. L. Knight, E. Bogusz, E. S. Zolick, F. E.

Zedeck and M. J. MacMillan. The paratypes are deposited in U. S. N. M., Johns Hopkins University and the California Academy of Sciences.

The paratypes were all reared from coconut halves, bamboo stumps, tree holes, banana stumps, palm stump hole and from a water bucket in the woods. Other specimens were captured as adults when aroused from resting places in deep woods. On at least one occasion, 2 specimens were captured biting man in the woods. This species apparently is more abundant in the Philippines than *abolineatus* (see distribution).

No definite locality was given for the male specimen that Bonne-Wepster and Brug mentioned, but apparently it was from somewhere in the Dutch East Indies.

This species is dedicated to Dr. Richard M. Bohart.

Aedes (*Stegomyia*) *hoogstraali*, new species

MALE. Wing about $2\frac{1}{2}$ mm. Similar to *abolineatus*, but differing markedly in scutal and genitalic characters. Palpus approximately five-sixths the length of the proboscis. Proboscis slightly shorter than the abdomen. Head with median area as in *abolineatus*, laterad to this is an area of broad black scales that is approximately the same width as the median white area, frequently a band of white scales present in this dark-scaled portion, lateral corner of head with pale broad scales, a narrow area of small black forked scales on the nape. Scutum (Fig. 6) dark, densely clothed with hairlike black scales, marked with a complete median longitudinal line of hairlike white scales, the line increasing slightly in width to the level of the postspiracular area, then tapering gradually to the prescutellar space, the portion that extends through the prescutellar space widening slightly to the same width as the midscutellar lobe and with parallel sides, scales at posterior margin of prescutellar portion of the line broad and undistinguished from mid lobe scutellar scales; lateral scutal margin from level of posterior edge of *ppn* to level of wing base with creamy-white narrow-curved scales. Mid lobe of scutellum with broad white scales, lateral lobes with broad black scales. *Apn* and *ppn* with narrow-curved creamy-white scales only. Hind femur white, a black subapical band that is ventrally incomplete on both surfaces. Fore tarsus with a small basal white patch on I; mid tarsus with a white basal patch on I and a few basal white scales on II; hind tarsus with prominent white basal bands on the first three segments, that on III incomplete ventrally. Abdomen with complete subbasal bands on tergites V to VII. Genitalia (Figs. 10 and 20) with basistyle cylindrical, about 1×3 , several irregular rows of short curved-tipped hairs dorsally, basal lobe with 3 stout spines, 2-3 stout setae and 2-3 slenderer setae apically. Dististyle half the length of the basistyle, tapering to a blunt apical point; appendage inserted at basal third and extending almost to apex of dististyle, long, slender, acutely tapered. Lateral plate of mesosome with a dorsal row of 13-15 rather thin teeth. Tenth sternite ending in a 1-2 lobed blunt process. Ninth tergite with 4-5 hairs on each side.

FEMALE. Wing about 3 mm. Palpus only about one-sixth the length of the proboscis. Legs marked as in male except that the fore femur possesses an anterior kneespot; the mid tibia is entirely dark. Remainder as in male.

LARVA. Apparently two slightly different larval types occur in this species, although not sufficient larval material is available to be com-

pletely sure. The two types are separable on the branching of head hair 6 and on the length of the antenna. The larva of *hoogstraali* is distinct from the other species described in this paper on the absence of prominent thoracic and abdominal stellate tufts and on the form of the comb and pecten teeth.

Type A (Series of 3 associated larval skins). *Head*:—Antenna with a few very fine spicules scattered basally; $8\frac{1}{2}$ - $9\frac{1}{2}$ times longer than wide, hair tuft inserted just beyond middle, single. Median mouth brush hairs with comblike tips. Preclypeal spine pale, elongate and slender. Head hair 4 many branched; 5 with 8-11 branches; 6 single; 7 with 10-14; 9 double; 15 with 4-5; 17 with 2-4; 18 with 2-6; 20 with 3-4; hairs 4 and 6 anterior to 7, 5 behind and slightly mesad to 6. Mentum with first 2-3 teeth separated, acute, the remainder rounded and evenly ranked, 10-11 lateral teeth. *Thorax*:—Mesothoracic pleural hair tuft with stout basal spine which may be split into several points; metathoracic pleural hair tuft with similar but smaller spine. *Abdomen* (Fig. 5):—Dorso-lateral hair of segment I is 4 branched, lateral hair single, the hairs located at opposite ends of a small barlike plate; the lateral hairs of II-VI double, rarely one or more single. Comb scales with broad oval bases, the spines narrow thornlike, equal to or somewhat less in length than the basal portion, very fine fringe on basal portion and extending onto base of spine, 6-10 in number. Siphon smooth, index approximately 2.5; acus present, a basal line at point of attachment, acus occasionally entirely detached; single subventral hair tuft approximately at middle, 4-6 branched; 3-6 pecten teeth, each with a group of basal spines. Anal plate incomplete ventrally, dorso-posterior margin with small area of short spines; lateral hair double; *isc* 4-5 branched; *osc* single; ventral brush with 10 tufts, each tuft 2-4 branched, the most anterior 2 not attached to a lateral bar. Anal gills broad fingerlike, dorsal pair slightly longer than ventral pair and 1.3-1.9 times longer than the anal plate.

Type B (Two associated larval skins). Similar to Type A except as follows: Antenna ten times longer than wide, hair tuft 1-2 branched. Head hair 5 with 14-20 branches; 6 with 3; 15 with 4-5; 17 with 1-2; 18 double. Dorso-lateral hair of abdominal segment I is 6-8 branched. Dorsal pair of anal gills 2.8 times length of anal plate.

PUPA. Similar to *albolineatus* except as follows: Vertical plate differently shaped (Fig. 15). Trumpet shorter and broader (Fig. 16). Hairs 4 and 6 of the cephalothorax not appreciably different in length from hair 5. Hair 6 of abdominal segments IV-V (usually III also) is mesad of a longitudinal line through 10. Hair 1 of VII lies mesad of a longitudinal line through 2 and is nearer the posterior margin of the segment than the lateral margin.

TYPES. *Holotypes*:—Male, with larval and pupal skins and dissected genitalia (U. S. National Museum Cat. No. 57771), Subic Bay, Luzon, June 27, 1945 (E. S. Zolick and F. E. Zedeck), reared from bamboo stump. *Paratypes* (6 males, 8 females):—1 female, with larval and pupal skins, same data as for type; 3 males and 5 females, with larval and pupal skins, 2 males and 2 females, Subic Bay, Luzon, July 1945 (M. J. MacMillan, L. E. Rozeboom, F. E. Zedeck), reared from bamboo stumps; 1 male, Subic Bay, Luzon, July 1945 (M. J. MacMillan), reared from a tin can.

The paratypes are deposited in U. S. N. M., Johns Hopkins University and California Academy of Sciences.

This species is dedicated to Mr. Harry Hoogstraal.

***Aedes (Stegomyia) bambusicolus*, new species**

MALE. Wing about 2½ mm. Externally, somewhat intermediate between *hoogstraali* and *pseudalbolineatus*, but differing markedly on genitalia from any of the *albolineatus* group. The following points of difference from *albolineatus* occur: Palpus nearly as long as the proboscis (0.97 of the proboscis length). Scutum (Fig. 7) dark, covered with hairlike black scales, a median longitudinal stripe of hairlike white scales, tapered to level of the wing bases from where it continues onto the bare prescutellar space as a narrow line, a few broad white scales medially on posterior margin of scutum, a few broad black scales laterally, a band of broad white scales extending from level of mesothoracic spiracle to level of wing base on extreme lateral margin of scutum, a small patch of narrow curved ochreous scales above wing base. Scutellum clothed with broad white scales. *Apn* densely covered with broad white scales, *ppn* with narrow white scales dorsally and broad white scales below. Fore femur black with a narrow white kneespot and a few basal pale scales anteriorly, posteriorly broadly white on basal half, reduced to a line on apical portion; mid femur with a white kneespot, a ventral pale line anteriorly, posterior surface all white basally, the white extending narrowly along ventral margin to near middle, a white ventral line at apex. Hind femur white, a broad complete subapical dark band. Fore tarsus dark with white basal patch on I; mid tarsus dark with pale basal patch on I, a few basal white scales on II; hind tarsus with broad basal white bands on first three segments, that on I about one-third of the segment, that on II about one-half and that on III about two-thirds. Abdominal tergites with complete subbasal bands on IV to VII. Genitalia (Fig. 8) with basistyle conical, 1 x 2, dorsally with several rows of very long stout bristles; a lobe-like prominence on inner dorsal surface near the base, a number of long stout setae with slender curved tips arising from this prominence, 4 large curved blade-like specialized setae inserted just dorsally to this prominence; basal lobe with a dense covering of long stout setae but without distinctly enlarged spines. Dististyle slender, almost as long as basistyle, sharply angled before apex, the tip truncate, appendage short, tapered, rodlike and located at basal one-seventh. Lateral plate of mesosome with 7-8 dorso-apical teeth. Tenth sternite ending in a long slender blunt process. Ninth tergite with 5 hairs on each side.

FEMALE, LARVA and PUPA. Unknown.

TYPES. *Holotype*:—Male, with mounted genitalia (U. S. National Museum Cat. No. 57772), Culion Island, June 20, 1945 (D. R. Johnson and Jean Laffoon), reared from bamboo stump. *Paratype*:—1 male, same data as for holotype. Paratype deposited in U. S. N. M.

***Aedes (Stegomyia) laffooni*, new species**

MALE. Wing about 2 mm. Similar to *albolineatus*, but differing markedly in scutal, scutellar and genitalic characters (for separation from the other species, see key). The following points of difference from *albolineatus* occur: Scutal stripe widest at midpoint of length; an area of broad white scales extending forward from level of wing base to

level of postspiracular area on lateral margin of scutum. Scutellum clothed with broad white scales, some broad dark scales apically on each lobe. *Apn* and *ppn* clothed with broad white scales, a few narrow dark scales dorsally on *ppn*. Mid tarsus with a few white basal scales on I; hind tarsus with first 3 segments basally banded with white, those on I and III being incomplete medially, the band on I being about one-fourth the length of the segment and those on II and III about one-third. *Genitalia*:—Apparently not distinct from that of *arboricolus*.

FEMALE. Wing about 3 mm. Similar to the male except as follows: Fore femur with a few anterior apical white scales; subapical dark area of hind femur only slightly extended basally on dorsal aspect (not reaching middle); mid tarsus with lateral basal white scales on first 2 segments; hind tarsus with basal white bands on first 4 segments, incomplete medially on all except II, the band on I about one-fourth to one-third the length of the segment, on II-IV one-third to nearly one-half.

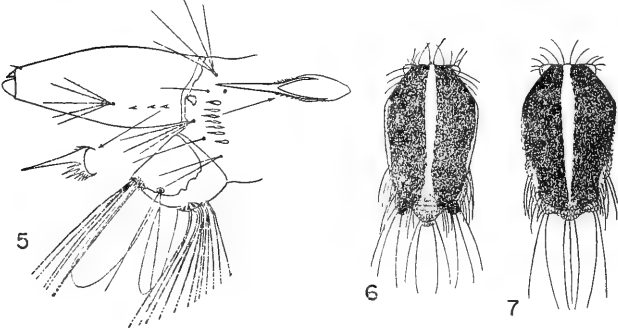
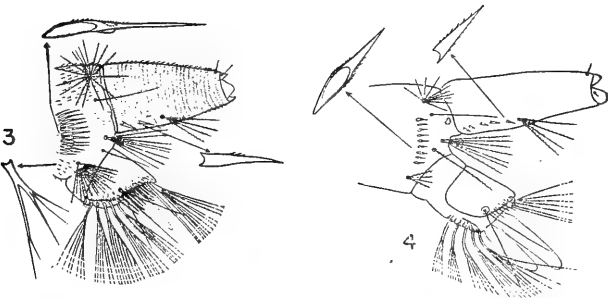
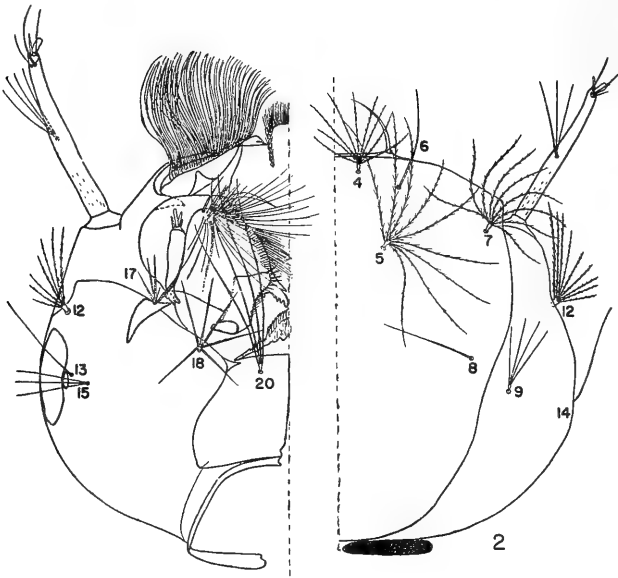
LARVA and PUPA. Unknown.

TYPES. *Holotype*:—Male, with mounted genitalia (U. S. National Museum Cat. No. 57876), 2 miles inland from San Ramon, Mindanao, about 500' elevation, September 17, 1945 (Jean Laffoon), reared from tree hole in dense jungle. *Paratypes*:—2 females, same data as for holotype; 1 female, Maasin Village, Zamboanga Province, Mindanao, September 25, 1945 (Jean Laffoon), collected as an adult in a nipa palm swamp. Paratypes deposited in U. S. N. M.

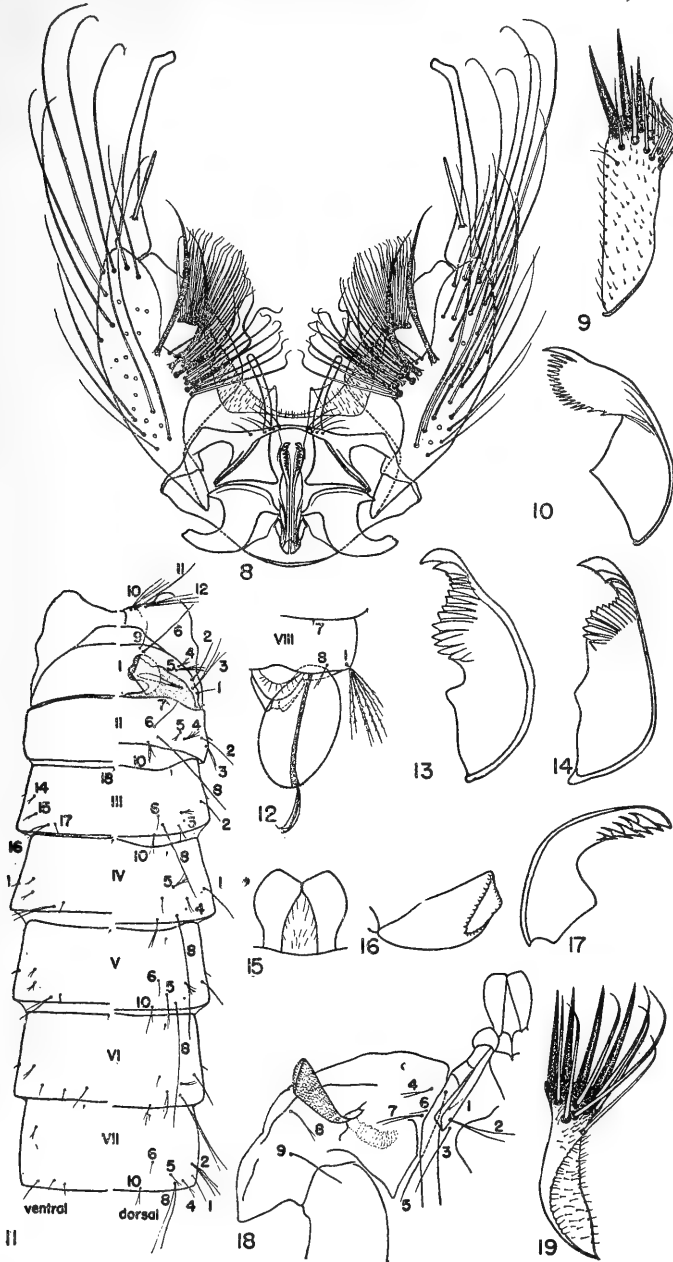
This species is dedicated to the collector.

EXPLANATION OF PLATES

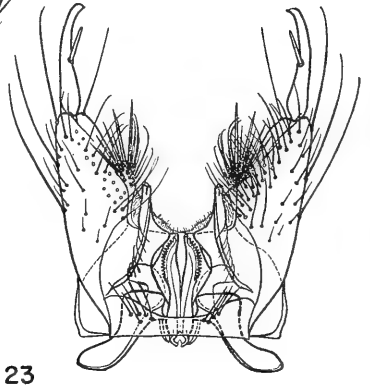
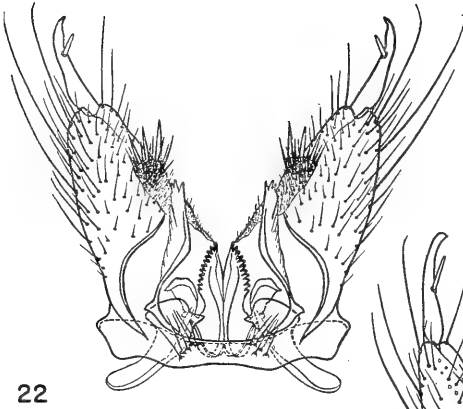
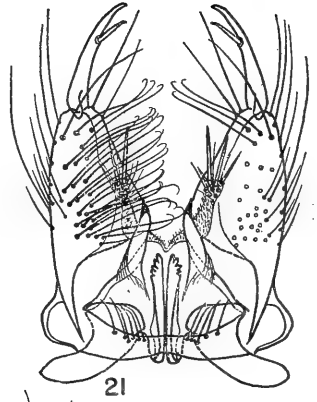
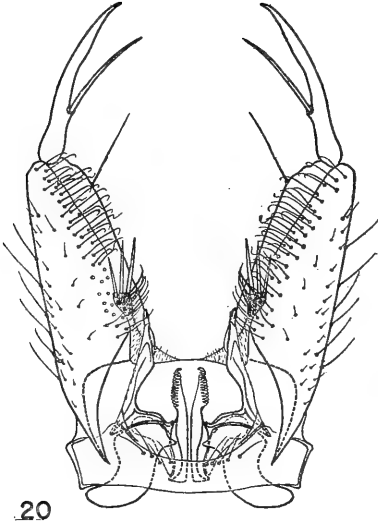
- Figure 1. *A. albolineatus*. Ventral aspect of larval head.
- Figure 2. *A. arboricolus*. Dorsal aspect of larval head.
- Figure 3. *A. arboricolus*. Lateral aspect of larval terminal segments.
- Figure 4. *A. albolineatus*. Lateral aspect of larval terminal segments.
- Figure 5. *A. hoogstraali*. Lateral aspect of larval terminal segments.
- Figure 6. *A. hoogstraali*. Dorsal aspect of anterior prothoracic lobes, scutum and scutellum.
- Figure 7. *A. bambusicolus*. Dorsal aspect of anterior prothoracic lobes, scutum and scutellum.
- Figure 8. *A. bambusicolus*. Male genitalia.
- Figure 9. *A. boharti*. Basal lobe of male genitalia.
- Figure 10. *A. hoogstraali*. Lateral aspect of lateral mesosome plate.
- Figure 11. *A. albolineatus*. Metanotum and abdominal segments I-VII of pupa.
- Figure 12. *A. albolineatus*. Segment VIII and paddle of pupa, dorsal aspect.
- Figure 13. *A. boharti*. Lateral aspect of lateral mesosome plate.
- Figure 14. *A. arboricolus*. Lateral aspect of lateral mesosome plate.
- Figure 15. *A. hoogstraali*. Vertical plate of pupal cephalothorax.
- Figure 16. *A. hoogstraali*. Pupal trumpet.
- Figure 17. *A. albolineatus*. Lateral aspect of lateral mesosome plate.
- Figure 18. *A. albolineatus*. Cephalothorax of pupa.
- Figure 19. *A. arboricolus*. Basal lobe of male genitalia.
- Figure 20. *A. hoogstraali*. Male genitalia.
- Figure 21. *A. albolineatus*. Male genitalia.
- Figure 22. *A. boharti*. Male genitalia.
- Figure 23. *A. arboricolus*. Male genitalia.



Details of Aedes



Details of Aedes



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Details of *Aedes*

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON



TWO NEW WARBLERS FROM MEXICO

By ROBERT T. MOORE

The following warblers, apparently new to science, have been added to the Moore Collection in the last few years and are herewith described:

Geothlypis nelsoni karlenae¹ subsp. nov.

Karlene's Warbler

Type.—Male adult; number 38391, collection of Robert T. Moore; Totontepec, Mt. Zempoaltepec, Oaxaca, Mexico; altitude about 6,560 feet, according to the collector; April 21, 1942; collected by Mario del Toro Aviles.

Subspecific characters.—Males differ from *Geothlypis nelsoni nelsoni* Richmond in having upper parts grayer (less greenish); gray band behind the black mask wider, more conspicuous and carried laterally to the post-ocular and post-auricular areas; averages slightly larger in wing and tail. The female has the lower throat brighter yellow (more orange); under tail coverts more bronzy yellow.

Range.—Although the topotypical series, all adults, of five males and one female were all taken on Mt. Zempoaltepec in eastern Oaxaca, this form ranges north through Puebla (Chalchicomula) to Careaga in the District Federal.

Measurements.—

Males	Wing	Tail	Exposed Culmen
Aver. 7 ad. <i>karlenae</i>	56.2 (53.2-58.2)	60.7 (57.2-63.2)	11.3 (11.1-11.7)
Aver. 5 ad. <i>nelsoni</i>	53.7 (51.-56.6)	57.1 (55.2-59.)	11.2 (10.0-12.)

Specimens examined.—Moore Collection—*karlenae*—Oaxaca: Totontepec 3 ♂ 1 ♀ (Apr. 12-May 11), Moctum 1 ♂ (Dec. 5); District Federal: Careaga 1 ♂ (Mar. 15). *nelsoni*—Veracruz: 5 mi. N. of Jalapa 3 ♂ 1 ♀ (Mar. 15-25); San Luis Potosi: 6 mi. E. Ciudad del Maiz 1 ♀ (Oct. 2). Collections U. S. Nat'l Mus. and Biol. Sur.—*karlenae*—Puebla: Chalchicomula 2 ♂ (Mar. 17-April 18). *nelsoni*—Veracruz: Las Vegas 1 ♂ (Apr. 4), Jico 2 ♂ (June 30); Hidalgo: Real del Monte 1 ♂ (Mar. 12, Type of *microrhyncha*).

Remarks.—No comparison was made between *karlenae* and *microrhyncha* Ridgway, because the latter is deemed a synonym of *G. nelsoni nelsoni*. I have examined two of the three males of the topotypical series (Biol. Sur. Coll.) of *microrhyncha*, taken at Real del Monte, Hidalgo in

¹Named in honor of the author's daughter, Karlene Pim, who accompanied him and helped him on his last expedition in Ecuador.

March 1891. It is true that the gray of the crown is much reduced in these specimens, but the same is equally true of my three specimens from Jalapa, Veracruz, which are practically topotypical and were secured in the same month of March, they showing barely a trace of gray. The type and the only other specimen in good condition from Real del Monte, No. 143334, were collected on March 13th and 12th, whereas the three specimens from Jalapa were secured between March 15th and March 22nd. All are in exactly the same condition of wear. The type of *Geothlypis cucullata* Salvin and Godman was collected at the Cofre de Perote only a few miles from Jalapa and as the name was preoccupied, Richmond re-named this bird *nelsoni* to replace *cucullata*. Furthermore, there is another male in the Biological Survey Collection, No. 365932, taken by Burleigh at Las Vigas on April 4th, 1939, also only a short distance from Jalapa and this bird, too, resembles my specimens. The only individual of *nelsoni*, which has an appreciable amount of gray behind the black mask, is a male from Jico, Veracruz, a June 30th bird, which possesses the minimum amount shown by any *karlanae*. If the type of *cucullata* has a more conspicuous gray crown band, the wider band is abnormal or probably due to its being in fresh plumage and a series of *microrhyncha* in similar plumage would probably show the same wide band. The only other character alleged to differentiate *microrhyncha*, small bill, is certainly very unimportant. Even Ridgway shows the difference as only about 1 mm smaller! In the females, too, this difference is slight. The female from Ciudad del Maiz, San Luis Potosi has an exposed culmen of 10.3 mm, compared with 10.5 for the Jalapa female. Dr. Herbert Friedmann examined all of these birds with me in April 1944 and agrees with me that *Geothlypis nelsoni microrhyncha* Ridgway is a synonym of *Geothlypis nelsoni nelsoni* Richmond.

Great care should be taken to compare birds of the same period of the year and of amount of wear, because the feathers of the pileum in March and April are generally somewhat worn. Fortunately, all of the critical birds from Real del Monte, Jalapa, Las Vigas, Careaga and Mt. Zempoaltepec were collected in the same two months of March and April.

Basileuterus belli bateli, subsp. nov.
Batel Chestnut-eared Warbler

Type.—Male breeding adult in nearly fresh plumage; number 20647, collection of Robert T. Moore; Rancho Batel, 6 mi. north of Santa Lucia, Sinaloa, Mexico; altitude about 6,800 feet; May 28, 1938; sex organs fully enlarged; collected by Chester C. Lamb.

Subspecific characters.—Differs in breeding and winter plumage from *Basileuterus belli clarus* Ridgway in having auriculars darker chestnut; underparts darker yellow, rather than paler; upperparts darker golden green; olive on flanks more extensive. Differs from *Basileuterus belli belli* (Giraud) in having chestnut area around the eyes and auriculars paler chestnut; upperparts more golden (less olive) green; rectrices not only longer as in *clarus*, but also much broader.

Range.—Occurs in Temperate and Upper Transition Zones on the sierras of southeastern Sinaloa (Rancho Batel breeding) through Jalisco (San Sebastian) and Michoacan to at least the Sierra Ozumatlan (9,500 ft.) and (in somewhat intermediate form) to the mountains surrounding the Valley of Mexico.

