

HERPETOLOGY OF THE BOGOTA AREA

EMMETT REID DUNN (*)

This article is an examination into the status and actual provenance of the amphibian and reptile species described or recorded from "Bogotá". As a résumé of the present state of our knowledge of the herpetological fauna of the Bogotá area (the Sabana and the páramos above it) it may also serve as a guide for further investigation.

As in most centers of population, specimens from elsewhere tended to accumulate in Bogotá and were eventually shipped thence as if they had originated there. This was notoriously true in the case of bird specimens, and it was the special object of the ornithological expeditions of the American Museum of Natural History, under the direction of Dr. Frank M. Chapman, to clear up the confusion caused thereby. It should be noted, however, that in the case of ornithology the amount of "Bogotá" material was very large and had received a great deal of attention. Relatively few systematic problems remained, and the work of the

American Museum group was largely that of establishing correct geographical stations for forms which were taxonomically well known. In herpetology the case is not quite the same. The amount of material sent out was by no means so large nor are there as many erroneous "Bogotá" records, but the systematic status of the forms involved presents more problems due to the paucity of the material and to the wide dispersion in various museums. While it is rash to comment on the status of specimens which have not been personally examined, the impossibility of studying specimens in European museums at the present time is obvious, and unless some analysis of the situation is made confusion will continue to accumulate.

The mean elevation of the city of Bogotá is 2620 meters; the general level of the Sabana is nowhere much lower than 2570 meters, and the top of the falls of the Río Bogotá at Tequendama is 2400 meters. Thus there is a descent of some 170 meters before the 147 meter vertical plunge of the river. For the purposes of this paper I shall take the top of the Tequendama Falls (2400 m.) as the lower limit of the Bogotá area. The mountains just east of Bogotá rise to heights of 3666 meters (Cruz Verde), 3680 m. (Los Tunjos), and 3688 m. (La Viga), and at some distance to the south to 4650 (Sumapaz). There is some indication that forms not present on the Sabana itself or on the páramos to the east may occur at higher levels than the Sabana on the rim of lower mountains which separate it from the western and south-western slopes leading down to the Magdalena Valley. This seems to be true of an area south of Sibaté, on the road to Fusagasugá, called variously "Alto von Sibaté, 2800 m." by Werner, "El Piñón, 9600 ft." by Chapman, and "San Miguel" by Hermano Nicéforo María.

The first two Bogotá species were based on material in the Paris Museum and were described in 1851 and in 1854 by Duméril and by Duméril and Bibron. No collector is mentioned in the descriptions. It is possible that the specimens were taken by Humboldt and Bonpland in 1801 or perhaps a few years later by Lozano or Goudot. Nine Bogotá species described in a series of papers by Peters between 1862 and 1882 were based on material in the Berlin Museum. It is possible that this material was gathered by Warszewicz, the Polish botanist, who was in Bogotá in 1851, and who did much herpetological collecting in Colombia, Panamá and Costa Rica. Many of his specimens were deposited in Berlin, but for the Bogotá specimens Peters gives no collector's name. Nor is any collec-

tor mentioned for a Bogotá species described by Günther in 1868, on British Museum material.

In 1899 (May 26) Cope reported on a collection "made in Colombia, near Bogotá, for the World's Exposition of Chicago, where it was exhibited in the department of New Granada. The number of species is fifty-four, of which nine are new to science. I have not been able to ascertain the exact localities at which the specimens were obtained, but most of them, it is believed, were found in the neighborhood of Bogotá. Some of them, as for instance, the *Crocodilus americanus*, were not found in that neighborhood" (Phila. Mus. Sci. Bull, 1, pp. 1-22, pl. 1-4). My own analysis of Cope's list indicates that of the fifty-four species at most nine were actually taken in the neighborhood of Bogotá as defined above, and that of the nine new forms only three should be considered as having Bogotá as the type locality. The collection found its way to the Commercial Museum of Philadelphia where it remained for about 20 years, at which time it was purchased by the American Museum of Natural History in New York where it still is (although some of the specimens are no longer extant).

Also in 1899, but on Sept. 30, Werner published on part of the collection deposited in the University of Göttingen by Prof. Otto Bürger, who collected widely in Colombia in 1896-7. Eight species of frogs with specific localities and altitudes are mentioned from the Bogotá area and seven of them described as new (Verhand. k. k. zool.-bot. Ges. Wien, 1899, pp. 471-484). The next year Werner reported on the rest of Bürger's collection, mentioning six more species from the Bogotá area, most of them with specific localities and altitudes. (Verhand. k. k. zool.-bot. Ges. Wien, 1900, pp. 262-272).

In 1910 the Swiss naturalists O. Fuhrmann and E. Mayor visited Colombia and their collections of reptiles and amphibians were reported on by Peracca in 1914 (Mem. Soc. Sci. Neuchatel 5, pp. 96-111). Ten species were recorded from the Bogotá area, two of them described as new. The specimens are presumably in Neuchatel.

In 1916 Werner reported on a collection deposited in Brunn by Fassel, who collected in 1910. Four amphibians, three described as new, and two lizards are mentioned from the Bogotá area (Zool. Anz. 47, 10, p. 301-310).

In 1919 (Proc. Zool. Soc. London, p. 79-81) Boulenger described as new a lizard from "near Bogotá" and a lizard and a frog from "Bogotá". These were sent to him by Hmno. Apolinar María and are in the British Museum.

In 1921 (Bull. Amer. Mus. Nat. Hist. 61, 7, pp. 227-395) Burt and Burt mention five lizards from the Bogotá area sent to the American Museum by Hmno. Nicéforo María, and describe as new a sixth species from Bogotá based on two specimens in the American Museum which came from the old Maximilian (Wied) collection.

There is no question about the provenance of the snakes from the Bogotá area sent to Amaral and to Prado by Hmno. Nicéforo María. Their identifications have appeared in a series of recent papers and the 1942 list of Hmno. Nicéforo (Revista Acad. Colombiana Ciencias 5, 17, pp. 81-101) presents a summary of their views.

