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SNAKES FROM THE UPLANDS OF THE CANAL ZONE
AND OF DARIEN

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No. 1. — *Snakes from the Uplands of the Canal Zone and of Darien*¹

By E. R. DUNN and JOSEPH R. BAILEY

We report on 268 snakes from the uplands of eastern Panama gathered in 1936 to 1938 through the initiative of Dr. H. C. Clark, Director of the Gorgas Memorial Institute in Panama City. These add three genera and five species to the fauna of North America, eight species to that of Panama, and ten species to that of eastern Panama. Specimens of each species are deposited in the Museum of Comparative Zoölogy. We have examined, and include in this report, the only snakes previously taken from these uplands: twenty in the United States National Museum, and eight in the Museum of Comparative Zoölogy, so that we have seen, in all, 296.

We are indebted to Dr. Clark, Dr. Stejneger, and Dr. Barbour for the opportunity to examine these snakes.

Darien uplands. Major Goldman, in 1912, took 18 snakes at the Cana Mines (2000 feet), and on the Pirri Range above Santa Cruz de Cana. He has given a general account of the region (1920: 10–15). His snakes are in the National Museum and have been reported on by Amaral (1923), and by Schmidt (1933).

Dr. Barbour and Mr. Brooks, in 1922, took a snake on Mt. Sapo, Garachiné Peninsula (elevation 1200–1500 feet, Barbour *in litt.*). The specimen is in the Museum of Comparative Zoölogy (cf. Barbour 1923, Barbour and Brooks 1923).

Dr. Clark has sent 153 snakes from Cana, collected by natives.

Canal Zone uplands. Major Goldman, in 1911, took two snakes on Cerro Bruja, at about 2000 feet. He gives an account of conditions in the mountains surrounding the Chagres basin (l.c.). His snakes are in the National Museum and have been reported on by Schmidt (1933).

Captain Stewart, in 1926, took seven snakes while surveying the Bruja Mountain part of the divide of the Chagres basin. His snakes are in the Museum of Comparative Zoölogy, and were reported by Barbour and Amaral (1928).

Dr. Clark has sent 115 snakes from the uplands of the Chagres basin.

The main divide of the Chagres basin had been mapped by January 1927 (official Canal Zone Map) as far as 79 degrees 45 minutes west longitude in the north (including the Bruja Mountains) and as far as 79 degrees 29 minutes west longitude in the south. In 1936 this mapping was completed, and surveys were made along the major ridges

¹ Contributions from the Department of Biology, Haverford College, No. 36.

of the basin, the work being entirely to the east of the former mapping. Dr. Clark obtained the cooperation of Mr. R. B. Kirkpatrick, Chief of Surveys, and that of the leaders of the various parties.

Mr. W. M. Sargent, head of "B" party, was especially interested. His party took 78 snakes, on most of which we have detailed field data. Four of these were taken on the Caribbean slope, while attaining the main divide from the north.

The other parties took 37 specimens. Five have no data, and many have simply "E" party. This outfit worked up the Piedras and along the Piedras-Pacora ridge. As the Piedras enters the Chagres at 500 feet elevation, this is a minimum elevation for "E" party snakes. The harmless snakes are said to have come from the "valley of the Piedras."

Of the 115, a single specimen is from 200 feet and eight are from 350-495. In all probability the rest are from over 500 feet. Twenty-six (including the nine just mentioned) are from below 1000 feet; 53 are from 1000-2000 feet; 17 are from 2000-3000 feet.

The 115 specimens were collected by the men of the surveying gangs, "82 men on the ridges for three months and travelling in a line on the ridges, making a new camp each night" (Grayson, Crowell, and Clark, 1937: 18).

The localities mentioned are:

Cerro Bruja, 934 m., or about 3200 feet. Northeast part of divide.

Rio Miramar, enters Caribbean near Nombre de Dios.

Rio Cuango, enters Caribbean just east of Rio Miramar.

Rio Pequeni. With the more westerly Boqueron the two main northern tributaries of the Chagres. The two meet and empty into the Chagres in the Madden Dam area.

Rio Adeo. Eastern tributary of Pequeni.

Rio Chico. First large northern tributary of Chagres above Madden Dam area.

Rio Piedras. Enters Chagres from south above mouth of Chico. The most southern tributary.

Piedras-Pacora ridge. Separates Chagres basin from that of Pacora, which enters the Pacific.

Rio Limpio. Enters the Chagres from north, above mouth of Piedras.

Rio Esperanza. A very large stream which enters Chagres from north, above mouth of Limpio.

Pequeni-Esperanza ridge. Extends northeast-southwest, dividing Chagres system into a southern Chagres-Esperanza basin and a northern and western Pequeni-Boqueron basin.

Tres Hermanas Quebrada. Enters Esperanza from the north.

Playa Grande. Enters Esperanza from north above mouth of Tres Hermanas.

