

SMITHSONIAN MISCELLANEOUS COLLECTIONS  
VOLUME 89, NUMBER 1

AMPHIBIANS AND REPTILES COLLECTED  
BY THE SMITHSONIAN BIOLOGICAL  
SURVEY OF THE PANAMA  
CANAL ZONE

BY

KARL PATTERSON SCHMIDT

Assistant Curator of Reptiles and Amphibians, Field Museum of Natural History



(PUBLICATION 3181)

CITY OF WASHINGTON  
PUBLISHED BY THE SMITHSONIAN INSTITUTION  
MARCH 16, 1933

The Lord Baltimore Press  
BALTIMORE, MD., U. S. A.

AMPHIBIANS AND REPTILES COLLECTED BY THE  
SMITHSONIAN BIOLOGICAL SURVEY OF  
THE PANAMA CANAL ZONE

BY KARL PATTERSON SCHMIDT

*Assistant Curator of Reptiles and Amphibians, Field Museum of Natural History*

The opportunity to study the plant and animal life of a tropical area presented during the construction of the Panama Canal was seized by the Smithsonian Biological Survey of the Panama Canal Zone. The collections of cold-blooded vertebrates for this survey were made under a cooperative agreement between the Smithsonian Institution, the United States Bureau of Fisheries, and the Field Museum of Natural History. Dr. S. E. Meek of the Field Museum and Dr. S. F. Hildebrand of the Bureau of Fisheries were actively engaged in collecting in Panama from January to May, 1911, and from January to March, 1912; their collecting was primarily ichthyological but considerable numbers of amphibians and reptiles were incidentally preserved. This collection was more than equalled by the material collected by E. A. Goldman in the course of his field-work in Panama for the Smithsonian Survey. Goldman's report on the "Mammals of Panama"<sup>1</sup> contains an excellent account of his field-work and a map on which his collecting stations may be located. Spelling of locality names in the present paper follows Goldman's map wherever possible. Minor additions to the Survey collection of amphibians and reptiles were made by H. Pittier and E. D. Christopherson. The total collection (exclusive of the turtles) amounts to 758 specimens, representing 82 species.

So much attention is now focussed on the biology of the Panama Canal Zone by the existence of the Barro Colorado Island Laboratory, maintained by the Institute for Research in Tropical America, that it seems desirable to record the herpetological collections of the Smithsonian Survey, and the following list has been prepared at the suggestion of Dr. Leonhard Stejneger. I am indebted to Miss Doris Cochran of the United States National Museum for assembling this material for shipment to the Field Museum, and to Dr. E. R. Dunn of Haverford College, who has an extensive report on the amphibians

<sup>1</sup> Smithsonian Misc. Coll., vol. 69, no. 5, 1920.

and reptiles of Panama, Costa Rica, and Nicaragua in preparation, for much information and assistance in identification, obtained during a memorable association with him on Barro Colorado Island in 1928. A short paper by Dr. G. K. Noble of the American Museum of Natural History lists the frogs of the Panama collection, describing one of them as a new species, *Elcutherodactylus goldmani*.<sup>2</sup>

Doctor Dunn has examined a number of specimens, including especially the frogs of the genera *Phyllobates* and *Atelopus*, which are listed by him,<sup>3</sup> and has differed with Noble in various identifications.<sup>4</sup> Amaral has listed some of the snakes of this collection in connection with various studies. A new pit-viper, *Bothrops leptura*, was described in 1923.<sup>5</sup> This is now placed in the synonymy of *Bothrops monticellii* (Peracca).

The present paper lists the entire collection with the exception of the turtles, which are to be reported upon in a separate paper by Doctor Stejneger. Bibliographic references have been omitted in view of the expected appearance of a complete review of the fauna in question by Doctor Dunn.

## Class AMPHIBIA

### Order APODA

#### CAECILIA OCHROCEPHALA (Cope)

Two specimens, U.S.N.M. No. 54058, from Porto Bello, May 26, 1911, and 50249, from Cana, April 10, 1912, both collected by E. A. Goldman.

### Order SALIENTIA

#### BUFO GRANULOSUS Spix

The single specimen of this species measures as follows: Length of body 55 mm; length of head 15 mm; width of head 20 mm; arm

---

<sup>2</sup> Noble, G. K., Some neotropical batrachians preserved in the United States National Museum with a note on the secondary sexual characters of these and other amphibians. Proc. Biol. Soc. Washington, vol. 37, pp. 65-72, 1924.

<sup>3</sup> Dunn, Emmett R., New frogs from Panama and Costa Rica. Occ. Papers Boston Soc. Nat. Hist., vol. 5, pp. 385-401, 1931.

<sup>4</sup> Dunn, Emmett R., The amphibians of Barro Colorado Island. Occ. Papers Boston Soc. Nat. Hist., vol. 5, pp. 403-421, 1931.

<sup>5</sup> Amaral, Afranio do., New genera and species of snakes. Proc. New England Zool. Club, vol. 8, pp. 85-105, 1923.

27 mm; leg 56 mm. The back is marbled with brown and brownish yellow.

U.S.N.M. No. 53739, collected at Rio Calobre, March 18, 1911, by S. E. Meek and S. F. Hildebrand.