I shall present the various forms in the following order: first, those forms which seems to me authentic members of the local fauna; second, species described from Bogotá but which have not since been found in the area or anywhere else; third, species described from Bogotá which have not been found there since but which are known to occur elsewhere; fourth, species described from and known to occur elsewhere but which have been recorded, in my opinion erroneously, as occurring in the Bogotá area.

I. The actual Bogotá fauna.

The following is a discussion of the species described or reported from the Bogotá area which seems to me actually to occur there. It has been a great pleasure to me to observe seventeen of these eighteen forms alive in the field, twelve of them in the Bogotá area and five just below the Tequendama Falls, and along the road between San Miguel and Aguadita.

The fauna seems to me to consist of two salamanders, seven frogs, six lizards, and three snakes. The eastern slopes of the eastern Andes, at a lower elevation than the Sabana itself, maintain a number of additional species which can scarcely be expected to be found here because of the high páramos east of Bogotá. However, it is possible that additional collecting may extend the range of some forms known from the western slope up to the Sabana itself. It may be worthwhile to list these, which have been taken between San Miguel (2800 m.) and Aguadita (1950 m.), and between the Tequendama Falls and the new electric plant at Arracachal (2000 m.). A number of them have not yet been described:

Two or three additional species of *Eleutherodactylus* at Quebrada Sosiego (2300 m.), below the Falls.

Bufo typhonius at Aguadita (1950 m.).

Hyla rubra at Aguadita.

An additional Hylid at Quebrada Sosiego.

An additional *Phyllobates* at Quebrada Sosiego and Arracachal (2000 m.), and from 2460 m. (below San Miguel) down to Aguadita on the Fusagasugá road.

Hyloxalus palmatus at Quebrada Sosiego, Arracachal, and from 2250 m. (below San Miguel) down to Aguadita.

Euspondylus vertebralis at Arracachal.

AMPHIBIA CAUDATA

Genus *Oedipus*

Apparently two species exist in the Bogotá area. They are very closely related. I separate them on

(*) El Profesor Emmett Reid Dunn, Ph. D. de la Universidad de Harvard (1921). Custodio de Reptiles de la Academia de Ciencias Naturales de Filadelfia y miembro prestante del personal científico de Haverford College, Haverford, Pennsylvania, EE. UU., permaneció trece meses en Colombia—desde junio de 1943 hasta fines de julio de 1944— estudiando la fauna herpetológica de nuestro país, en colaboración con el Instituto de Ciencias Naturales de la Universidad Nacional y bajo los auspicios del Comité de Relaciones Artísticas e Intelectuales Interamericanas. Fue recientemente nombrado Miembro Correspondiente de nuestra Academia.

Durante su estancia en Colombia el Profesor Dunn y su esposa, la señora Merle de Dunn, organizaron la colección de anfibios y reptiles del Instituto de Ciencias Naturales y aumentaron considerablemente el número de ejemplares realizando excursiones a las siguientes regiones: estribaciones inferiores de la Cordillera Oriental en Buenavista, vertiente oriental; Llanos del Meta, cerca de Villavicencio; Mariquita y Honda (Tolima); El Centro, región de Barrancabermeja (Santander); Popayán (Cauca); Buenaventura, en la Costa del Pacífico, y Andagoya en el Chocó. Alrededor de Bogotá coleccionaron en las cercanías del páramo de Cruz Verde, Monserrate y los cerros arriba del Parque Nacional, la región de Tablo, la vertiente occidental en Arracachal, cerca de la nueva planta hidroeléctrica abajo del Tequendama. Numerosos ejemplares fueron recogidos también en los terrenos de la Ciudad Universitaria y del Country Club. La última excursión, en julio de 1944, fue a la quebrada Sosiego (cerca del Tequendama), las inmediaciones del páramo de San Miguel al sur de Sibaté y varias quebradas a lo largo de la carretera de Fusagasugá, desde San Miguel hasta cerca de Aguadita.

Tuvieron además a su disposición las interesantes colecciones del Instituto de La Salle de Bogotá y gran parte de las del Colegio Biffi de Barranquilla.

El Profesor Dunn ha publicado en los últimos números de "Caldasia" varios estudios técnicos sobre ciertos grupos de anfibios y reptiles de Colombia. Entre estas obras se destaca por su especial importancia para nosotros la titulada "Los Géneros de Anfibios y Reptiles de Colombia" ("Caldasia", Nos. 9, 10 y 11), que servirá de base indispensable para los estudios herpetológicos en nuestro país, puesto que comprende el análisis conciso de todos los grupos taxonómicos, claves diagnósticas para la determinación de las familias y géneros con mención de las especies más comunes o interesantes e indicación de su distribución geográfica en Colombia.

Por sus grandes conocimientos y su carácter sencillo y afable, así como por la valiosa ayuda que han prestado a la ciencia colombiana, el Profesor y la señora Dunn se han hecho acreedores a nuestra sincera estimación y gratitud. — ARMANDO DUGAND.

the grounds of adult size, of leg length, and of coloration.

A.—Male up to 53 mm. head-body length; female to 70 mm.; light dashes or streaks on a dark background; appressed legs separated by 4-5 costal interspaces....

adspersus.
AA.—Male up to 70 mm. head-body length; uniform dark above or with a broad light dorsal band; appressed legs separated by only two costal interspaces.....
andicola.

Oedipus adspersus Peters.

Spelerpes (Oedipus) adspersus Peters 1863, Mon. Ak. Berlin, p. 468.

TYPE LOCALITY: Bogotá.

TYPE MATERIAL: Two or more specimens in Berlin.

BOGOTÁ AREA LOCALITIES: Werner (1900) reports it as having been taken by Bürger at the following localities: "near Bogotá; Boquerón near Bogotá; Páramo of Bogotá, road to Choachí; Bogotá to Ubaque (an hour from Bogotá, 2900 m.); páramo towards Ubaque (two hours from Bogotá, 3200 m.); Alto de Sibaté, 2800 m.". Possibly the last of these records pertains to *andicola*.