Upland Versus Lowland Material

The 296 upland snakes represent 59 species: 19 from only the Chagres ridges, 22 from only upland Darien, and 18 common to the two areas.

The senior author has examined all available snakes from the lowlands of the Canal Zone and eastern Panama. He is aware of 28 in Turin which he has not seen, but these add no species to the 64 lowland forms he has seen. The lowland material amounts to 7961 specimens with definite data, 7021 of which have been sent by Dr. Clark in the last six years (1933-38).

The upland material of 296 specimens contains 16 forms not known from the lowlands. We list these here, adding the other areas from which they are known.

Four are endemic:

Atractus clarki spec. nov. from Cana.

Rhadinaea decorata ignita from Cana.

Rhadinaea sargenti spec. nov. from the Chagres ridges.

Micrurus stewarti from the Chagres ridges.

Four are North American only in upland Darien:

Atractus crassicaudatus? Colombia and Venezuela.

Trachyboa boulengeri. Western Colombia and western Ecuador.

Trypanurgos compressus. Bolivia, Brazil, the Guianas, Trinidad, Colombia.

Trimeresurus montecelli. Western Colombia and western Ecuador.

Seven are eastern Panamanian only in the Chagres ridges:

Ungaliophis panamensis. Atlantic Nicaragua.

Nothopsis rugosus. Atlantic Nicaragua, Atlantic Costa Rica, Pacific Ecuador.

Sibon temporalis. Western Colombia and western Ecuador.

Oxybelis brevirostris. Atlantic Nicaragua, Atlantic Costa Rica, Atlantic Veragua, western Colombia, western Ecuador.

Imantodes inornatus. Near Matagalpa, Nicaragua; Atlantic Costa Rica; Chiriqui.

Tantilla schistosa. "Mexico"; Alta Vera Paz, Guatemala; "Honduras"; near San Jose, Costa Rica.

Trimeresurus nummifer. Mexico, Guatemala, Honduras, Nicaragua, Costa Rica.

One is Panamanian only on the Chagres ridges and at Cana:

Tantilla annulata. "Nicaragua," Atlantic Costa Rica.

The majority of these snakes are elsewhere inhabitants of "rain-forest" areas, which have no dry season. We know of only four snakes (of three species) from this sort of area on the Atlantic coast of Eastern Panama. We expect that most of these "upland" snakes will be found there when that coast is properly worked.

The snake fauna of the Chagres ridges (37 species) has more affinity with that of the lower Chagres basin than with any of the other known lowland areas. It has eleven species restricted to the uplands and 23 in common with the lower Chagres. The three not accounted for are: *Ninia atrata*, which is not uncommon in the lower Tuira valley in Darien; *Rhinobothryum bovallii* and *Drymobius rhombifer*, both rather rare in the Panama Sabanas area and in the lower Tuira.

The snake fauna of Cana has its greatest affinity with that of the lower Tuira. Cana has six species restricted to the uplands, the other 34 being all known from the lower Tuira.

Since the two upland areas have only 18 species in common, it is obvious that the Ridge fauna is more of the Atlantic slope type and that of Cana more of the Pacific slope type.

List and comments

UNGALIOPHIS PANAMENSIS Schmidt

Cerro Bruja, 2000 feet, U.S.N.M. 54059, type. This form is otherwise known only from the Misterioso River, 10 miles from Greytown, Nicaragua, U.S.N.M. 29215. The name *Peropodum*, sometimes used for this genus, is a form of the group name *Peropoda*, and is no more of a generic name than *Avium*, *Mammalium*, etc.

TRACHYBOA BOULENGERI Peracca

A female from Cana introduces the species and the genus to the North American fauna. It has no anal spurs; 33 dorsal scale rows, the vertebral and three rows on each side keeled, the four rows below these nearly smooth, eight lateral rows very strongly keeled with the keels running obliquely in the more dorsal of them; lowest row smooth; 134 ventrals; 21 caudals; eye separated from labials by suboculars; horns on internasals and supraoculars. The species has been recorded from localities in northwestern Ecuador and in western Colombia.

CONSTRUCTOR CONSTRUCTOR IMPERATOR (Daudin)

Cana, USNM 50094.

EPICRATES CENCHRIA MAURUS Gray

Cana, five specimens.

BOA ENYDRIS COOKII (Gray)

Cana, three specimens.

NOTHOPSIS RUGOSUS Cope

A female from "ridge at headwaters of west branch of Rio Cuango 700 feet." It contained a specimen of *Oedipus parvipes* in its stomach. Dorsals 29, rows 7-10 smaller; ventrals 161+1; caudals 95 pairs; upper and lower labials both 13; sixth supralabial below eye; a pair of internasals; a trace of right prefrontal; paired areas represent frontal and parietals; paired anterior geneials; otherwise the head is covered with tiny granular scales; length 213 mm.; tail 61.