#### BUFO HAEMATITICUS Cope

The normal color pattern of this species exhibits two pairs of black spots on the back; but these may be entirely absent. There is usually a light preocular spot on the lip. Some specimens have a light vertebral line; one, No. 53769, has small spots sharply outlined with very narrow yellow rims. No. 50221 is much the largest specimen in the collection, measuring 78 mm from snout to vent, the length of arm 54 mm, length of leg 106 mm. There are 73 specimens in the collection, collected as follows:

U.S.N.M. No.	Locality	Date	Collector
50179-96	Cana, 1,800-2,000 ft.	Mar. 1-24, 1912	E. A. Goldman
50210	" 2,000 ft.	Mar. 30, 1912	" " "
50216	" 3,000 ft.	June 6, 1912	" " "
50221	" 2,000 ft.	Mar. 28, 1912	" " "
50228	Rio Chilibrillo	Jan. 30, 1912	" " "
53740, 53757-59	Chepo	Mar. 21, 1911	Meek & Hildebrand
53769-70 } 53772-81 }	Gatun River, above Mitchells	.....	" " "
53782-97	Upper Chagres River	Feb. 24, 1911	" " "
53822	Rio Juan	Apr. 22, 1911	" " "
53959-63	Rio Jappe	Mar. 22, 1912	" " "
53986-88	Rio Mamoni	Mar. 20, 1911	" " "
54040	Porto Bello	May 27, 1911	E. A. Goldman
54236, 54239, } 54248 }	Oruza	Feb. 27, 1912	Meek & Hildebrand
54241-46	Rio Capeti	Mar. 5, 1912	" " "

#### BUFO TYPHONIUS (Linné)

Out of 43 specimens, 14 have the vertebral light stripe; the vivid black dorsal pattern frequent in this species is present in 6 specimens; 4 have two pairs of black dorsal spots, like *Bufo haematiticus*.

Out of the 43 specimens, 10, U.S.N.M. Nos. 50176, 50211-15, 50217-20, were collected at Cana during March, May, and June, 1912, by E. A. Goldman, who collected further specimens of this species as follows: 53721 and 54010, Rio Indio, near Gatun, March 3 and February 16, 1911; 54006 and 54054, Panama; 54035-39, 54041-48 and 54050-53, Porto Bello, May 26, 1911; and 54055, Cerro Brujo, June 7, 1911. Specimens collected by Meek and Hildebrand are

Nos. 53716, Arrijan, February 19, 1911; 53736, Rio Calobre, March 18, 1911; 53745, Paraiso, March 3, 1911; 53751-52, Empire, February 8, 1911; 53844-45, Miraflores, January 18, 1911; 53865-66, Rio Cardenas, Corozal, February 16, 1911; and 53957-58, Rio Jappe, March 2, 1912.

#### **BUFO MARINUS (Linné)**

One hundred and forty-one specimens, collected at the following localities in Panama: U.S.N.M. Nos. 50154-67, Las Cruces, January 29, 1912; 50201, east slope of Pirri Range, May 2, 1912; 50202-5, 50223, 50224, Cana, February to June, 1912; 54065, Buenaventura Island, May 30, 1911; 54066, Porto Bello, May 24, 1911; and 54173, Gatun, January 14, 1911, collected by E. A. Goldman; Nos. 53728 and 53760-68, Chepo, March 21, 1911; 53744, Mindi Cut, January 28, 1911; 53771, Gatun River, above Mitchells; 53823, Pectine River, February 22, 1911; 53860-64 and 53906-17, Agua Clara, March 8, 1911; 53898-99, Frijoles, February 13, 1911; 53920-24, 53929-52, 54233, 54259-60, Gorgona, March 29-31, 1912; 53953-56, 54229, 54232, Cana, March 1, 1912; 53966-72, Upper Chagres River, February 24, 1911; 53977, Pedro Miguel, January 13, 1911; 53978, Chagres River at Gatun, February 10, 1911; 53985, Rio Mamoni, March 20, 1911; 54201, Porto Bello, April 24-28, 1911; 54237-38, 54240, 54247, 54256-58, Oruza, February 27, 1912; 54248-55, Rio Capeti, March 5, 1912; 54261, Rio Cascajal, Porto Bello, March 17, 1912; 54273, Rio Cupe, Darien, February 26, 1912; 54274-75, Rio Tuyra, February 28, 1912; 54277-78, Rio Jappe, Darien, March 6, 1912; and 54279-92, Rio Chame, February 14, 1912, collected by Meek and Hildebrand; No. 54149 from the Canal Zone Survey without further data.

#### **BUFO CONIFERUS Cope**

A single specimen, U.S.N.M. No. 53719, collected on the Upper Trinidad River, March 7, 1911, by Meek and Hildebrand, has been referred to this species by Dunn.

#### **ENGYSTOMOPS PUSTULOSUS (Cope)**

One specimen, U.S.N.M. No. 53992, collected by Meek and Hildebrand on the Rio Mamoni, March 20, 1911, and one, No. 54294, from the Canal Zone, without further data, collected by E. D. Christopherson.

#### **LEPTODACTYLUS PENTADACTYLUS (Linné)**

A single specimen, U.S.N.M. No. 54068, from Porto Bello, collected May 26, 1911, by E. A. Goldman.

**LEPTODACTYLUS QUADRIVITTATUS** Cope

A single specimen, U.S.N.M. No. 54177, from Gatun, collected May 19, 1911, by E. A. Goldman.

This specimen, a male, differs from descriptions in having a projecting snout with sharp horizontal edge. Dimorphism in this character appears in a number of species of *Leptodactylus*. It is interpreted by Noble,<sup>6</sup> as a breeding season character of the male sex, used in excavating the hollow in which the eggs are to be laid. A pair of internal vocal sacs are present, their openings rather posteriorly placed; they are indicated externally by a fold and darker coloration.