The Instituto de La Salle in Bogotá has 56 from "Páramo de Choachí", 14 from "Bogotá", one from Monserrate (3241 m.), and 6 from Chipaque (2470 m.). The Instituto de Ciencias Naturales has 4 from Páramo de Cruz Verde (3300 m.), 57 from between Monserrate and Arrayán at about 3100 m., and 7 from about the same elevation on the Bogotá-Cruz Verde road.

Except for "Alto de Sibaté", these localities are in the mountains just east of Bogotá.

RANGE OF SPECIES: All high altitude *Oedipus* from Colombia and Venezuela have been assigned to this species by myself and other authors. I have seen nearly all the material but have never been able to compare specimens. Thus "*Oedipus adspersus*" from various localities between 1000 and 2114 meters in the Santa Marta range, from Mérida and up to 3500 meters in the Sierra de Mérida, Venezuela, and from Santa Rosa de Osos, "Quindío Mts." and Medellín in the central Andes of Colombia have never been directly compared with typical Bogotá specimens. I hope to be able to remedy some of this. At present, as far as my memory serves, the specimens from these localities (except Medellín) are of a size and color consonant with *adspersus*. The Medellín specimens are in the American Museum of Natural History and the British Museum. The British Museum specimen in not *adspersus*.

HABITS: Found on the ground under stones and under the bark of fallen trees. Lies hidden by day and probably wanders abroad at night, like most *Oedipus*. Peters found ovarian eggs 3 mm. in diameter and stated that the animal was viviparous; Ruthven said of the Santa Marta form (found chiefly in bromeliads) "this is a viviparous species" (1922, Misc. Publ. Mus. Zool. Univ. Michigan 8, p. 49). This may be correct, but more defi-

nite observations are needed. Oviparity is definitely known for some species in México, Guatemala, and Brazil, and viviparity has been reported only for the Colombian mountain forms.

REMARKS: The smallest specimen seen measured 33 mm. in total length; the largest male from Arrayán had head-body length of 53 mm., and a female from the same locality is the largest with head-body length of 70 mm. Peters measurements were 79 mm. long, tail 37 mm. In this genus the adult female is considerably bigger than the adult male. Adult males may be recognized by the swollen snout, especially in the area of the nostrils, with protuberances on the lip below the nostrils, by protruding teeth in the upper jaw between the nostrils, and by a circular swollen glandular area at the chin.

Oedipus andicola (Posada).

Geotriton andicola Posada, 1909, Estud. Cient. p. 125.

TYPE LOCALITY: Mountains of Colombia.

TYPE MATERIAL: Posada resided in Medellín, and is known to have spent some time in Paris. It is thus possible that a large *Oedipus* with a wide dorsal band of light color which is labelled "Medellín" in the British Museum, from a French collection, may be from Posada. I noted this specimen in 1926 as quite different from anything else I had seen from Colombia, and put it in the addendum to my 1926 "Salamanders of the Family Plethodontidae" as "*O. platydictylus*?"

BOGOTÁ AREA LOCALITIES: San Miguel (above Sibaté, 2800 m.), three specimens in the Instituto de La Salle. Two are young, and the other is an adult male with head-body length of 70 mm. A male in the mixed La Salle lot of seven from Chipaque has head-body length of 57 mm. Dr. A. Dugand recently took a young specimen at 2550 m. elevation between San Miguel and Aguadita.

RANGE OF SPECIES: Hermano Nicéforo sent me eleven from Aguadita (2000 m. on the Fusagasugá road). I took a male at Quebrada Sosiego (2300 m.) below Tequendama Falls. I have already mentioned the Medellín specimen in the British Museum.

REMARKS: Unfortunately I can find no great structural differences between *andicola* and *adspersus*, and unless so preserved that color is kept, immature specimens may be impossible to identify. Posada gives the color of *andicola* adult as uniform intense black above, lighter and with some whitish spots on the belly. He says the young are bronze on the back, black on the sides, and reddish below. His measurements are 130 mm., tail 64. He claims the form is viviparous. More material of this questionable form is needed.

AMPHIBIA SALIENTIA

The Salientian fauna of the Bogotá area consists of three species of *Eleutherodactylus*, one of *Hyla*,

one of *Hyloscirtus*, one of *Phyllobates*, and one of *Atelopus*. The five genera represent four families.

Atelopus lacks teeth on the upper jaw, and there are no adhesive discs on the digits. These structures are present in the other four genera.

Atelopus and *Hyloscirtus* have no tympanum; the other three genera have one.

Phyllobates alone has a pair of dermal scutes on the upper surface of the adhesive discs.

Hyla and *Hyloscirtus* have a web between the outer fingers, absent in the other genera.

Hyla has the vomerine teeth between the nares; they are behind the level of the nares in *Hyloscirtus* and *Eleutherodactylus* and absent in *Atelopus* and *Phyllobates*.

Hyla, *Hyloscirtus* and *Atelopus* have webbed feet; the toes are free in the other two genera.

A tadpole stage is absent in *Eleutherodactylus* and is not known for *Atelopus* or *Hyloscirtus*. Tadpoles of *Hyla* in the Bogotá area may be distinguished from those of *Phyllobates* by the rows of horny teeth around the mouth. In *Hyla* tadpoles there is one row in front of the mouth and two behind; in *Phyllobates* tadpoles there are two rows in front (the inner widely interrupted in the middle) and three behind.

Genus *Eleutherodactylus*.

Key to Bogotá species.

- A.—Heel of appressed leg reaches beyond snout; groin and concealed surfaces of leg white (yellow in life) with black spots *buergeri*.
AA.—Heels reaches to eye.
B.—Smooth above and on sides; a thick wide fold of skin over and behind tympanum; no red in groin, thigh or shin; adhesive discs moderate in size....
eleghans.
BB.—Finely warty above, coarsely so on sides; a thin narrow fold above tympanum; usually clear light red in groin, thigh and shin; adhesive discs large *bogotensis*.

Eleutherodactylus buergeri (Werner).

Hylodes buergeri Werner, 1899, p. 477.

TYPE LOCALITIES: Alto de Sibaté (2800 m.), Fusagasugá.

TYPE MATERIAL: "Many, mostly well preserved, specimens".