Specimens are now known from: San Juan River, Nicaragua (USNM 19562); Cariblanco, Costa Rica (BMNH 1905-1-30, 51); Reventazón, C. R. (MCZ 15269); "Atlantic side of Isthmus of Darien" (USNM 12427, TYPE); Salidero, Ecuador, 350 feet (Boulenger 1905, TYPE of *N. affinis* Boulenger).

As *Oedipus* are terrestrial salamanders and as the specimen was taken on a "ridge," this, the only information we have on the habits of *Nothopsis*, provides a strong contrast to the highly aquatic habits of its Asiatic relatives.

NINIA ATRATA (Hallowell)

Cerro Bruja (MCZ 24928-9). Cana, two specimens. A male has 143 ventrals and 55 caudals; the loreal enters the eye, but there are tiny preoculars, two lower and one upper on the left side, one lower on the right. This species, whose range includes Trinidad, Venezuela, Ecuador and Colombia, is not uncommon in the lower Tuira basin. It is also known from Cariblanco and from Cartago, Costa Rica.

NINIA MACULATA (Peters)

Cana (USNM 50114, *Ninia atrata sebae* Schmidt, p. 14). This specimen was erroneously recorded from Gatun by the senior author in 1935. Of three that we have from Cana, a male and a female have tiny preoculars on each side below the contact of the loreal and the eye. The male has 143 ventrals, 62 caudals; the female 142 ventrals,

54 caudals. The species is not known south of Darien. A single specimen has been seen from the lower Tuira Valley (Yavisa), and this has two preoculars on each side, excluding the loreal from the orbit. Since preoculars are unknown in more northern specimens of this species, their presence in three out of five Darien specimens is significant.

ATRACTUS cf. CRASSICAUDATUS Duméril and Bibron

A single head, sent in 1936 from the Piedras-Pacora ridge, introduced the genus to North America (the so-called Mexican *Atractus* are really *Geophis*). We have compared it with topotypes of *crassicaudatus* from Bogotá, and have examined a number of other specimens. This head has four lower labials in contact with the geneials. We have been unable to find a Colombian specimen with more than three in contact. Other characters of scalation and markings are within the range of variation of Colombian *crassicaudatus*, although it may be pertinent to state that ours has a long slim scale in the upper secondary temporal row, whereas in 21 topotypes this character appears on both sides in one and on one side in four, the others having two or more scales in this area; and that ours has a black postocular streak across the last upper labial, while the topotypes have it across the next to last. Ours has two preoculars on the left side, three on the right, a tiny lower scale being present; seven upper labials 3rd and 4th in orbit; seven lower labials; temporals 1-2, upper of posterior set very long; 17 dorsals; mental and geneials separated by contact of first lower labials; loreal thrice as long as high.

ATRACTUS CLARKI spec. nov.

Type. M.C.Z. 28800, female, collected in 1938.

Type locality. Mine at Santa Cruz de Cana, Darien.

Diagnosis. An *Atractus* with 17 dorsals; mental and geneial separated by contact of first lower labials; loreal thrice as long as high; 7 upper labials; 2 postoculars; prefrontals longer than wide; dark, lower scale rows lighter and belly immaculate; 185 ventrals; 33 caudals.

Description. Besides the characters given in the diagnosis the specimen has: 3rd and 4th upper labials in orbit; three lower labials contacting geneials, temporals 1-2, the upper second extending to tip of parietals; dorsal scales black, except lowest three which are progressively lighter in the center, so that there is a light line along scale row two; throat and belly immaculate except for a faint dark mark on tip

of ventrals; upper labials light except for a dark streak from eye across labial 6; throat color extends up onto labial 7 and temporals; length 313 mm., tail 35. The specimen has been cut in half, so that measurements and count of ventrals is approximate and minimum.

Remarks. This form is one of the great mass of *Atractus* species, with 17 dorsals, seven upper labials, two postoculars, and elongate loreals. At least fifteen of these have been reported from Colombia, differing in color, in ventral and caudal count, and in proportions of the head scales. Of these Colombian forms, *pamplonensis* Amaral, from Pamplona near the Venezuelan border, is much the most similar, both in scalation and in color. It has a double series of small black paravertebral spots; the tips of the ventrals are much more definitely marked with black; the highest female ventral count is 184; the highest female caudal count is 24 (the highest male count is 30); the second upper temporal is short. These are the characters in which *pamplonensis* differs from *clarki*. Of the other *Atractus* known to us, *collaris* Peracca, from Cononacco, near Iquitos, Peru, has a quite similar body color, but the temporal patches are much more marked, and the ventrals are only 163.

SIBON TEMPORALIS (Werner)

A head from "Pequeni-Chagres ridge between headwaters of Rio Limpio and Las Tres Hermanas Quebrada;" a head from "E party." Dorsals 15, vertebral enlarged; supralabials 7, 4-5-6 in eye; loreal entering eye; an upper preocular; postoculars 2-3; lower labials 8, anterior not in contact; anterior pair of geneials tiny, followed by three pairs of normal geneials; 3 anterior temporals.