**LEPTODACTYLUS BOLIVIANUS** Boulenger

Eight specimens, collected at the localities shown in the following table:

U.S.N.M. No.	Locality	Date	Collector
50222	Cana, 1,800 ft.	Mar. 22, 1912	E. A. Goldman
53720	Tabernilla	Mar. 12, 1911	" " "
53841	Miraflores	Jan. 18, 1911	Meek & Hildebrand
53885	Rio Chorrera	Apr. 4, 1911	" " "
53928	Rio Marte Arnade	Mar. 26, 1912	" " "
53982-83	Rio Mamoni	Mar. 20, 1911	" " "
54176	Gatun	Jan. 13, 1911	E. A. Goldman

**ELEUTHERODACTYLUS GOLLMERI** (Peters)

Two specimens, U.S.N.M. Nos. 54033-34, from Cerro Brujo, collected June 7, 1911, by E. A. Goldman. No. 54033 is the type of *Eleutherodactylus goldmani* Noble, which is placed in the synonymy of *E. gollmeri* by Dunn.

**ELEUTHERODACTYLUS FITZINGERI** (Schmidt)

Twenty-one specimens of this species are in the collections of the Smithsonian Biological Survey of the Canal Zone. These may be listed as follows:

U.S.N.M. No.	Locality	Date	Collector
50178	Cana	Mar. 1-24, 1912	E. A. Goldman
50229	Rio Chilibrillo	Jan. 30, 1912	" " "
53717	Arrijan	Feb. 19, 1911	Meek & Hildebrand
53726-27	Toro Point	Jan. 9, 1911	" " "
53729	Pedro Miguel	Feb. 11, 1911	" " "
53732	Culebra	Apr. 1911	" " "
53798-807	Upper Chagres	Feb. 24, 1911	" " "
53843	Miraflores	Jan. 18, 1911	" " "
53990	Rio Mamoni	Mar. 20, 1911	" " "
54148	Gatun	Jan. 21, 1911	E. A. Goldman
54178	"	Apr. 6, 1911	" " "

<sup>6</sup> Noble, G. K., The biology of the Amphibia, p. 120, 1931.

**ELEUTHERODACTYLUS LONGIROSTRIS (Boulenger)**

Three specimens, U.S.N.M. Nos. 54180-82, collected at Cerro Azul, March 25, 1911, by E. A. Goldman.

**ELEUTHERODACTYLUS LATIDISCUS (Boulenger)**

Two specimens, U.S.N.M. Nos. 54022-23, from Cerro Brujo, collected June 7, 1911, by E. A. Goldman. Two additional specimens, U.S.N.M. Nos. 50207-8, were collected near the head waters of the Rio Limon in the Pirri Range, Darien, April 15 and 22, 1912, by E. A. Goldman.

No. 50207 has a generally pale coloration, with brownish marbling which defines a pair of conspicuous light bands extending from the eyelids to the mid-back.

**ELEUTHERODACTYLUS DIASTEMA (Cope)**

A single specimen of this very distinct form, U.S.N.M. No. 53718, from the Rio Calobre, was collected March 18, 1911, by Meek and Hildebrand.

**HYLA GABBII Cope**

Two specimens, U.S.N.M. No. 53722, from the Rio Calobre, collected by Meek and Hildebrand; and No. 53886, with no further data than Panama.

**HYLA ROSENBERGI Boulenger**

A single specimen, U.S.N.M. No. 50209, from Cana, at 2,000 feet altitude, collected June 6, 1912, by E. A. Goldman, agrees very closely with Boulenger's description and figure. The vomerine teeth in the present specimen are in more elongate and more angularly bent series than is shown in the original figure. A second specimen, No. 53979, from the Rio Bayano, was collected March 22, 1911, by Meek and Hildebrand.

**PHYLLOBATES LATINASUS (Cope)**

Two specimens, Nos. 54174-75, from Cerro Azul, collected March 26, 1911, by E. A. Goldman; and No. 54231 from Cana, collected March 1, 1912, by Meek and Hildebrand.

**PHYLLOBATES FLOTATOR Dunn**

One specimen, U.S.N.M. No. 50177, from Cana, collected March 1-24, 1912, by E. A. Goldman, is a paratype of this species.



**PHYLLOBATES KINGSBURYI** Boulenger

Four specimens, U.S.N.M. Nos. 50197-200, with no data, and two, 53737-38, from the Rio Calobre, collected March 18, 1911, by Meek and Hildebrand, represent this species. Dunn lists Nos. 50197-200 as from Cana, Darien, which is probably their true provenance; but they are unfortunately without locality data.

**DENDROBATES AURATUS** (Girard)

Twenty-four specimens in the Smithsonian Survey collections were collected as follows:

U.S.N.M. No.	Locality	Date	Collector
54025-32	Cerro Brujo	June 6-7, 1911	E. A. Goldman
54235	Oruza, Darien	Feb. 27, 1912	Meek & Hildebrand
54296-310	Canal Zone	1911-1912	E. D. Christopherson

**DENDROBATES PUMILIO** (Schmidt)

One specimen, U.S.N.M. No. 54168, from Gatun, collected April 14, 1911, by E. A. Goldman.

**ATELOPUS VARIUS GLYPHUS** Dunn

Forty-four specimens, collected as follows:

U.S.N.M. No.	Locality	Date	Collector
50168-75	Cana	Mar. 1-24, 1912	E. A. Goldman
50226	"	Mar. 30, 1912	" " "
50230-48	Pirri Range, near head of Rio Limon	Apr. 15, 1912	" " "
53964-65	Rio Jappe	Mar. 2, 1912	Meek & Hildebrand
54183-84	Cerro Azul	Mar. 25, 1911	E. A. Goldman
54186-96	" "	" " "	" " "
54230	Cana	Mar. 1, 1912	Meek & Hildebrand

**RANA PALMIPES** Spix

Four frogs and five tadpoles are referred to this species:

U.S.N.M. No.	Locality	Date	Collector
50225	Cana	May 24, 1912	E. A. Goldman
53887	Panama	1911-1912	Meek & Hildebrand
54067	Porto Bello	May 24, 1911	E. A. Goldman
54276	Upper Reservoir Creek	Jan. 25, 1912	Meek & Hildebrand
54293	Rio Sabiganti	Mar. 1, 1912	" " "

## Class REPTILIA

## Suborder SAURIA

**GONATODES FUSCUS** (Hallowell)

Twenty-five specimens represent this common species. Of these, U.S.N.M. Nos. 54208-16 and 54218 were collected by E. D. Christopherson in the Canal Zone, and Nos. 54311-21, collected by Meek and Hildebrand, bear the same indefinite data. Nos. 50145-48 were collected at Cana, Darien, by E. A. Goldman, in May and June, 1912.