BOGOTÁ AREA LOCALITIES: No Bogotá localities for this form are known except "Alto de Sibaté" and it has not been taken there except by Bürger.

RANGE OF SPECIES: I have examined specimens from Aguadita, Fusagasugá and La Mesa in the eastern Andes; Medellín, La Estrella, Laguneta and San Pedro in the central Andes; Jericó and Andes in the western Andes. Dr. A. Dugand and I took five at about 2200 meters along the road above Aguadita.

REMARKS: This a large *Eleutherodactylus*, probably of the *conspicillatus-fitzingeri* group, and attains a length well in excess of the 37 mm. given by Werner. Possibly *E. insignitus* Ruthven from 1809-2114 m. (San Miguel) in the Santa Marta mountains is an ally.

Eleutherodactylus elegans (Peters).

Hylodes fuhrmanni Peracca, 1914, p. 104.

TYPE LOCALITIES: *elegans*, "mountainous surroundings of Bogotá"; *fuhrmanni*, Páramo de Cruz Verde, 3000-3600 m.

TYPE MATERIAL: Peters had a single 20 mm. specimen; Peracca had five specimens, 3 young and 2 females up to 41 mm.

BOGOTÁ AREA LOCALITIES: The Instituto de La Salle has a 36 mm. specimen from Páramo de Cruz Verde (3000 m.). The Osorno brothers, Mrs. Dunn and I have taken six between Monserrate and Arrayán (about 3100 m.) and I took one near San Miguel at 2900 m.

RANGE OF SPECIES: Hermano Nicéforo sent me five from Aguadita. The description and figure of *E. carmelitae* Ruthven from San Lorenzo (1524-3019 m.), in the Santa Marta mountains may indicate an allied form.

REMARKS: The specimens taken by the Osornos are males 35 mm. long. They were in concealment on the ground. We heard the note of the captured males, a low purring sound, and it was repeated all during the day and all along the route from Monserrate to Arrayán, so that in that area the frog must be abundant, but we could find only two.

The network of linear black markings on a brown ground is very characteristic, as is the parotoid-like fold over and behind the tympanum.

The name *Liuperus elegans* of Peters has apparently been missed by later writers on Leptodactylidae. It does not appear, even in synonymy, in the writings of Boulenger, Nieden, or Parker. I have carefully compared the specimens with the original descriptions of both Peters and Peracca.

Eleutherodactylus bogotensis (Peters).

Hylodes bogotensis Peters 1863, Mon. Ak. Berlin, p. 408.

Hylodes fasslianus Werner 1916, p. 303.

TYPE LOCALITIES: *bogotensis*, "surroundings of St. Fe de Bogotá"; *fasslianus*, "Bogotá".

TYPE MATERIAL: *bogotensis*, 10 females to 35 mm., 3 males to 26 mm.; *fasslianus*, females, 33-35 mm.

BOGOTÁ AREA LOCALITIES: Páramo towards Ubaque, 3200-3500 m. (Werner 1899); El Verjón, 3485 m. (ILS 9); Monserrate to Arrayán, about 3100 m. (ICN 148); Bogotá to Páramo de Cruz Verde, about 3100 m. (ICN 38); Bogotá to Choachí (Werner 1899); Mts. above Bogotá 2800 m. (Peracca 1914); Parque Nacional, Bogotá, 2700 m. (ICN 6); Bogotá (ILS 25); San Miguel (ILS 1), (ICN 17); Alto de Sibaté, 2800 m. (Werner 1899); Boquerón, 2800 m. (ICN).

RANGE OF SPECIES: Chipaque, 2470 m. (ILS 5). Werner (1899) records it from Fusagasugá (1750 m.). I took two very young specimens which are probably referable to this species at the electric plant at Arracachal (2000 m.), and I was sent 15

from Aguadita (2000 m.) by Hmno. Nicéforo María.

REMARKS: The majority of the specimens examined show light areas (red in life) in the groin, on the thigh and on the shin, as are mentioned in the original descriptions of both *bogotensis* and *fasslianus*. Occasionally, in any of the following types of coloration, a narrow light middorsal line may occur. Rarely a light spot on the snout and a light spot in the middle of the scapular area may appear. There is almost always a black mark over the tympanum, and usually at least a trace of a dark mark between the eyes and a dark W mark running back from the eyes onto the back, and more rarely a dark inverted V on the back. Many specimens are uniform dark brownish or blackish above, with no notable difference between the color of the less warty dorsum and the more warty sides. This was the case with the type material of both *bogotensis* and *fasslianus*. Frequently there is a marked difference between sides and dorsum, the sides being dark and the dorsum light, or vice-versa. In either of these two cases the dorsum may be uniform or striped light and dark (three dark stripes).

I refer here the young specimen of *affinis* (Werner 1899, p. 479) but not the type from La Unión-Chingasa, 1500-2400 m.). This was said to differ from the type in just the way *bogotensis* does, and was taken with *bogotensis* on the páramo between Bogotá and Choachí.

I also refer here, with some doubt, a specimen of *Eleutherodactylus* taken with *bogotensis* above Bogotá at 2800 m., and identified by Peracca as *crucifer* Boulenger. This seems very dubious to me as *crucifer* was described from Ecuador.

Despite my having taken some 220 of this species in the field I have not heard the call. Most of the specimens taken were in hiding, under stones or under the bark of logs. One taken in the Boquerón at 2800 m. was in a bromeliad.

Genus *Hyla*

I can make out only a single species in the abundant Bogotá material seen:

Hyla labialis Peters 1863, Mon. Ak. Berlin, p. 463.

Hyla vilsoniana Cope 1899, p. 3, pl. 1, f. 1.

Hyla servalina Werner 1899, p. 483.

Hyla creolica Werner 1899, p. 484.

Hyla gularis Werner 1916, p. 302.

TYPE LOCALITIES: *labialis*, "mountainous surroundings of Bogotá"; *vilsoniana*, "believed... neighborhood of Bogotá"; *servalina*, Boquerón near Bogotá; *creolica*, sabana near Bogotá and Hacienda Otoño near Bogotá; *gularis*, Bogotá.