We think that this species, described from Esmeraldas, Ecuador (Werner 1909) and *spurrelli* (Boulenger 1913) from Peña Lisa, Condoto, Chocó, Colombia, 300 feet, are the same. Werner's specimen had one of the two anterior temporals entering the eye between the two postoculars. Boulenger says his specimen had no preocular and seven upper labials. His figure shows an upper preocular and eight upper labials, as well as three anterior temporals. The type of *temporalis* had 206 ventrals and 125 caudals; the type of *spurrelli* had 208/132. Werner and Boulenger both remark, and we can confirm them, that this form is very similar to *S. annulata* of western Panama, Costa Rica, and Nicaragua.

SIBON VIGUIERI (Bocourt)

Cana, USNM 50112.

SIBON SIBON (Linné)

Cana, USNM 50117. We have a female from Cana: dorsals 15-13, the paravertebrals dropping just anterior to the vent, vertebrals wider than long, paravertebrals enlarged; ventrals 184; navel at 158-9; caudals 89; supralabials 7, 4th and 5th in eye; postoculars 1; temporals 1-2.

RHADINAEA PACHYURA FULVICEPS Cope

Cana, USNM 50121.

RHADINAEA DECORATA DECORATA (Günther)

Bruja Mountains, MCZ 24930. We have one from the Pequeni-Esperanza ridge near the head of the Adeo at 1300 feet.

RHADINAEA DECORATA IGNITA (Cope)

Two females from Cana. Two preoculars; subpreocular present on both sides in one, absent in the other; former has 124 ventrals, 99 caudals; latter has 121 ventrals.

Typical *decorata* from Mexico to western Panama inclusive always has a light streak back of the eye, a light spot on the nape, a light dorsolateral line on the anterior part of the body. The Cana specimens have these three light markings fused into a single line, on either side, as do the types of *ignita* (USNM 24501-2, from "Atlantic side of Isthmus of Darien"). Specimens from the lower Chagres basin show every possible transition between the two types of coloration, but a strong majority are of the northern type. The two from the uplands of the Zone are of the northern type. In these circumstances we prefer to retain *ignita* as a racial name for the southernmost specimens of *decorata*.

RHADINAEA SARGENTI spec. nov.

Type. MCZ 42788, adult male, collected by Sargent's party.

Type locality. Pequeni-Esperanza ridge near head of Pequeni, 1800 feet.

Range. 1000-2530 feet elevation on ridges of Chagres basin.

Diagnosis. A *Rhadinaea* with 17 dorsals; 118-126 ventrals; 67-72 caudals; 8 upper labials; a broad black band on the lower scale rows; labials with black borders; top of head with a pattern of interlacing light black-bordered lines.

Description. The collection contains six specimens:

Pequeni-Esperanza ridge near head of Pequeni, 1000 feet, MCZ 42787
 " " 1800 " " 42788
 " " 2000 " head
 " near head of Adee 1300 " " 42789
 Pequeni-Chagres ridge 2530 " head
 Piedras-Pacora ridge 2460 " " 42764
 All have: dorsals 17; upper labials 8, 4th and 5th in eye; oculars 1-2
 (subpreoculars present in 42787); temporals 1-2.

M.C.Z. No.	sex.	vent.	caud.
42787	♀	126	67
42788	♂	118	72
42789	♂	120	—
42764	♂	119	—

The outer edge of the ventrals and the lower $3\frac{1}{2}$ (rarely $4\frac{1}{2}$) scale rows are black. The dorsum is brown, slightly darker on the paravertebral rows, and slightly lighter just above the lateral band, especially anteriorly where this becomes a narrow white, black-bordered line reaching the eye. Belly red in life, with a few black flecks on the throat. Parietals, frontal, and supraoculars with more or less symmetrical black-edged yellow vermiculations; upper labials each with a black spot and black sutures.

Remarks. This snake, called "vibora candela" by the workmen, is close to *vermiculiceps*, the type of the genus. The latter was described in 1860 from Cocuyas de Veraguas, a gold mine at some elevation above sea level on the Atlantic slope of Veragua. A recent year's record gives over 250 inches of rainfall with no dry season. *R. vermiculiceps* (types ANS 3524-5, 3741) differs in having a narrow black lateral line on the lower edge of scale row 5; the vertebral row is light and the paravertebral rows dark; there is a black spot on the end of each ventral. It has thus four narrow black stripes; *sargenti* has two broad ones. The three male cotypes have 77, 78, 81 caudals; all three have 118 ventrals.

It is a pleasure to name this new form for Mr. Sargent, whose party took five of the six specimens.