**SPHAERODACTYLUS LINEOLATUS** (Lichtenstein)

Six specimens collected as follows:

U.S.N.M. No.	Locality	Date	Collector
53734	Rio Bayaria	Mar. 23, 1911	Meek & Hildebrand
53991	Rio Mamoni	Mar. 20, 1911	" " "
54219-22	Canal Zone	1911-1912	E. D. Christopherson

**THECADACTYLUS RAPICAUDUS** (Houttuyn)

Two specimens in the collection, No. 54202 collected at Porto Bello, April 24-28, 1911, by Meek and Hildebrand, and No. 54267 with no locality except the Canal Zone, collected by E. D. Christopherson.

**NOROPS AURATUS** (Daudin)

Six specimens represent this widespread form. These were collected as follows:

U.S.N.M. No.	Locality	Date	Collector
50126-27	Empire	Feb. 15-16, 1912	E. A. Goldman
53817	Alhamel	1911	Meek & Hildebrand
53989	Rio Mamoni	Mar. 20, 1911	" " "
54226	Canal Zone	1911-1912	E. D. Christopherson
54269	Gorgona	Mar. 28, 1912	Meek & Hildebrand

**ANOLIS HUMILIS** Peters

A single specimen, U.S.N.M. No. 54056, collected June 7, 1911, by E. A. Goldman at Cerro Brujo.

**ANOLIS LEMURINUS** (Cope)

A single specimen, U.S.N.M. No. 50150, collected May 2, 1912, at 4,000 feet altitude on the east slope of the Pirri Range, by E. A. Goldman, is referred to this species. The ventrals are keeled; the dorsals strongly keeled but not greatly enlarged, in at least 16 or 18 rows; laterals small, keeled; a dorso-lateral light stripe on each side; semicircles separated by a single scale. Dunn writes me that this is what he has called *vittigerus*.

**ANOLIS POECILOPUS (Cope)**

U.S.N.M. No. 50149, collected at Cana, at 2,000 feet, March 27, 1912, by E. A. Goldman, is tentatively referred to this species. This specimen agrees in detail with Cope's original description with the exception that the occipital is large and well distinguished. The rugosity of the head scales extends to the occipital, and this might account for an error in the original description. The species is characterized by its very small keeled scales; 13 loreal rows from labials to canthals; no elongate superciliary; and the caudal scales are notably small.

**ANOLIS STIGMOSUS Bocourt**

Twelve specimens represent this species:

U.S.N.M. No.	Locality	Date	Collector
53724	Toro Point	Jan. 9, 1911	Meek & Hildebrand
53750	Empire	Feb. 8, 1911	" " "
53821	Chorrera	Apr. 10, 1911	" " "
53889-90	Panama	1911-1912	" " "
54179	Cerro Azul	Mar. 25, 1911	E. A. Goldman
54217	Panama	1911-1912	E. D. Christopherson
54223-25	"	" "	" " "
54263	Cristobal	Feb. 15, 1911	Meek & Hildebrand
54324	Canal Zone	1911-1912	E. D. Christopherson

**ANOLIS PETERSII Bocourt**

Two specimens, U.S.N.M. No. 53888, collected by Meek and Hildebrand, without definite locality, and No. 54144, collected at Gatun, May 2, 1911, by E. A. Goldman, run directly to this species in Dunn's recent arrangement of the anoles of Central America.<sup>7</sup>

**ANOLIS LIMIFRONS (Cope)**

Eleven specimens represent this species:

U.S.N.M. No.	Locality	Date	Collector
48597	Viento Frio	1911	H. Pittier
50129	Old Panama	Feb. 7, 1912	E. A. Goldman
50151-52	Pirri Range, east slope	Apr. 22, 1912	" " "
53725	Toro Point	Jan. 9, 1911	Meek & Hildebrand
53731	Panama	1911-1912	" " "
54007	Rio Indio	Feb. 13, 1911	E. A. Goldman
54011-12	Gatun	Feb. 3, 1911	" " "
54172	Lion Hill	Jan. 13, 1911	" " "
54325	Canal Zone	.....	.....

<sup>7</sup> Notes on Central American Anolis, Proc. New England Zool. Club, vol. 12, p. 19, 1930.

**ANOLIS PENTAPRION (Cope)**

A single specimen, U.S.N.M. No. 45574, collected at Bohio, April, 1911, by H. Pittier, is referred to this species.