Measurements in mm of males	Wing	Tail
Aver. 12 <i>bateli</i>	60.3	59.2
Aver. 6 <i>clarus</i>	62.0	60.2
Aver. 6 <i>belli</i> from eastern Mexico	60.0	53.4
Aver. 10 <i>belli</i> from Oaxaca	60.4	55.2
Aver. 8 <i>scitulus</i> from Chiapas	61.4	57.3
Aver. 8 <i>subobscurus</i> from Honduras	61.2	56.7

Specimens examined.—Moore Coll. of Orcutt Trust—*bateli*—Sinaloa: Rancho Batel 1 ♂ (May 28 Type, breed.); Michoacan: Sierra Ozumatlan 1 ♂ 1 im. ♀ (Nov. 3-4); Boundary range between Michoacan and Mexico: Puerta Lengua de Vaca 7 ♂ 1 im. ♂ 2 ♀ 1 im. ♀ (Oct. 12-31); District Federal: Desierto de Leonos 1 ♂ 2 ♀ (July 15-Aug. 7). *Bateli* × *belli*—Puebla: El Venerable, 4 mi. E. Agua Frio, 1 im. ♂ 1 ♀ (Apr. 2, July 30). In other collections—*bateli*—N. W. Jalisco: San Sebastian 1 ♀ (Mar. 17); Michoacan: Mt. Tancítaro 2 ♂ 4 ♀ (Feb. 24, June 28-July 31). In Orcutt Trust Coll.—*belli*—Veracruz: La Puerta, top of Aculzingo Grade, 4 ♂ (breed.) 2 juv. ♂ 1 ♀ 1 im. ♀ (July 20-26); 5 mi. N. of Jalapa 2 ♂ 1 ♀ (Mar. 16-23); San Luis Potosí: 16 mi. E. Ciudad del Maiz, 2 im. ♂ (Oct. 5-8); Oaxaca: Totontepac 6 ♂ 2 juv. ♂ 4 ♀ 4 juv. ♀ (Apr. 1-May 31); Moctum 4 ♂ 10 ♀ (Sept. 19-Dec. 25). Intergrades *belli* × *clarus*—Morelos: Coajomulco 2 ♂ 1 ♀ (June 22 breed.); Mexico: Temascaltepec 1 ♀ (June 27). Other collections—*belli*—Veracruz: Orizaba 1 Type (no data), 1 ♀ (Mar. 7), Jico 1 (?) 1 ♀; Oaxaca: Mt. Zempoaltepec 2 ♂ 1 ♀ (July 10-13), Reyes 1 ♀ (Oct. 20); Tamaulipas: Montelunga 2 ♂, Galindo 1 ♀, Carrietos 2 ♂; District Federal: Ajusco 1 ♂, Mt. Orizaba 2 (not sexed). *Belli* × *clarus*—Morelos: Huitzilac 1 ♂ (June 12). Orcutt Trust Coll.—*clarus*—Guerrero: Cuapongo 2 ♂ (Dec. 20-30). Other collections—Guerrero: Chilpancingo 2 ♂ (includ. type) 1 ♀, Omilteme 1 ♂ 1 ♀ 1 ♀. Moore Coll.—*scitulus*—Chiapas: Volcan de Tacaná 8 ♂ 1 ♀ (Apr. 11-May 13); *subobscurus*—Honduras: 35 specs. altogether.

Remarks.—Wetmore (Proc. U. S. Nat'l. Mus., 89, No. 3105, 1941, pp. 552-573) gives an excellent review of the species *belli*, in which he recognizes *Basileuterus belli clarus* Ridgway of Guerrero, an opinion with which I agree. None of the races of *belli* are sharply differentiated and characters overlap somewhat from one race to another. The Orcutt series of nine April-May birds from Volcan de Tacaná, Chiapas, includes a fall male that can be matched by a *clarus* and a dark female that is as dark and dull as a female *obscurus* from Cantoral, Honduras. Wetmore stated he had not seen specimens "from near Mexico City." At that time he was also not aware of an important two hundred mile extension of the range of the species northwest to Sinaloa and the filling of important gaps in our knowledge of its distribution in the Transverse Volcanic Province. 30 of the 112 specimens of the species in the Moore Collection of the Orcutt Trust come from this area and give us our first real glimpse of the performance of this northwestern group of the species. It is now fairly certain that *clarus* in its clearest manifestation does not extend north of Guerrero beyond the Rio Balsas, the birds of Mt. Tancítaro, Michoacan, just north of the Balsas, being nearer *bateli*, while those of Morelos and the southwestern portion of the state of Mexico are almost exact intergrades between *clarus* and true *belli*. We still do not have a clear picture of the distribution of *bateli* and an ade-

quate series must be obtained in the practically unknown northwestern prong of its habitat to complete it. We can be reasonably positive it breeds near the top of the Sierra Madre range above Rancho Batel, around the 7,000 foot level, for the author in early June of 1938 observed several individuals obviously under the spell of the mating season, but their secretive actions made collecting in the thick undergrowth difficult. The type had the sex organs greatly enlarged, which the author checked with Mr. Lamb. The next nearest specimen, geographically, was taken two hundred miles to the southeast at San Sebastian by Nelson and Goldman and this female, though not so clearly marked, is nearer to *bateli* than to *clarus*, and the same is true of the birds of southwestern Michoacan. But the true range of the race probably turns east through *northern*, instead of southern, Michoacan, since we find the birds of the Sierra Ozumatlan in northeastern Michoacan and of the Puerta Lengua de Vaca range in the northwestern portion of the State of Mexico—five hundred miles from the Type locality—slightly nearer to *bateli* than those of Mt. Tancitaro. Even the individuals from the mountains surrounding the Valley of Mexico are nearer to *bateli*, the real change towards *belli* coming in a group of specimens from the "Top of the Acuzingo Grade," Veracruz, southwest of Mt. Orizaba. The range of *bateli*, therefore, appears to be a long belt of some 600 miles, running southeast from Sinaloa to the District Federal.

On the contrary, the range of *Basileuterus belli belli* is a north-south one along the mountain boundary of eastern Mexico, beginning in southwestern Tamaulipas and extending south through San Luis Potosí to the great Mount Orizaba massif, thence southeast through Oaxaca to Mount Zempoaltepec in the eastern part of that state. The series of 10 adult males of the 30 winter and breeding birds from this last locality have slightly longer tails than *belli* of Veracruz, a slight approach in this one character only to *clarus*.

Since Todd (Revision of the Wood Warbler Genus *Basileuterus* and Its Allies, Proc. U. S. Nat'l. Mus., Vol. 74, Art VII, No. 2752, P. 84) has suggested a type locality for *Basileuterus belli belli* (Giraud) in terms of a large region including many zones: "Mount Orizaba, Vera Cruz," thus restricting it only to that portion of the mighty massif, which is not in Puebla, it would be desirable to restrict it more definitely to that portion of the northeastern slope of the Mount Orizaba massif near Jalapa, Veracruz. For the sake of clarity, I thus designate and restrict the type locality.

I wish to thank Messrs. Emmett R. Blake, Harold C. Hanson and Mrs. Ellen T. Smith for the loan of five specimens from Mount Tancitaro, Michoacan; Dr. Alexander Wetmore and Dr. John Aldrich for the privilege of inspecting specimens in the United States National Museum and Biological Survey collections and especially to Dr. Herbert Friedmann for checking up with me the characters of *bateli*.

The type of *bateli* has less black on the margins of the pileum than in true *belli* or *clarus*.

There is a remarkable difference in the tails of both *bateli* and *clarus* when compared with those of *belli*. They are not only longer, but noticeably broader and sturdier, these differences being very obvious when one is measuring them. The tails of these two races are almost as long as their wings, whereas in the case of the eastern bird (*belli*), the tails are much shorter than the wings, while *scitulus* and *subobscurus* lie in between. The wings of all are about the same length.

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A NEW WOODPECKER FROM MEXICO

By ROBERT T. MOORE¹

Ascents by the author in 1942 of three of the highest mountains of Mexico (Popocatepetl, Ixtaccihuatl, Toluca) and several crossings of the great range, which forms part of the boundary between the states of Michoacan and Mexico, the road itself reaching an altitude of nearly 10,000 feet, have made possible the collecting of eighteen specimens of the species, *Dendrocopos stricklandi*. This bird is a frequenter of very high altitudes. It was a common bird about our base camp on Mt. Popocatepetl at 13,000 feet near the upper limit of tree line. Sutton and Burleigh (Auk, 1942, 419) found a breeding pair on March 31st at Rio Frio on the eastern side of Mt. Ixtaccihuatl at an altitude of about 11,000 feet. That it occurs occasionally at lower stations is proved by the taking of our series of five specimens from Puerta Lengua de Vaca at approximately 9400 feet among a dense stand of firs with scattered oaks and by a female taken by Loetscher on April 4th on the mountains south of Las Vigas, Veracruz. I believe that the record given in the Catalogue of the Birds of the British Museum (Vol. 18, p. 244), of the taking of an adult female in January at Xochimilco on the floor of the Valley of Mexico is either an error or represents an individual driven down from the high mountains by an unusually cold winter, for snow sometimes falls even at the low altitude of Mexico City, 7415 feet. Neither Chester Lamb nor I have obtained it at lower localities in the strictly Transition Zone, which in Michoacan is the chief habitat of *stricklandi*'s nearest relative, *Dendrocopos arizonae fraterculus*.

Heretofore, the nominate form, *Dendrocopos stricklandi*, has been shown to range from Cofre de Perote, Veracruz, only to the mountains

¹Contribution from the California Institute of Technology, Pasadena, California.

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on the western side of the Valley of Mexico. We are dealing with two distinct forms and true *stricklandi* is confined to the eastern section of its range, namely to the Orizaba-Zempoaltepec District of the great Transverse Volcanic Biotic Province.

The birds which are found on the mountains surrounding the Valley of Mexico and thence west to the great mountain range between the states of Mexico and Michoacan, an area recently denominated the "Aztec Faunal District" of the above-mentioned Province (Trans. San Diego Soc. Nat. Hist., X, No. 12, p. 219, Map), apparently represent a new form and it is herewith described:

***Dendrocopos stricklandi aztecus* subsp. nov.**

Aztec Woodpecker

Type.—Male adult in winter plumage; number 30697, collection of Robert T. Moore; Puerta Lengua de Vaca, on the boundary line between the states of Michoacan and Mexico, 15 miles east of Zitácuaro, Michoacan, altitude about 9350 feet; Oct. 17, 1941; collected by Chester C. Lamb.

Subspecific characters.—Differs in both sexes from *Dendrocopos stricklandi stricklandi* (Malherbe) in having white portions of posterior underparts immaculate or streaked chiefly on flanks instead of densely barred on flanks and entire abdomen; streaks on lower throat narrower; dark portions of upper parts blacker (less brownish); white of anterior portion of back more extensive toward nape.

Range.—Upper Transition and Temperate Zones of the great range in the western portion of the state of Mexico; thence in somewhat intergrading form east to Mt. Ixtaccihuatl.

Measurements.—About the same as those in the nominate race.

Specimens examined.—Moore Col.—*D. s. aztecus*—Boundary between states of Michoacan and Mexico: Puerta Lengua de Vaca 2 ♂ 3 ♀ (Oct. 17-28); District Federal: Mount Popocatepetl (13,000 ft.) 3 ♂ 2 im. ♂, 3 ♀ 1 im. ♀ (May 17-27); Mt. Toluca (11,000 ft.) 2 ♂ 2 ♀ (June 10-15). *D. s. stricklandi*—Biol. Sur. Col.—2 ♂ 1 ♀ (Apr. 22, Dec. 31, Jan. 1).

Remarks.—Malherbe did not give the type locality, but it is a strong probability that the type was secured in the mountains of Veracruz and specimens have been taken on the vast Mt. Orizaba massif of that area. Therefore, the author herewith restricts the type locality of *P[icus] (Leuconotopicus) stricklandi* Malherbe to the Mt. Orizaba massif.

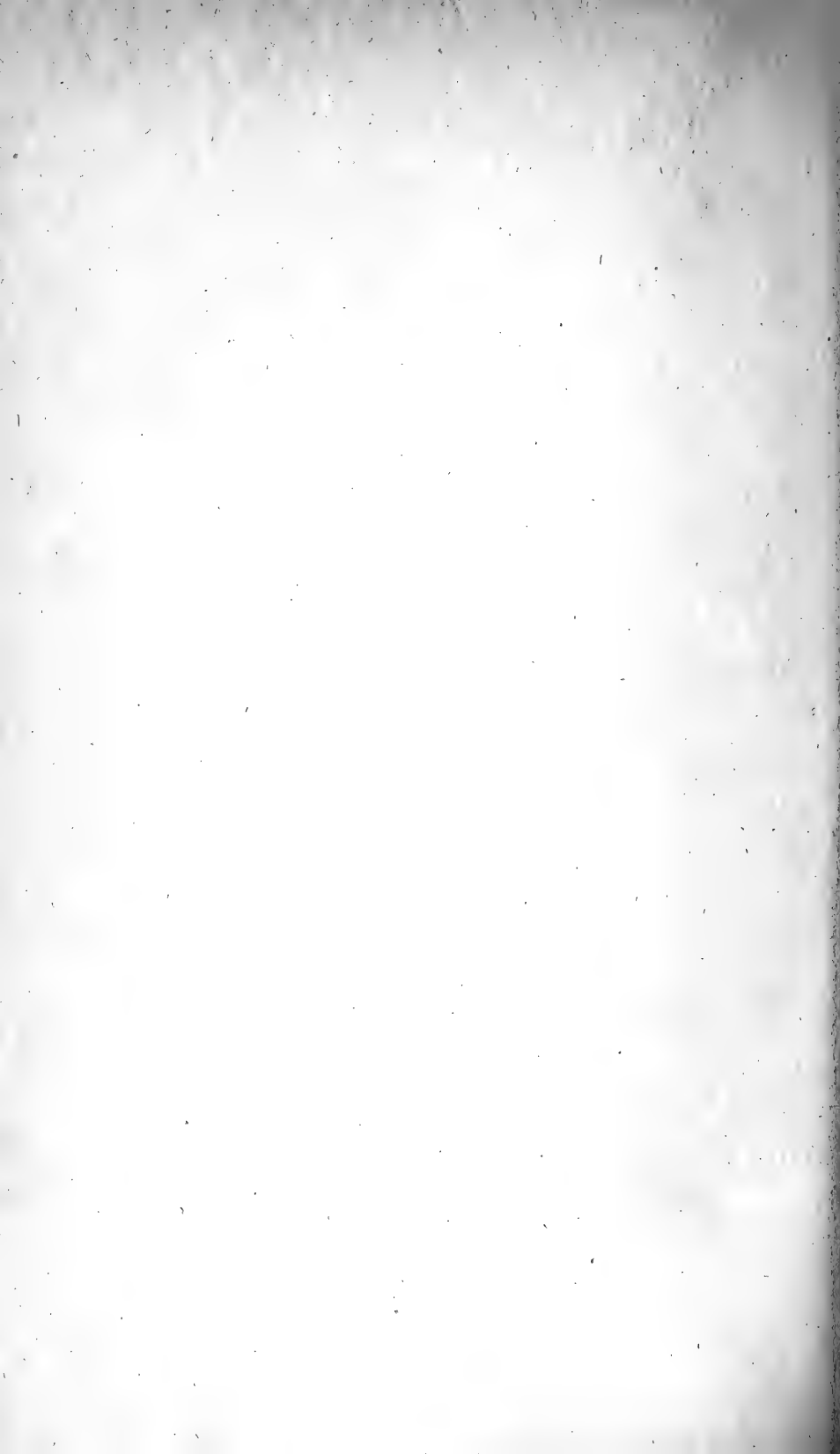
Since the now known habitat of its nearest congener, *Dendrocopos arizonae fraterculus*, has been extended by our collections southeast and east to Tzitzio, Michoacan (shown on Rand McNally's Map as Sitzio), only 50 miles west of the type locality of *aztecus*, it is alluring to think of the two forms as possibly conspecific. However, these most eastern specimens show no approach whatever to *stricklandi* and the well-marked differences in pattern negative such an amalgamation.

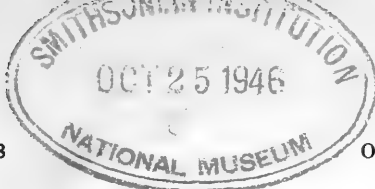
Aztecus expresses itself in its truest form in the mountains of the western portion of the state of Mexico and the series of five specimens

from these mountains have one character much more pronounced than any of the specimens from farther east, namely: the extension of white on the anterior back much more prominent and in addition a second character, not previously mentioned, the nasal tufts, point of chin and anterior forehead conspicuously Tawny-Olive.

There may be an additional important character, which appears in all specimens of the topotypical series from Puerta Lengua de Vaca, namely, the apical quarter of the three outer pair of rectrices is Apricot-Orange instead of merely buffy brown as in some specimens of true *stricklandi*, as well as in some intergrades from the mountains surrounding the Valley of Mexico. This is not believed to be stain, because all the feathers of the Puerta Lengua de Vaca birds are freshly molted.

Although true *stricklandi* generally seems to be found as a breeding bird in pure stands of evergreens, chiefly pines, the Puerta Lengua de Vaca series of *aztecus* was taken at a somewhat lower altitude around 9400 feet, where oaks occur occasionally among the firs and some of the individuals were actually collected as they foraged on oak trees.





PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON THE DISTRIBUTION OF THE CHIPMUNKS
(*EUTAMIAS*) IN SOUTHERN BRITISH COLUMBIA
AND THE ROCKY MOUNTAIN REGION OF SOUTHERN
ALBERTA WITH DESCRIPTIONS OF TWO NEW
RACES

BY I. McT. COWAN

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A critical examination of the specimens of chipmunks in the collection of the Museum of Zoology at the University of British Columbia, and the B. C. Provincial Museum, makes it evident that the existing concepts of the distribution of certain species and races of *Eutamias* in southern British Columbia and western Alberta require revision.

In the course of the present study many specimens have been loaned to me from the National Museum of Canada through the kindness of Dr. R. M. Anderson; others have been borrowed from the U. S. Fish and Wildlife Service collection, through Dr. H. H. T. Jackson; from the Kenneth Racey collection, Vancouver; and from E. S. Booth of Walla Walla, Washington. Grateful acknowledgment is made of this assistance.

The genus *Eutamias* is represented in western Canada by four species: *Eutamias amoenus*, *Eutamias minimus*, *Eutamias ruficaudus*, and *Eutamias townsendii*. Certain phases of the distribution of the first three of these have been studied in connection with this paper.

Eutamias townsendii (Bachman) is represented by two races in extreme southwestern British Columbia, a region not dealt with in the present study. *Eutamias amoenus felix* (Rhoads) occupies a slightly wider range in the same general region, while *Eutamias minimus caniceps* (Osgood) occurs in extreme northwestern British Columbia. Both races occupy ranges outside the region dealt with in this paper.

Eutamias amoenus:—The species *Eutamias amoenus* ranges over practically the entire southern half of British Columbia from the Rocky Mountains to the beaches of the Pacific Coast and north to the region between the 54th and 55th parallels of north latitude. It occurs also in parts of the Rocky Mountains of western Alberta but its distribution there makes it plain that the species had its origin west of the Rockies and has pene-

trated onto the east slope to a very limited degree by way of the low passes. As will be discussed further later in this paper the two geographic races inhabiting the Rocky Mountains of Alberta do not occupy contiguous territory but are separated by 100 miles or more of mountains in which no chipmunks of the *amoenus* group are known to occur.

Eutamias amoenus luteiventris (Allen)

This race occupies a very wide range in southeastern and south-central British Columbia and southwestern Alberta. Over much of this region it is the only chipmunk present but at various places it occupies the same general terrain as one or more other species of chipmunks. Where this occurs there is frequently an ecological separation that for the most part prevents interspecific competition.

In the Waterton Lakes region of southwestern Alberta this race is in co-occupancy with *Eutamias ruficaudus* and *Eutamias minimus oreocetes* and here the ecological separation is most apparent. *Luteiventris* inhabits the aspen parkland type of environment to the exclusion of the other two species. It is thus the only chipmunk seen at lake level at 4,000 feet elevation. Where, as on the east slope of Sofa Mountain, there is continuous parkland environment from the prairie edge to timberline *luteiventris* is found up to timberline and in close proximity to *minimus*.

Farther north on the east slope of the Rockies, at the level of Banff, Alberta, *luteiventris* is more local in its distribution. It is found in fair numbers at the base of Mt. Rundle, along the lower reaches of Brewster Creek and Redearth Creek, and on Mt. Inglesmaldie, all but the last, localities on the south side of the Bow Valley and at elevations between 4,500 and 5,000 feet. It has not been seen at or near timberline, nor anywhere north of the Bow Valley, though it seems probable that it does occur at lower levels along the lower reaches of some of the streams tributary to the Bow from the north.

None was seen on the Panther, Red Deer, Clearwater or Saskatchewan rivers in the northern part of Banff Park. The race is, however, widely distributed on the western slope of the Rockies. In Kootenay and Yoho Parks, B.C., it was the only chipmunk taken, but *minimus* certainly occurs at and near timberline where these two parks have a common boundary with Banff Park, as the latter species has been seen and taken just on the Alberta side of the Interprovincial Boundary. It was found abundantly at Mt. Assiniboine on the British Columbia side of the Rockies just south of Kootenay Park (Crowe, 1943: 399).

The northernmost locality record for *luteiventris* on the west slope of the Rockies is Kinbasket Lake, B. C.

From this Rocky Mountain area of distribution the race extends westward through the mountains of southern British Columbia to the North Thompson River near Kamloops and to the Monashee Range on the east side of the Okanagan Valley. In the latter region intergradation with *Eutamias amoenus affinis* takes place.

Material from southern British Columbia is inadequate to give a clear

picture of the nature of the distribution of *luteiventris* and of *affinis* where these two meet. In certain places there is an indication of altitudinal separation with *luteiventris* occupying the higher zones and *affinis* the valley bottoms. In other places all levels seem to be occupied by a population of intergrades.

In a few localities large rivers seem to serve as barriers to chipmunk distribution. In the vicinity of Kamloops the South Thompson River, flowing in an east-west direction, is joined from the north by the North Thompson River. In the northeast angle of this junction the chipmunk population is intermediate between *affinis* and *luteiventris* but closer to the latter, while west of the North Thompson and south of the South Thompson the chipmunks are typical of *affinis*.

At Newgate, B.C. the Kootenay River appears to have some barrier effect. Here in 1930 there was a readily discernible difference in the populations on either side of the river. Chipmunks collected on the east side are referable to *luteiventris* and differ most obviously from those across the river in having buff bellies, upper sides of the feet ochraceous and the tail edged with buff, as compared with the white bellies, pale yellowish feet and white-margined tails of the chipmunks from the west side of the river. This west-side population is apparently intermediate between *luteiventris* and *canicaudus*. The results of such intermediacy are closely similar to the characters of *affinis*, and Cranbrook specimens, which appear to me to fall into the same category, were so identified by Howell (1929:73). However the tails of these intermediates are even paler ventrally and more obviously margined with white than the mean of *affinis*. *Canicaudus* is a larger, longer-tailed race than *luteiventris* but the Newgate specimens are not intermediate as regards dimensions. In this respect they are not significantly different from the condition in the smaller race.

At Newgate there were no discernible differences in the environments offered by the opposing sides of the river.

At another point in southwestern British Columbia a river apparently separates chipmunk populations. Dr. R. M. Anderson writes me that a National Museum of Canada field party collecting on the west side of the Kootenay River took *E. amoenus luteiventris* and *E. ruficaudus simulans*, while Maillard (1932:289) took only *E. a. affinis* (cited by him as *E. r. simulans*) (Anderson 1934) on the east side of the river.

Specimens of *luteiventris* examined 53: Alberta: Waterton Lake 6, Brewster Creek 5, Healy Creek 6, Mount Inglesmaldie 1, Mount Rundle 2, 15 miles up Spray River 1, Marvel Lake 1. British Columbia: Vermilion Crossing 1; Kootenay Crossing 1, Radium Hot Springs 1, Sherbrooke Lake near Field 2, Crow's Nest Pass 2, 19 miles w. of Invermere 1, Kinbasket Lake 1, Newgate 5, Phoenix 1, Revelstoke 10, Monashee Pass 4, Rayleigh 2.

Specimens of *affinis* examined, 47 all from British Columbia: Midway 1, Anarchist Mountain 10, Hedley 6, Ashnola Creek 4, Fairview-Keremeos summit 4, Salmon Arm 2, Kamloops 10, Black Pines 2, Wentworth Lake 2, Princeton 1, Clinton 1, Lytton 2, Pavilion 2.

Eutamias amoenus ludibundus (Hollister)

As mentioned earlier, there exists, between the northernmost known locality of *luteiventris* on the Alberta side of the Rocky Mountains and the southernmost locality inhabited by *ludibundus* in that province, a hundred-mile stretch of terrain in which *amoenus* chipmunks are not known to occur. Many chipmunks have been examined closely in the field in this region and some collected, but all have been *minimus*.

The Jasper population of *ludibundus* is at the eastern end of Yellowhead Pass; the Bow Valley *luteiventris* at the eastern entrance to Kickinghorse Pass. There are no low passes between the two.

E. a. ludibundus in the Athabasca valley near Jasper, Alberta, inhabits rockslides and rock cliffs close to the valley floor (3,500 ft.) and altitudinally above the main range of *minimus* at that latitude. Both, however, have been taken in the same rockslides on a few occasions. *Ludibundus* ranges to timberline but does so rarely in the Jasper region.

In the heavily wooded mountainous terrain, extending from the west slope of the Rockies in the vicinity of Robson to the valley of the Fraser River near Quesnel and south through the eastern Cariboo district to Canim Lake, *ludibundus* is the only chipmunk.

Specimens of *ludibundus* examined, 59: Alberta: Jasper and vicinity (Astoria Creek and Portal Creek) 19, Tonquin Valley 1. British Columbia: Moose Lake 5, Indianpoint Lake near Barkerville 8, Quesnel 1, Canim Lake 3, Lac La Hache 5, and Horse Lake 17.

The great plateau area constituting the western Cariboo and Chilcotin districts, together with the western mountain ranges, is apparently inhabited by a clearly differential race of *Eutamias amoenus* for which there is no name available. This newly recognized geographic race is named and described below.

Eutamias amoenus septentrionalis subsp. nov.

Type: Female adult, number 1648 British Columbia Provincial Museum, taken July 24, 1938 at Ootsa Lake P.O., on the north shore of Ootsa Lake, B.C., by I. McT. Cowan. Original number 839.

Distribution: West-central British Columbia west of the Fraser River, north at least to Babine Lake, south at least to Chezacut Lake and west to the sea coast at the heads of certain inlets.

Diagnosis: A large bodied, relatively short-tailed race of *Eutamias amoenus*.

In summer pelage all dark stripes black, with a reddish brown wash over their anterior ends to a slight degree on the middle stripe, and a progressively greater degree on the lateral stripes; inner light stripes reddish brown anteriorly, paler on lower back; outer light stripes white with faint reddish brown wash; sides between Cinnamon and Tawny (capitalized color terms are from Ridgway "Color Standards and Nomenclature"); a wash of the same color over shoulders and part way down back as mentioned above; rump between Drab and Grayish Olive; under side of tail between Pinkish Cinnamon and Cinnamon Buff; underparts white.

In worn winter pelage all dark stripes broad and black without tipping; inner light stripes brownish gray, outer white; rump between Light Grayish Olive and Drab; under side of tail between Pinkish Buff and Cinnamon Buff; sides of body pale, nearest Cinnamon Buff.

Comparisons: Most nearly like *E.a. affinis*, from which it differs as follows: In worn winter pelage darker throughout with all 5 stripes black instead of outermost stripes with pronounced brownish wash. Inner light stripes brownish gray, rather than clear gray. Rump brownish rather than grayish; shoulders and flanks more brightly coloured.

Mid-summer juvenals of *septentrionalis* as compared with those of *affinis* are duller in general body color with a dull brownish wash across the shoulders, darker median light stripes, darker sides and with color of sides extending farther onto thighs; rump with an ochraceous tinge rather than clear gray.