PLIOCERCUS EURYZONUS DIMIDIATUS Cope

One from the Piedras-Pacora ridge. We think the separation of these ringed snakes from the striped Rhadinaeas justifiable. They are very long-tailed, but some striped Rhadinaeas are just as much so.

Urotheca, whose type, *dumerilii* from Cuba, has been very kindly examined for us by Mr. Roger Conant in Paris, is often used for this group. We do not think it congeneric. It may be a species of the later genus *Arrhyton*, or a *Rhadinaea* mislabeled as to locality, but we have been unable to identify it with any recognized species.

PLIOCERCUS EURYZONUS EURYZONUS Cope

A female from Cana has 130 ventrals; 97 caudals; one preocular with a small subpreocular; 8 upper labials.

CONIOPHANES FISSIDENS FISSIDENS (Günther)

One from "Two Falls of Chagres, 400 feet"; one from "E party."

ERYTHROLAMPRUS BIZONA Jan

A head from Cana. A revision of *Erythrolamprus*, in progress by the junior author, has brought to light the fact that the earliest available name for the common form of Costa Rica and Panama is *bizona*. As the original name was somewhat composite, it becomes necessary to restrict it to Colombian specimens with the bands double, *even on the neck*. It has well developed grooves on the teeth and a higher ventral count than other Central American forms.

ERYTHROLAMPRUS MIMUS MICRURUS subspec. nov.

Type. MCZ 31828, adult female sent in by Dr. Clark in 1938.

Type locality. Mine at Santa Cruz de Cana in Darien, 2000 feet.

Range. Rio Concepcion, Atlantic slope Veraguas, Panama, to Andagoya and Rio San Juan, Chocó, Colombia.

Paratypes. MCZ 18848, 37887 France Field, Canal Zone; MCZ 24957 Juan Mina, Canal Zone; USNM 11136 Atlantic side isthmus of Darien; MCZ 32724-7 Andagoya, Chocó, Colombia; USNM 72353 San Juan River, Chocó, Colombia.

Diagnosis. An *Erythrolamprus* with grooves on the posterior maxillary teeth feebly developed or absent; a single black occipital collar; 9-15 (average 10.7) single black body rings 2-5 scales long, (often offset on middorsal line), edged with white.

Description. The type has 15 dorsals; 181 ventrals; 44 caudals; oculars 1-2; temporals 1-2; supralabials seven, 3rd and 4th in eye; infralabials nine on right side, five in contact with anterior geneials, ten on left side, 6 in contact with anterior geneials; anterior geneials

very much longer than posterior. Top of snout black to middle of parietals; rostral and upper labials mostly white; postoculars, posterior upper labials, hind half of parietals, temporals, mostly white; throat white; body red, with black, white-bordered rings, which are often offset on middorsal and midventral line and hence alternate; there is a neck band and 11 rings on each side on the body; three paired black rings with narrow white interspaces on tail; length 711 mm., tail 95 incomplete.

Variation. In eight paratypes the body rings vary from 9 to 12, but MCZ 37887 has 15. The red interspaces are about twice or more than twice the width of the dark rings which are broader in Panamanian than Colombian specimens. The snout is usually completely black in large specimens but the anterior sides of the head are spotted with light in smaller ones. Posteriorly there may be a light ventrolateral spot in the center of the dark rings. The black collar may or may not be complete ventrally. In MCZ 32724, from Colombia, the collar is represented by a median spot on the tips of the parietals, as in *mimus*, hence the subspecific designation. In eight paratypes the ventrals are 178–187, but USNM 11136 has 199. The caudals are 46–51 in six males; 42–46 in three females.

Remarks. *E. mimus micrurus* occurs with *bizona* in the following proportions:

	Chagres Ridges	Chagres valley	Panama Sabanias	Tuira valley	Cana
<i>bizona</i>	—	14	131	5	1
<i>micrurus</i>	2	6	—	1	3

We have three from Cana, one from Base Camp on Chagres, 350 feet; one from Piedras-Pacora ridge.

The present form, with *mimus* (*Liophis mimus* Cope) from eastern Peru and Ecuador, and *impar* Schmidt, from Nicaragua and Honduras, comprise a group characterized by the absence or feeble development of grooves on the posterior maxillary teeth, and by single body rings. The following key will serve to differentiate them from each other and from *bizona*.

- A. Double black collar; double black body rings; grooves on maxillary fangs distinct; ventrals 181–201 (average of 74, 191.2); Costa Rica to Venezuela.....*bizona*
- AA. Single collar and body rings; grooves on maxillary fangs indistinct or absent; ventrals usually under 188.
- B. Black collar covering posterior tips of parietals and at least 3 scales on midline of neck.