**IGUANA IGUANA IGUANA (Linné)**

Five specimens with the following data :

U.S.N.M. No.	Locality	Date	Collector
53709	Gatun	Jan. 24, 1911	S. F. Hildebrand
54116	"	Jan. 15, 1911	E. A. Goldman
54117	"	Apr. 26, 1911	" " "
54118	Bohio	Apr. 29, 1911	" " "
54143	"	" " "	" " "

**BASILISCUS BASILISCUS (Linné)**

Out of a total of 113 specimens, 70 were collected by Meek and Hildebrand at the following localities: Gatun, Nos. 53710-13, January 24, 1911; 53747-48, January 9, 1911; 53828, March 30, 1911; 53836-40, February 10, 1911; Alhajuela(?), No. 53714; Arrijan, No. 53715, February 19, 1911; Toro Point, No. 53723, January 9, 1911; Mindí, No. 53735, January 17, 1911; 53824-25, (no date); 53833-34, January 28, 1911; Empire, Nos. 53753-56, February 8, 1911; Corozal, Rio Cardenas, Nos. 53809-10, February 17, 1911; 53869-71, 53903-5, February 16, 1911; Alhamel, Nos. 53818-19, 1911; Tabernilla, Nos. 53846-58, April 9, 1911; Upper Trinidad, Nos. 53872-76, 53901-2, March 7, 1911; Culebra, No. 53877, February 11, 1911; Rio Chorrera, No. 53884, April 4, 1911; Porto Bello, No. 53918, March 17, 1912; Rio Marte Arnade, Nos. 53935-36, May 26, 1912; Dimon Creek, Alhajuela, Nos. 53973-76, February 26, 1911; Rio Bayano, No. 53981, March 22, 1911; Gorgona, No. 54270, March 28-April 2, 1912; Panama (no locality or date), Nos. 53811, 53859, 53891. Forty-three were collected by E. A. Goldman as follows: Cana, Darien, Nos. 50065-75, 50079-81, 50083-84, February-May, 1912; Seteganti River, Cana, No. 50076, March 20, 1912; Empire, No. 50077, February 17, 1912; Marraganti, No. 50078, June 20, 1912; Boca de Cupe, No. 50082, June 14, 1912; Old Panama, No. 50128, February 7, 1912; Lion Hill, Nos. 54016-17, February 6, 1911; Gatun, No. 54018, January 12, 1911; 54121-22, April 24-26, 1911; Corozal, Nos. 54061-62, June 15-19, 1911; Buenaventura Id., Nos. 54063-64, May 29-30, 1911; Cerro Azul, Nos. 54120, 54124-25, 54127, March 22, 1911; Tabernilla, No. 54123, April 20, 1911; Miraflores, No. 54126, May 13, 1911; Panama (no locality or date), Nos. 54001-4.

**CORYTHOPHANES CRISTATUS** Gray

A single specimen, U.S.N.M. No. 50153, was shot from a bird's nest in the forest at Gatun, July 30, 1911, by E. A. Goldman.

**CTENOSAURA SIMILIS** (Gray)

A single specimen, U.S.N.M. No. 54204, was collected at Corozal, April 20, 1911, by Meek and Hildebrand.

**ENYALIOIDES HETEROLEPIS** (Bocourt)

Two specimens, U.S.N.M. No. 54005, from Panama, collected by E. A. Goldman, with no further data, and No. 54019, from Gatun, January 20, 1911, also collected by E. A. Goldman. The latter specimen was shot along a cliff in the forest. This species has been recorded from Gatun by Fowler.\* The femoral pores are two on each side.

**AMEIVA FESTIVA** (Lichtenstein)

Fourteen specimens of this species may be listed as follows:

U.S.N.M. No.	Locality	Date	Collector
50134	Cana	Mar. 27, 1912	E. A. Goldman
50136	"	Apr. 4, 1912	" " "
50138	"	Apr. 2, 1912	" " "
50139	"	May 30, 1912	" " "
50142	"	May 21, 1912	" " "
50143	"	May 19, 1912	" " "
54072-75	Porto Bello	May 25, 1911	" " "
54134	Gatun	Apr. 26, 1911	" " "
54135	"	May 4, 1911	" " "
54137	Chepo	Mar. 28, 1911	" " "
54169	Gatun	Apr. 26, 1911	" " "

**AMEIVA UNDULATA** (Wiegmann)

Sixteen specimens represent this species. Eight were collected by Meek and Hildebrand as follows: Chepo, No. 53741, March 21, 1911; Alhamel, Nos. 53813-16, 1911; Miraflores, No. 53842, January 18, 1911; Rio Cardenas, Corozal, No. 53868, February 16, 1911; Culebra, No. 53880, February 11, 1911. Eight were obtained by E. A. Goldman as follows: Cana, No. 50135, June 10, 1912; 50137, June 6, 1912; 50140, May 21, 1912; 50141, May 16, 1912; Cerro Azul, Nos. 54136, 54147, March 22, 1911; Gatun, No. 54142, January 2, 1911; Panama (no locality or date), No. 53999.

\* Proc. Acad. Nat. Sci. Philadelphia, 1916, p. 406.

**AMEIVA PRAESIGNIS (Baird and Girard)**

Out of the series of 45 specimens in the Survey collection, 25 were collected by Meek and Hildebrand as follows: Toro Point, No. 53742, April 14, 1911; Gatun, No. 53746, January 9, 1911; 53826-27, March 30, 1911; Mindi Cut, No. 53835, January 28, 1911; Rio Cardenas, Corozal, No. 53867, February 16, 1911; Culebra, Nos. 53878-79, 53881, February 11, 1911; Rio Marte Arnade, No. 53927, March 26, 1912; Rio Bayabo, No. 53980, March 22, 1911; Rio Mamoni, Nos. 53993-95, March 20, 1911; Taboga Id., Nos. 54197-98, 54206, May 12-15, 1911; Gorgona, Nos. 54271-72, March 28, April 2, 1912; Canal Zone (no further data), Nos. 53733, 53892-95, 54323. Specimens collected by E. A. Goldman may be listed as follows: Gatun, Nos. 54000, March 6, 1911; 54020, January 19, 1911; 54021, April 5, 1911; 54069, January 15, 1911; 54131, April 21, 1911; 54133, 54140, January 3, 1911; 54142, January 2, 1911; Corozal, Nos. 54070-71, June 15, 1911; Miraflores, Nos. 54128, 54139, 54141, May 13, 1911; Bas Obispo, No. 54129, May 5, 1911; Tabernilla, Nos. 54130, 54132, 54138, April 13-20, 1911; Panama (no further data), Nos. 53996-98.