From *ludibundus*, the only other race with contiguous range, *septentrionalis* is readily separable on the basis of color of undersurface of tail. This is usually rich tawny in *ludibundus*, almost as it is in *rusticaudus*, while in *septentrionalis* it is paler, as described above. In winter pelage *septentrionalis* differs from *ludibundus* in having the dark stripes broader and darker, the sides paler, and the upper surface and rump more grayish. *Septentrionalis* also differs from *ludibundus* in having a longer body while tail length remains the same. Mean and extreme measurements in a series of 18 specimens, 9 ♂♂ and 9 ♀♀, from Jasper Park, Alberta, are: body length 117 ± 1.30 , (109-127); tail 95 ± 1.90 , (86-104); while corresponding measurements for 15 *septentrionalis*, 10 ♂♂ and 5 ♀♀, are: 123 ± 1.20 , (114-130); tail 95 ± 1.84 , (89-100). The difference in body length has been subjected to statistical test for probability and has a value of $P =$ less than .01 and can therefore be regarded as significant.

Skull: Not differing in general dimensions from those of *affinis* and *ludibundus* but usually separable from the latter on the basis of dorsal outline of cranium. In *ludibundus* the anterior part of the cranium is swollen to produce, between the supra-orbital processes, a prominent bulge on the dorsal outline, or an angle on the even contour of this line. In *septentrionalis* the high point on the dorsal surface is farther back, at the fronto-parietal suture. The condition in *affinis* is approximately intermediate.

Specimens examined 31: Ootsa Lake 6, Western end of Eutsuk Lake, 1; Chezacut Lake, 10; Itcha Mountains, 1; Babine Lake, 1; Puntchesakut Lake, 3; Nulki Lake, 6; Rocher Deboule, 1; and Lonesome Lake, 2. The National Museum of Canada specimens from Kimsquit, Stue, Caribou Mts., and Rainbow Mts. were examined in February, 1944, and identified as belonging to the race here described but were not re-examined during the preparation of the description of this race.

Remarks: Specimens now referred to this race have been examined by other students of mammalian systematics and identified variously. For instance Howell examined the Chezacut specimens and their labels bear his determination of them as *affinis*. Later Anderson and Rand reported upon the Kimsquit and other specimens from the coastal

region (op. cit.) and while noting the paler ventral surface of the tail, regarded them as representing the race *ludibundus*. Further study has revealed other characters serving to identify this population of *amoenus* chipmunks from the great central plateau region of British Columbia and from the western mountains as distinct from the other described forms. No specimens have been seen from the area in which *septentrionalis* would be expected to intergrade with *ludibundus* but it seems certain that intergradation does take place. The Chezacut specimens show a slight approach toward *affinis*, particularly in the restriction of the reddish dorsal wash on the shoulders and dorsum so characteristic of *septentrionalis*.

Eutamias minimus.—*Eutamias minimus* is known to inhabit the greater part of British Columbia north of the 55th parallel of latitude as well as the length of the Rocky Mountain Range of Alberta south to the International Boundary. *Eutamias minimus caniceps* (Osgood) is the race occupying the extreme northwesterly part of British Columbia east of the Coast Range and south as far as Telegraph Creek. *Eutamias minimus oreocetes* Howell is found at high altitudes in the extreme southern end of the Canadian Rockies. As yet no specimens have been taken in British Columbia in the Waterton Lakes Park area but the author has seen chipmunks of this species within two miles of the Alberta-B.C. boundary and there is no ecological barrier to prevent them ranging across. This they undoubtedly do. The intervening area, between the ranges of the two races mentioned above, is inhabited by *E. m. borealis* Allen.

There is a noteworthy change in the ecological distribution of the *minimus* chipmunks in the Rocky Mountains between the 49th and 54th parallels of latitude. In the Waterton Lakes area of southwestern Alberta *oreocetes* is a very scarce mammal and is confined exclusively to the most intensely insulated mountain slopes above timberline where fairly coarse broken rock is strewn on slopes that support sparse stands of weeds and grasses.

At the latitude of Banff, Alberta (approx. 51°) *E. minimus* is distributed from alplands to valley floor—that is, at elevations from 7,800 ft. to 4,500 ft. Preference, however, seems to be for the partially wooded or brush-covered areas, and for burns in early stages of forest regeneration at intermediate elevations.

In the vicinity of Jasper, Alberta, (latitude 53°) *Eutamias minimus* is an inhabitant of the lower elevations in the more easterly areas of the Rockies. It extends west to Jasper but not beyond, and it is not found at timberline on the mountains of the main divide at least.

In the Peace River district of British Columbia at latitude 56° it was found to be an inhabitant of the aspen parkland floral type at an altitude of 1,500 feet.

Comparisons of series of specimens from various points on the latitudinal distribution of *E. m. borealis* reveals that there is a cline in total length and tail length measurements (table I) with the more northerly populations having greater body size and longer tail than the southern populations. For this reason external measurements do

not serve as reliable criteria for delimiting the ranges of *borealis* and *oreocetes* in the area where these two races meet.

Specimens examined from the Rocky Mountain region as far south as the Bow Valley at Banff have the color characteristics of *borealis*. This was mentioned by Anderson and Rand (op. cit.) who found themselves in disagreement with Crowe's (op. cit.) assignment of Banff specimens to *oreocetes*. I have not seen Crowe's series, which was preponderantly from the timberline region and it may be that the timberline populations from the ranges south of the Bow Valley have the color characteristics of *oreocetes*, but the change would be an unexpectedly abrupt one if this were the case.

In 1944 Carl and Hardy (1945: c 33) discovered *Eutamias minimus* in the Selkirk Mountain range 19 miles west of Invermere. Here the species was occupying a timberline habitat and was not found below such elevations. Fairly intensive studies of the mammals of the Selkirk Range in the vicinity of Revelstoke (Cowan and Munro 1945) and of Glacier (Munro mss.) failed to discover this chipmunk there. It can be assumed then that the population of the southeastern Selkirks is an isolated one, separated from the timberline populations of the Rockies by the full width of the Rocky Mountain trench and without more northern connection with the main range of the species.

The original collections made by Carl included but two specimens of *E. minimus* both juveniles, but in August 1945 the author took three additional specimens, an adult pair and a juvenile. These five specimens reveal that the Selkirk population possesses characteristics distinguishing it from both *borealis* and *oreocetes* and it is here named and described as—

Eutamias minimus selkirki ssp. nov.

Type: Adult female, skin and skull, Museum of Zoology, University of British Columbia number 1551, taken August 28, 1945, at Paradise Mine near Toby Creek, 19 miles west of Invermere, B. C. by I. McT. Cowan.

Diagnosis: A small pale race of *minimus* resembling *oreocetes* in external dimensions and in size and proportions of skull. In August pelage median dark stripe black; second dark stripes brown on anterior half black on posterior half; outer dark stripes brown. Inner light stripes heavily overlaid with gray and brown; outer light stripes white washed with gray on rump. Dark facial stripes extending to nostrils. Ear black anteriorly, white posteriorly; post-auricular patch grayish white. Crown hair Brown (capitalized color terms are from Ridgway, "Color Standards and Nomenclature"); sides nearest Cinnamon Buff; rump between Mouse Gray and Deep Mouse Gray; under-surface of tail between Pinkish Cinnamon and Cinnamon Buff; tail edged with Pinkish Buff; upper surface of front feet whitish, of hind feet gray.

Comparisons: *E. m. selkirki* is most like *E.M. oreocetes* but differs from that race in darker body color; rump and hind legs in August specimens gray rather than grayish with a yellowish brown wash; dorsal surface of shoulders and back with duller brown hair-tipping; dorsal

surface of tail darker in comparable specimens; facial stripes darker and more extensive; crown darker and more grayish rather than brownish in tone.

Measurements: Measurements of the adult male and female are respectively: total length 189 mm., 204 mm.; tail 85, 91; hind foot 32, 34; greatest length of cranium 31.6, 31.7; basilar length of Hensel 23.8, 24.2; zygomatic width 17.4, 18.2; least interorbital width 7.7, 7.7; width of brain case 15.7, 15.8; length of upper molar row 5.3, 5.5; length of nasals 9.0, 9.5.

Distribution: Known only from the vicinity of the type locality.

Remarks: *E. m. selkirki* in the sum of its characteristics approaches closer to *oreocetes* than it does to *borealis*. From the latter race it differs in having a shorter tail; upper surfaces of feet whitish, rather than distinctly brownish; median dark stripe narrower; and general body color brighter and less brownish.

Specimens examined: 5, all from the type locality.

Eutamias ruficaudus:—This species is represented in the region under discussion by the races *E. r. simulans* Howell, recorded from Nelson by Anderson and Rand (1943) and from Invermere, B.C. by Crowe (1943) and *E. r. ruficaudus* Howell. The latter race is a fairly abundant inhabitant of the upper rim of the spruce forests in the vicinity of Waterton Lakes Park, Alberta, and Akamina Pass, B.C. Anderson and Rand (1943:135) record a specimen from Portal Creek, Jasper Park, Alta., as referable to this race, thus extending the known range of the race north from 49°50' to 53° north latitude. No other specimens of *ruficaudus* have been taken in the region between Waterton Lake and Jasper despite a considerable amount of careful biological work extending over many years.

Dr. Anderson has very kindly loaned me the specimen in question, male, number 16033, National Museum of Canada. In body color it resembles summer specimens of *ruficaudus* closely, but in summation of characters is clearly referable to *Eutamias amoenus ludibundus*. The brilliant under-tail color of this race closely resembles that of *ruficaudus* and in the specimen in question is perfectly matched by certain topotypes of *ludibundus* collected by Hollister (1911) and used as a basis for the original description of this race. The external measurements 211, 92, 31, while considerably less than the minimum measurements of topotypical *ruficaudus* given by Howell (1929:96) are within the limits of variation for that species as it occurs in Waterton Lakes Park except as regards length of hind foot. All *ruficaudus* measurements available indicate a hind foot in excess of 32 mm. long, and averaging in excess of 34 mm. As regards cranial dimensions the Jasper specimen is below the minimum for *ruficaudus* in almost every respect and below the mean of *ludibundus* in all measured features. (See table II.)

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TABLE I
External measurements of *Eutamias minimus* populations from northern British Columbia to northern Montana.

	—Total Length—			—Tail—			—Hind Foot—		
	N.	Mean	Extremes	Mean	Extremes	Mean	Extremes	Mean	Extremes
Peace River, B.C.	7	217	209-227	100	93-108	32.5	31-34		
Jasper, Alta.	9	210	198-218	95	90-100	32	30-33.5		
Banff, Alta.	17	198	193-211	88	81-94	32	29-34		
Waterton-Glacier	4	195	185-201	85	82-90	32	31-34		

TABLE II
Comparison of cranial measurements of *E. r. ruficaudus* and *E. a. ludibundus*.

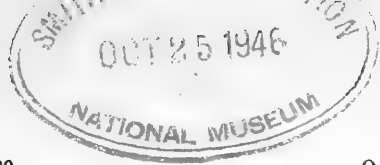
	N	Greatest Length	Zygomatic Width	Cranial Width	Interorbital Width	Length of Nasals
<i>Eutamias r. ruficaudus</i> *	20	35.2(34.0-36.2)	19.5(19.0-20.3)	15.3(14.5-15.8)	8.0(7.5-8.8)	11.2(9.6-11.9)
<i>Eutamias a. ludibundus</i>	12	33.9(33-34.4)	19.0(18.4-19.5)	15.0(14.3-15.6)	7.6(7.4-7.8)	10.9(10.1-11.4)
N.M.C. spec. No. 16033		33.9	18.6	14.7	7.3	10.7

*In part from Howell, 1929.

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PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW BUTTERFLIES FROM THE ADMIRALTY
ISLANDS¹

BY AUSTIN H. CLARK

Messrs. Warren H. Wagner, Jr., and David F. Grether in the course of a number of visits to the Admiralty Islands in 1944 and 1945 made extensive collections of the local butterflies on Manus, Los Negros, and Lou Islands. There are no published records of any species from either Los Negros or Lou.

Among the rather numerous additions to the known butterfly fauna of the Admiralty Islands are the two interesting local races the descriptions of which follow. Both will be figured in the report on the butterflies of the Admiralties soon to be published by Messrs. Wagner and Grether.

***Hypolimnas antilope wagneri*, subsp. nov.**

Description: This subspecies resembles *H. a. antilope*, but the fore wings have a broad light brownish patch 4-6 mm. wide contrasting with the darker brown general ground color which extends from just beyond the middle of the costal border to the middle of the outer border; the hind wings have a broad light border shading into the darker base; fore wings 31-36 mm. long.

Type: No. 57958 U. S. National Museum, male, from Los Negros, Admiralty Islands, collected by W. H. Wagner, Jr., and D. F. Grether on November 16, 1944. In addition to the holotype there are two male cotypes, one from Los Negros, November 11, 1945, and one from the Drangot River, Manus, November 14, 1945.

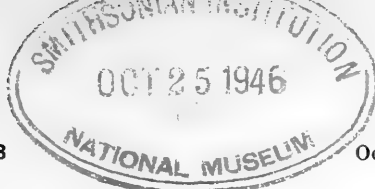
***Hypolimnas pithoea gretheri*, subsp. nov.**

Description: This subspecies resembles *H. p. unicolor* from the Solomon Islands but is much darker—blackish; there is a submarginal row of white dots on both wings, one in each interspace, the dots on the fore wings being slightly larger than those on the hind wings, the most anterior the largest; fore wings 41-42 mm. long.

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Type: No. 57959 U. S. National Museum, male, from Lou Island, Admiralty Islands, collected by W. H. Wagner, Jr., and D. F. Grether on November 16, 1945. In addition to the holotype there is a male cotype taken at the same place on the same date.

Note: For comparison with this new subspecies there is available in the National Museum a long series of *H. p. unicolor* from Lunga, Guadalcanal, collected and presented by James Paul Burke, and a single specimen from Kukum Ridge, Guadalcanal, collected by W. H. Wagner, Jr., and J. W. Perry on June 8, 1945.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW GENERA OF ELEOTRIDAE AND GOBIIDAE
AND ONE NEW SPECIES FROM WEST AFRICA

BY ALBERT W. C. T. HERRE

The fishes of West Africa are but little known. Any material from there is particularly welcome for the light it throws on geographical distribution, and for the help it affords in the better elucidation of the genera and species occurring in that region.

The Rev. A. I. Good, stationed in Cameroon, has earned the thanks of all who are interested in the study of fishes. From the considerable collection of marine and fresh-water fishes obtained by the Rev. Good, the eleotrids and gobies have been turned over to me for study.

Boulenger placed all eleotrids in the genus *Eleotris*, and nearly all gobies in the genus *Gobius*. This is an easy and simple method of disposing of troublesome fishes, but it results finally in having a hodgepodge of divergent and unrelated species spilled into a catch-all genus. In the present paper several genera are proposed and defined, in order to free the genera *Eleotris* and *Gobius* from species that cannot fit into them.

ELEOTRIDAE

Batanga Herre, new genus

Head and body laterally compressed, strongly so posteriorly. Scales ctenoid, except part of those on head; under a compound microscope the opercular scales and part of those before the dorsal are ctenoid; the preopercular scales and those on top of the head are cycloid. Head much deeper than broad. Mouth moderate, teeth in both jaws in villiform bands; the teeth in the outer row in both the upper and lower jaws are longer, very slender, and movable, becoming conspicuous in large old specimens. No canines, no palatal teeth, and no preopercular spine. The free tip of the tongue is truncate to emarginate.

Scales in longitudinal series 28 to 32, extending before the first dorsal through the interorbital space. Dorsals close together, VII—VIII—I—8 or 9; anal I—9. The second dorsal and anal both high, longer than the head, and extending on the caudal when depressed. The rounded caudal is also longer than the head.

Anal papilla large, flat, elliptical or somewhat pointed; a few large

old specimens (males?) have it very broad and relatively short, the wide free end fimbriate.

Batanga is distinguished by its shape, scalation, dentition, and vertical fins.

Type, *Batanga lebretoni* (Steindachner). Only known on the west coast of Africa.

Bataanga lebretoni (Steindachner)

Dorsal VII—VIII—I—8 or 9; anal I—9; scales in longitudinal series 28-32, plus 4 small ones on the caudal base; transverse series 10 or 9; predorsal scales 18-22.

Depth 3.9 to 4.3 in the length; the head and rounded caudal are equal or nearly so, 3.2 to 3.4 in the length; the eye is lateral, 4 to 4.33 in the head. The mouth is moderate, the lower jaw slightly or not at all projecting, the maxillary not reaching the eye. The first dorsal extends upon the second dorsal when depressed; the three posterior second dorsal rays are much elongated, extending to or upon the caudal base; the ultimate and penultimate anal rays are elongate, reaching or nearly reaching the caudal.

The color is brown, with a longitudinal band of black vertical bars along the side; some specimens have one, two, or three rows of black spots above this; behind and above the upper angle of the gill opening, and extending downward on the pectoral base, is a large black spot; four dusky stripes radiate backward from the eye; a series of blackish bands across the back, often much obscured; dorsals and caudal with numerous transverse rows of dark brown spots, the anal uniform brown; ventral more or less brown with the central rays more or less black; pectoral colorless. Juvenile specimens have the anal nearly colorless, with 3 brown longitudinal streaks; the ventral and pectorals colorless.

10 specimens, 37-44 mm. in length, from the Nkao, a very small brackish stream flowing into the sea at Batanga.

15 specimens, 36-62 mm. in length, from a small stream flowing into the ocean at Kribi.

A specimen, 37 mm. long, from a small stream at Moode.

Eleotris monteiri O'Shaughnessy

2 specimens, 74 and 83 mm. in length, from a small brackish stream, Mbode, on coast 10 miles south of Batanga.

3 specimens, 36-44 mm. in length, from the Nkao, a very small brackish stream emptying into the sea at Batanga.

1 specimen, 62 mm. in length, from a small stream emptying into the sea north of Kribi.

Eleotris vittata Dumeril

3 specimens, 40-115 in length, from the Nkao, a very small brackish stream emptying into the sea at Batanga.

2 specimens, 39 and 42 mm. in length, Dihane, on the Edea-Kribi road, 20 miles from Kribi, and 15 miles from the sea.

1 specimen, 43 mm. long, from Ebunga, on the coast 6 miles south of Batanga.

6 specimens, 65-93 mm. in length, from a small stream at Kribi.

4 specimens, 57 to 87 mm. in length, from the Bivusé, a small stream flowing into the sea, between Kribi and Lobé rivers.

Hanno Herre, new genus

The stout, somewhat elongate body is little compressed, low, the dorsal profile horizontal, the head broad with depressed snout, the caudal peduncle strongly compressed.

Dorsals—VI—I—9, close together; anal I—8; vertical fins low; caudal rounded, shorter than the head. Scales cycloid, small, becoming very small anteriorly, 75-90 in longitudinal series and 33-35 in a transverse series; predorsal scales 52-55, extending to snout; scales on opercle and preopercle, and extending well out on caudal and pectoral fins. Mouth large, maxillary extending beneath middle of the eye or beyond; lips thick, with double row of fimbriate papillae concealing the outer teeth; upper jaw with 5, the lower with 4 rows of teeth, those of the outer and inner rows in both jaws slightly enlarged; no palatal teeth, no canines, and no preopercular spine. Under the lower jaw is a groove containing a series of groups of papillae, a feature not observed in any other eleotrid or gobioid fishes. Numerous transverse and longitudinal rows of sensory papillae on the preopercle and opercle. Ventrals rather narrow, well separated, shorter than the broad, rounded pectorals. A black ocellus above on the basal part of the caudal fin.

The type is *Hanno africanus* (Steindachner). This fish, described as an *Eleotris* and listed as such by various authors following Steindachner, is manifestly not a member of the genus *Eleotris*.

Hanno, in honor of the great Carthaginian who circumnavigated Africa more than 2,500 years ago.

Hanno africanus (Steindachner)

2 specimens, 68 and 84 mm. in length, from a small stream flowing into the sea at Kribi.

1 specimen 132 mm. long, from Londji.

Kribia Herre, new genus

Body cylindrical to slightly compressed, the head broad, with projecting lower jaw. The maxillary extends beneath the anterior part or middle of eye, the large mouth strongly oblique; bands of very small teeth in both jaws; no canines and no palatal teeth. The free tip of the tongue is broad and rounded. No preopercular spine.

32 to 35 ctenoid scales in longitudinal, 12 in transverse series; predorsal scales cycloid. The opercles covered with very small cycloid scales, the rest of the head naked. Ridges of sensory papillae on the cheeks and top of the head.

Dorsals VI—I—8 (9), close together; anal I—7, opposite second dorsal; vertical fins of moderate height; caudal rounded, shorter than head. Ventrals narrow, wide apart. The thin flat anal papillae has the tip broadly rounded. The gill opening is moderate, extending forward beneath the posterior part of the preopercle.

The type of the genus is *Kribia kribensis* (Boulenger), first collected from the Kribi River. Only known from Cameroon.

Kribia kribensis (Boulanger)

Dorsal VI—I—8; anal I—7; 32-35 etenoid scales in longitudinal, 12 in transverse series; 10-14 cycloid predorsal scales, extending to a point above the opercles.

The dorsal and ventral profiles are very slightly curved, the depth 4.7 to 5, the broad head 3. to 3.2, the rounded caudal about 4 times in the length. The broad rounded snout equals the eye; the interorbital is noticeably wider than the eye. The breadth of the head is two-thirds of its length. The second dorsal and anal do not reach the caudal when depressed. The broad pectoral $\frac{3}{4}$ to $\frac{5}{6}$ of the length of the head, or 3.65 to 3.73 times in the length, and longer than the narrow, widely separated ventrals.

The color in alcohol is dusky brown; some specimens with narrow transverse pale lines which separate 5 or 6 poorly defined dark crossbands; a black crossband on the caudal base. Vertical fins black or blackish, and more or less white-edged. Caudal dark brown, with traces of pale crossbands. Pectorals and ventrals more or less suffused with pale brown and specked with darker.

Described from 4 male specimens, 33 to 37 mm. in length, from the Lobé river, Mabenanga, Batanga. A juvenile specimen, 27 mm. long, was taken from the Mvas river, a tributary of the Ntem river, Campo.

GOBIIDAE

Ebomegobius-Herre, new genus

Body naked, moderately plump, compressed posteriorly. The head moderate, the oblique mouth large with projecting lower jaw, the maxillary extending to beneath the middle of the eye, or below its hind margin; teeth small, uniform, in bands in both jaws. Eyes small, very close together, dorso-lateral, equal to the rather broad snout. Tongue narrow, its free tip more or less emarginate or bilobed. Gill openings very wide, extending forward to beneath the hind margin of the eye.

Dorsal VI—I—11-14; anal I—11-14. Pectorals broad, rather short; ventrals long, with delicate and easily torn frenum; the round pointed caudal much shorter than the head.

Type *Ebomegobius goodi* Herre, new species. Name derived from a small stream, the Ebomé, where the specimen was caught.

Ebomegobius goodi Herre, new species

Dorsal VI—1-12; anal I—13. Body with protuberant belly, the posterior half of the body laterally compressed. The depth equals the caudal, 4.37, the head 3.18 times in the length. The eyes are high up, their inner margins touching, equal to the snout in length, 7.33 times in the head. The mouth is large, oblique, the prominent maxillary extending beneath the hind margin of the eye, 2.29 times in the head. The upper jaw has 4 rows, the lower jaw 3 rows of small uniform teeth. The vertical fins are low and do not touch the caudal base when depressed, nor does the first dorsal extend to the second dorsal. The first dorsal and anal are about equal in height, 3.14 times, the second dorsal 2.75 times in the head. Pectorals rather short, 5.8, the large ventrals 4.1 times in the length. The anal papilla is tongue-like in shape.

The color in alcohol is uniform reddish brown, sprinkled with minute black dots, which are coarsest on top of the head and about the dorsal fins; all the fins are clear brown, more or less lightly sprinkled with blackish dots; on the first dorsal is a black vertical band between the fourth and fifth spines.

Here described from the type and only specimen, 35 mm. long. It was taken by A. I. Good from the Ebomé, a small brackish stream at Kribi. Type in Natural History Museum of Stanford University.

Named for A. I. Good, missionary and ardent collector of West African fishes.

Bathygobius fuscus (Rüppell)

22 specimens, 29-65 mm. in length, from the Ebunja river in brackish water, at Ebunja, on the coast 6 miles south of Batanga.

2 specimens, 45-48 mm. in length, from the mouth of the Kribi river, Kribi.

8 specimens, 40-75 mm. in length, from the Ebomé, near Kribi.

3 specimens, 39-55 mm. in length, from brackish water, Bwanjo river, Bwanjo.

Chonophorus guineensis (Peters)

11 specimens, 55-75 mm. in length, from the Nkao, a very small brackish stream at Batanga.

7 specimens, 45-116 mm., from the Mbode, 10 miles south of Batanga.

One specimen, 110 mm. long, from the Bilobi, 40 miles from the ocean, Njabilobi (Efulan).

5 specimens, 80-138 mm. in length, Kribi, Kribi river system.

2 specimens, 90 to 110 mm. in length, Kribi, from a small brackish stream, the Ebome, the Kribi river system.

3 specimens, 55 to 96 mm. in length, from brackish water, Ebunja river, Ebunja.

1 specimen, 77 mm. long, Mvase river, a tributary of Campo river, Campo.

A specimen, 19 mm. long from a small brackish stream 10 miles south of Batanga, on the coast at Mbode.

Coronogobius schlegeli (Günther)

Dorsal VI—I—8; anal I—9; scales in longitudinal series 28, plus 3 more on the caudal base; transverse series 8. The body is laterally compressed, the dorsal profile very little curved, the ventral outline gently arched; the depth is 4.95 times in the length; the caudal and pectoral are both pointed, of equal length, 2.85 times in the length. The head is pointed, with prominent chin, 3.17 in the length, the cheeks more or less tumid; the eyes are very high up, 4.25 times in the head, the inter-orbital 3 in the eye; the snout equals the eye; the mouth is oblique, the angle of the maxillary beneath the front margin of the eye; the teeth are typical of the genus, with a well developed posterior canine. A row of sensory pores descends from the posterior nostril to the middle of the maxillary, where it gives off two branches which cross the preopercle to its hind margin; behind the angle of the mouth it turns and crosses the cheek parallel to the lines across the middle of the preopercle; above

it is a much smaller parallel line. Another line of pores runs around the margin of the preopercle and along the lower margin of the jaw to the symphysis. Several small lines of pores cross the opercle transversely and diagonally two small lines of pores extend backward from the eye a short distance; two others are on the snout. The vertical fins are of moderate height, the second spine of the first dorsal 5 times in the length; the longest second dorsal spine is 7.7, the longest anal spine 6.75 times in the length. The ventral is broad and long, with a strong frenum, 4.5 times in the length. The least depth of the caudal peduncle is 1.8 times in its own length.

The color in alcohol is brown, with 8 or 9 faint darker stripes over the back, 8 black transverse lines on the lower third of the trunk, and another one three scales behind; the fins are concolorous; a black spot at the base of the first three rays of the second dorsal, and a black spot on the upper part of the pectoral base; some longitudinal rows of black spots are on the lower part of the caudal fin.

Here described from the following specimens:

1 specimen, 54 mm. long, collected from a small brackish stream, called Nkao, at Batanga, Cameroon, Africa.

3 specimens, 38-50 mm. in length, from a brackish water stream at Ebunja, on the coast 6 miles south of Batanga.

4 specimens, 39-56 mm. in length, from brackish water at the mouth of the Kribi river, Kribi.

4 specimens, 51-60 mm. in length, from the Ebomé, a small brackish stream at Kribi.

2 specimens, 41-46 mm. in length, from brackish water, the Ebunja river, Ebunja.