- C. 12–15 body rings with light centers laterally; ventrals 171–183 (average of 11, 177); Honduras and Nicaragua *impar*
- CC. 9–12 (rarely more) body rings, usually solid, but occasionally split ventrally on the posterior part of the body; ventrals 178–199 (average of 9, 184.4); Panamá and Chocó *micrurus*
- BB. Black collar absent, represented by spots, or only about one scale wide on midline, diverging to about three scales on sides of neck; eastern Peru and Ecuador *mimus*

E. mimus micrurus is practically identical in color with the recently described *Micrurus clarki* which occurs with it in the lower Chagres, in the lower Tuira, and at Cana. Its name was suggested by this similarity. They have been mistaken for each other on a number of occasions, even by experts.

LEIMADOPHIS TAENIURUS EPINEPHALUS (Cope)

Cana, USNM 50118–20. We have 12 from Cana. A female has dorsals 17–15, one scale pit; 140 ventrals; 60 caudals. A male taken swimming the Esperanza at 600 feet near mouth of Las Tres Hermanas Quebrada has 137 ventrals, 62 caudals.

XENODON COLUBRINUS Günther

Cana, USNM 50109. We have five from Cana. One has scales 19–17, oblique; 137 ventrals; anal single; oculars 1–2; temporals 1–2; upper labials 8, 4th and 5th in eye. One from Two Falls of Chagres, 400 feet.

PSEUDOB OA PETOLA (Linné)

Cana, USNM 50111. We have a female from Cana (scales 19–17; 210 ventrals; 85 caudals); a female from Chagres divide two miles east of junction with Pequeni-Esperanza ridge, 700 feet (211 ventrals, 94 caudals); a male from Pequeni-Esperanza ridge, 1½ miles east of head of Adee, 1000 feet (198 ventrals, 95 caudals).

PSEUDOB OA CLELIA (Daudin)

“Casadora”. Pirri Range, 5000 feet, USNM 50098. We have one from Cana. One from Pequeni-Esperanza ridge between head of Pequeni and Adee, 1150 feet.

TRYPANURGOS COMPRESSUS (Daudin)

A male from Cana introduces the genus and species to the North American fauna. Dorsals 19-15, smooth with two apical pits; vertebrals and paravertebrals somewhat enlarged; ventrals 227+1; caudals 113; oculars 1-2; temporals 2-3; upper labials 8, 4th and 5th in eye; head white; throat and belly white; dorsum reddish brown with 23 narrow black crossbars; hemipenis to 8th caudal; sulcus and organ deeply bifurcate; spines increasing distally to beyond point of forking; calyculate area small, capitate; length 560 mm., tail 140. This compressed arboreal form is, as appears from the hemipenis, close to *Pseudoboa*.

DENDROPHIDION DENDROPHIS (Schlegel)

"Monteadora". Cana, USNM 50123. We have nine from Cana; a female has 169 ventrals; nine upper labials, 4, 5, and 6, in eye. Nine from the ridges:

Pequeni-Esperanza ridge between Pequeni and Adee, 1200 feet.

" near head Pequeni, 2000 feet (♂, 151 ventrals).

" junction main divide, 1200 feet.

Playa Grande-Tres Hermanas ridge, 1800 feet (♂ 171 ventrals).

Chico-Limpio ridge 1½ miles from Chagres, 1600 feet.

Piedras-Pacora ridge, four.

DRYMOBIUS RHOMBIFER (Günther)

Four from Cana. One from Pequeni-Esperanza ridge, 2 miles east of head of Adee, 700 feet. One from "E party."

DRYADOPHIS BODDAERTII ALTERNATUS (Bocourt)

"Candelaria". Twelve from Cana. A young male has dorsals 17-15; ventrals 183; caudals 94; upper labials 9, 4, 5, and 6 in eye; labials and throat black with white spots; anteriorly with a dorsal and a lateral row of alternating square black spots, posteriorly obscure. Two from junction of Pequeni-Esperanza ridge with main divide, 1000 feet; one from west branch of Cuango, 1100 feet.

LEPTOPHIS OCCIDENTALIS (Günther)

One from Cana.

LEPTOPHIS DEPRESSIROSTRIS (Cope)

"Bejuco verde." One from Pequeni-Esperanza ridge near head of Adee, 1200 feet. No loreal; scales smooth except for strong keels on paravertebrals. This species, which ranges from Nicaragua to Colombia, has been previously taken in Panama at Cocuyas de Veraguas (the type); near Colon; and at Porto Bello (*Leptophis mexicanus* Schmidt, 1. c., p. 16).

OXYBELIS BREVIROSTRIS (Cope)

"Bejuco verde." Sixteen specimens from the Chagres ridges. In Miramar River, 200 feet (♀ ventrals 177 + 1, caudals 152). Main divide near Pequeni-Esperanza ridge, 1200 feet (♂ ventrals 179, caudals 175).