**ECHINOSAURA PANAMENSIS Barbour**

A single specimen, U.S.N.M. No. 50144, from the Pirri Range, near the headwaters of the Rio Limon, was collected by E. A. Goldman, April 22, 1912. The species was described from La Loma, Bocas del Toro Prov., near the other end of Panama.

**MABUYA AGILIS (Raddi)**

Two specimens, U.S.N.M. No. 50133, collected at Cana, June 12, 1912, by E. A. Goldman, and 54322 from the "Canal Zone," collected by Meek and Hildebrand.

## Suborder SERPENTES

**UNGALIOPHIS PANAMENSIS sp. nov.**

*Diagnosis.*—Distinguished from *Ungaliophis continentalis* Müller by having 21 dorsal scale rows instead of 25, 3 postoculars instead of 2, and 2 elongate loreals, the nostril being in the single small nasal, instead of a single loreal and divided nasal of the Guatemalan species.

*Type.*—U.S.N.M. No. 54059, from Cerro Brujo, Panama, altitude 2,000 feet, collected on June 6, 1911, by E. A. Goldman.

*Description of the type.*—Head small, little wider than the neck, depressed, the snout projecting beyond the lower jaw; eye small with a very small vertical pupil; body strongly compressed; tail incomplete.

Rostral just visible from above, about twice as wide as high; a single large prefrontal, roughly 7-sided, separated from the rostral by the small internasals; frontal subtriangular, shorter than the prefrontal; parietals not distinguished from the adjacent scales; nostril in a single small scale; two elongate loreals; a single preocular; three postoculars; upper labials 8 to 9, the fourth and fifth and sixth on the respective sides entering the eye; lower labials 10, the first pair very large and in contact; one pair of chin shields slightly enlarged; dorsal scales in 21 rows, dropping to 15 anterior to the anus; centrals 236; tail incomplete.

*Coloration (in alcohol).*—Ground color pale, punctate with brown dots and maculation; a large brown spot on the head, behind which are about 53 pairs of triangular spots with their apices at the vertebral line, frequently confluent into hour-glass shaped spots, more often offset, *i. e.* alternate; an incomplete lateral row of small brown spots; 44 lateroventral brown spots, mostly extending across the belly; a brown line from the angle of the mouth to the eye.

*Dimensions.*—Total length about 500 mm.

*Remarks.*—The nasal and loreal arrangement in this snake are radically different from that in *Ungaliophis continentalis*, which has only a single loreal, and a divided nasal. The anterior loreal of the present specimen apparently corresponds with the posterior nasal of *continentalis*. The constancy of this arrangement of the nasals requires verification from additional specimens. In addition to the characters mentioned in the diagnosis, *panamensis* differs from the Guatemalan species in the separation of the prefrontal and rostral by the internasals. The inclusion of Panama in the range of *continentalis* by Amaral<sup>9</sup> appears to be based on the present specimen which was entered as *continentalis* in the United States National Museum catalogue.

#### CONSTRUCTOR CONSTRUCTOR IMPERATOR (Daudin)

Three specimens, from the following localities:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ven- trals	Cau- dals
50094	Cana	May 25, 1912	E. A. Goldman	♀	243	59
54060	Gatun	June 23, 1911	" " "	♀	236	62
54145	Tabernilla	Apr. 29, 1911	" " "	♀	239	60

<sup>9</sup> Lista remissiva dos ophidios da regio neotropica. Mem. Inst. Butantan, vol. 4, p. 145, 1929.

The dorsal dark cross-bars in No. 50094 number  $20\frac{1}{2}$  on the body and 5 on the tail. The transformation of a narrow cross-bar, constricted on the mid-dorsal line anteriorly, to an oval longitudinally elongated spot on the posterior part of the body is clearly shown on this specimen.

#### **EPICRATES CENCHRIS MAURUS (Gray)**

A single female specimen, U.S.N.M. No. 50125, collected at Gatun, July 31, 1911, by E. A. Goldman, has 238 ventrals and 54 subcaudals. The remains of a Boqueron cotton rat (*Sigmodon hispidus chiriquensis* Allen) are contained in the stomach.

#### **BOA RUSCHENBERGII (Cope)**

A single male specimen, U.S.N.M. No. 53896, was collected by Meek and Hildebrand, without data other than "Panama." The ventrals number 267, the subcaudals 86.

#### **TRETANORHINUS MOCQUARDI Bocourt**

Two specimens, U.S.N.M. Nos. 54200, 54203, collected at Corozal, April 20, 1911, by Meek and Hildebrand. The first of these, a female with tail incomplete, has 168 ventrals; the second is a male with 166 ventrals and 78 subcaudals.

The venter is nearly uniform dark brownish; lateral yellow stripe with scales narrowly outlined with brown. The lateral scales just above the anal cleft have well developed supra-anal ridges in the male specimen.

#### **TRETANORHINUS NIGROLUTEUS Cope**

One specimen, U.S.N.M. No. 54151, collected at Gatun, May 13, 1911, by E. A. Goldman, is referred to this species. It is in excellent agreement with Cope's description except that the internasals are narrowly in contact with the rostral, and that there is a mid-ventral series of widely spaced brownish spots, as described by Bocourt for his *lateralis*. The specimen is a female, with 147 ventrals and 61 subcaudals.

#### **NINIA ATRATA SEBAE (Duméril and Bibron)**

A single specimen, U.S.N.M. No. 50114, collected at Cana, April 10, 1912, by E. A. Goldman, is a male, with strongly tuberculate chin-shields. The ventrals number 140, the subcaudals 60.