3 specimens, 34-40 mm. in length, Bwanjo River, in brackish water, Bwanjo.

Ctenogobius bequaerti (Fowler)

2 specimens, 31-36 mm., from a small stream emptying into the sea at Kribi.

Ctenogobius thomasi (Boulanger)

6 specimens, 26-34 mm. in length, from the Nkao, a very small brackish stream flowing into the sea at Batanga.

Nematogobius ansori Boulanger

1 specimen, 37 mm. long, from the Nkao, Batanga.

Oxyurichthys occidentalis (Boulenger)

2 specimens, 46 and 51 mm. long, from the Nkao, Batanga.

Sicydium brevifile Grant

9 specimens, 33-51 mm. in length, from the Lokunje river, Sepindi.

Periophthalmidae

Periophthalmus papilio Bloch and Schn.

13 specimens, 67-126 mm. in length, Londji.

2 specimens, 88-95 mm., from the Nkao, a small brackish stream at Batanga.

1 specimen, 48 mm. long, from the brackish Bwanjo river, at Bwanjo.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW SUBSPECIES OF BIRDS FROM WESTERN
NORTH AMERICA

BY JOHN W. ALDRICH

During the past few years the writer's studies have dealt largely with collections of birds from the State of Washington. In attempting satisfactorily to identify these specimens it has been thought desirable to recognize additional races of some of the species. Some of these have already been described in previous papers. The purpose of the present paper is to describe formally the remainder in advance of the publication of the complete report on the birds of Washington State.

Centrocerus urophasianus phaios, new subspecies
Western Sage Grouse

Type.—Adult ♂, 259861, U. S. National Museum (Fish and Wildlife Service collection); Fremont, Oregon; August 21, 1914; L. J. Goldman, original number, 106.

Subspecific characters.—Similar to *Centrocerus u. urophasianus* of the Great Plains and eastern Great Basin, but darker. White markings reduced in area and grays darker and more brownish. The resultant impression is a more dusky appearance above, on flanks and tarsal feathering.

Geographic distribution.—Permanent resident north to central-southern British Columbia; west to central Washington, central Oregon, and northeastern California; south to northeastern California; east to southeast-central and northeastern Oregon (possibly central-western Idaho) and central-eastern Washington.

Specimens examined.—*Washington*: Yakima River [♀], Sept. 16, 1853; [♂], Sept. 14, 1853; Spokane Plain [♂, 1853], head only. *Oregon*: Fremont, ♂, Aug. 21, 1914; Blitzen Valley, Harney County, ♂, Oct. 11, 1934; Huntington, ♀, May 22, 1916; Juntura, 2 [im.], July 9, 1916; Mt. Warner, 2 [♂], Sept. 23, 1914. *California*: Ravendale, ♂, Jan. 25, 1915.

Certhia familiaris caurina, new subspecies
Northwestern Brown Creeper

Type.—Adult ♂, No. 367378, U. S. National Museum (Fish and Wildlife Service collection); Gotchen Creek Ranger Station, Mt. Adams, Yakima County, Washington; May 16, 1942; Stanley G. Jewett, original number, 1395.

Subspecific characters.—Similar to *Certhia familiaris montana* from Arizona north to eastern Washington, but more brownish and buffy, less grayish and whitish. Similar also to *Certhia familiaris occidentalis*, of the Pacific coastal region from the islands of southeastern Alaska, south to California, but more grayish, less rufescent above and less buffy below. From *Certhia familiaris zelotes* of the Sierra Nevada and southern Cascade Mountains it differs in being paler, with brown areas lighter and black areas less extensive above.

Measurements.—Adult ♂ (16 specimens): wing, 58-66 (Av. 63.4) mm.; tail, 56-65.5 (60.7); exposed culmen, 13-16 (15.2); tarsus, 14-16.8 (15.7); middle toe without claw, 11-12.3 (11.5). Adult ♀ (4 specimens); wing, 58-63 (60.6); tail (59.5-63); exposed culmen, 12-14 (13.4); tarsus, 14.5-16 (15.4); middle toe without claw, 11-11.5 (11.3).

Geographic distribution.—Breeds on the east slopes of the Cascade Mountains from northern Oregon northward to the mainland of Alaska. Apparently partially permanent resident throughout its range, but at least some of the birds migrate southward to California.

Remarks.—The above described population of brown creepers might be considered merely as intergrades between the extremely grayish and whitish race *montana*, and the extremely rufescent and relatively uniformly colored *occidentalis*. However, the large range occupied by this variant with a relatively uniform appearance throughout necessitates recognition as a separate subspecies.

Specimens examined.—*Alaska*: Head of Toklat River, —, Oct, 1907; Susitma, ♂, Feb. 4, 1922; Cook Inlet, ♀, Aug. 31, 1900, ♂, Apr. 8, 1892; Yakutat, ♂ im., ♀ im., July 18, 1895, ♂, ♂ im., July 19, 1895; Juneau, ♂, Apr. 7, 1920. *Washington*: Whatcom County, Noosak River at Swamp Creek, ♂, July 23, 1920; Whatcom Pass (between Chilliwack Creek and the pass), ♂, July 30, 1920; Glacier, ♂, July 15, 1920; Okanogan County, Hidden Lakes, ♂, Sept. 2, 1920; Bauerman Ridge, ♀, Sept. 11, 1920; Monument 83, U. S. Boundary, im., July 26, 1942, ♀ im., Aug. 3, 1942; Aeneas, 2 ♂, Feb. 18, 1942; Ferry County, Swan Lake, ♀, ♂, June 17, 1942, ♂, June 12, 1942; Ferry Lake, ♂, June 16, 1942, ♂, June 21, 1942; Snohomish County, Suiattle River, Chiwawa Mt. Fork, ♀, Aug. 4, 1918; Chelan County, Wenatchee Lake, ♂ im., Aug. 19, 1918; Keechelus Lake, ♂, Aug. 15, 1897; Pierce County, Mt. Rainier, Owyhigh Lakes, juv., Aug. 12, 1919 ♀ im., Sept. 1, 1919; Yakima County, Bumping Lake, ♂ im., Aug. 28, 1917; Mt. Adams, Bird Lake, ♂, May 12, 1942, ♂ May 16, 1942, ♂, July 17, 1942, ♂ im., July 27, 1942; Yakima Indian Reservation, Signal Peak, ♂, July 26, 1917; Skamania County, Trout Lake, ♂, Oct. 5, 1941. *Oregon*: Portland, ♂, Feb. 27, 1882; Warm Springs, ♀, May 5, 1915; Anchor, ♀, Aug. 8, 1916; Fort Klamath, ♂, Dec. 15, 1882, ♂, Dec. 29, 1882, ♂, April 14, 1883, ♂, Oct. 25, 1882. *California*: Freestone, ♂, Nov. 20, 1904; Quincy, ♂, Nov. 4, 1897.

***Talmatodytes palustris pulverius*, new subspecies**

Northwestern Long-billed Marsh Wren

Type.—Adult ♂, No. 262472, U. S. National Museum (Fish and Wildlife Service collection); Sprague, Lincoln County, Washington; June 11, 1918; George G. Cantwell, original number, 175.

Subspecific characters.—Similar to *Telmatodytes palustris plesius* from the Rocky Mountain and eastern Great Basin regions, but duller, less rufescent brown above and on flanks.

Measurements.—Adult ♂ (14 specimens): wing, 50-57.5 (53.9); tail, 42.5-50 (45.6); exposed culmen, 12-13.8 (13.0); tarsus, 18.5-20.5 (19.8); middle toe without claw, 12-14 (13). Adult ♀ (8 specimens): wing, 49-54.5 (51.1); tail, 42-46 (44.4); exposed culmen, 12-13.5 (12.6); tarsus, 18.5-20 (19.4); middle toe without claw, 11.5-13 (12.4).

Geographic distribution.—The northwestern portion of the Great Basin region from northeastern California and northwestern Nevada, north to east-central Washington (Lincoln County).

Remarks.—*Telmatodytes palustris pulverius* is the duller colored of all the interior forms of the long-billed marsh wren. It is relatively pale and rufescence is at a minimum. The contrast with the deeply colored *paludicola* west of the Cascade Mountains is very pronounced. *T. p. plesius*, which breeds somewhat farther east than *pulverius* in the eastern Great Basin and Rocky Mountain region, is somewhat paler and distinctly more rufescent. Two immature specimens from Lovelock in northwest central Nevada are intermediate. The breeding marsh wren of the Great Plains region north to Lake Athabaska (= *laingi*) is very light and bright colored, being more rufescent than *plesius*. The type specimen of *Telmatodytes palustris iliacus* Ridgway, which was apparently a migrant specimen from Wheatland, Indiana, matches these birds perfectly and *laingi* should be considered a synonym of *illiacus*.

Specimens examined.—*Washington*: Sprague, 2♂, June 11, ♂, June 13, 1918; Marshall, —, Oct. 5, 1890; Odessa, Sylvan Lake, 2♂ im., ♀ im., June 20, 1918; Sulphur Lake, Franklin County, —, Nov. 4, 1941; Lake Washtucna, ♂, Nov. 4, 1941. *Oregon*: Burns, ♂, July 7, 1896; Harney County, ♀, Dec. 10, 1914; Klamath Falls, ♀ im., Aug. 28, 1916. *California*: Tule Lake, ♂ im., ♀ im., July 6, 1899; Marysville, —, 1877; Sunset Beach, Orange Co., ♀, Dec. 27, 1916, ♀, Jan. 24, 1917, —, Jan. 28, 1921, ♀, Feb. 7, 1916, ♂, Feb. 27, 1917.

Catherpes mexicanus griseus, new subspecies

Northern Canyon Wren

Type.—Adult ♂, Br.; No. 367804, U. S. National Museum (Fish and Wildlife Service collection); Logy Creek, Yakima Indian Reservation, Yakima County, Washington; April 20, 1943; Stanley G. Jewett, original number 1603.

Subspecific characters.—Similar to *Catherpes mexicanus conspersus* of the Great Basin region, but more grayish, less rufescent both above and below. Similar also to *C. m. punctulatus* of California west of the Sierra Nevadas, but paler and more grayish.

Measurements.—Adult ♂ (14 specimens): wing, 57-62 (60.2); tail, 47.5-54 (51.1); exposed culmen, 18-21 (19.9); tarsus, 17.5-19 (18.4); middle toe without claw, 13-15 (13.8).

Geographic distribution.—Permanent resident in eastern Washington and eastern Oregon.

Remarks.—From the material available to me *Catherpes mexicanus punctulatus* seems like a very distinct race and I cannot concur with Grinnell and Behle (Condor, 37: 247, 1935) in lumping it with *conspersus*.

sus. Specimens in the U. S. National Museum from California west of the Sierra Nevadas (*punctulatus*) are markedly and consistently darker and more brownish, less rufescent, than a series from the Great Basin east of the Sierra Nevadas. *Catherpes mexicanus griseus* is a pale form and is more grayish than either *conspersus* or *punctulatus*. The differences in these three races are equally obvious in fresh autumn, worn breeding, and immature plumage.

Specimens examined.—Oregon: Mt. Vernon, ♂, July 1, 1915; Crane, ♂, July 28, 1916; Homestead, ♂, June 17, 1916; Malheur Cave, ♂, Oct. 6, 1916. Washington: Yakima County, Logy Creek, 2♂, April 20, 1943; Yakima, ♀, April 15, 1928; Wenatches, ♂, June 28, 1934; Almota, ♂, April 17, 1904, ♂ im., Aug. 21, 1895, ♂ im., Aug. 22, 1895, ♂ im., July 24, 1903; ♂ im., Sept. 4, 1920; Wishram, ♂, Nov. 10, 1941; Rogersburg, ♀, May 31, 1918.

Dumetella carolinensis ruficrissa, new subspecies

Western Catbird

Type.—Adult ♂, No. 262173, U. S. National Museum (Fish and Wildlife Service collection), Colville Lake, Sprague, Washington; June 10, 1918; Walter P. Taylor, original number, 294.

Subspecific characters.—Similar to *Dumetella carolinensis carolinensis* of Virginia and other eastern states, but lighter colored below. This is particularly noticeable on the abdomen, which shows more whitish in contrast to the chest, and on the crissum, which is Russet instead of Bay. There is no significant difference in size.

Measurements.—Adult ♂ (23 breeding specimens from west of the Great Plains): wing, 86.5-97 (91.1); tail, 91-104 (96.2); exposed culmen, 15-17 (16). Adult ♀ (13 breeding specimens from west of the Great Plains): wing, 83.5-93.5 (8.4); tail, 88.5-97.5 (93.5); exposed culmen, 15.5-17 (16.1).

Geographic distribution.—Breeds north to southwestern British Columbia and Montana; east to northeast-central North Dakota (Devils Lake) and central-northern New Mexico (Rinconada); south to central-eastern Arizona (Springerville); west to north-central Utah (Provo), northeast central Oregon (Mt. Vernon), and central-southern Washington (Trout Lake). Migrates south through Mexico and to the West Indies.

Remarks.—A disconcerting fact that was soon evident in the course of studying catbird specimens is that in old specimens the brown color of the under tail coverts of eastern birds tends to fade and approach those of western specimens. Specimens collected prior to 1900 are quite unreliable in this respect, some retaining the deeper tones while others are very rufescent exactly like western specimens.

Specimens examined.—British Columbia: Chilliwack, ♂, June 3, 1889. Washington: Odessa, ♀, June 19, 1918; Trout Lake, ♂, Aug. 17, 1918, ♀, Aug. 28, 1918; Stehekin, ♀, July 20, 1918; Sprague, ♂, June 10, 1918; Spokane Bridge, ♀ im., Aug. 13, 1895; Anatone, ♀, June 26, 1919. Oregon: Mt. Vernon, ♂, June 30, 1915. Utah: Provo, ♀, July 30, 1872; Ogden, ♂, June 18, 1872; Salt Lake, Strawberry Island, ♀, June 12, 1869; mouth of Bear River, —, May 28, 1915. Idaho: Shelley, ♂, July 28, 1911; Idaho City, ♂, June 17, 1910; Blackfoot, —, July 7, 1890, ♂, July 10, 1890; American Falls, ♂, June 1, 1911. Montana:

Lismas, ♀, June 25, 1919; Geysers, —, Aug. 14, 1919; Livingston, ♂, July 5, ♂, July 6, 1917; Glasgow, ♂, June 21, 1910, June 7, 1919; Big Timber, ♂, June 25, 1917, ♀, June 6, 1918; Terry, ♀, June 12, ♀, July 2, ♂, ♀, July 3, 1916; Reese Creek, Gallatin County, ♂, Aug. 14, 1888; Hilger, ♀, July 31, 1919; Fort Logan, ♀, Aug. 25, 2♂, 2♀, Aug. 30, 1919; Dillon, 2♂, Aug. 10, 1917. *Wyoming*: Laramie, 2♂, summer, 1875; Moran, ♀, Sept. 13, 1910; Fort Bridger, ♂, May 21, 1858; Valley, ♀, July 11, 1910; Greybull, ♂, June 8, ♂, June 11, ♀, June 13, 1910; Fort Steele, ♂, May 24, 1911; Fort Fetterman, ♂, June 4, 1878. *Colorado*: Colorado Springs, ♂, June 9, 1883. *Arizona*: Springerville, ♂, June 7, 1915; Tunitcha Mountains, ♀, June 25, 1927. *New Mexico*: Rinconada, ♂, ♀, June 4, 1904. *North Dakota*: Oakdale, ♂, July 1, 1913; Turtle Mountains, ♂, July 23, 1873; Devils Lake, Graham Island, ♂, Sept. 21, 1903. *Texas*: Point Bolivar, ♀, April 22, 1907. *Vera Cruz*: Papanita, ♀, March 6, 1898; Tres Zapotes, ♀, Jan. 17, 1940. *Mexico*: Metlaltoyuca, ♂, Feb. 22, ♀, Feb. 23, 1898. *Tabasco*: Frontera, ♀, March 5, 1900. *Yucatan*: (G. F. Gaumer specimen). *Louisiana*: Jefferson Parish, Southport, ♀, Jan. 13, 1900. *Cuba*: Port Tanamo, ♀, March 2, 1930.

***Spinus pinus vagans*, new subspecies**

Western Pine Siskin

Type.—Adult ♂, No. 228860, U. S. National Museum (Fish and Wildlife Service collection); Edna, Idaho; June 21, 1910; Stanley G. Jewett, original number, 109.

Subspecific characters.—Similar to *Spinus p. pinus*, but lighter in coloration. Less heavily streaked with black above and below, and ground color of dorsal region lighter and more buffy, less brownish. Similar also to *Spinus pinus macropterus*, but smaller in wing and tail measurements. More heavily streaked with black above and below, and ground color of dorsal region lighter and more buffy, less brownish.

Measurements.—Adult ♂ (18 breeding specimens): wing, 68-75 (71.6); tail, 42-47 (44.9); exposed culmen, 9.3-11.5 (10.3); tarsus, 14-15 (14.6); middle toe without claw, 10-12 (11.1). Adult ♀ (7 breeding specimens): wing, 67.5-73 (69.9); tail, 41-46 (43.9); exposed culmen, 9.8-11 (10.4); tarsus, 14-15 (14.7) middle toe without claw, 10.5-11.3 (10.8).

Geographic distribution.—Breeds in coniferous forests of western North America from the Pacific coast region north to southern Alaska, and south to northern Baja California, eastward normally to the Rocky Mountains from Canada to northern Mexico. Apparently breeds farther east during years of excessive wandering to Ontario, Wisconsin, Michigan, and Ohio.

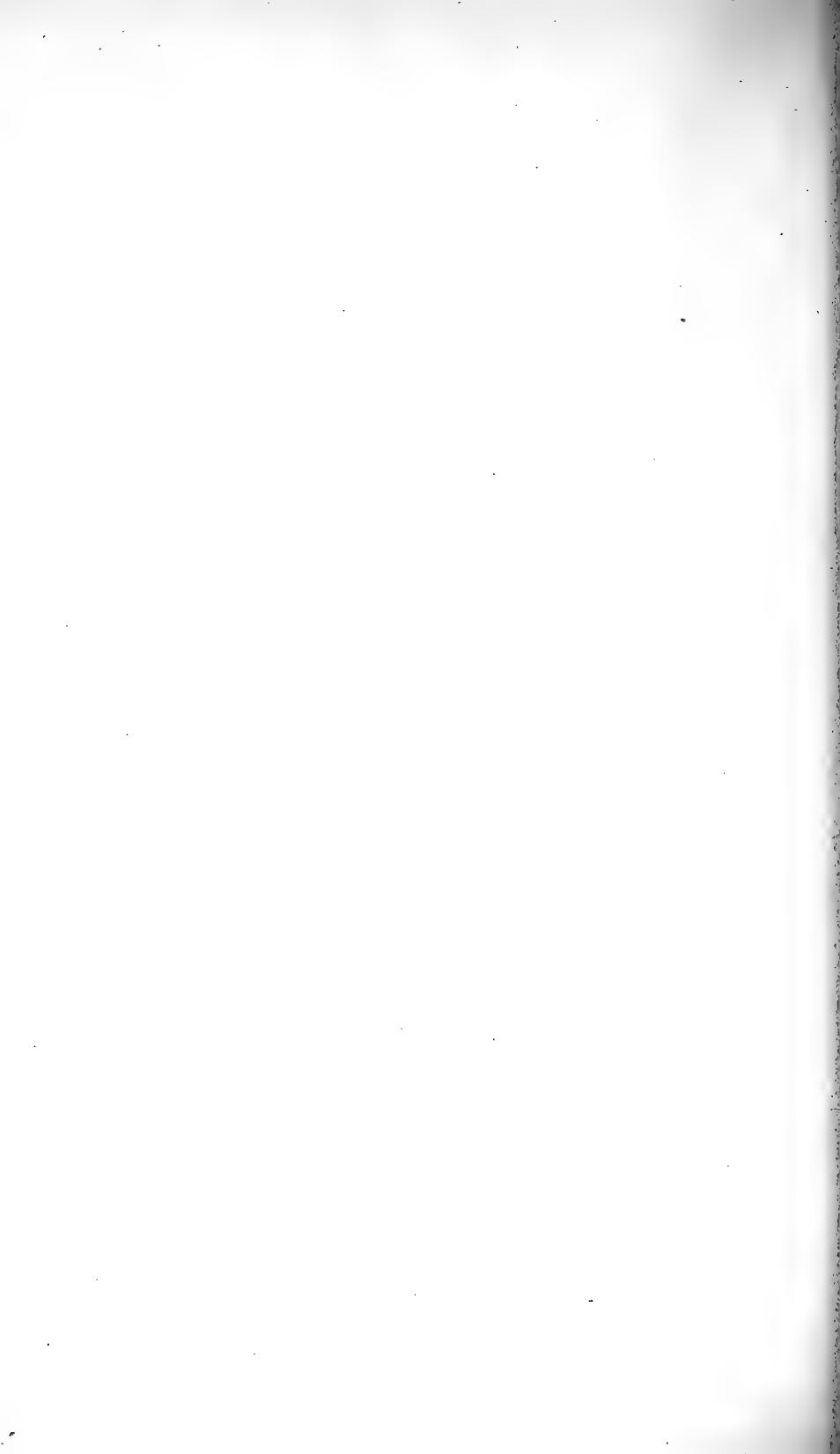
Remarks.—The vagrant habits of this species makes the separation of races difficult. It is more than ever necessary to have definitely breeding material for comparison. I was fortunate in having a good series of breeding specimens from various parts of the west, as well as from the east (Newfoundland south to the Great Smoky Mountains). In these series the differences were uniform and striking. In large series of specimens in fresh autumn plumage from east and west the differences were equally well marked, although not as constant. The western pine

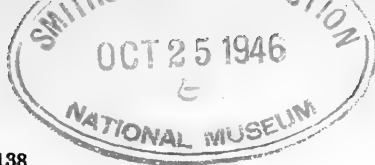
siskin evidently invades the eastern States in large numbers in certain years, evidenced by the specimens of this form from New York, Maryland, Virginia, and the District of Columbia, particularly in the winters of 1882-83 and 1887-88. The eastern race wanders into the range of *Spinus pinus vagans*, even to western Washington, and is represented by three December specimens from South Park and Ravenna, Washington, in the U. S. National Museum. *Spinus pinus macropterus* wanders up from Mexico after the breeding season as far as New Mexico, judging from 2 specimens from that State (Bosque Del Apache, near Socorro, Aug. 17, 1942, and Questa, Aug. 15, 1904), in the U. S. National Museum collection.

Specimens examined.—*Alaska*: Cook Inlet, Tyoonok, 2, Sept. 22, 1900; St. Paul Island, Sept. 24, 1917; Keku Pass, Nov. 19, 1919; Kodiak, June 4, 1894, July 4, July 3 (5), July 20, and July 1, 1899; Juneau, April 5, 1920; Douglas Island, near Juneau, Jan. 9, 1920; off Pribilof Islands, Aug. 19, 1893; Sitka, Aug. 5, 1895; Lake Iliamna, Iliamna Village, July 13, 1902. *British Columbia*: Goldstream, May 15, May 14, 1895; North Fork, Moose River, July 21, 1911. *Washington*: Vancouver, April 13, 1892; Trout Lake, Skamania County, 2, Oct. 2, 1941; South Park, King County, 8, Dec. 1, 1894, 2, Dec. 12, 1894; Shoalwater Bay, Oct. 12, 1854, 1, no date; Ridgefield, April 3, 1941; Yakima Indian Reservation, Signal Peak, July 27, 1917; Mt. Vernon, 4, Dec. 18, 1895; Mt. Adams, southeast slope, Aug. 29, 1943; Semiahmoo Bay, Oct. 10, —. *California*: Eureka, 2, March 27, 1899, March 25, 1902; Haywards, 2, April 8, March 30, 1902; Mt. Shasta, Aug. 26, 1902; Marysville, no date; Walker's Basin, Nov. 5, 1875; South Yolla Bolly Mountain, July 26, 1905; Fort Crook, March 19, April 10, 1860; Pescadero, Feb. 19, 1894; Nevada, Oct. 1872; Humboldt Bay, 2, Dec. 4, 1885, June 12, 1899; St. Helens, 2, Dec. 23, 1897, Jan. 5, 1898; Beryessa, Feb. 26, 1890, Dec. 23, 1889; Smith River, Del Norte County, Oct. 9, 1905; Placerita Canon, 3, April 23, 1921; Big Trees, Aug. 10, 1878; Fort Tejon, no date; Eel River, near South Yolla Bolly Mountains, Aug. 6, 1905; Temescal Mountains, Feb. 23, 1889. *Oregon*: Seaside, Sept. 8, 1905; Philomath, 3, March 8, 1919; Fort Klamath, 3, Oct. 4, 1882, 2, Oct. 3, 1882; Corvallis, June 1, 1920. *New Mexico*: Cinequilla, March 31, 1904; Fort Wingate, March 6, 1885; Manzano Mountains, 2, Oct. 8, 1903; Zuni Mountains (Mt. Sedgwick), June 23, 1909; Capitan Mountains, Aug. 20, 1903; Arroyo Seco, 3, Jan. 28, 1904; Cantonment Burgwin, March 27, 1860; Big Hachita Mountains, Grant County, May 22, 1892. *Wyoming*: Sierra Madre Mountains, June 20, 1911; Fort Steele, May 27, 1911; Pahaska Tepee, Grinnell Creek, July 29, 1910; Jackey's Creek, 3 miles south of Dubois, May 13, 1910; Laramie, no date; Bull Lake, Aug. 21, 1893; Fort Bridger, 2, June 16, 1858. *Texas*: Frijole, June 14, 1939; Presidio County, May 24, 1890. *Montana*: Highwood Mountains, 2, Aug. 27, 1910; Poison Creek, 10 mi. S. E. Livingston, July 1, 1917; West of Boulder Creek, 18 mi. S. E. Livingston, June 27, 1917; Pass Creek, Gallatin County, Aug. 26, 1888. *Idaho*: Bannock Mountains, Swan Lake, July 8, 1911; Edna, June 21, 1910; Resort, July 30, 1913; Little Blackfoot River, Aug. 21, 1860. *Utah*: Promontory Point, Oct. 14, 1914; Pine Valley Mountains, Oct. 13, 1909. *Nevada*: East Humboldt Mountains, Sept. 5 and 8, 1868. *Arizona*: Mt. Thomas,

White Mountains, July 30, 1915; Fort Verde, 6, Jan. 25, 1888; Williams, May 26, 1927; Mount Graham, Sept. 21, 1874; Graham Mountains, Ash Creek, May 11, 1914, April 23, 1914; Pine Springs, Nov. 15, 1884; Fort Huachuca, May 16, 1892; Alpine, Apache County, Sept. 19, 1914; San Francisco Mountains, Aug. 31, 1889. *Colorado*: Fort Garland, May 29, 1873; Pueblo, Dec. 1, 1890; Park of the Peaks, west of Denver, July, 1867; Colorado Springs, May 26, 1883. *Chihuahua*: Colonia Garcia, 15 mi. W., Feb. 29, 1904. *Coahuila*: Sierra Guadalupe, April 23, 1902; *Nuevo Leon*: Mesa del Chipinque, Feb. 14, 1938, March 20, 1939. *Lower California*: La Paz, March 3, 1882; Hansen Laguna, 3, June 8, 1905; Sierra Guadalupe, 2, April 23, 1902; Vallecitos, July 14 and 17, 1905. *District of Columbia*: Washington, 4, Jan. 29, 1888, Feb. 12, 1888, 4, Jan. 22, 1888. *Maryland*: Laurel, Feb. 25, 1879. *Virginia*: Rosslyn, May 19, 1888; Ballston, Nov. 8, 1887; Arlington, Oct. 24, 1889. *Georgia*: Liberty County, no date. *New York*: West Point, Oct. 30, 1899, Feb. 11 and March 3, 1900; Highland Falls, March 9, 1883; Fort Montgomery, Feb. 6, 1878. *Wisconsin*: Outer Island, Sept. 10 and 11, 1919; Mamie Lake, Vilas County, June 12 and 18, 1918. *North Dakota*: Dawson, Sept. 11, 1922. *Illinois*: Milton Township, DuPage County, Sept. 26, 1896; Mount Carmel, April 21, 1869. *Michigan*: Escanaba, June 8, 1883. *Manitoba*: Western Manitoba, no date. *Massachusetts*: Belmont, 2, Oct. 17, 1880. *Ohio*: Rockport, July, 1849. *West Virginia*: White Sulphur Springs, Nov. 6, 1936. *Maine*: Westbrook, 2, Dec. 21, 1891. *Ontario*: Elmsdale, May 24, 1897.

Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C., May 20, 1946.





PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW COTTON RAT FROM VIRGINIA

BY MARSHALL C. GARDNER

During the course of a revision of the North American cotton rats (Genus *Sigmodon*) a hitherto unrecognized subspecies was discovered. It is described as follows:

Sigmodon hispidus virginianus, subsp. nov.

Virginia Cotton Rat

Type specimen.—Adult ♀, skin and skull, No. 273535, U. S. National Museum (Biological Surveys collection); collected January 30, 1943, by John B. Lewis; original number, 705; Biological Surveys Miscellaneous No. 31384X.

Type locality.—Triplet, altitude 160 feet, Brunswick County, Virginia.

Geographic range.—As yet undetermined, but probably includes the southern portions of Mecklenburg and Brunswick counties in Virginia. Carolinian province (Dice) and Carolinian life zone.

Diagnostic characters.—A smaller, more blackish-gray subspecies, most closely allied to *Sigmodon hispidus hispidus*, but less brown. Hind feet average grayer. Skull about as in *S. h. hispidus* but smaller.

Color.—Upper parts raw umber brown mixed with black; sides buffy brown; hind feet averaging neutral gray; tail blackish above, grayish below; under parts neutral gray to whitish gray.

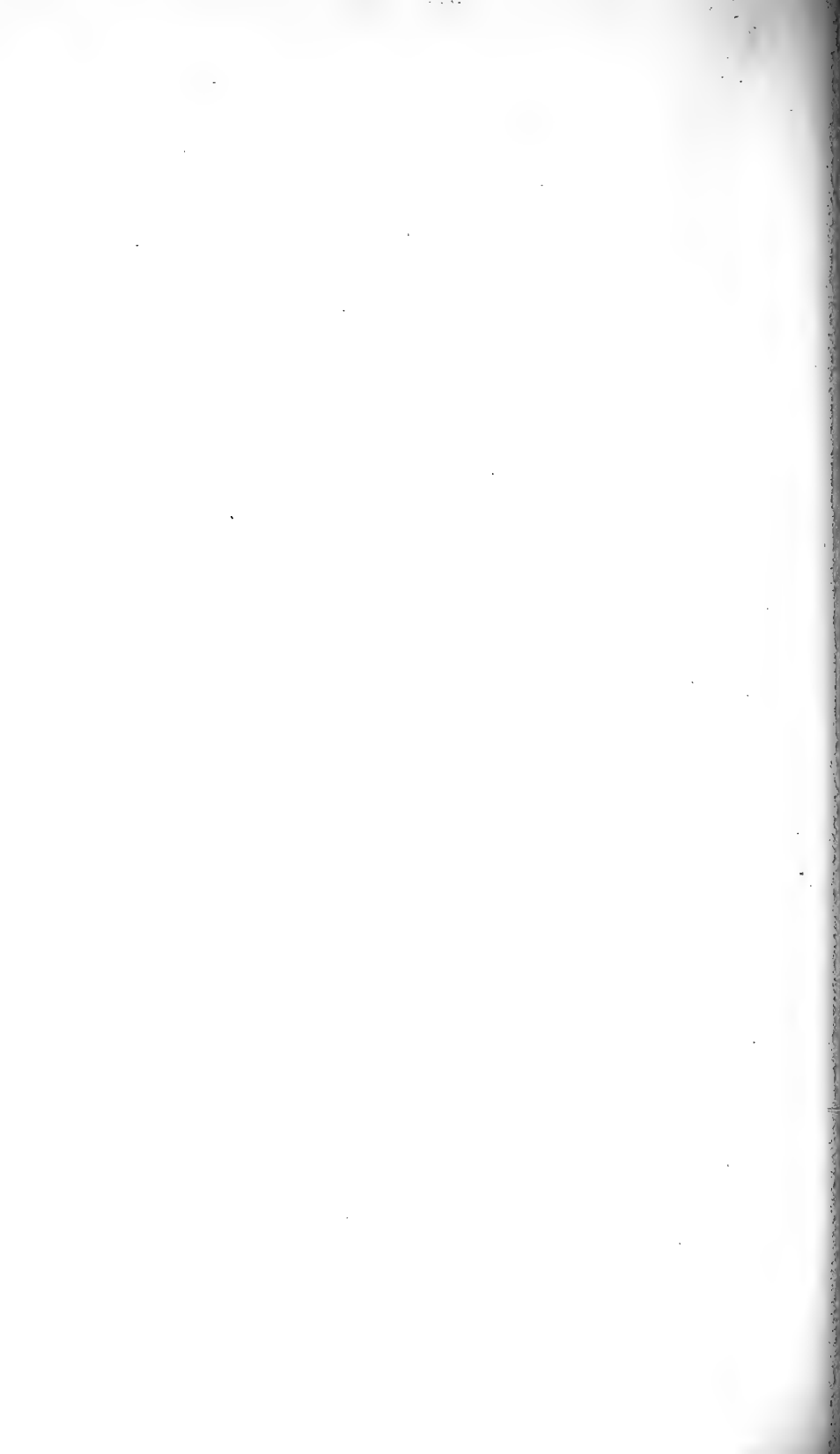
Skull.—Similar to that of *S. h. hispidus* but smaller.

Measurements.—*Type*: Total length, 239; tail vertebrae, 93; hind foot, 31. *Skull (type)*: Condylbasal length, 31.1; length of anterior palatine foramina, 7.2; palatal bridge, 6.1; nasals, 12.8; zygomatic breadth, 19.1; least interorbital breadth, 4.9; cranial breadth, 13.4; maxillary tooth row, 6.3.

Remarks.—When compared with *Sigmodon hispidus hispidus* from North Carolina this new subspecies averages smaller and more blackish gray.

Specimens examined.—Six, from the following localities in Virginia: Triplet (type locality), 5; Clarksville, 1.

Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C., June 13, 1946.





PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

ON FOUR MILLIPEDS FROM GEORGIA
AND MISSISSIPPI

BY RALPH V. CHAMBERLIN

In two small collections of diplopods recently sent me for identification the four new species here described were found represented.

The first of these collection was made by P. W. Fattig in Georgia and contains the types of the two new species of the Xystodesmid genus *Epeloria*. Other species represented are *Spirostrephon lactarium* (Say), *Euryurus erythropygus* (Brandt), and *Dixidesmus humilidens* Chamberlin.

The second collection was made at Pass Christian, Mississippi, by J. and W. Rapp and in Illinois and Tennessee by Wm. F. Rapp, Jr., and was transmitted by the last named collector. It contains the types of the new species of the Xystodesmid genus *Eurymerodesmus* and of the Polydesmid genus *Dixidesmus*. Additional forms represented are *Pseudopolydesmus serratus* (Say) and *Nopoiulus minutus* (Brandt) from Urbana, Ill.; *Euryurus erythropygus* (Brandt) from Shawnee National Forest, Ill.; and *Pseudopolydesmus serratus* (Say) and *P. euthetus* Chamberlin from Reelfoot Lake, Tenn.

The types of the new species are retained in the author's collection at the University of Utah.

Epeloria dela, new species

A smaller form than *E. talapoosa*, the generotype, from which it differs in the details of the male gonopods. In the telopodite of these the apical branches are obviously unequal in size with the larger one somewhat lamellate, and of the form shown in the accompanying figure. Another readily detected difference is in the presence of a lateral tooth or spine on the basal process which is lacking in *E. talapoosa*. (Figs. 1 and 2.)

None of the sternites spined.

The dorsum is brown with the borders of the keels yellow, some showing within the yellow border a somewhat reddish area.

Width of the male holotype, 7 mm.

Locality—Georgia: Morgan, at Cordrays Pond. The male holotype and female allotype were taken April 4, 1946, by P. W. Fattig.

Epeloria leiacantha, new species

A somewhat smaller form than *E. dela* to which it is closest in form of the gonopods of the male. It differs, however, in lacking the lateral

tooth on the basal spine and in the more robust form of the telopodite as shown in the accompanying figure. (Fig. 3.)

Sternites not spined. No coxal spines, but those of femora well developed as usual.

The dorsum is brown, with borders of keels and covered portion of prozonites yellow. Legs and lower parts of segments yellow.

Width, 6.2 mm.

Locality—Georgia: Decatur Co., Spring Creek.

One male taken April 3, 1946.

***Eurymerodesmus christianus*, new species**

This species seems to be set off very clearly from others so far known by the length of the apical beak or prolongation of the telopodite of the male gonopods, the beak in its form being otherwise nearest that of *E. louisianae* Chamberlin. It is further distinct in the number and arrangement of the setae on the telopodite as shown in the accompanying figure. (Fig. 4.)

The male lacks sternal processes on the sixth somite.

The venter, sides, keels and background of the dorsum yellow, the tergites incompletely covered with a network of brown which is denser across posterior part of prozonites and anterior border of metazonites. In the types the legs and antennae are also yellow.

Width, about 2.5 mm.

Locality—Mississippi: Pass Christian. Four specimens taken Feb. 16, 1946, by J. and W. Rapp.

***Dixidesmus christianus*, new species**

Dorsum dark brown or in part somewhat chestnut with the keels light. Legs brown and antennae dark brown.

A typical tergite with the usual rounded swelling at base of each keel. The 6 tubercles of the posterior row distinct, those of adjacent row less well defined, while those in front of the sulcus are absent or obscure. Serrations of keels fine but distinct.

Sternal processes at bases of anterior legs of the sixth segment cylindrical and well developed, those of the eighth segment but little developed.

Distinguished by the details of the gonopods of the male as represented in the accompanying figure. (Fig. 5.)

Length of male holotype, 19.5 mm; width 3.2 mm.

Locality—Mississippi; Pass Christian. One male (holotype), three females and several immature specimens taken Feb. 15, 1946, by J. and W. Rapp.

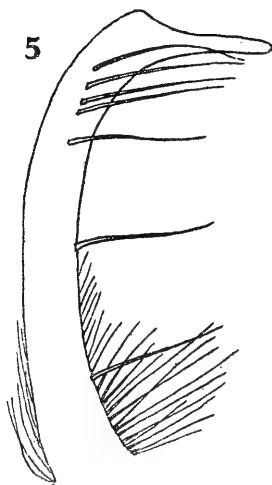
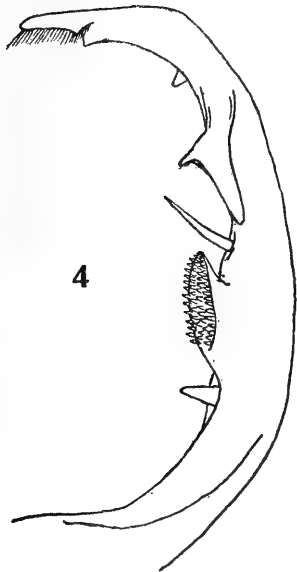
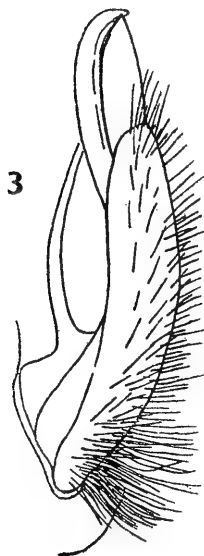
EXPLANATION OF FIGURES ON PLATE XII

Epeloria dela, n. sp. Fig. 1. Right gonopod of male, a little ectad of ventral view. Fig. 2. Basal spine of left gonopod, lateral view.

Epeloria leiacantha, n. sp. Fig. 3. Right gonopod of male, aspect a little ectad of ventral.

Dixidesmus christianus, n. sp. Fig. 4. Ectal aspect of telopodite of male gonopod.

Eurymerodesmus christianus, n. sp. Fig. 5. Mesal aspect of telopodite of male gonopod.





PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE NEW GUINEA SPECIES OF *CULEX* (*CULICIO-
MYIA*), WITH DESCRIPTIONS OF TWO NEW
SPECIES*

BY WILLARD V. KING, *Colonel*
and HARRY HOOGSTRAAL, *Captain, Sn.C., AUS*

The members of this subgenus have unicolorous scaling of the tarsi, proboscis and scutum, and a lower mesepimeral bristle is present. They are usually of about medium size. The main characteristic of the subgenus is the presence of a row of long, translucent, modified scales extending ventrolaterally from the apical portion of the long segment of the male palpus. Usually also there are some broad flat scales on the head vertex, no scales on the pleurites, and a spiny crest on the male style. One species, *C. pullus*, a ground-pool breeder, is one of the most commonly encountered species of *Culex* in New Guinea, and both this species and *C. fragilis* are widely distributed. Neither is of any importance as pests so far as known.

Only five species are definitely known at present from New Guinea. An Indian species, *C. pallidothorax*, was listed from New Guinea by Bonne-Webster (1938) but without any description of specimens and the records are possibly attributable to *C. pullus*.

***Culex* (*Culiciomyia*) *nailoni* new species**

MALE.—*Head*: Proboscis slightly longer than fore femur, dark scaled. Palpus longer than proboscis by length of apical segment, dark scaled, with long bristles on apical two segments; a row of at least five long, curved, pale, modified scales arising from ventrolateral surface toward apex of long segment. Antenna with dense long hair whorls. Vertex with a small median triangular area of narrow pale brown scales not reaching eyes; remainder of vertex, border of eyes and lateral surface of head with broad pale scales; a patch of brownish upright forked scales posteriorly. *Thorax*: Scutum clothed with fine brownish scales; two narrow bare submedian lines extending almost to antescutellar space.

*From the 19th Medical General Laboratory, U. S. Army. Contribution No. 10 from the Entomology-Mammology Department.

Scutellum with narrow brownish scales on each lobe. Posterior pronotum with fine, hairlike scales on upper third. Pleurites pale yellowish without scales or dark markings; mesepimeron with a single long, median, lower bristle. Wings with the lateral scales of veins 2 to 4 long, linear, those at the tips of the forked cells slightly broadened; first forked cell about 1.5 times length of its stem, arising slightly closer to base of wing than second; posterior cross vein closer to base of wing than mid by a little more than its own length. Length of wing 2 mm. Inner surface of the femora with a narrow line of pale scales, the legs otherwise uniformly dark; fore and mid tarsal claws subequal, the larger ones toothed. *Abdomen*: Tergites uniformly clothed with dark scales. *Hypopygium* (fig. 1): Coxite about twice as long as mid width, unscaled; inner border with a row of closely set strong setae. Subapical lobe (SA) prominent, apically with a heavy rod and five flattened pointed spines; at base a stout rod on ventral side and a slender flattened spine on dorsal side. Apicoventral lobe (AV) slender, clothed with small hairs, the apex with an elongate somewhat flattened rod. Style (S) a little more than half as long as coxite, strongly curved, slightly swollen basally and constricted medially, tapered to a pointed reflex tip; crest not spinose; a small patch of fine hairs on inner margin subbasally, outer margin and crest with several short hairs; appendage subapical, blunt. Paraproct moderately sclerotized apically, without the usual tuft of hairs and row of blunt spines on crest, having instead five or six long, closely appressed, pointed spines, at the base of which on the inner margin is a slender, weak extension bearing a few minute hairs; lateral arm short, slightly curved. Phallosome long and slender; lateral plate elongate, rounded at tip, simple except for a small sub-basal ventral tooth; basal process narrow, curved, pointed, nearly half as long as lateral plate. Ninth tergite with shoulders slightly rounded, well separated, each bearing a few weak setae.

FEMALE.—Similar to male except as follows: Antenna slightly longer than proboscis, with five or six short bristles arising from the base of each flagellar segment, pale hairs over entire surface; palpi not quite one-fourth length of proboscis; first fork cell a little more than twice the length of its stem; lateral scales toward tips of veins 2 to 4 distinctly broadened.

LARVA (fig. 6)—*Head*: Broader than long, very lightly pigmented. Antenna about three-fifths as long as head, with numerous heavy spines on basal three-fourths; a narrow darkly pigmented ring basally; tuft about two-thirds from base; subapical bristles arising well before apex. Preclypeal spines slender, about a third the length of antenna. Head hairs arising posterior to base of antenna, plumose, A with 6 to 8 branches, B and C double; *d* fine, single, anterior and internal of B; *e* bifid, *f* three-branched. *Abdomen*: Segment I with the upper lateral hair 3-branched, the lower single; lateral hair of II 3-branched, III single or with 2 or 3 branches, IV double, V 2-3 branched, VI and VII single (the hairs on I and II much stouter and darker than on other segments). Comb of segment VIII a triangular patch of 27 to 37 long, narrow scales, apically rounded and fringed; pentad hair 1 with five or six plumose branches, 2 and 4 single, 3 with five plumose branches, 5 with three or four plumose branches. Siphon rather long and narrow,

the apex about half as wide as base, index about 5:1, the surface covered with rows of fine spicules; a prominent acus present; pecten with 18 to 25 teeth on basal two-fifths, each tooth with a few stout denticles on one side; four or five pairs of branched hairs on apical half of siphon, the first three pairs longer than the diameter of the siphon at the point where they arise. Anal segment encircled by saddle; surface of saddle covered with rows of small spicules, the posterior border with short spines; lateral hair single or double; dorsal subcaudal hair single or double, ventral one single; anal gills equal, slender, pointed, about one and a half times as long as saddle.

Holotype.—Male (459), reared from larva taken from crab hole in rain forest, elevation 250 feet, Hollandia, Netherlands New Guinea, 22 December 1944 (W. T. Nailon, Collector). *Allotype*.—Female (459), same data. *Paratypes*.—Six males, 13 females, 12 larvae, and 3 larval exuviae (459), same data as above. Holotype, allotype, and paratypes deposited in the United States National Museum; other paratypes to be deposited in the Museum of the Division of Economic Entomology, Council for Scientific and Industrial Research, Canberra, A.C.T., Australia.

On external characters, this species is separable from other *Culiciomyia* of New Guinea by its small size combined with a lack of pleural and abdominal markings. The peculiar development of the paraproct (which is reminiscent of some species of *Lophoceraomyia*) appears to be unique in the subgenus, while the absence of a spiny crest on the style is unusual. *C. bailyi* Barraud, of India, which is similar in the latter respect, differs in having a banded abdomen, a dark stripe across the upper part of the pleura and in several genitalic characters.

Only one collection of this species was made at Hollandia, though it is probably more elusive than rare. *Aedes* (*Pseudoskusea*) *lunulatus* King and Hoogstraal and *Aedes* (*Aedes*) sp. were taken from the same crab hole at the same time. The species is named for Sergeant William T. Nailon, the collector.

Culex (*Culiciomyia*) *fuscicinctus* new species

MALE.—Similar in size and general appearance to *C. nailoni* except as follows: narrow scales of head yellowish, covering almost all of vertex; flat scales reduced, limited to a short line laterally on eye margin; no scales on posterior pronotum (three bristles on posterior border); pleurites pale with two brownish stripes, one beginning on the posterior pronotum and continuing across the upper part of the sternopleuron and mesepimeron, the other beginning on propleuron and extending across onto the lower portion of the mesepimeron; propleuron with about six bristles; femora largely pale beneath for entire length; lateral scales of veins 2 to 4 linear, slightly broadened towards tips of 2.1 and 2.2; first fork cell about one and a third times as long as its stem, its base about level with that of the second; abdominal tergites with small basal lateral spots of pale scales. Wing length 2 mm. *Hypopygium* (fig. 2): Coxite about a third longer than its midwidth; apicoventral lobe prominent, with a closely set pair of stout rods, one heavily sclerotized, arising from its apex, a group of about 15 flattened setae below these; subapical lobe inapparent but in its usual position a stout blunt rod, a lanceolate leaflet and a flattened

spine, a patch of uniform setae external to these. Style slightly more than half as long as coxite, the base greatly enlarged and finely pilose, the apical portion tapered to an upturned pointed tip; crest with six or seven retrorse spiny platelets; two papillated hairs on apical third; appendage slightly subapical, long, bluntly rounded. Paraproct sclerotized, the crown with a row of blunt spines and a tuft of hairs; lateral arm short and blunt. Phallosome (damaged in mount) apparently simple in structure without teeth. Ninth tergite with slightly rounded lobes bearing several small setae.

HOLOTYPE.—Male, collected by the writers in a light trap operated in the laboratory clearing, elevation 250 feet, Hollandia, Netherlands New Guinea, 4 April 1945. Female and larva unknown. The holotype is deposited in the United States National Museum.

On the combination of genitalic characters (enlarged base of style, two apical spines and patch of flattened setae on coxite, and short lateral arm of the paraproct) this species is very distinct among the described species. It is separable otherwise from other New Guinea species by the small amount of flat scales on the eye margins, presence of basal lateral spots on the abdominal tergites, two brownish stripes across pleurites, and, except for *C. nailoni*, by its small size.

Culex (Culiciomyia) papuensis (Taylor)

Melanoconion papuensis Taylor, 1914. Trans. Ent. Soc. London, p. 201.
(Type female, Papua, Lakekamu Gold Field.)

Culex (Culiciomyia) papuensis Taylor. Edwards, 1924, Bull. Ent. Res. 14:397 (in part).

This species has been confused with *C. fragilis* as the females of the two forms are similar in appearance. The male genitalia and the larvae of the two, however, are found to be very distinct. An examination by the senior author in 1944 of the type female in the University of Sydney (through the kindness of Mr. F. W. Taylor) showed it to be the same as females reared by ourselves and others from larvae having an inflated airtube. An illustration of the male genitalia of *C. papuensis* by Brug (Bull. Ent. Res., 17:82, 1926) is not recognizable either as this species or *C. fragilis* (only four spines are shown on the subapical lobe and the paraproct lacks a lateral arm).

The following description of the male hypopygium and larva, not previously described, is based on reared material from Hollandia, Netherlands New Guinea, and Dobodura, Papua.

Hypopygium (fig. 3): Coxite about twice as long as mid width; apico-ventral lobe (AV) large, bearing a cluster of about a dozen curved modified bristles; subapical lobe (SA) prominent, with two groups of structures, the first consisting of a stout spine and two longer, apically curved and flattened rods, the second group a pair of stout spines one of which is flattened leaflike; a dense patch of long fine hairs at side of lobe near base of style. Style (S) about three fourths as long as coxite, curved and upturned at tip, the crest with a row of from four to seven erect spines of varying sizes; a pair of fine hairs on each side near crest; appendage small, blunt, subapical. Paraproct heavily sclero-

tized, the crown basally bearing a row of about eight apically curved, broadened spines and an overlying row of shorter pointed spines; apically with a dense tuft of hairs; lateral arm (LA) long, slender and curved. Lateral plate of phallosome slender apically, widened basally, with from 4 to 7 small teeth on one side and a much larger tooth sub-basally. Ninth tergite with shoulders slightly rounded, separated, each bearing about 7 setae.

LARVA (fig. 7).—*Head*: Pale, two-thirds as long as wide. Antenna about two-thirds as long as head, with slender spinules on basal two-thirds; tuft arising near middle, with about 12 plumose branches not reaching apex of shaft; shaft narrower beyond tuft, without subapical bristles. Preclypeal spines one-sixth length of antenna, moderately stout, usually with one to four small lateral spinules; a slender clypeal hair arising near base of spines. Head hair A arising just posterior to base of antenna, with six to nine plumose branches; B and C both long, arising behind and interior of A, both usually 3-branched, one or the other sometimes 2-branched, plumose; *d* arising about level with A and interior of C, single, lightly plumose; *e* and *f* with two or three branches non-plumose. *Abdomen*: Lateral hairs on segment I double or triple, on segment II usually double or single, on III to V usually single, sometimes double. Segment VIII with lateral comb a triangular patch of from 35 to 45 elongate, apically rounded scales, each fringed from base to apex; pentad hair 1 with five or six plumose branches; hairs 2 and 4 single, non-plumose; hair 3 with seven or eight plumose branches; hair 5 double, lightly plumose. Siphon index 4:1, bulbous sub-basally, the distal half narrowed to apex, which is one-third width of base; acus present; 3 to 5 pecten teeth on basal two-fifths, each with elongate denticles along basal half of one side; four pairs of latero-ventral hair tufts, 4 to 6 branched, beyond pecten. Anal segment completely encircled by saddle, short spinose rows posteriorly on saddle; saddle hair single to triple; subcaudal hair tufts single; ventral brush of four or five pairs of tufts arising from a grid; anal gills slightly swollen basally, the apical half tapered to a blunt tip; dorsal pair about three times length of saddle (sometimes shorter), ventral pair about five-sixths as long as dorsal pair.

On external characters, the adults of this species are most apt to be confused with *C. fragilis* among the New Guinea fauna. They are somewhat larger (wing about 4.0 mm. compared with 3.5 mm.) and darker in color, there is no trace of apical lateral pale spots on the abdominal tergites, the wing scales on veins 2 to 4 are distinctly narrower, and there are fewer flat scales on head vertex. The swollen airtube of the larva is unusual, although in this respect it resembles somewhat *C. phalidothorax* Theobald of India and runs to this species in D. J. Lee's "Atlas of the Mosquito Larvae of the Australasian Region. Tribes-Megarhinini and Culicini" (Aust. Mil. Forces, 1944, North Melbourne). The adults of *pallidothorax* differ in having a banded abdomen and in several characters of the male genitalia.

This species was much less common at Hollandia than *Culex fragilis*, although the larvae were sometimes very numerous in certain collections of water. Twice they were taken in large numbers from the putrid water in hollowed sago trunks used by natives for preparing their sago dough; in these instances no other species was found with them.

Other collections were from wooden kegs, tin food containers, tree-holes, and drums, with *Aedes (Finlaya) notoscriptus* (Skuse), *Culex (Lutzia) halifaxi* (Theob.), *C. (Neoculex) brevipalpis* (Giles), *C. (Culex) pullus* Theob., and *Uranotaenia argyrotarsis* variety. The breeding places were shaded or semi-shaded, and the water was either clear or filled with leaves. In two collections at Dobodura, eastern New Guinea, (one collection in a steel drum filled with rocks and water, the other in pools in sagging canvas) numerous larvae were taken, associated with *C. fragilis*, *Aedes (Stegomyia) scutellaris* (Walk.), *A. (F.) notoscriptus*, *A. (F.) novalbitarsis* K. & H., *Tripteroides bimaculipes* (Theob.), and *Uranotaenia* sp. At Hollandia, adult specimens were taken in the light trap at the edge of rain forest only five times between January and June, and no females were taken attempting to bite.