Pequeni-Esperanza ridge near head of Pequeni, 1300 feet (three)

" " 1500 feet

" " 1930 feet

" near head of Adee 1200 feet

Chico-Limpio ridge 1540 feet

Few miles NE head of Limpio 2500 feet

Pequeni-Chagres divide between heads of Limpio and Tres Hermanas, 2380 feet

Tres Hermanas-Playa Grande divide, 1 mile from Esperanza, 1980 feet

Tres Hermanas-Playa Grande divide, 5 miles from Esperanza, 2050 feet

Piedras-Pacora ridge 2100 feet

" alt. ? (two)

In all the upper labials are six, 3rd and 4th in eye. In the entire specimens the scales are 15-13.

This species ranges from Nicaragua to Ecuador. The only previous Panamanian record was Cocuyas de Veraguas, from the type, USNM 31349.

OXYBELIS AENEUS (Wagler)

"Brown bejuco." One from Cana; Pequeni Esperanza ridge one mile from head of Adee, 1000 feet; Las Tres Hermanas-Playa Grande ridge five miles from the Esperanza, 1600 feet.

RHINOBOOTHRYUM BOVALLII Andersson

Two from: head of Adee, two miles east of Pequeni-Esperanza ridge, 700 feet ("crawling beneath a cot after dark"; scales 21-17, weakly

keeled posteriorly; ventrals $246 + 2$; caudals $107 +$; female); "E party." The top of the head is black with white scale margins; temporal region red with black spots; neck white for two scales; a black band for 13 scales; a white ring for two scales; a red band with black spotting for ten scales; a black band, and so on for 15 black bands on body. Labials $8/10$, fourth and fifth upper in eye; five in contact with anterior geneials; oculars 1-2; temporals 2-2; nostril very large; ventrals strongly keeled laterally.

This large and gaudy snake has so far been reported only from the type locality, Siquirres, Costa Rica. The senior author has seen it from Limon, Costa Rica; the Sabanas near Panama City; Yavisa, Darien; "Colombia."

IMANTODES INORNATUS Boulenger

One from the Esperanza at 800 feet between the Tres Hermanas and the Playa Grande. The only previous specimen from Panama was from Progreso, Chiriqui (Univ. Michigan). It is also known from two Costa Rican and two Nicaraguan specimens.

IMANTODES CENCHOA (Linné)

"Mapana guinea." Four from Cana. A male has 17-17 scales; ventrals $216 + 2$; 174 caudals; 8 upper labials, 3-4-5 in eye; oculars 1-2; temporals 1-2. Three have the more usual two labials in eye. Seven from the Chagres ridges.

Pequeni-Esperanza Ridge near head of Pequeni, 1800 feet

" " 2300 "

" at junction with main divide, 1200 feet

Tres Hermanas-Playa Grande ridge, $\frac{1}{2}$ mile from Esperanza,
1200 feet

Near head of Piedras, 1600 feet.

Piedras-Pacora ridge.

"E party."

DRYMARCHON CORAIS MELANURUS (Duméril and Bibron)

Two from Cana.

PSEUSTES POECILONOTUS SHROPSHIREI (Barbour and Amaral)

Two from Cana.

SPILOTES PULLATUS PULLATUS (Linné)

Cana (USNM 50095, and 50096 from 3500 feet). We have two from Cana.

CHIRONIUS CARINATUS (Linné)

Cana (USNM 50097). We have 11 from Cana. A young specimen has 161 ventrals; 120 caudals; 9 upper labials, 5 and 6 in eye.

CHIRONIUS FUSCUS (Linné)

"Casadora." Cana, one head in poor condition, ten scale rows on neck. Six from the Chagres ridges:

Pequeni-Esperanza ridge near head of Pequeni, 1530 and 1800 feet.

Pequeni-Chagres ridge, 2500 feet.

Tres Hermanas-Playa Grande ridge, 1770 feet.

Dos Bocas of Esperanza and Chagres branch, on gravel bank near water, 600 feet.

Mouth of Piedras, 500 feet. Small and spotted, the rest big and black.

Five specimens of this species were previously known from Panama, the lower valleys of the Chagres, the Bayano, and the Tuira have each furnished a single specimen.

LAMPROPELTIS TRIANGULUM MICROPHOLIS Cope

A head and a section of body from a four foot specimen from 1700 feet on Pequeni-Esperanza ridge near head of Pequeni. The light areas are all red, instead of alternately red and white, thus differing from all other specimens of tropical *Lampropeltis*.

LEPTODEIRA RHOMBIFERA Günther

Cerro Bruja (MCZ 24826, *L. annulata* Barbour and Amaral 1928; 21 scales, 172 ventrals; 70 caudals). Six from Cana.

LEPTODEIRA ANNULATA ANNULATA (Linné)

Cerro Sapo, 1200-1500 feet, MCZ 17188. Cana, USNM 50115. We have six from Cana. Pequeni-Esperanza ridge near head of Pequeni, 800 feet (♀, sc. 21, ventrals 193); near mouth of Esperanza, 700 feet (♂, sc. 21, ventrals 188, caudals 101).