**DRYMOBIUS BODDAERTII (Sentzen)**

Four specimens of this species were collected as follows:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ventrals	Caudals
54013	Gatun	Jan. 14, 1911	E. A. Goldman	♀	188	95
54014	"	" " "	" " "	♀	184	..
54156	"	May 6, 1911	" " "	♀	189	97
54158	Tabernilla	May, 1911	" " "	♀	183	95

**DRYMOBIUS DENDROPHIS (Schlegel)**

Two specimens collected at Gatun by E. A. Goldman, U.S.N.M. No. 54080, January 14, 1911, and 54150, April 6, 1911. The first, a female, has 161 ventrals and 144 subcaudals; the other, a male, has 158 ventrals and 140 subcaudals.

**DRYMOBIUS MARGARITIFERUS (Schlegel)**

A single female specimen, U.S.N.M. No. 53830, collected at Rio Cardenas, February 16, 1911, by Meek and Hildebrand, has 151 ventrals and 116 subcaudals.

**PHRYNONAX POECILONOTUS SHROPSHIREI Barbour and Amaral**

Two male specimens collected by E. A. Goldman, U.S.N.M. No. 50100, at Gatun, July 9, 1911, with 199 ventrals and 125 subcaudals, and 54084 at Corozal, June 19, 1911, with 209 ventrals and 138 subcaudals.

**SPILOTES PULLATUS PULLATUS (Linné)**

Two male specimens collected at Cana, by E. A. Goldman, U.S.N.M. No. 50095, June 7, 1912, has 224 ventrals and 125 subcaudals, and No. 50096, May 24, 1912, has 217 ventrals and 126 subcaudals.

**DRYMARCHON CORAIS MELANURUS (Duméril and Bibron)**

A single female specimen, U.S.N.M. No. 54166, was collected at Gatun, January 10, 1911, by E. A. Goldman. It has 206 ventrals and 71 subcaudals.

**CHIRONIUS CARINATUS (Linné)**

Seven specimens collected as follows:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ventrals	Caudals
50097	Cana	Apr. 5, 1912	E. A. Goldman	♀	163	126
53743	Mindi	Jan. 13, 1911	Meek & Hildebrand	♀	157	122
53900	Upper Trinidad	Mar. 7, 1911	" " "	♂	157	127
54159	Bohio	Apr. 29, 1911	E. A. Goldman	♀	151	127
54165	Tabernilla	May, 1911	" " "	♂	158	124
54167	Gatun	May 8, 1911	" " "	♂	155	...
54199	Panama	1911-1912	Meek & Hildebrand	♀	162	126

**LEPTOPHIS MEXICANUS (Duméril and Bibron)**

Two specimens of this species, U.S.N.M. Nos. 54082-83, collected at Porto Bello, May 24-25, 1911, by E. A. Goldman. The first, a male, has 156 ventrals, the tail incomplete; the second is a female with 158 ventrals and 165 subcaudals.

**LEPTOPHIS OCCIDENTALIS (Günther)**

Five specimens may be listed as follows:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ventrals	Caudals
53820	Chorrera	Apr. 10, 1911	Meek & Hildebrand	♂	169	150
54015	Gatun	Jan. 15, 1911	E. A. Goldman	♂	164	144
54163	Tabernilla	May, 1911	" " "	♀	166	...
50106	Gatun	.....	.....	♀	182	175
50124	Old Panama	Jan. 21, 1912	E. A. Goldman	♂	167	156

**DROMICUS TAENIURUS (Tschudi)**

Four specimens of this species may be listed as follows:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ventrals	Caudals
50118	Cana	May 30, 1912	E. A. Goldman	♀	137	61
50119	"	Apr. 10, 1912	" " "	♀	140	63
50120	"	June 12, 1912	" " "	♀	139	..
54228	Empire	1911-1912	E. D. Christopherson	♀	144	56

**RHADINEA FULVICEPS (Cope)**

One specimen, a male, U.S.N.M. No. 50121, was collected at Cana, June 12, 1912, by E. A. Goldman. The tail is incomplete; the ventrals number 142.

**XENODON COLUBRINUS (Günther)**

Four specimens representing this species may be listed as follows:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ventrals	Caudals
50105	Gatun	July 11, 1911	E. A. Goldman	♀	150	48
50109	Cana	June 7, 1912	" " "	♀	147	46
54146	Panama	1911-1912	" " "	♀	151	44
54154	Gatun	May 12, 1911	" " "	♀	146	45

**LEPTOCALAMUS TORQUATUS Günther**

One specimen, U.S.N.M. No. 50107, was collected in Panama by the Smithsonian Biological Survey of the Panama Canal Zone, but it bears no further data. It is a female with 185 ventrals and 92 subcaudals.

**SIBON SIBON (Linné)**

Two specimens of this species were collected by E. A. Goldman for the Canal Zone Survey; U.S.N.M. No. 50117, Cana, June 12, 1912, a female, has 190 ventrals and 86 subcaudals; No. 54079, Corozal, June 15, 1911, also a female, has 178 ventrals and 82 subcaudals.

**SIBYNOMORPHUS VIGUIERI (Bocourt)**

A single specimen, U.S.N.M. No. 50112, a female, comes from Cana, collected May 24, 1912, by E. A. Goldman. It has 190 ventrals and 115 subcaudals.

**SIPHLOPHIS CERVINUS GEMINATUS Duméril and Bibron**

One specimen, U.S.N.M. No. 50113, collected at Boca de Cupe, June 15, 1912, by E. A. Goldman. A male specimen, it has 204 ventrals and 109 subcaudals.