Culex (Culicomyia) fragilis Ludlow, 1903

Culex fragilis Ludlow, 1903. Jl. N. Y. Ent. Soc. 11:142. (Type male and female, Oras, Samar, Philippine Is.)

Culex (Culicomyia) papuensis of Lee, 1944 (nee Taylor), Atlas of Mosq. Larv. of Aust. Region, Aust. Mil. Forces, p. 96. (Illustration of larval characters).

A recent comparison by the writers of adult and larval material of *C. fragilis* from the Philippines has indicated that New Guinea specimens are the same species. The larva (fig. 8) is distinguishable from related species by the long tubular gills, multiple branching of head hairs B and C, and three pairs of hair tufts on a rather short siphon. The adults have a wide line of flat scales along the eye margin, the wing scales on the forked veins are distinctly broadened and the abdominal tergites have faint yellowish spots on the apical corners. In the male (fig. 4) the styde has a long crest of blunt spines, subapical lobe of coxite with a leaflet and about seven rods and spines, paraproct with a basal arm shorter and stouter than in *C. pullus*, the crown with a row of about seven long blunt spines followed by an equal number of sharp ones; lateral plate of phallosome with four to six medial teeth and a larger one sub-basally. Differences between this species and *C. papuensis* are mentioned under the latter.

This was one of the most common *Culex* breeding at Hollandia. Of 62 larval collection records about half are from temporary and semi-permanent ground pools, especially with stagnant, more or less foul or algae-filled water, in all degrees of shade, and the others are from larger tree and log holes and artificial containers, especially with rotting vegetation and usually shaded. Associated larvae from ground pools were *Culex (Lutzia) halifaxi*, *C. (Culicio.) pullus*, and *Uranotaenia argyrotarsis* var; from tree and log holes, coconut husks and artificial containers were *Aedes (Finlaya) notoscriptus* and *aureostriatus*, *A. (Stegomyia) scutellaris*, *Armigeres (Armigeres) breinli*, *Tripteroides* spp. *Uranotaenia nigerrima*, *Culex (Lutzia) halifaxi*, *C. (Mochto.) brevipalpis*, and *Megarhinus splendens*. Three collections were from putrid water in the tips of fallen betel nut palms in a rain forest, associated with larvae of *Armigeres (A.) breinli* and *milnensis*. Adult fe-

males were taken from tents and from buttresses of large rain forest trees. None were taken hovering about persons or attempting to bite. Males and females in about equal proportions were attracted in large numbers to light traps operated between January and June.

Culex (Culiciomyia) pullus. Theobald

Culex pullus Theobald, 1905. Ann. Mus. Nat. Hung., 3:87. (Type female, Muina New Guinea.)

Culex (Culiciomyia) muticus Edwards, 1923. Bull. Ent. Res. 14:6. (Type male and female, Rabaul, New Britain; synonymized by Edwards, 1926, Bull. Ent. Res. 17:121.)

Culex (Culiciomyia) muticus Edw. Hill, 1925, Proc. Roy. Soc. Viet., 37:74. (Partial illustration of larva and pupa.)

Culex (Culiciomyia) muticus Edw. Brug., 1934, Bull. Ent. Res., 25:517. (Description and illustration of male genitalia and notes on the larval siphon.)

Culex (Culiciomyia) pullus Theob. Lee, 1944, Aust. Mil. Forces, p. 94. (Illustration of larva.)

?*Culex (Culiciomyia) pallidothorax* of Bonne-Webster (nec Theobald), 1938. Meded. Dienst Volksgezond., Ned.-Ind., 27, 206-212. (Listed from New Guinea.)

The larva of this species is easily recognized by the very long and slender airtube which has a lightly sclerotized section beyond the middle, giving the tube a broken appearance. The lateral and submedian hairs of abdominal segments 4 to 6 are each long and single. The characteristics of the adults are as given in the key. Parts of the male hypopygium are shown in Fig. 5.

Aside from *Aedes (Stegomyia) scutellaris*, this was the most commonly encountered mosquito at Hollandia. About 150 larval collections of *pullus* were recorded, and many individuals were frequently present. Sixteen records were from log holes or artificial containers, the others from shaded and sunlit collections of ground water of all types, except permanent ponds and brackish water. The list of associated species from these pools includes almost all the ground pool breeders taken at Hollandia. The collections other than ground pools were from large holes in logs, usually shaded, and from large cans, cisterns, oil drums, and beached canoes, in association with *Aedes (S.) scutellaris*, *A. (S.) albolineatus*, *A. (F.) notoscriptus*, *Culex (Lutzia) halifaxi*, *C. (Mochtwo.) brevipalpis*, *C. (Culicio.) fragilis*, *C. (Culicio.) papuensis*, *Megarhinus splendens* and *Tripteriodes* spp. Adults of both sexes were taken in tents and from buttresses of large rain forest trees on several occasions. Females were taken hovering about persons in the rain forest and sago swamp, but never biting. In light trap collections at the edge of a rain forest, adults of both sexes (about one-fourth males) were taken at an average of from four to ten per night during different months from January to May, 1945.

Besides New Guinea, the species has been reported from New Britain, the Solomons, Amboina and Queensland, Australia.

DESCRIPTIVE KEY TO ADULTS

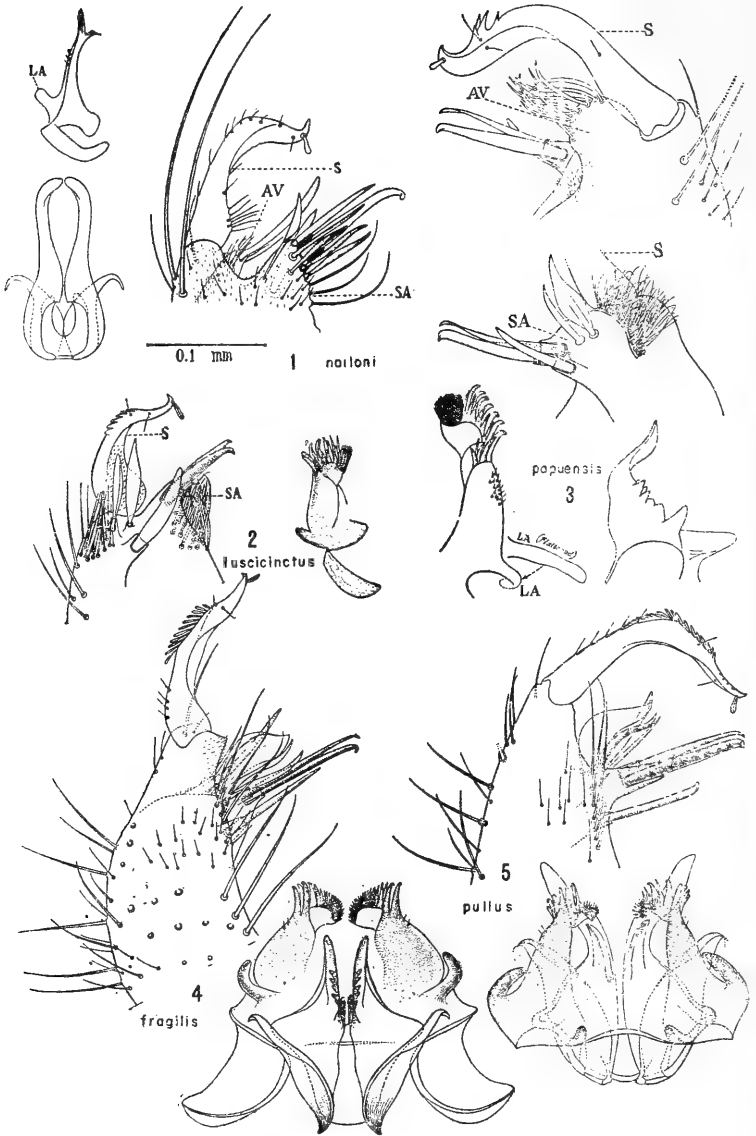
1. Abdominal tergites with wide basal white bands (frequently having a rounded posterior border on some segments). Upper parts of pleurites dark or with dark spots on sternopleuron and mesepimeron; subapical lobe of coxite with a large leaflet; apical half of style with a long row of flattened platelets on crest; lateral plate of phallosome elongate, rounded at tip, simple, basal arm elongate, pointed; basal arm of paraproct long and curved *pullus*
- Abdominal tergites unbanded 2
2. Abdominal tergites with small basal lateral spots of white scales; pleurites with two dark longitudinal stripes; only a few broad flat scales laterally on eye margin, not extending nearly to mid line. Style enlarged at base, the crest with a short row of spines; apicoventral lobe of coxite with two stout rods from tip; subapical lobe with a narrow leaflet; lateral arm of paraproct short; lateral plate of phallosome untoothed medially
fuscicinctus n. sp.
- Abdominal tergites without basal lateral white spots; pleurites unicolorous or with only indistinct dark markings; head vertex with 1-3 rows of flat scales along eye margin reaching median line, or nearly so; male style not greatly enlarged at base..... 3
3. Abdominal tergites entirely dark 4
- Abdominal tergites with indistinct apical lateral pale spots. Lateral wing scales distinctly broadened; head with a wide line of flat pale scales around eye margin, narrowly interrupted at mid line; a single lower mesepimeral bristle; crest of style with a long row of rounded spines; subapical lobe of coxite with a moderately broad leaflet; lateral arm of paraproct moderately long, stout; lateral plate of phallosome with 4-6 median teeth and a larger basal tooth..... *fragilis*
4. A small species, rather pale in color; head with a wide line of flat scales along eye margin, usually uninterrupted in middle. Lateral wing scales slightly broadened on apical half of the forks of vein 2; male style without a spiny crest; apicoventral lobe of coxite with an elongate rod; subapical lobe without a leaflet; lateral plate of phallosome simple; paraproct with a short lateral arm and only a few pointed spines on crest
nailoni n. sp.
- A rather large species, darker in color; head with the lines of flat scales well separated by narrow scales in middle. Lateral wing scales linear; two or three lower mesepimeral bristles frequently present; male style with a few spines on crest; apicoventral lobe of coxite with a cluster of modified bristles; subapical lobe with a narrow leaflet; lateral plate of phallosome toothed; paraproct with a long curved lateral arm, the crest with the usual dense tuft of hairs and a row of flattened, rounded spines *papuensis*

KEY TO LARVAE (Fourth instar)

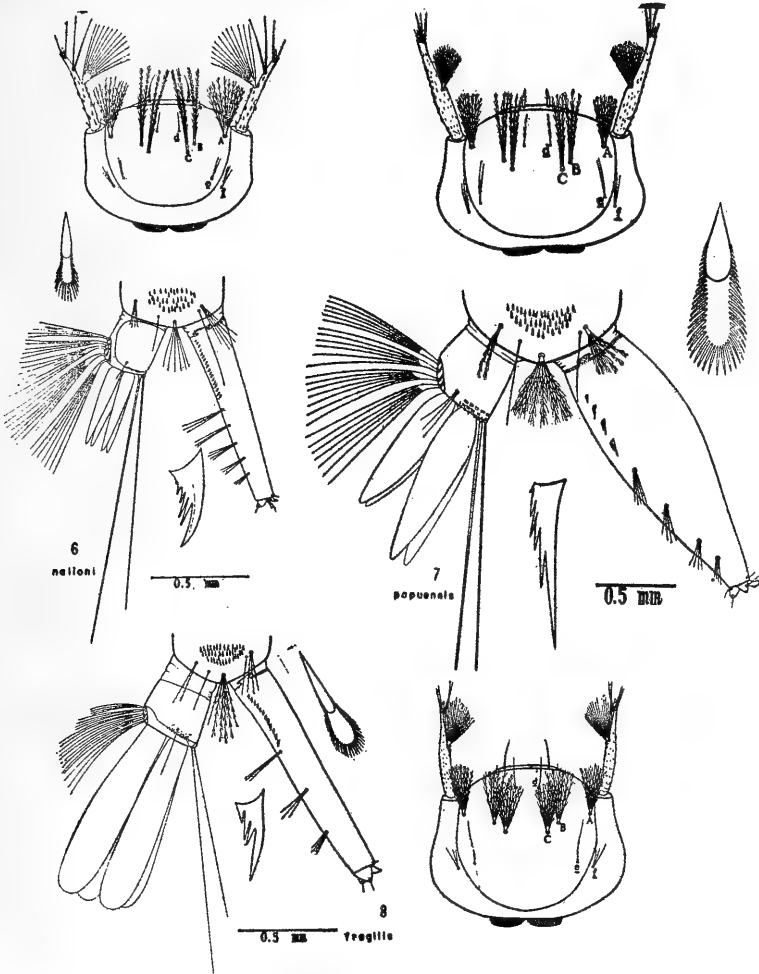
1. Airtube elongate, the sides straight and nearly parallel; pecten normal; anal gills usually equal..... 2
 Airtube enlarged, distinctly inflated before middle and tapered to tip; pecten of only 3-5 teeth; anal gills unequal, the dorsal pair twice as long as saddle, or longer, rather large but tapered to a bluntly pointed tip.....*papuensis*
2. Airtube moderately long, index about 5:1, normally sclerotized.... 3
 Airtube very long and slender, index 8-10:1, a weakly sclerotized band at apical third which gives the tube a fractured appearance; two or three pairs of ventrolateral hairs, single or bifid, very small; anal gills slender, about as long as saddle; head hairs B and C usually triple.....*pullus*
3. Anal gills large, 3-4 times as long as saddle, broadly rounded at tip; siphon with three pairs of hair tufts, each about as long as diameter of tube; head hairs B and C with 6-8 branches
fragilis
 Anal gills slender, less than twice as long as saddle; siphon with five pairs of hair tufts of decreasing lengths apically; head hairs B and C usually bifid.....*nailoni*
 (Larva of *fuscicinctus* unknown.)

ILLUSTRATIONS

Male genitalia: Fig. 1, *Culex nailoni*, paraproct, phallosome and tip of coxite (outer aspect); Fig. 2, *C. fuscicinctus*, tip of coxite (inner aspect) and paraproct; Fig. 3, *C. papuensis*, coxite (outer and inner aspects), paraproct and lateral plate of phallosome; Fig. 4, *C. fragilis*, coxite, paraproct and phallosome; Fig. 5, same of *C. pullus*. Head and terminal segments of larvae: Fig. 6, *Culex nailoni*; Fig. 7, *C. papuensis*; Fig. 8, *C. fragilis* (New Guinea).



New Guinea Species of *Culex*.



New Guinea Species of *Culex*.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GNATCATCHER FROM BOLIVIA

By W. E. CLYDE TODD

A recently completed study of the Gnatcatchers (*Poliop-tila*) in the collection of the Carnegie Museum has revealed one form which is apparently undescribed, and which may be called

Polioptila dumicola saturata, subsp. nov.

Type, No. 80,776, Collection Carnegie Museum, adult male; Samaipata, Bolivia, November 17, 1919; José Steinbach.

Subspecific characters.—Similar to *Polioptila dumicola dumicola* (Vieillot) of Paraguay, eastern Bolivia, etc., but general coloration decidedly darker; pileum and upperparts slate color, and underparts slate gray, only slightly paler posteriorly; tail averaging longer.

Range.—Highlands of Bolivia.

Remarks.—The characters of this new race have already been indicated by Hellmayr (Field Mus. Zool. Ser., 13, pt. 7, 1934, 490, note). It varies away from *dumicola* of the lower elevations in a direction precisely opposite to *berlepschi* (a pale race). Hellmayr synonymizes the *Culicivora boliviana* of Selater (1853) with *dumicola*. It was described from "Bolivia" (exact locality unspecified), and since Hellmayr examined Selater's type, and comments as well on Samaipata specimens, his identification may be accepted. Our four males come from Samaipata and Chilon; they measure as follows: wing, 54, 55, 60, 55 mm.; tail, 63, 60, 64, 63. Thirteen males of *dumicola* from Bolivia and northern Argentina average: wing, 53.8; tail, 57.5.

Count Nils Gyldenstolpe (K. Svenska Vet. Hand., 23, No. 1, 1945, 246-7) has also commented on the peculiarities of the specimens he handled. Very significantly, he states that "the type of *C. boliviana*, as well as another male from Santa Cruz de la Sierra, is somewhat paler above and beneath than topotypical *P. d. dumicola* of Paraguay."



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE OCCURRENCE OF WEHRLE'S SALAMANDER,
PLETHODON WEHRLEI FOWLER AND DUNN, IN
VIRGINIA

By M. GRAHAM NETTING, *Carnegie Museum*
and
N. BAYARD GREEN, *Marshall College*
and
NEIL D. RICHMOND, *Laneza, Virginia*

The eastern boundary of the range of *Plethodon wehrlei* Fowler and Dunn, as mapped by both Bishop¹ and Grobman,² lies slightly west of the border of Virginia. It appears desirable, therefore, to call attention to certain specimens which demonstrate the occurrence of this salamander in Virginia. This new state record, although of interest as an addition to the already large herpetofauna of Virginia, does not merit extended treatment as such. Nor do we attach any great significance to the fact that these appear to be the first examples of *wehrlei* obtained in the Atlantic Drainage, since the ultimate destination of local run-off can scarcely affect purely terrestrial salamanders living along a divide. The new locality records do indicate, however, that *Plethodon wehrlei* is not so strictly limited physiographically as was formerly believed. This should stimulate more careful search for the species in suitable habitats elsewhere in the folded Appalachians, and even in the Blue Ridge!

On May 30, 1940, we visited the portion of Allegheny Mountain known as Tamarack Ridge. The collecting site was about eight and a half miles (airline) southeast of Durbin, West Virginia, at the point where U. S. highway 250 crosses the ridge. The West Virginia-Virginia state line, in this area, follows the crest of Tamarack Ridge, Pocahontas County, West Virginia, lying to the west, and Highland County, Virginia, to the east. We searched along the ditches and roadcuts of the main highway, along the low banks of an intersecting dirt road, and in the woods adjacent to each, at elevations between 4,350 and 4,400 feet on both slopes.

¹Bishop, Sherman C., *Handbook of Salamanders*: 292, 1943.

²Grobman, Arnold B., *Ann. N. Y. Acad. Sci.*, 45: 286, 1944.



The ridge is largely covered with mixed second-growth forest, but occasional pastures with scattered trees border the highway. Small red spruce (*Picea rubra*), yellow birch (*Betula lutea*), striped maple (*Acer pennsylvanicum*), red-berried elder (*Sambucus pubens*), and brambles (*Rubus canadensis*) are well represented. Numerous decaying logs of chestnut, birch, and spruce lie scattered on the forest floor.

Within forty-five minutes, during a hard afternoon rain, we obtained twelve specimens of *Plethodon wehrlei* (three of them, CM 19,597-99, being taken in Virginia), nine *P. cinereus cinereus* (both states represented), and two *P. glutinosus glutinosus* (West Virginia only). Of the dozen *wehrlei* found, most were in or under spruce logs, a few were under rocks, and one was in a chestnut log that also contained a specimen of *glutinosus*. The other *glutinosus* was found under a large rock, and the nine *cinereus* were in or under spruce logs. Our examination of birch logs here confirmed previous experiences, for, although many were torn apart, none contained salamanders. Birch decays as a soggy mass within its bark shell, and is usually either too wet or too spongy to be attractive to *Plethodons*.

We returned to the same spot in the evening and collected from 9:30 to 10:30 P.M. The air temperature was 43° F. and intermittent rain was falling. In one hour we obtained thirteen *wehrlei* (ten, CM 19,600, from the Virginia side) and four *glutinosus* (five additional specimens were observed). A careful search was made for *cinereus*, but no specimens were found, probably because the temperature was too low for nocturnal activity on the part of this species, which certainly appears to be less cold-resistant than *glutinosus*, although it is *reputed* to be more tolerant of low humidity. (In high-altitude collecting in West Virginia we have found that temperatures below 45° F. largely inhibit the nocturnal activities of many terrestrial plethodontids, but, on rainy evenings, *wehrlei*, *glutinosus*, and *nettingi* are sometimes active at somewhat lower temperatures.) Most of the specimens of *P. wehrlei* were found walking along the leaf-filled drainage ditches, but one was in a rock crevice, and one was on top of a log. One specimen of *wehrlei* regurgitated a centipede. Although several *glutinosus* were walking on the bare soil of the roadcut, the majority observed were resting in their burrows in the bank, their bright eyes sometimes glowing pink when caught by the beam of a headlamp.

Two additional specimens of *wehrlei* (CM 19,801-02) were obtained on June 2, along U. S. 250, at a point somewhat farther down the east slope of Tamarack Ridge, about one-half mile beyond the first locality.

Through the courtesy of Prof. H. W. Jackson, Virginia Polytechnic Institute, we are privileged to record *P. wehrlei* at a second area in Virginia; namely, the vicinity of Blacksburg, Montgomery County. The senior author has examined one specimen (VPI No. C19) collected in the twilight zone of Nellie's Cave, two miles southeast of Blacksburg, at an elevation of 2,100 feet, on February 9, 1943, and two specimens (VPI Nos. A3-4) collected under a log in a gully two miles east of Blacksburg, at an estimated elevation of 1,700 feet, on March 30, 1943. Professor Jackson stated (letter of Nov. 18, 1943):

It might interest you to know that this species is not at all un-

common and could be recorded as generally distributed. Although this species is frequently observed near the entrance of caves, it is not at all confined to caves and may be collected under stones or logs on moist wooded hillsides; for example, Trillium Vale, a valley one mile east of Blacksburg, and at an average elevation of 2,100 ft., is a very reliable source which we use for class demonstrations.

Still more recently (letter of Sept. 17, 1945), Professor Jackson reported:

You might be interested to know that we also have collected this species from Dixie Caverns which are located near the west border of Roanoke county on Route 11 about 300 yards north of the Roanoke River.

Dixie Caverns are about six miles west-southwest of Salem, approximately fourteen miles east of the Blacksburg stations, and only about eleven miles northwest of the crest of the Blue Ridge. Collectors in Virginia should make an especial attempt to locate *wehrlei* on Poor Mountain just south of the Roanoke River, and should also search for it at Slings Gap and Mason Knob in the adjacent Blue Ridge. The eastern slope of Tamarack Ridge is drained by northeast-flowing Laurel Fork, which combines with Straight Fork (in Pendleton County, West Virginia) to form the North Branch of the Potomac River. Blacksburg is actually in the New River drainage, but the three specific *wehrlei* localities are drained by short tributaries of the North Fork of the Roanoke River. Dixie Caverns are close to the Roanoke itself.

The occurrence of *P. wehrlei* in three counties in Virginia, as listed above, also establishes for the first time the presence of this species in two Atlantic drainage systems, apparent indication that the species can spread readily across environmentally suitable divides. Whether or not large rivers are a barrier to the dispersal of *wehrlei* remains to be established. It is beyond the scope of this paper to consider Grobman's discussion of the Ohio River as a modern barrier, but we do wish to point out in this connection that this author's statement, "It may be that the New-Kanawha Rivers restrict the southwestern spread of *wehrlei*," is contraverted by his own distribution map, which includes dots representing stations in Mercer and Raleigh counties, West Virginia, southwest of the New-Kanawha. (The specimens supporting these records are: CM 7,483 from Brush Creek Falls, near Athens, Mercer County; CM 15,874-76 from one mile south of Daniels, Raleigh County; and CM 15,873 from two miles west of Eccles, Raleigh County.) Although we are disinclined to regard water itself as a barrier to *wehrlei*, we cannot deny the possibility that a broad, hot flood-plain bordering a river might prove a very effective barrier indeed.

Plethodon wehrlei is widespread and locally numerous in suitable habitats in the middle eastern portion of the Appalachian Plateaus Province. Except for the localities discussed above, the forty-seven stations represented by the 391 specimens of *wehrlei* in the Carnegie Museum collection are all within this Province. In eastern West Virginia the Plateaus Province boundary, recently delimited by Fenneman,³ leaves the Allegheny Front just south of the thirty-ninth parallel and curves

³Fenneman, Nevin M., *Physiography of Eastern United States*: 250, 1938.

westward to Back Allegheny Mountain. From a strictly physiographic point of view it is correct, therefore, to consider that the specimens reported here constitute the first stations for *wehrlei* in the Valley and Ridge Province. Such treatment, however, implies a discontinuity in habitat that does not in fact occur. Allegheny Mountain, on which the Tamarack Ridge specimens were taken, is actually a continuation of the Allegheny Front, environmentally if not physiographically. Similarly, the Blacksburg stations, although well within the Valley and Ridge Province, are situated in an area where the Great Valley is completely blocked by a maze of short, high ridges and hills which are well interconnected with the dissected plateau to the west. To the best of our knowledge, *P. wehrlei* has not yet been collected at Mountain Lake, Giles County. In 1938, however, Prof. Maurice Brooks saw a large *Plethodon* in a hemlock log there. The specimen eluded capture, but he noted at the time that it was "not *glutinosus*."

We believe that virgin spruce forest provides the optimum conditions of moisture, food, and shelter for *P. wehrlei*, at least in the southern half of its range. Caves, although probably a secondary habitat, appear to provide nearly optimum conditions, also, but access to their twilight zones must be by external routes through vegetative cover that is, or has been, suitable. The caves of the Shenandoah Valley offer apparently satisfactory habitats for *wehrlei*, yet much exploration by speleologists has not resulted in the finding of the species there. Its absence probably reflects the lack of present or former high-humidity migration lanes across the floor of the Great Valley.

On the basis of the records discussed here, we believe that it is safe to conclude that the folded ridges of the western portion of the Valley and Ridge Province—the Allegheny Ridges of some physiographers—may be expected to harbor *wehrlei* wherever spurs interconnect the ridges and plateau. Further search for *wehrlei* at Mountain Lake is indicated, for the absence of the species at this locality is difficult to understand in the light of the Blacksburg records. Extensive collecting between Blacksburg and the Blue Ridge should be productive of additional stations and should indicate whether or not the species has actually reached the Blue Ridge.

In conclusion, we believe that it is desirable to regard *Plethodon wehrlei* as essentially an Appalachian Plateaus endemic,⁴ which enters the Valley and Ridge Province in places where there is, or has recently been, continuity of habitat, and which may possibly have gained access to the Blue Ridge via the jumbled ridges which block the southern portion of the Great Valley.

⁴Mayr has recently (Wilson Bull., 58: 11, 1946) differentiated between endemic, "restricted to a given region," and autochthonous, "having originated in a given region; now sometimes found beyond the borders of that region." Using this terminology, *P. wehrlei* is an autochthonous rather than an endemic Appalachian Plateaus species.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A NEW MILLIPED AND TWO NEW CENTIPEDES
FROM GUAM

By RALPH V. CHAMBERLIN

The specimens from Guam Id. upon which the present descriptions are based were among arthropods found "associated with the freeliving stages of a trombiculid mite that was investigated in connection with a study of the vectors of scrub-typus by members of U. S. Naval Medical Research Unit No. 2," a study being made by Lieut. George W. Wharton, Jr.

The specimens sent to me for identification by Mr. C. F. Muesebeck of the U. S. Bureau of Entomology and Plant Quarantine prove to represent one species of spirobolid milliped typifying a new genus, and two species of chilopods, one a hemicopid and one a geophilid.