TANTILLA ARMILLATA Cope

One from Cana.

TANTILLA ANNULATA Boettger

Cerro Bruja, MCZ 24927 (*Tantilla semicincta* Barbour and Amaral 1928). Cana, one specimen. The senior author has one from between Peralta and Turrialba, Costa Rica, kindly given him by Dr. Picado. We can thus add three to the two already known (the type in Lubeck from "Nicaragua" and a specimen in Hamburg without locality, described by Werner (1909:239).

	vent.	caud.	first lower labials in contact	nasal-ocular contact	body rings
Type	149	54	yes	yes	?
Hamburg	149	59 ♀	?	yes	14
Costa Rica	151	?	no	no	13
Cerro Bruja	149	?	no	no	12
Cana	153	65 ♀	yes	yes	11

Scales 15-15; oculars 1-2; temporals 1-1; upper labials 7, 3-4 in eye; head color that of *T. melanocephala* and related forms; body dull red, lighter below; narrow rings of black-yellow-black, frequently broken on middorsal line, absent on belly, more obscure posteriorly (especially so in the Costa Rican specimen and in the type). This is much the largest *Tantilla* (Hamburg specimen, 590 mm.) and closest to the ringed coloration of its more generalized ally, *Scolecophis*.

TANTILLA SCHISTOSA (Bocourt)

A male from "E party" has scales 15-15; ventrals 132; caudals 34; mental in contact with geneials; nasal in contact with preocular; oculars 1-2; temporals 1-1; upper labials 7, 3-4 in eye; dark above; belly white anteriorly, red posteriorly; no head markings save a light collar. This specimen agrees well with the description of *schistosa* from Mexico and Alta Vera Paz, and with MCZ 15302 from Altos de Cangrejal, near San Jose, Costa Rica.

STENORHINA DEGENHARDTII (Berthold)

Cana, USNM 50116. We have eleven from Cana; a female has 161 ventrals, 33 caudals, no loreal, prefrontal in contact with second upper labial. One from "E party." None have definite markings.

MICRURUS MIPARTITUS (Duméril and Bibron)

Cana, six. Cerro Bruja, MCZ 24925.

MICRURUS CLARKI Schmidt

One from Cana.

MICRURUS STEWARTI Barbour and Amaral

"Serrania de Bruja, 1200 m.", MCZ 24924, the type, remains unique. The altitude given seems excessive, as Cerro Bruja, the highest peak, is only 934 m.

TRIMERESURUS ATROX (Linné)

Twenty-eight from Cana. Seven from the Chagres ridges, 700–2900 feet:

1	mile east of junction of Pequeni-Esperanza ridge and main divide,	1200 feet
2	"	"
		700 feet
	Tres Hermanas-Playa Grande ridge 4 miles from Esperanza, 1550 feet.	
	Piedras-Pacora ridge, 2900 feet. "E party." No data (two).	

TRIMERESURUS MONTECELLI (Peracca)

Cana, 3000 feet, USNM 50110, type of *Bothrops leptura* Amaral.

TRIMERESURUS NUMMIFER (Rüppell)

A head from the Pequeni-Esperanza ridge near the head of the Pequeni, 1400 feet, is the first record for Panama.

TRIMERESURUS LANSBERGI (Schlegel)

One head from Cana.

TRIMERESURUS NASUTUS (Bocourt)

"Patoco." Cerro Bruja, USNM 54057. We have seventeen from the Chagres ridges, 600–2000 feet.

Pequeni-Esperanza ridge:

near head of Pequeni: 1000 feet (two); 1400 feet; 1500 feet; 1600 feet; 2000 feet.

near head of Adee, 1000 feet.

near river Adee, 1300 feet.

2 miles east of head of Adee, 700 feet.

1200 feet.

Main divide, 1 mile east of Pequeni-Esperanza ridge, 900 feet.

Chico-Limpio ridge, $3\frac{1}{2}$ miles from Chagres, 1540 feet.

Spur ridge near Miramar, 600 feet; "B party"; no data.

TRIMERESURUS SCHLEGELII (Berthold)

"Patoco." Eight from the Chagres ridges, 350-3000 feet.

Base Camp on Chagres, 350 feet; Two Falls of Chagres 400 feet (two); "Camp Patoco, E party"; "E party"; no data (two); Piedras-Pacora ridge 3000 feet.

LACHESIS MUTA (Linné)

Seven from the Chagres ridges, 600-2100 feet.

Pequeni-Esperanza ridge near head of Pequeni, 1700 feet.

" 3 miles east of head of Adee, 600 feet.

" at junction with main divide, 1300 feet.

Pequeni-Chagres ridge, 1530 feet.

Playa Grande-Tres Hermanas ridge, 2100 feet.

Chagres-Piedras ridge, 2000 feet.

Rio Piedras.

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