TYPE MATERIAL: It is not clear how many specimens of *labialis* Peters had before him but he speaks of "males" so he may have had a series. Cope had eight *vilsoniana*; Werner had one male *servalina*,

four female and four young *creolica*, and at least one male and one female of *gularis*.

BOGOTÁ AREA LOCALITIES: Besides the type localities it has been recorded or seen from the following places:

Laguna El Verjón, 3485 m. (ILS 2); Laguna de los Patos, Páramo de Cruz Verde, 3500 m. (ICN 3); Bogotá (ILS 180, ICN more than 50); Madrid (ICN 3); Tabio (ICN 6); Cota (ICN 25); Facatativá (Peracca, 1914, p. 108).

RANGE OF SPECIES: North to Chita (3005 m.) in Boyacá, Páramo de Tamá and Pamplona (2340 m.) in Santander del Norte, as shown by Institute de La Salle specimens. To the east at Chipaque, 2470 m. (ILS 15) and Gutiérrez, 2350 m. (ILS 1). To the west Peracca records it from "Tequendama, 2260 m.", I took 5 at the electric plant at Arracachal (2000 m.), and Hmno. Nicéforo sent me 5 from Aguadita at the same level on the Fusagasugá road. A close relative, apparently undescribed, is common at similar elevations in Antioquia in both the central and the western Andes. I think that *H. variabilis* of Cali, and *H. colombiana* of Popayán are also allied, but I have not seen the former. The latter is quite distinct. Ruthven (1922, Misc. Publ. Mus. Zool. Univ. Michigan, 8, p. 55) refers a *Hyla* from Fundación, in the lowlands south of Santa Marta, to *vilsoniana*. This seems to me an extremely improbable record.

REMARKS: The tadpole of this species may reach a total length of 50 mm. (head-body 15 mm.) Transforming specimens with rudimentary tails, from 3500 m. on Cruz Verde, measured 24 mm. without tails. A small but perfectly transformed specimen from Chipaque measured 18 mm. Males in the Bogotá area, distinguishable by vocal sac and swollen base of thumb, may reach 43 mm., and females to 48 mm. The single specimen from Gutiérrez is a giant female 60 mm. long.

The most frequent coloration is a rather uniform bright light green above, paler below and with blue in the concealed surfaces and, in large individuals, on the belly also. A black line runs from the nostril back over the tympanum to widen and fade out on the body. This was the color of the types of *labialis* and of *vilsoniana*. The black line may be lacking in some bright green individuals (types of *gularis*). There is some ability for color change in individuals in life (in tone, not in pattern), and most of the uniform specimens darken in preservation, but there are also very dark olive green individuals (almost black) and the black line does not show up in these either (types of *creolica*).

Green individuals may be irregularly spotted with black on the whole dorsal surface (type of *servalina*). Very frequently the green is not uniform, diffuse black pigment producing darker sides and a darker dorsum, the two separated by a light dorsolateral band, and the dorsum divided by a lighter and vaguer mid-dorsal light line wider

and more prominent posteriorly. These also may have the black "*servalina*" spotting.

An occasional frog may not be any shade of green at all but a golden brown, either uniform or with the lighter dorsolateral band. A combination of the striping, the "*servalina*" spotting, with green and golden brown each forming irregular parts of the background produces a very gaudy frog indeed.

I have kept these different color forms alive for days and the individuals maintained their colors constantly, except for a little darkening or lightening of the general tone.

This species exists in enormous numbers in the Sabana of Bogotá. On June 25, 1943, just outside the Instituto de Ciencias Naturales, near the Humboldt plaque, I was able to count 42 individuals in plain sight on vegetation in the little pond without moving my feet from one spot and scarcely moving my head. They sit out in the open in the sunlight, as many as six in a row together.

Mating behavior and egg-laying was observed on Jun 25, 1943, and on May 23, 1944. Very large tadpoles were seen on July 17, 1943, and transforming ones were taken on Feb. 23, 1944. I am inclined to think that there is no regular breeding season, and the length of the larval period is quite uncertain but may be over a year. The note is a low croak, and is fairly frequently given in the daytime.

Genus *Hyloscirtus*.

Hyloscirtus bogotensis (Peters).

Hylonomus bogotensis Peters 1882, Sitz.-Ber. Gesell. naturf. Fr. Berlin, 1, p. 107.

TYPE LOCALITY: Bogotá.

TYPE MATERIAL: a single 30 mm. long specimen.

BOGOTÁ AREA LOCALITIES: The only exact spot is the upper end of the Boquerón gorge, at about 2900 meters, on the trail from Bogotá to Arrayán.

RANGE OF SPECIES: Not known to occur elsewhere.

REMARKS: This genus is monotypic. I consider myself lucky to have taken a 47 mm. long male of this species on July 21, 1944, while accompanied by Mrs. Dunn and the Osorno brothers. The frog was in a bromeliad growing on a small tree about four feet from the ground alongside the path. This was the first accessible good sized bromeliad met with on the way down.

The type was said to be "grayish yellow with microscopical black dots above"; the present specimen is of similar color but the black dots are plainly visible to the naked eye, and larger concentrations of black pigment form rounded black spots scattered over the upper surfaces. A circular black glandular area, not mentioned for the type, is very noticeable on the chin, and may be a sexual character of the adult male. There is a rather thin skinned gular vocal sac. As in the type, there is no tympanum, and there is a heavy, almost paratoid-like fold of skin passing from the eye to behind the angle of the jaw. The vomerine teeth are in

two lines converging forward behind the nares as in the type.

There is no question that this genus belongs to the family Hylidae, but its precise relationships to *Hyla* or to *Cryptobatrachus* remain to be determined. It would be of great interest to know the breeding habits, whether or not it breeds and has tadpoles like *Hyla*, or whether the eggs are carried on the back and hatch directly into frogs like *Cryptobatrachus*. The possibility that it breeds in bromeliads, and has tadpoles modified for that habitat should be investigated.

Genus *Phyllobates*.

I can only make out a single species in the Bogotá area:

Phyllobates subpunctatus (Cope).