Genus **GUAMOBOLUS**, new genus

Distinguished among other genera of the Spirobolidae in wholly lacking a sternite to the anterior gonopods. These gonopods undivided, distally prolonged into processes which in the generotype meet mesally; their bases with lamellate extensions meeting at the middle line. Posterior gonopods widely separated, undivided, expanded distally in a somewhat canoe-shaped lamella. Supralabial setigerous feveolae 5+5 or 5+4. Repugnatorial pores on the metazonites. Anal valves protruding in the usual manner, neither depressed nor compressed at middle.

Generotype.—*Guamobolus delus*, new species.

Guamobolus delus, new species

A small dark brown form with paler annuli, these not always sharply defined. Legs also brown.

Eyes very widely separated. Ocelli in 5 transverse series, e.g., 6, 6, 6, 5, 4.

Collum strongly narrowed down the sides, with the lower ends rounded as shown in the figure (Fig. 3); without impressed sulci. Second tergite not descending below level of collum.

The ordinary segments moderately constricted, with course puncta and some horse-shoe shaped impressions especially in and in front of the furrow. The posterior segmental sulcus not sharply impressed, the pore touching the light line representing it.

In the male the coxae of the fifth legs with conspicuous, somewhat lamellate, processes which are distally bent forward. (Figs. 4 and 5.)

The gonopods of the male are as figured. (Figs. 1 and 2.)

Number of segments in the male holotype, 37 or 38.

Width, 1.6 mm.

Locality.—Guam Id: Oca Point. Male holotype taken Aug. 10, 1945 by Carver; one adult male, one immature male and three females taken Aug. 17, 1945 by Fritts, and a very young specimen by the latter on Aug. 24, 1945.

Mecistocephalus ocanus, new species

Head about once and a half as long as wide, its form as figured. (Fig. 6.)

Anterior margin of prosternum with two pale but distinct teeth; coxoid with a rounded tooth and femuroid with a similar one; two next joints also with distinct rounded teeth but claw not dentate at base.

Anterior areolated area of the clypeus decidedly longer antero-caudally than the anterior non-areolated band.

Coxae of first maxillae with a well marked ectal shoulder the antero-ectal angle of which is produced moderately distad. (Fig. 7.) Palpi of second maxillae long, curving distally beyond the first maxillae; distal end with an abortive claw and with setae moderate in number as shown in the figure. (Fig. 8.)

First lamella of mandible with 5 long teeth, the corner beneath it produced as shown in the figure. (Fig. 9.)

Coxal pores small, moderate in number.

Pairs of legs, 49.

Length, about 15 mm.

Locality.—Guam: Oca Point. One specimen collected by Fritts, on Aug. 24, 1945.

Lamyctes guamus, new species

A smaller species than the widespread *L. fulvicornis* from which it differs in having the prosternal teeth 2+2 instead of 3+3, these teeth small, well spaced, with the median interval wide, obtusely angular at bottom. Antennae with articles short, moniliform, 23-25 in number. Ocellus present, large, pale, with no pigmented area about it.

Coxal pores 1, 1, 1, 1, small and circular, as against 2, 2, 2, 2, to 4, 4, 4, 3 in the other species known from the Pacific area.

Gonopods of male beyond the stout basal article straight and distally bristle like.

Length, 4.5 mm.

Locality.—Guam: Bile Bay. Five males taken by Carver, Aug. 31, 1945.

The occurrence exclusively of males in this lot is very interesting in view of their usual rarity.

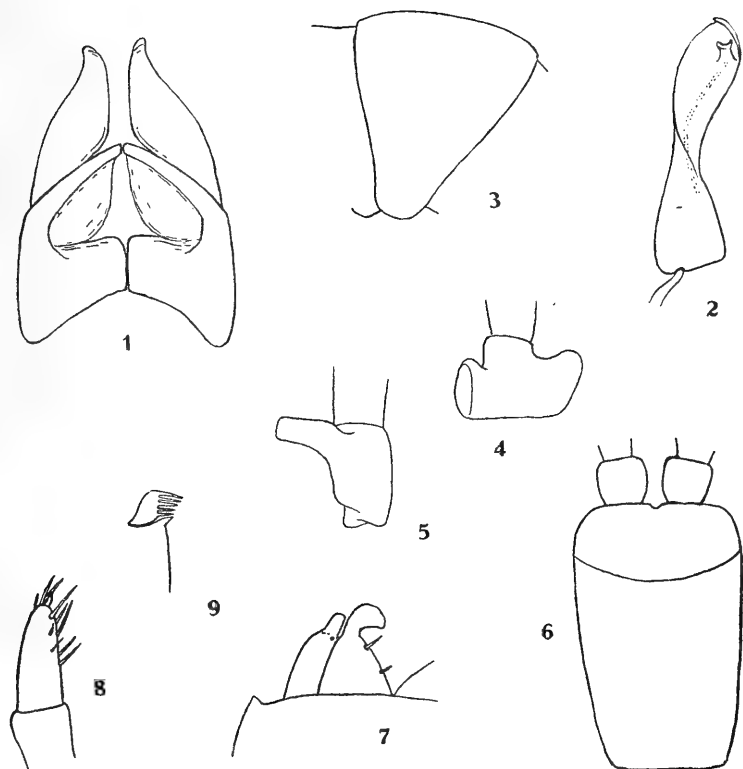
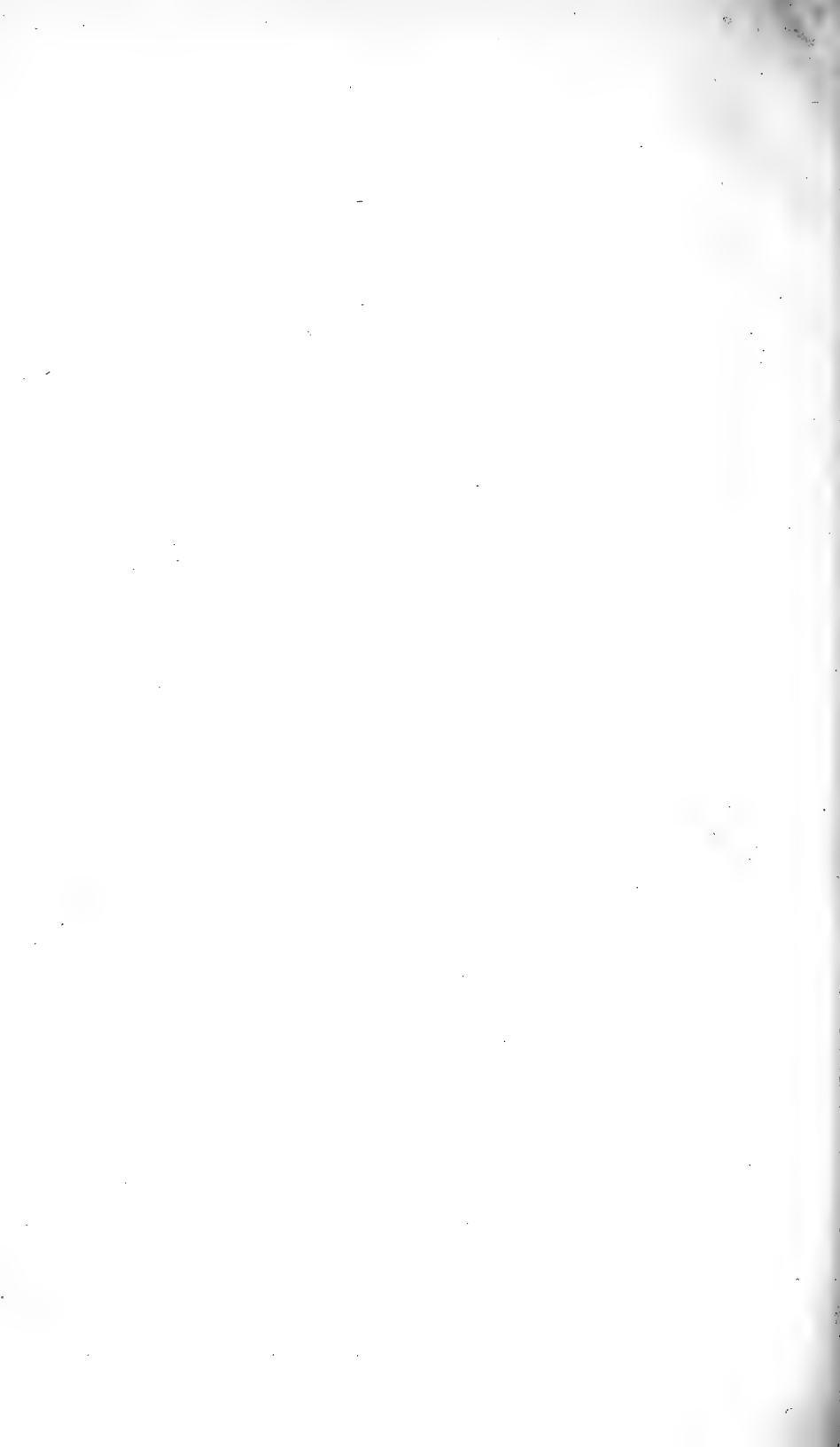


PLATE XV

Guamobolus delus, n. sp. Fig. 1. Gonopods of male, anterior view. Fig. 2. Posterior gonopod of male, subcaudal view. Fig. 3. Collum, viewed from right side. Fig. 4. Coxa of fifth left leg of male, anterior aspect. Fig. 5. The same, mesal aspect, showing process.

Mecistocephalus ocanus, n. sp. Fig. 6. Cephalic plate in outline. Fig. 7. First maxillae, right half. Fig. 8. End of palpus of second maxilla. Fig. 9. First lamella of mandible.



PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

GENERAL NOTES

A NEW LOCALITY RECORD FOR *EUMECES LATICEPS* (SCHNEIDER) IN MARYLAND

McCauley (1945, The Reptiles of Maryland and the District of Columbia, p. 51) indicates that the distribution of *Eumeces laticeps* in Maryland is limited to a few localities on the Coastal Plain. He also points out the possibility of its occurrence on the Piedmont Plateau and even as far west as the Allegheny Ridges.

On June 18, 1946, while collecting about 2½ miles above Seneca, Montgomery County, Maryland, a large specimen of this species was secured. The locality from which this specimen was taken is on the Piedmont Plateau in that portion known as the Triassic Lowland. This lowland is characterized by sandstones and shales of the Newark formation. Above Seneca these rocks form a line of bluffs about 200 feet high running parallel to the Potomac River for a distance of several miles.

The specimen was taken from beneath a large slab of shale poised on the edge of the bluffs at a point below which there is a broad floodplain of the river. When first noted its head and a part of its body were protruding from a burrow-like hole near one corner of the rock. Detecting the observers, it withdrew into this hole but reappeared a few minutes later. It was finally caught by sliding away this rock beneath which it was hiding. A nest, presumably of some rodent, was also found under the rock.

The lizard was an adult male with a snout to vent length of 123 mm. The largest Maryland specimen mentioned by McCauley (loc. cit.) had a snout to vent length of 120 mm. The maximum size attained by this species is 130 mm. (Smith, 1946, Handbook of Lizards, p. 353.) Other reptiles and amphibians collected at this same locality included *Agkistrodon m. mokeson*, *Triturus v. viridescens* (eft), *Ambystoma maculatum*, *Bufo woodhousii fowleri*, and *Hyla c. crucifer*.

J. A. FOWLER

PARTIAL NEOTENY IN A COMMON NEWT

Noble (1929, Amer. Mus. Novitates, No. 348, pp. 1-22) in connection with observations on the life history of the newt, *Triturus v. viridescens*, reported a typical larva which contained fully formed spermatozoa. This was the first report of true neoteny in this species. In addition, many newts were partially neotenic in that they failed to complete metamorphosis and retained open gill-clefts, a more or less larval branchial apparatus, and gills partly or fully developed. Noble's investigations were conducted at Woods Hole on the Coastal Plain in Massachusetts but neotenic individuals of this newt have also been reported from other parts of the Coastal Plain as far south as New Jersey (Bishop, 1943, Handbook of Salamanders, p. 12).

In Maryland, judging from the number of normally transformed adults encountered in all parts of the state, neotenic newts are apparently the exception. It is therefore of interest to record a partially neotenic individual collected on Bear Island near Great Falls, Montgomery County. This locality is on the Piedmont Plateau about 10 miles west of its junction with the Coastal Plain. The specimen was taken from a small body of water occupying a river pot-hole. It had vestiges of gills and open gill-clefts and measured 72 mm. in total length. The average length of this species at transformation is about 36 mm. (Bishop, loc. cit., p. 103.) This is the only neotenic newt that has been noted among a number of individuals of this species collected from various ponds on the island where the immature, terrestrial red "eft" stage has also been found.

J. A. FOWLER

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTONA NEW MOUSE OF THE *PEROMYSCUS BOYLI*
GROUP FROM UTAH

By STEPHEN D. DURRANT

In the course of preparing the accounts of the Utah mammals an hitherto undescribed race of *Peromyscus boylii* has been recognized. The description and name of the new form are as follows:

Peromyscus boylii utahensis, new subspecies

Type.—Female, adult, skin and skull, No. 4400, Museum of Zoology, University of Utah; 5 mi. above lower power station, Millcreek Canyon, 5,800 ft., Salt Lake County, Utah; November 15, 1941; collected by Henry W. Setzer, original number, 297.

Range.—In that part of the state bounded on the east by the Colorado and Green rivers and on the west by the area formerly occupied by Pleistocene Lake Bonneville; limits unknown outside of Utah.

Diagnosis.—Size large; tail long; ears and hind feet short (see measurements). Color: Upper parts a mixture of Fuscous, Light Ochraceous-Buff and gray giving a ground color of Hair Brown; ears dusky, faintly margined with white; nose and post orbital regions grayish; eye ring black; markings at base of vibrissae black; hind legs dusky to tarsal joints; dorsal surface of tail like mid-dorsal region; lower sides, flanks, cheeks and outer surface of front legs Light Ochraceous-Buff; front feet, hind feet, ventral surface of tail and entire underparts white (Capitalized color terms according to Ridgway, Color Standards and Color Nomenclature, Washington, D. C., 1912). Skull: Large; nasals long; depression at proximal end of nasals present; interparietal actually as well as relatively narrow; braincase wide and moderately inflated; diastema long; tympanic bullae well inflated ventrally.

Measurements.—The average and extreme measurements of five adult females from the type locality and near vicinity are as follows: Total length, 194 mm. (200-188); length of tail, 104 (109-95); ratio of length of tail to head and body length, 118 per cent (133-100); length of hind foot, 19.6 (22.0-17.0); length of ear, 18 (19-16); greatest length of skull, 27.9 (28.3-27.6); zygomatic breadth, 13.9 (14.0-13.7); greatest breadth of braincase, 13.3 (13.4-13.2); interorbital breadth, 4.5 (4.5-4.4); length of nasals, 11.1 (11.2-10.8); length of palate, 4.4 (4.5-4.2); length of incisive foramina, 5.2 (5.4-5.1); length of diastema, 7.0 (7.1-6.8); post palatal length, 9.5 (9.7-9.1); interparietal, 9.1×2.9 (9.4×3.0 - 8.8×2.6); depth of braincase, 8.25 (8.4-8.2); alveolar length of upper molar series, 4.05 (4.1-4.0). No topotypical males were available for measurements.

Comparisons.—Among named races of *Peromyscus boylii utahensis* most closely resembles *Peromyscus boylii rowleyi* from southeastern

Utah. Topotypical specimens of *utahensis* can be recognized from topotypes and near topotypes of *rowleyi* as follows: Size smaller; hind foot and ear shorter; tail relatively longer, averaging 118 per cent of the length of head and body as opposed to 106 per cent in *rowleyi*. Color: Markedly darker on upper parts (much more black and gray and less ochraceous); tail markedly darker. Skull: Larger in eleven of thirteen measurements; interorbital breadth narrower; alveolar length of upper molar series shorter; interparietal longer and narrower, extending nearly to the temporal suture in *rowleyi* (9.1×2.9 mm. as opposed to 9.6×2.8 in *rowleyi*); infraorbital foramina slightly narrower dorsally.

Remarks.—From the time of Osgood's revision of the genus *Peromyscus* (North American Fauna, No. 28, April 17, 1909) to the present, all Utah representatives of the species *Peromyscus boylii* have been referred to the subspecies *rowleyi*. At the time of his revision, Osgood (*op. cit.*: 147) only had specimens from extreme southeastern Utah, extreme southwestern Utah and from Ogden in northern Utah. He referred them all to *rowleyi*, the type locality of which is Noland's Ranch, N side San Juan River, $1\frac{1}{2}$ mi. above present "Four Corners" (Hall, Univ. California Publ. Zool., 37:2, April 10, 1931) in extreme southeastern Utah, east of the Colorado River. Thus there existed a peculiar discontinuity in the known distribution of this species within the state, as no specimens were known from the central part. Even though many more specimens are now available, they are all from the same general regions that Osgood reported and the large gap in the distribution still persists. Evidently these mice are not common, but further intensive collecting may yet bridge the gaps in this discontinuous distribution.

From the material available for this study it is apparent that the race *rowleyi* formerly considered to include all Utah animals of this species is limited to that part of the state east of the Colorado and Green rivers which appear to act as a barrier. All specimens studied from elsewhere in the state are referable to the subspecies *utahensis*.

Specimens from Zion National Park are intergrades between *utahensis* and *rowleyi*. They are intermediate in color but have the darker cast and the dark tail typical of *utahensis*. Moreover, they resemble *utahensis* in the proportion of tail length to head and body length. The majority of the cranial characters are like *utahensis* to which they are here referred. One specimen from 8 mi. N Escalante, Garfield County is also an intergrade, but referable to *utahensis*. Two specimens reported from the eastern end of the Uinta Mountains, west of Green River (Svihla, Journ. Mamm., 12:263, August 24, 1931) were unobtainable and have apparently been lost. They represented the most northern and eastern records of this species, and are provisionally placed under this new subspecies on distributional basis only. *Peromyscus boylii* is a southern species that in Utah reaches the northernmost limits of its range within the Great Basin. This new form here described is the northernmost one known from this region.

Specimens examined.—31, distributed as follows: *Salt Lake County*: 1 mi. above Forks, City Creek Canyon, 4,800 ft., 4; 2 mi. above mouth Millcreek Canyon, 4,800 ft., 2; 5 mi. above lower power station, Millcreek Canyon, 5,800 ft. (type locality), 3. *Garfield County*: 8 mi. N Escalante, 6,500 ft., 1. *Washington County*: Zion National Park, 21.

Contribution from the Department of Biology, University of Utah, Salt Lake City, Utah.

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

THE SPINY RATS OF THE RIU KIU ISLANDS

By DAVID H. JOHNSON*

The name *Rattus jerdoni osimensis* was proposed by Abe in 1933 for a remarkable new rodent from Amami-Osima, Riu Kiu Islands. In 1941 Tokuda showed that this form was quite distinct from the Indian *Rattus jerdoni* and proposed for it the generic name *Acanthomys*. As the latter name has been used previously, a new name is required for the genus. Heretofore these rats have been recorded only from Amami-Osima. In the course of epidemiological surveys made in September, 1945, by U. S. Naval Medical Research Unit No. 2, specimens representing a new subspecies were trapped in the northern part of Okinawa Island. The taxonomy of this group is rearranged to stand as follows:

Genus *Tokudamys* (new name)

Rattus (part), Abe, Shokobutsu oyobi Dobutsu (Botany and Zoology), vol. 1, p. 942, July 1, 1933; Jour. Sci. Hiroshima Univ., ser. B, div. 1, vol. 3, p. 107, December, 1934 (*nec* G. Fischer, Das Nationalmuseum der Naturgeschichte zu Paris, vol. 2, p. 128, 1803).

Acanthomys Tokuda, Biogeographica (Trans. Biogeog. Soc. Japan), vol. 4, p. 93, December, 1941 (genotype, *Rattus jerdoni osimensis* Abe). Preoccupied by *Acanthomys* Lesson, Nouveau Tableau du Règne Animal, p. 135, 1842 (genotype not designated, applied to five species of murine rodents).

Genotype.—*Rattus jerdoni osimensis* Abe.

Remarks.—To the generic characters given by Tokuda (*loc. cit.*) for "*Acanthomys*," I would add, from observation of Okinawan specimens, that the mammary formula is $0 - 2 = 4$, that the posterointernal cusp and a posteroexternal heel are present in M^1 and M^2 , and that M^2 lacks an anteroexternal cusp.

Tokudamys osimensis osimensis Abe

Rattus jerdoni osimensis Abe, Shokobutsu oyobi Dobutsu (Botany and Zoology), vol. 1, p. 942, July 1, 1933 (in Japanese); Abe, Jour. Sci. Hiroshima Univ., ser. B, div. 1, vol. 3, p. 107, December, 1934 (in English); Kuroda, List of the Japanese mammals, p. 67, June, 1938; Kuroda, Monograph of the Japanese mammals, p. 137, 1940 (in Japanese).

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Rattus fulvescens osimensis, Ellerman, Families and genera of living rodents, vol. 2, p. 193, March 21, 1941.

Acanthomys osimensis, Tokuda, Biogeographica (Trans. Biogeog. Soc. Japan), vol. 4, p. 95, December, 1941.

Type specimen.—Not designated. Abe's description was based on "several specimens" (10 are itemized in a table of measurements) collected by S. Ueki between April and June 15, 1933.

Type locality.—Village of Sumiyo, Anami-Osima, Riu Kiu Islands. Apparently no further locality records have been published.

Specimens examined.—None.

***Tokudamys osimensis muenninki*, new subspecies**

Type specimen.—U. S. National Museum, No. 278757, adult female, skin and skull; collected September 24, 1945, by David H. Johnson and Odis A. Muennink, original No. 479 (D. H. J.).

Type locality.—Hentona, western coast of northern Okinawa Island, Riu Kiu Islands.

Diagnosis.—Similar to *T. o. osimensis* but larger (length of head and body of adult male near 150 rather than 125 mm.; greatest length of skull near 40 rather than 36 mm.); tail relatively shorter (equal to about 73 rather than 87 per cent of head-and-body length); feet lacking dark extensions of body color on metapodial areas.

Description.—General external appearance like that of a large vole; body appearing short and thick (this impression enhanced by unusually thick pelage). Pelage composed of fine hairs mixed with coarse, flattened, grooved spines, the latter present and predominating everywhere except on tail, feet, ears, and area about mouth; spines on midback about 21 mm. long, those on belly about 11 mm. Color of upper parts a mixture of black and Ochraceous-Tawny (capitalized terms are from Ridgway, Color standards and color nomenclature, 1912); underparts grayish white, very faintly washed with ochraceous; individual hairs on back and sides gray with Ochraceous-Tawny tips; spines gray at base with distal parts either black or Ochraceous-Tawny with a minute black tip; black spines predominating at midback, ochraceous predominating on sides of body; spines on belly grayish white. Backs of fore and hind feet near Pinkish-Buff, metapodial areas lacking any indication of darker body color. Tail averaging about 73 per cent as long as head and body; bicolored, scales and hairs blackish above and grayish white below; scales in approximately 115 annular rows, averaging 8 rows per centimeter near base of tail; each scale subtending three hairs about 2.5 mm. long. Toes slender and distinct; forefoot with first toe apparently functional (its claw resembling a miniature hoof), and with claw of fifth toe extending to base of second phalanx of fourth toe; hind foot with sole bare to heel, claw to first toe reaching base of second phalanx of second toe, claw of fifth toe reaching middle of second phalanx of fourth toe. Ears subovate, moderately hairy inside and out. Vibrissae long, reaching well back to shoulder area; mostly black, those originating on cheeks whitish. Mammary formula: 0 — 2 = 4.

Skull angular and lightly built as compared with most species of *Rattus*. Rostrum prolonged, nasals extending about 3 mm. beyond in-

TABLE I
External and cranial measurements in millimeters of specimens of *Tokudamys osimensis muenninki*

U. S. Nat. Mus. cata. log No.	Sex	Length of head and body	Length of tail	Length of hind foot (with claw)	Length of ear (from notch)	Greatest length of skull	Condylobasal length of skull	Zygomatic breadth	Length of nasals	Diastema	Length of incisive foramina	Length of upper molar series
278758	♂	175	116	36	25	42.4	38.3	19.5	18.3	11.3	7.9	6.2
279039	♂	145	114	37	24	41.4	37.0	18.1	17.0	10.6	8.6	6.4
278760	♂	144	114	34	24	40.8	36.6	17.0	17.7	10.3	7.8	6.4
278756	♀	158	114	37	22	39.7	35.7	17.6	17.1	10.6	7.6	6.1
278759	♂	149	104	36	23	39.6	35.2	16.9	16.0	10.4	7.6	6.1
278755	♀	151	119	36	24	41.2	36.6	19.0	17.3	10.2	8.6	6.1
278757	♀	166	108	35	24	41.2	36.6	19.0	17.3	10.2	8.6	6.1
(type)												
279040	♂	165	117	38	24	38.9	35.6	17.4	16.6	10.4	7.9	5.9
278761	♂	149	107	35	23	40.1	35.5	17.2	17.1	10.6	7.6	6.1
278763	♂	153	108	35	23	39.5	35.5	17.3	16.5	9.9	8.4	6.4
278762	♂	141	99	34	23	39.5	35.5	17.3	16.0	10.0	7.6	6.4
278752	♀	141	99	34	23	39.5	35.5	17.3	16.0	10.0	7.6	6.4
278754	♀	141	99	34	23	39.5	35.5	17.3	16.0	10.0	7.6	6.4

cisors. Premaxillaries rising above level of nasals to form shallow trough near base of rostrum. Temporal ridges extended dorsolaterally on flange-like frontal processes, being thus raised above general frontal level in interorbital region, overhanging temporal fossae, and (in dorsal view) following almost straight divergent lines from premaxillary to occipital sutures. Maxillary part of zygomatic arch angular and prominent, squamosal part weak and adpressed to braincase. Incisive foramina broad, terminating opposite anterior root of M^1 . Palate narrow, terminating slightly posterior to M^3 , its posterior margin smoothly concave. Bullae small, recessed, little inflated. Mandible with weak coronoid process; articular process extending posteriorly beyond plane of angular process.

Upper incisors sharply recurved. Molars relatively high-crowned. M^1 with four roots (differing from *Rattus* in lacking external root beneath second lamina) and with anteroexternal cusp reduced; M^2 with this cusp absent. M^1 and M^2 each with a posterointernal cusp and an accessory posterioexternal cusp or heel. M_1 and M_2 each with two external accessory cusps.

Measurements.—See Table I.

Specimens examined.—A total of 13 (10 skins with skulls, 1 skull-only, 2 in alcohol) including the type, all from the type locality, collected September 19-25, 1945.

Remarks.—The rats were all trapped along a three-mile stretch of trail that follows the crest of a ridge running westward from the main divide to the coast a half-mile north of Hentona. Here, as in most other parts of northern Okinawa, the terrain is mountainous and is covered with a dense forest, which on the exposed ridge-tops is reduced to a chaparral-like growth about ten feet high. Mixed with the shrubs in these places is a flourishing growth of coarse grass used by the Okinawans for thatching roofs. In some places the ground is covered with a knee-high mat of brake fern. Well beaten footpaths traverse the ridge-tops, and a network of temporary lateral trails has been made by thatch cutters. The most satisfactory bait was found to be a cube of raw sweet potato. The presence of the rats was first detected when a piece of spine-covered skin was found in a trail where it had apparently been discarded by some predator. This species was not found in the cultivated strip of rice fields and terraced sweet potato patches immediately adjacent to the coast.