**LEPTODEIRA ANNULATA (Linné)**

Nine specimens of this species were collected as follows:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ven- trals	Cau- dals
50115	Cana	May 24, 1911	E. A. Goldman	..	...	..
53829	Rio Cardenas	Feb. 16, 1911	Meek & Hildebrand	♀	172	75
54077	Gatun	June 21, 1911	E. A. Goldman	♂	170	76
54078	"	May 23, 1911	" " "	♂	168	74
54155	"	May 11, 1911	" " "	♀	...	78
54160	"	May 13, 1911	" " "	♂	173	86
54161	"	" " "	" " "	♂	173	82
54227	Rio Aruza	Feb. 27, 1912	E. D. Christopherson	♂	169	79
54266	Empire	1911-1912	" " "	♀	172	75

**CLELIA CLOELIA (Daudin)**

Two specimens collected by E. A. Goldman; U.S.N.M. No. 50098, a female, Pirri Range, April 22, 1912, with 209 ventrals and 73 caudals; and No. 50099, Gatun, July 5, 1911, with 245 ventrals and 85 subcaudals.

**CLELIA PETOLA (Linné)**

A single specimen, U.S.N.M. No. 50111, collected at Cana, May 24, 1912, by E. A. Goldman, is a female with 210 ventrals and 113 subcaudals.

**PSEUDOBOA NEUWIEDII (Duméril and Bibron)**

A single female specimen, U.S.N.M. No. 54207, collected at Corozal, April 21, 1911, by Meek and Hildebrand, has 203 ventrals and 76 caudals.

**OXYBELIS ACUMINATUS (Wied)**

Five specimens collected as follows:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ventrals	Caudals
50108	.....	.....	.....	♀	189	158
50122	Empire	Feb. 1, 1912	E. A. Goldman	♀	189	140
53749	Frijoles	Feb. 8, 1911	H. Pittier	♂	186	...
53812	Alhamel	1911	Meek & Hildebrand	♂	185	180
54157	Tabernilla	May, 1911	E. A. Goldman	♀	183	184

**ERYTHROLAMPRUS AESCULAPII (Linné)**

A single male specimen, with no precise locality, U.S.N.M. No. 54008, was collected by E. D. Christopherson. It has 193 ventrals and 56 subcaudals.

**STENORHINA DEGENHARDTII (Berthold)**

Two specimens with the following data:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ventrals	Caudals
50116	Cana	May 30, 1912	E. A. Goldman	♂	155	47
54081	Gatun	June 23, 1911	" " "	♀	166	33

**PELAMIS PLATURUS (Linné)**

A single specimen, U.S.N.M. No. 53919, collected at Chame Point, February 4, 1912, by Meek and Hildebrand, a female, has 341 ventrals.

**MICRURUS NIGROCINCTUS NIGROCINCTUS (Girard)**

Seven specimens of the common Panama coral snake are included in the collection, from the following localities:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ventrals	Caudals
50103	Gatun	July 15, 1911	E. A. Goldman	♀	215	36
50104	"	July 11, 1911	" " "	♂	194	47
54076	"	June 23, 1911	" " "	♂	196	47
54152	Tabernilla	May, 1911	" " "	♂	204	48
54153	Gatun	May 8, 1911	" " "	♀	215	39
54162	Tabernilla	May, 1911	" " "	♀	218	35
54268	Canal Zone	1911-1912	E. D. Christopherson	♀	214	34

**BOTHROPS SCHLEGELII (Berthold)**

Three specimens with the following data:

U.S.N.M. No.	Locality	Date	Collector	Sex	Ven- trals	Cau- dals
50101	Gatun	July 30, 1911	"L.L.J."	♀	153	58
50102	"	July 4, 1911	"	♀	161	61
54264	"	1911-1912	E. D. Christopherson	♂	165	61

**BOTHROPS NASUTA (Bocourt)**

A single specimen, in bad state of preservation, U.S.N.M. No. 54057, collected at Cerro Brujo, June 6, 1911, by E. A. Goldman, represents this species in the collection.

**BOTHROPS MONTICELLII (Peracca)**

A single specimen, U.S.N.M. No. 50110, is the type of *Bothrops leptura* Amaral. It comes from Cana, collected June 7, 1912, by E. A. Goldman.

## Order LORICATA

**CROCODYLUS ACUTUS Cuvier**

A single specimen, U.S.N.M. No. 50088, was collected at Boca de Cupe, June 14, 1912, by E. A. Goldman.

**CAIMAN FUSCUS (Cope)**

The distinction of the Central American caiman, as *Caiman fuscus* (Cope), from the Amazonian *Caiman sclerops* has been proposed by myself in a recent paper.<sup>10</sup>

The skull of the Central American form is decidedly more massive, with a relatively broader snout, and the palatines are inflated anteriorly. The pterygoid border of the palatine fenestra is longer than in *sclerops*, and thus presents the extreme of divergence in this character from the Paraguayan *Caiman yacare*.

In the Panama series listed below, the nuchal scutes are regularly 4-4-2-2 in number, but an additional pair of small scutes is frequently intercalated between the nuchals and the dorsal shield. No. 54093 has the nuchal formula 2-4-2-2. The dorsal shield is composed of

<sup>10</sup> Publ. Field Mus. Nat. Hist., Zool., vol. 12, p. 227, 1928.

8 longitudinal and 16 or 17 transverse rows of scutes. The double crested verticils of caudal scutes number 14 in 7 specimens, 15 in 3, and 16 in 1.

The data for the caimans in the present collection are as follows:

U.S.N.M. No.	Locality	Date	Collector
50089	.....	.....	.....
50090-93	Cana	Mar. 18-20, 1912	E. A. Goldman
54089	Mindi	Mar. 2, 1911	Meek & Hildebrand
54090	El Capitan	Mar. 20, 1911	" " "
54092-93	Mindi	Mar. 2, 1911	" " "
54095	"	" " "	" " "
54096	Chorrera	Apr. 9, 1911	" " "