Prostherapis subpunctatus Cope 1899, p. 5, pl. 1, f. 2.

Prostherapis variabilis Werner 1899, p. 474.

Prostherapis tarsalis Werner 1916, p. 303.

TYPE LOCALITIES: *subpunctatus* "believed... neighborhood of Bogotá"; *variabilis*, Páramo de Fusagasugá; Tierra Negra, Fusagasugá, 2300-2830 m.; Alto de Sibaté, 2800 m.; above Bogotá, 2700 m.; Boquerón of Bogotá; Páramo of Bogotá (road to Choachí); La Unión, Chingasa, 1000-2400 m.; *tarsalis*, Bogotá.

TYPE MATERIAL: *subpunctatus*, eight specimens; *variabilis*, many specimens; *tarsalis*, a 22.4 mm. long female.

BOGOTÁ AREA LOCALITIES: Besides the type localities the following:

El Verjón (ILS 2).

Laguna de los Patos, Páramo de Cruz Verde, 3500 m. (ICN 3).

Páramo de Cruz Verde, 3600 m. (Peracca 1914, p. 103).

Parque de la Independencia, Bogotá (ICN 1).

Boquerón, 2800 m. (ICN 1).

Arrayán, east of Monserrate, 3100 m. (ICN 3).

Parque Nacional, Bogotá (ICN 18).

Ciudad Universitaria, Bogotá (ICN 1).

Bogotá (ILS 9).

Boca del Monte, 2400 m. (Peracca 1914, p. 103).

Sabana of Bogotá, 2650 m. (Peracca 1914, p. 103).

San Miguel, 2900 m. (ICN 5).

Rio Corrales, above Pasca, 2700 m. (ICN 2).

Páramo de Chisacá, 3500 m. (ICN).

RANGE OF THE SPECIES: Outside of the Bogotá area it apparently occurs at Aguadita (1950-2000 m.) on the Fusagasugá road, and at Quebrada Sosiego (2300 m.) below Tequendama. To the north, east, and west it seems to be replaced by allied but different forms, which have not yet been described. The *Phyllobates* referred to *subpunctatus* by Ruthven (1915, Occ. Papers Mus. Zool. Univ. Michigan 10, p. 1, and 1922, p. 49) from sealevel to 2114 meters in the Santa Marta region is, as appears from his descriptions, a different form.

REMARKS: An abundant frog in the area, but rather difficult to collect as it is very small and very shy. They call in the daytime, and the faint peeping voices of many individuals may be heard all over the country around Bogotá, but the call is always from a concealed place and ceases as soon as one gets close. In the mountains they are more easily taken in the runways worn bare by water. The Boquerón specimen was in a bromeliad.

Werner reported tadpole carrying for this species in 1899. Dr. Dugand took a male with tadpoles on its back in mid-February 1944, on the slopes above the Parque Nacional in Bogotá. Dr. Dugand and I took another male carrying 15 tadpoles on July 15, just above San Miguel.

In life there is some bright yellow in the groin, on the thigh and on the shin. The dorsum may be fairly uniform (but always with at least a trace of a middorsal light line) or it may have four fairly definite dark lines. The presence or amount of black ventral spotting is quite variable. I have seen specimens as small as 10 mm., and as large as 24 mm. Werner (1899) gives 20 mm. for males and 22 mm. for females. Cope gives a measurement of 43 mm., but this must be a misprint for 23.

Genus *Atelopus*.

Atelopus subornatus Werner 1899, p. 476.

Atelopus flaviventris Werner 1899, p. 476.

TYPE LOCALITIES: *subornatus*, Alto de Sibaté, 2800 m.; above Fusagasugá, 2300 m.; *flaviventris*, Alto de Sibaté, 2800 m.; Tierra Negra, Fusagasugá, 2300-2800 m.

TYPE MATERIAL: Six specimens in all, two from Alto de Sibaté, two from above Fusagasugá, two from Tierra Negra.

BOGOTA AREA LOCALITIES: Alto de Sibaté is the only locality known.

RANGE OF SPECIES: Hermano Nicéforo sent me specimens from Aguadita (2000 m.) and three from there are in the Instituto de La Salle. Dr. Dugand took one at 2500 m. on the road below San Miguel towards Aguadita. I am not at present prepared to say whether or not somewhat similar *Atelopus* seen from the central Andes (Salamina, 1822 m., and Laguneta, 2500 m., in Caldas) and from the western Andes (Andes, 1357 m.; "5000 ft. near Buenaventura", the type of *pachydermus* Schmidt 1857; Ricaurte, 1300 m.; Cumbal, 3500 m.) and recorded from the Santa Marta range by Ruthven (1922, p. 50) from altitudes of 1524-2114 meters are conspecific or not, as I have not had opportunity to compare specimens. Ruthven referred his specimens to *ignescens* Cornalia 1849, which was described from Ecuador. Inasmuch as I am unable to refer to Cornalia's paper, and as the specimens from the two Nariño localities are certainly not the same species, I prefer to use Werner's name for the Bogotá form.

REMARKS: This is an *Atelopus* brown above without any definite markings, and with a orange

belly, either immaculate (*flaviventris*) or black and orange mottled (*subornatus*). Werner's measurements for both color forms are 30 mm.

Atelopus are diurnal, and usually frequent the banks of streams. The breeding habits are unknown.

REPTILIA SAURIA

Three genera of Iguanidae and two of Teiidae are known from the Bogotá area. The Iguanids have semicircles of fairly large scales on top of the head outlining the inner edge of the eye area, and between these there is no median frontal. The Teiids do not have these semicircles and have a large median frontal between the eyes.

Among the Iguanids *Phenacosaurus* and *Leiocephalus* have a dorsal ridge of erect scales. The former has irregular flat scales above and a prehensile tail. *Leiocephalus* has coarse keeled overlapping scales above and the tail is not prehensile. *Anolis* lacks the dorsal ridge and the scales are very small.

The two Teiid genera may be told apart by the fact that *Anadia* has prefrontal plates on the head and flat square dorsal scales, whereas *Proctoporus* has no prefrontals and the dorsals are elongate and keeled or ridged.

Genus *Anolis*.