The Okinawan subspecies is named for Odis A. Muennink of Hondo, Texas, who during the recent war collected more than a thousand specimens of animals for Naval Medical Research Unit No. 2 in various parts of the Pacific area.

PROCEEDINGS
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THREE NEW MITES FROM RATS IN PUERTO RICO

By IRVING FOX

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The following new species of mites were found in the course of an ectoparasite survey of the rats of San Juan, Puerto Rico. At present, it is not possible to say whether they are parasitic on rats or simply associated with them. Types of these new species are in the entomological collection of the Department of Medical Zoology, School of Tropical Medicine, San Juan, Puerto Rico.

Family Laelaptidae

Androlaelaps setosus, new species

Female. Body oval in shape, longer than broad, well provided with setae: Total length, not including capitulum, .69 mm., width, .41 mm. Chelicerae prominent, toothed, fixed arm with a process. Sternal plate (Fig. 1) sculptured, broadest between coxae II and III with the corners acuminate. First pair of sternal setae on the anterior border of the sternal plate, second pair more or less level with the middle of coxa II, third pair of setae and the sternal pores placed as usual. Metasternal plates not heavily sclerotized, their setae level with the posterior borders of coxae III. Genito-ventral plate long and broad, more or less rounded posteriorly, almost reaching to the anal plate. Only one pair of setae—the genital pair—is present. Flanking the genito-ventral plate are three pairs of setae, the middle pair being in a very slight concavity of the plate. Approximately 15 setae are situated on each side laterad to the genito-ventral plate. A small narrow, more or less boat-shaped plate is present on each side posterior to coxa IV; below this is a much smaller, circular one. Anal plate broadly triangular, bearing the usual three setae. Peritremes extending posteriorly to beyond the middle of coxae IV, extending anteriorly to beyond coxae I. Stigmal pore level with the posterior border of coxa III, distant from the lateral edge of the body. Legs well provided with normal setae. Leg II broad, characteristic of the genus, femur with a long, stout spur, genu with a smaller one, tibia with a long sharp one, and tarsus with several pairs of setae. Dorsal plate covering most of the dorsal surface, provided with many long and stout, curved setae.

Type material. Female holotype and female paratype from *Rattus norvegicus* at San Juan (Santurce), Puerto Rico, collected September 18, 1946.

This new species resembles *A. oudemansi* Radford from which it differs in that the genito-ventral plate almost reaches to the anal plate, as well as in other respects.

Family Macrochelidae

Macrocheles alatus, new species

Female. Body oval, sparsely provided with setae; total length not including capitulum, .53 mm., width .32 mm., chelicerae robust, with prominent uneven teeth. Sternal plate (Fig. 2) expanded laterally, with three pairs of setae and two pairs of pores, the latter removed from the insertions of the setae. Metasternal setae not conspicuous, situated on small, weakly sclerotized plates. Genito-ventral plate weakly sclerotized, truncate posteriorly, bearing a single pair of setae; anteriorly with superimposed wing-like plates. Anal plate large and conspicuous, shield-shaped, provided with six setae in addition to the anal ones. Anal pore small, lyre-shaped, situated near the posterior border of the anal plate, its setae all of about the same size. Approximately seven setae are present on each side of the anal plate. Peritremes closely appressed to the lateral borders of the body, not extending posteriorly to the stigmal pore, reaching anteriorly to or beyond the anterior border of coxae I. Dorsal plate not occupying the entire dorsum, provided with setae and sculptured. Legs, characteristic of the genus, I long and slender without claws, II, III and IV broad with prominent claws and stout setae.

Type material. Female holotype from *Rattus norvegicus* at San Juan (Santurce), Puerto Rico, collected February 9, 1946.

This new species is readily differentiated from the other members of its genus by the shape of the anal plate.

Family Ascaidae

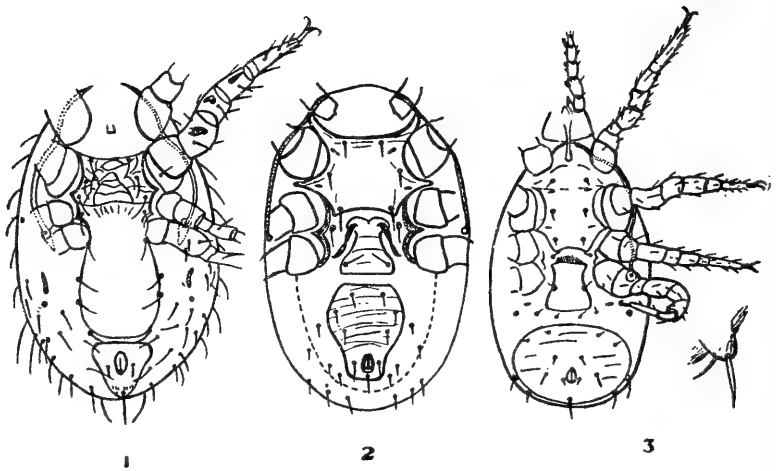
Asca duosetosa, new species

Female. Body oval, longer than broad, well provided with setae. Total length, not including capitulum, .40 mm., width .24 mm. Chelicerae toothed. Palpus (Fig. 3) with a prominent spur on the inner surface of the second and third joints. Sternal plate with the structure not clear, apparently weakly sclerotized anteriorly, extending from behind coxae I to the middle of coxae III. First pair of sternal setae in the anterior weakly sclerotized portion of the plate with the first pair of pores just below them; other two pairs of sternal setae and the second pair of sternal pores placed as usual. Metasternal setae inconspicuous, situated on small lightly sclerotized circular plates. Genital plate weakly sclerotized with a single pair of setae, of the shape shown in Figure 3. Between the genital plate and the ventro-anal plate are four setae. Ventro-anal plate sculptured, more or less oval in shape, bearing eight setae in addition to the anal ones. Stigmal pore on a level with the middle of coxae IV, peritremes extending anteriorly to beyond the anterior borders of coxae I. Legs as usual for the genus, provided with many

small setae. Dorsal plate divided in two, the conspicuous line of division on a level with the middle of coxae IV, sculptured and provided with many stout scimitar-like setae. The posterior lateral border of the notogaster bears on each side the tubercle characteristic of the genus, and the tubercle is armed with two large prominent setae (Figure 3).

Type material. Female holotype and female paratype from *Rattus norvegicus* at San Juan (Santurce), Puerto Rico, collected September 17, 1946.

This new species is similar to *A. quinquesetosa* Wharton differing from the latter in having two setae on the posterior dorsal tubercle instead of five.



Explanation of Plate XVI

- Fig. 1. *Androlaelaps setosus* n. sp. Ventral plates and leg II.
 Fig. 2. *Macrocheles slatus* n. sp. Ventral plates.
 Fig. 3. *Asca duosetosa* n. sp. Ventral view and dorsal tubercle.

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A NEW NAME FOR A MEALYBUG

By EDSON J. HAMBLETON

Office of Foreign Agricultural Relations, U. S. Dept. of Agriculture

The genus *Morrisonella* was recently erected by the writer (Rev. de Ent. 17 (1-2): p. 16, Aug. 1946) to accommodate a number of described and undescribed species of hypogeiic mealybugs. This name is preoccupied by *Morrisonella* Bartsch, The Nautilus, 50: p. 23, July 1945; therefore a new name, *Coccidella*, is here proposed.



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A NEW SUBSPECIES OF *HELICOSTYLA FLORIDA*
FROM MINDORO, PHILIPPINE ISLANDS

By PAUL BARTSCH

Associate, Division of Mollusks, United States National Museum*

Since the publication of my paper on "The tree Snails of the Genus *Cochlostyla* of Mindoro Province, Philippine Islands,"† there has come to hand from various sources a dark colored race of *Helicostyla florida* from the southern part of the Island of Mindoro, which merits recognition with a trinomial name, which is here furnished. Incidentally, it is well to state here that additional research has shown that the genus must be called *Helicostyla* not *Cochlostyla* used for it in my 1938 paper.

Helicostyla florida saturata, new subspecies

The shell, as far as shape is concerned, agrees with the typical race. It differs from all the other described subspecies in having the outer lip chocolate brown; in the other subspecies this is white excepting in *Helicostyla florida fuscolabiata* Mollendorff, Kobelt and Winter, in which the outer lip has a brownish wash. The main coloration of this, however, is bright brown not green as in the present form.

The type, U.S.N.M. No. 543504, has 5.5 whorls and measures: Length, 40 mm.; greater diameter, 28 mm. It was collected by Pedro de Mesa at Bulalacao, southeastern Mindoro.

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†1938. Bull. 100, vol. 6, pt. 9, U. S. National Museum.



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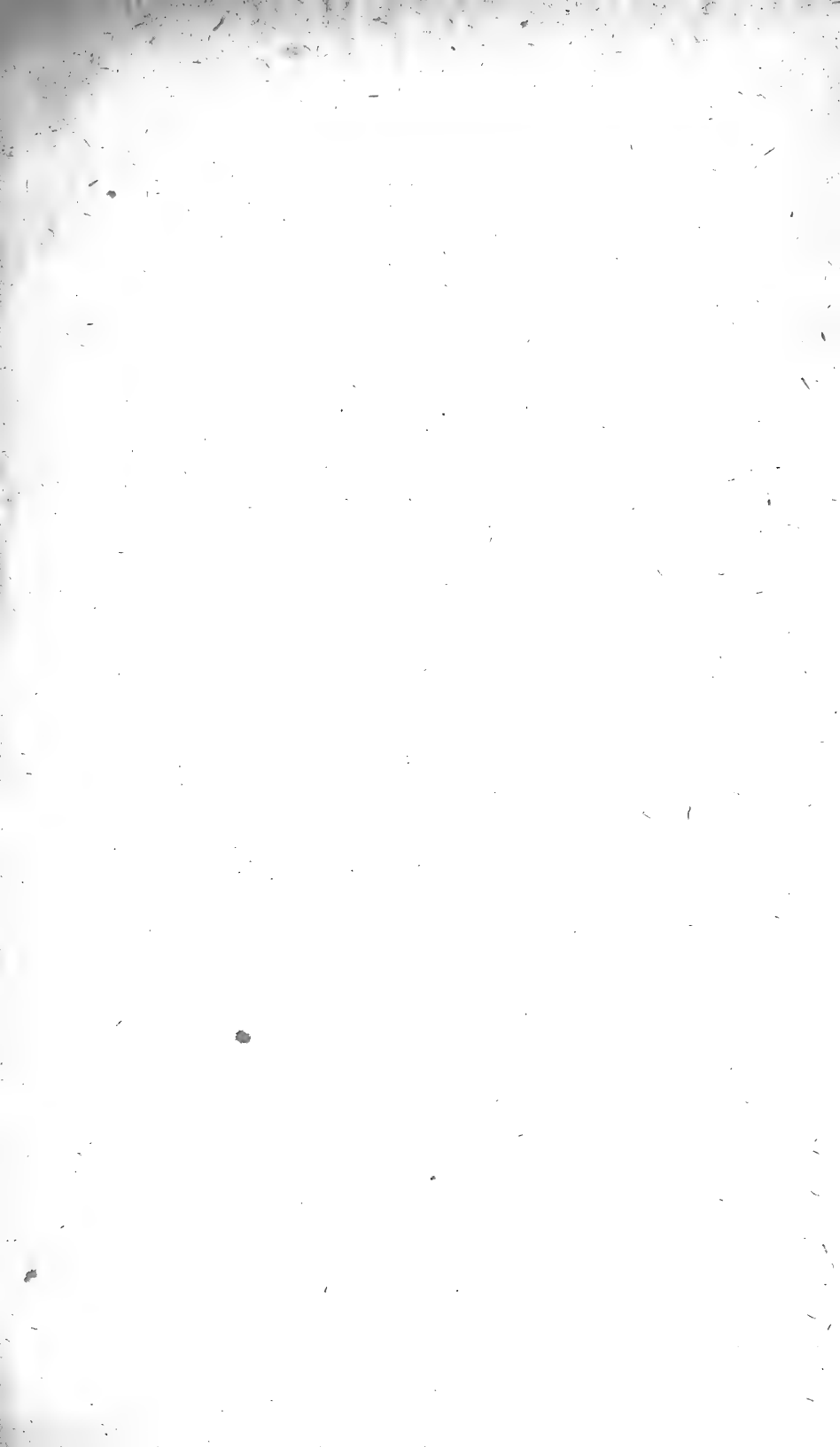
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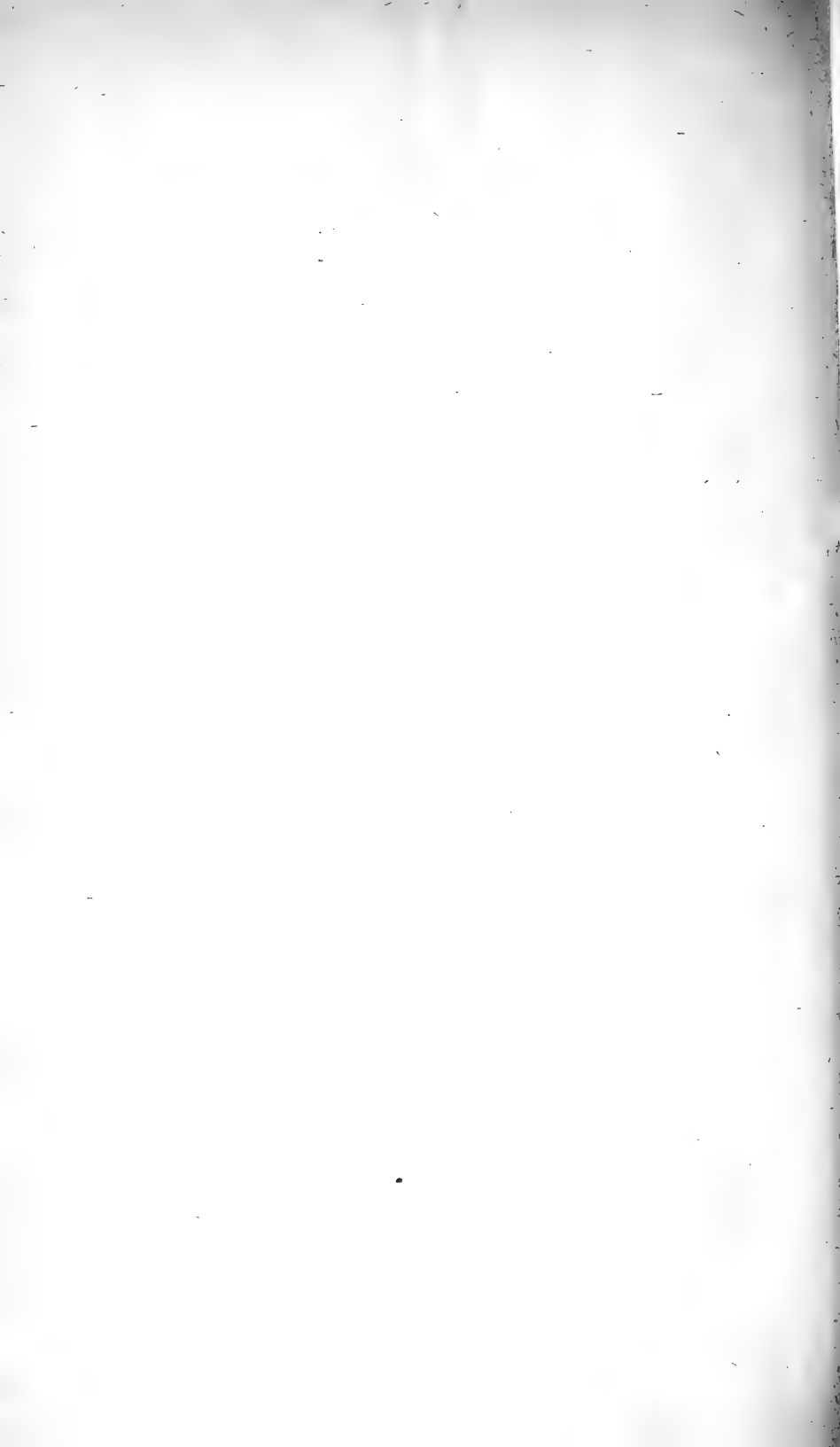
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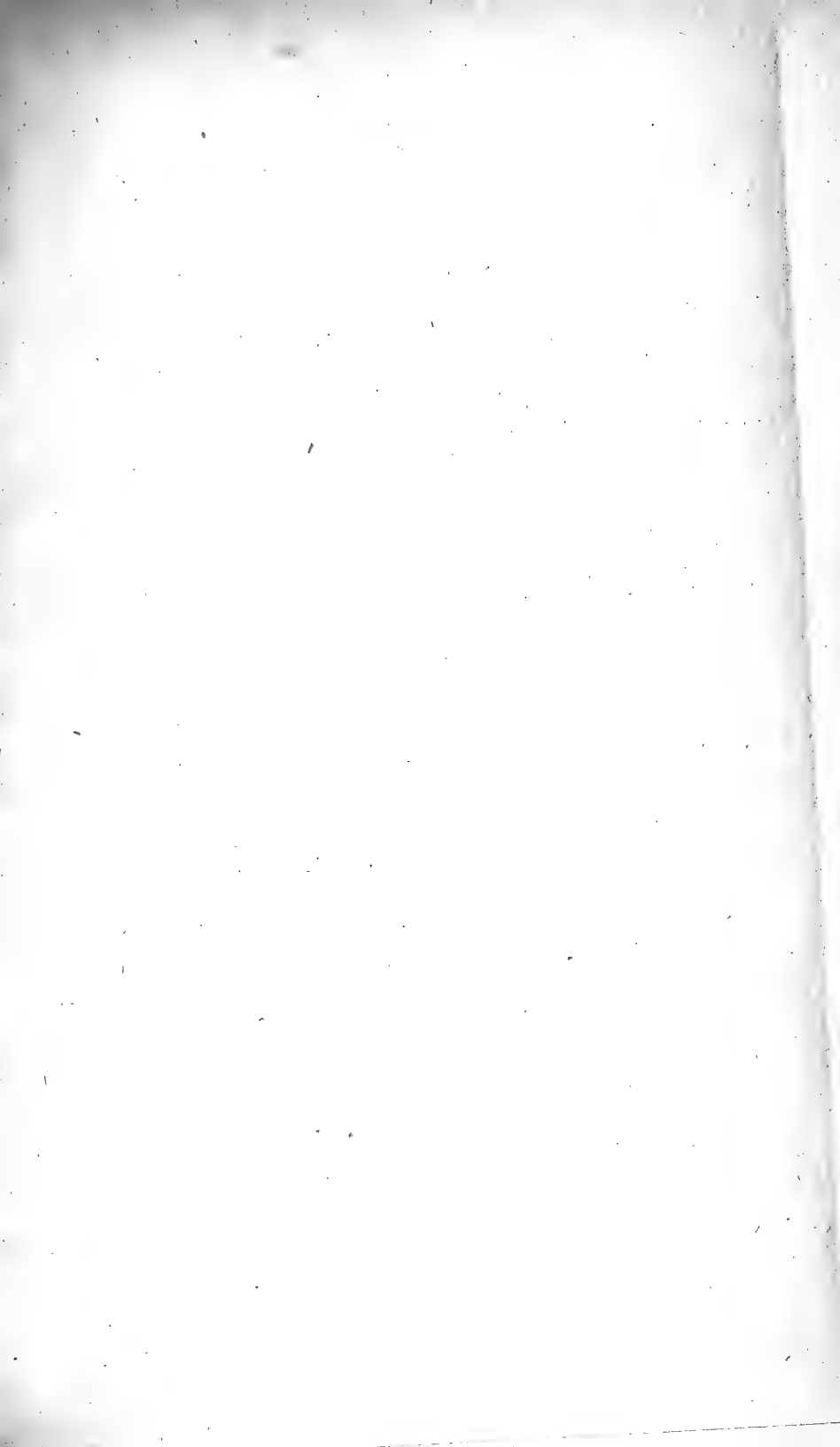
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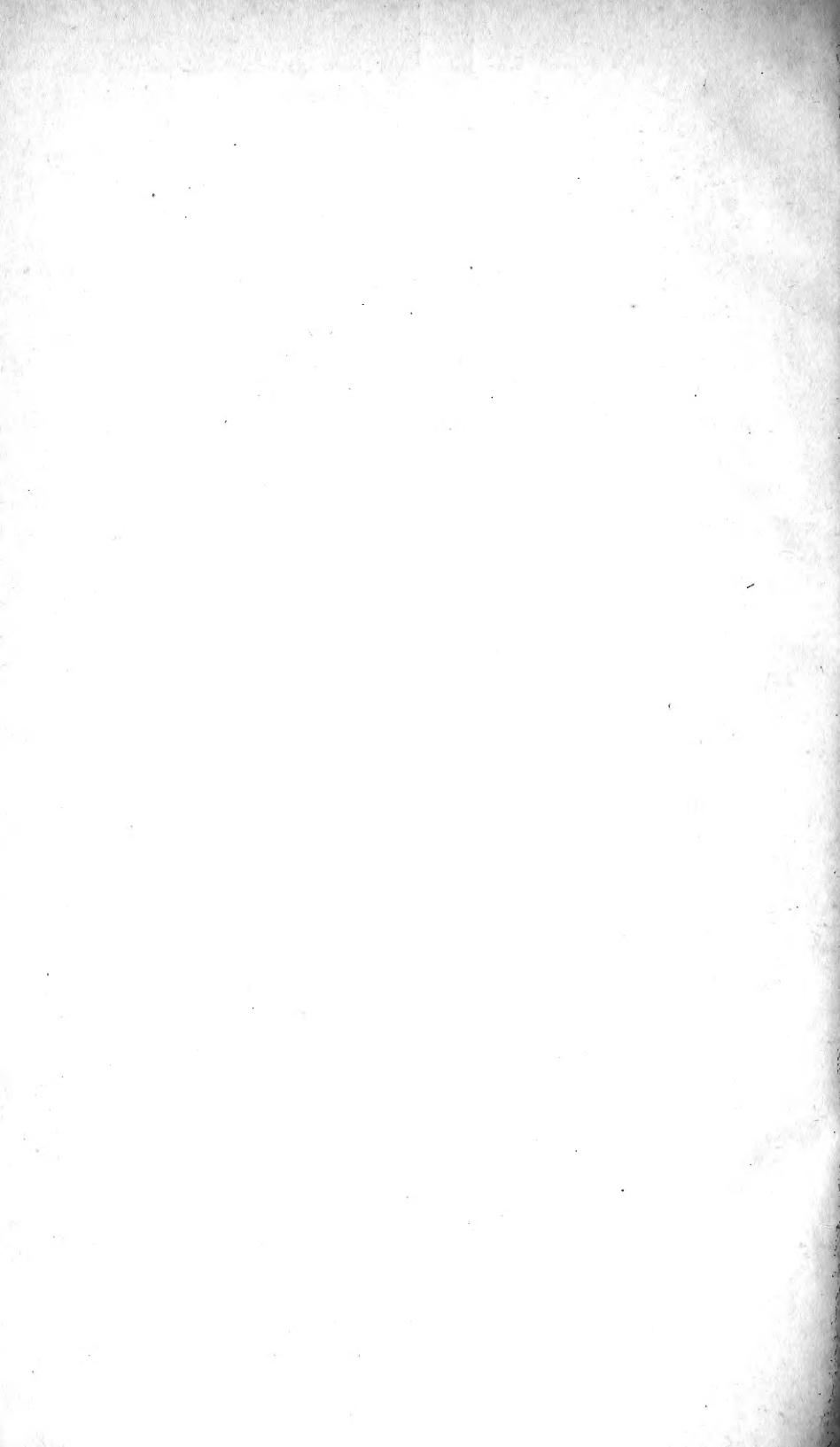
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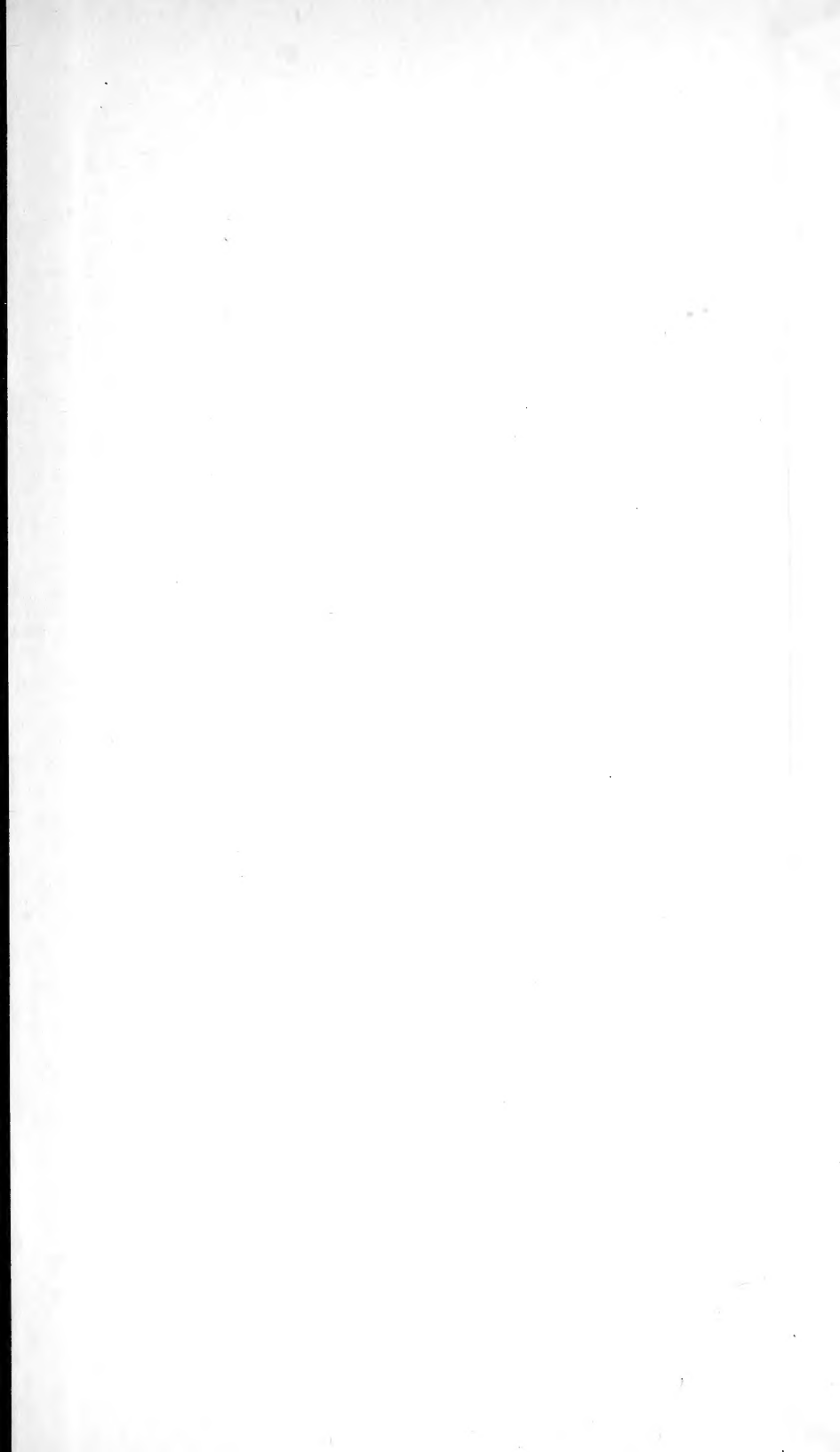
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