Only a single specimen has been taken in the Bogotá area.

Anolis nicefori Barbour.

Anolis incompertus nicefori Barbour 1932, Proc. New England. Zool. Club, 12, p. 100.

TYPE LOCALITY: Humbo (Muzo), Boyacá, 824 m.

TYPE MATERIAL: Two specimens, one of which was an adult male.

BOGOTA AREA LOCALITIES: The Instituto de La Salle has a single small individual from Tequendama.

RANGE OF SPECIES: It is not possible to determine this with accuracy as this form belongs to a widespread group of *Anolis*, including *incompertus* Barbour 1932 from Villavicencio, *marianum* Barbour 1932 from the uplands of Antioquia, *gaigae* Ruthven 1916 from sealevel to 2409 m. in the Santa Marta range, *radulinus* Cope 1882 from the Truandó R., *stigmatosus* Bocourt 1882 from the Magdalena R., and *tropidogaster* Hallowell 1856 from "Colombia". These probably intergrade with each other and much work remains to be done. However, specimens I collected at the electric plant at Arracachal (2000 m.) and at Santandercito (1700 m.), and others in the Instituto de La Salle from Fusagasugá (1746 m.), La Mesa (1320 m.), Anolaima (1726 m.) and Sasaima (1225 m.) seem to be the same form. It is probably this form that Peracca (1914) records as *stigmatosus* from Cafetal Buenavista near Viotá (1020 m.).

Specimens I took at Villavicencio differ from *nicefori* and are *A. incompertus*; those I took at Mariquita and at El Centro are still another form of this group and may be true *stigmatosus*. It will be noted that the identity of *tropidogaster* with any one of the geographic forms in Colombia has yet to be made. The type is no longer extant and the type description will have to be carefully checked with the various Colombian forms.

REMARKS: The color of the live specimens was either uniform brown or with dark and light chevrons on the dorsum. The dewlap of the male is pink with a russet edge and white scales. A tiny young is 57 mm. long, tail 37. A male is 142 mm., tail 87 (the male type was 144, tail 92). An adult female measures 165 mm., tail 110. I saw seven of these at Arracachal and four at Santandercito.

Genus *Phenacosaurus*.

Two species occur in the area and may be distinguished as follows:

- A.—Dorsal crest of two rows of pointed scales; large scales of dorsal surface usually in contact with each other *heterodermus*.
- AA.—Dorsal crest of a single row of pointed scales; large scales of dorsal surface usually separated from each other *richteri*.

Phenacosaurus heterodermus (Duméril).

Anolis heterodermus Duméril 1851, Cat. Méth. Coll. Reptiles Paris. p. 59.

TYPE LOCALITY: New Granada. (= Colombia).
TYPE MATERIAL: "Many specimens".

BOGOTA AREA LOCALITIES: Since this and the following species were only recently separated, most of the older records may be subject to revision. The first definite locality record for any *Phenacosaurus* seems to be "Páramo towards Chipaque, 3000 m." (Werner 1900). The most definite record is Páramo de Cruz Verde, 3200 m. (ICN 4). I have not seen this form alive and about all I know of it has been recently stated in my paper on *Phenacosaurus* in Caldasia (1944, 11, p. 57).

Phenacosaurus richteri Dunn, 1944, Caldasia, 11, p. 60.

TYPE: A male in the Instituto de Ciencias Naturales.

TYPE LOCALITY: Tabio, 2645 m.

BOGOTA AREA LOCALITIES: Tabio, Cogua, and above Bogotá on the road to Cruz Verde.

A full account of both this and the preceding form was given in a recent Caldasia, and I see no need to repeat it here.

Genus *Leiocephalus*.

A single species in the area.

Leiocephalus trachycephalus (Duméril).

Holotropis trachycephalus Duméril 1851. Cat. Méth. Reptiles Paris, p. 70.

TYPE LOCALITY: "New Granada, and in particular Santa Fe de Bogotá".

TYPE MATERIAL: I have no information save that the type was in Paris.

BOGOTA AREA LOCALITIES:

Páramo de Choachí, 3200 m. (ILS 2).

Cruz Verde (ILS 5).

Arrayán, east of Monserrate, 3100 m. (ICN 3).

Camino Rio Chico, 3212 m. (ICN 2).

Parque Nacional, 2900 m. (ICN).

Bogotá Country Club, 2640 m. (ICN 15).

Bogotá (ILS 14).

Tabio, 2645 m. (ICN 3).

Hills above Madrid, about 2900 m. (ICN).

Suba, 2615 m. (ICN).

Torca, 2640 m. (ICN).

Usaquén, 2662 m. (ICN).

Facatativá, 2614 m. (Burt and Burt 1931, p. 272).

RANGE OF SPECIES: Specimens examined in the Instituto de La Salle indicate a range north to Pamplona (Norte de Santander, 2340 m.), including Tona, 1909 m., and San Gil, 1095 m. in Santander. East of Bogotá it has been recorded from Gutiérrez (2350 m.) by Burt and Burt (1931, p. 272). Burt and Burt also record it from "mountains near Muzo" in Boyacá, which appears reasonable enough, and from La Dorada (195 m.), which appears fantastic.

The given range, and the fact that no *Leiocephalus* at all are known from central Andes, is sufficient to show that this form is probably a distinct entity and not a subspecies of *L. ornatus* of Ecuador.

REMARKS: This is the largest lizard in the Bogotá area, and a very active form. It climbs well on rocks but is not usually found up in the branches of vegetation. Individuals have considerable color change from light green to dark and viceversa. Young and females, and frequently males as well, have a lateral and a dorsolateral light stripe. The ventral coloration of young and of females is mottled and not dissimilar to the dorsum. Adult males have a quadrangular blueish black area on the belly, a black bar across the gular region, and the throat and chest are vivid orange.

A very young specimen with navel still noticeable measures 81 mm. tail 50. An adult female measures 232 mm. tail 152, head-body length 80 mm. An adult male, with head-body length of 82 mm., measures 266 mm., tail 184. Another male, with an imperfect tail, has head-body length of 93 mm.

Dr. E. Osorno, in an article in Copeia 1938, p. 200) points out that the female of this species buries two eggs in the ground and that the young hatch out some six months later.

Genus *Anadia*.

A single species in the area.

Anadia bogotensis (Peters).

Ecpleopus (Xestosaurus) bogotensis Peters 1862, Abh. Ak. Berlin, p. 217, pl. 3, f. 2.

TYPE LOCALITY: Santa Fé de Bogotá.

TYPE MATERIAL: This is supposedly in Berlin.

BOGOTA AREA LOCALITIES: The first definite localities are those given by Werner (1900) "páramo of Monserrate, 3400 m."; Bogotá to Boquerón; near Bogotá; Tierra Negra, Fusagasugá. The last locality is given elsewhere by Werner as 2800 m. I have taken it in the field at three localities. Two eggs found under a stone at Arrayán on Oct. 17th. 1943 hatched on Dec. 25, indicating an incubation period of at least 69 days. The new born young measured 55 mm., tail 33.

This species has been treated along with other Colombian *Anadia* in a recent paper in *Caldasia* (1944, 11, p. 63).

Genus Proctoporus.

One species in the area.

Proctoporus striatus (Peters).

Ecpleopus (Oreosaurus) striatus Peters 1862, Abh. Ak. Berlin, p. 201, pl. 3, f. 2.

Proctoporus columbianus Andersson 1914, Arkiv. f. Zool. 9, 3, p. 3.

Proctoporus bogotensis Boulenger 1919, Proc. Zool. Soc. London, p. 80, f. 5.

TYPE LOCALITIES: *striatus*, Santa Fé de Bogotá; *columbianus*, Colombia; *bogotensis*, Bogotá.

TYPE MATERIAL: That of *striatus* is presumably in Berlin; that of *columbianus* consisted of two males and two females collected by Nisser in 1833, and is presumably in Stockholm; the single male of *bogotensis* was sent by Hmno. Apolinar María to the British Museum.

BOGOTA AREA LOCALITIES: Werner (1900) records it from "Bogotá-Pacho and Zipaquirá, 2000-2200 m.". I have examined nine specimens from "Bogotá" and "Cordillera de Bogotá" in the Instituto de La Salle, and taken 9 at Arrayán east of Monserrate (3100 m.) and two at about the same elevation along the road to Cruz Verde.

RANGE OF SPECIES: Burt and Burt (1931, p. 371) record this species from "mountains near Muzo", Medellín, and Santa Rosa.

REMARKS: An adult male measures 172 mm., tail 107; a female measures 162 mm., tail 100. In lighter specimens there is a dorso-lateral light line and some dark streaking on the dorsum, a black spot in each ventral scale forming black lines on a white background. Dark specimens may be practically uniform dark brown above and almost entirely black below. The specimens I have taken were all hiding under stones.

REPTILIA SERPENTES

Two genera of Colubrid snakes, *Leimadophis* and *Atractus*, inhabit the Bogotá area. Neither

of them are venomous and I have not even been able to induce any of the specimens met with to bite. The *Leimadophis* eat frogs and salamanders, while the *Atractus* feed on earthworms. Both are oviparous. The *Leimadophis* is a slim snake, with head distinct from neck and a long tail. It has preocular scales. The *Atractus* is a stout little snake with head scarcely distinct from neck, a short tail, and lacks preocular scales, the elongate loreal entering the eye.

Genus Leimadophis.

Leimadophis bimaculatus bimaculatus (Cope).

Liophis bimaculatus Cope 1899, p. 11, pl. 4, f. 2.

Liophis bipræocularis Boulenger 1903, Ann. Mag. Nat. Hist. (7), 12, p. 351.

TYPE LOCALITIES: *bimaculatus*, "neighborhood... Bogotá" *bipræocularis*, Facatativá.

TYPE MATERIAL: *bimaculatus*, five specimens sent by the Colombian government to the Chicago Exposition of 1898, and now in the American Museum of Natural History; *bipræocularis*, a female sent to the British Museum by Mr. Kay Thompson.

BOGOTA AREA LOCALITIES:

Sumapaz (ILS 2).

Monserrate, 3241 m. (ILS).

Bogotá Country Club (ICN 4).

Ciudad Universitaria, Bogotá (ICN 10).

Bogotá (ILS 8).

Sabana ILS 4).

Tabio (ICN).

Cota (ICN 2).

Fontibón road (ICN).

Suba (ILS 4, ICN 1).

Guatavita (ILS).

Subachoque (ILS).

Sopó (ILS).

Lag. Fúquene (Werner 1899, p. 472 as "*L. reginae*").

RANGE OF SPECIES: North to La Uvita and Chita in Boyacá, west to Fusagasugá and Sasaima. A close relative (*L. bimaculatus lamonæ*) occurs in the central and western Andes.

REMARKS: The smallest specimen seen measures 199 mm., tail 44; the largest male 578 mm., tail 135; largest female 813 mm., tail 164. This record female, from the grounds of the Ciudad Universitaria near the Instituto de Ciencias Naturales, laid 16 eggs on Oct. 3, 1943. The eggs were 22-27 mm. long and 13-15 mm. wide. An egg opened on June 13, 1944, contained a living young snake with scales and color pattern, but not ready for hatching. I write this on July 23, and still they have not hatched. (*)

(*) After breaking open a number of eggs at different dates in order to verify the living condition of the young, four hatched on Sept. 4, 1944. The smallest snake measured 154 mm., largest 162 mm. All four shed their skin for the first time on Oct. 5; they measured then 195 and 200 mm.—A. DUGAND.

This snake has been recorded on occasion from the Bogotá area as *L. reginae* and as *L. reginae albiventris*.

Genus Atractus.

I have seen specimens of two species from the Bogotá area which I identify as *crassicaudatus* and *weneri*. I hope to publish in another article the technical details concerning these and other Colombian species of *Atractus*.

These two species are almost identical in scutellation. After exhaustive study of 39 *weneri* and 47 *crassicaudatus* the only differences that I can find are: (1) all *weneri* have 7 upper labials while 15.5% of *crassicaudatus* have 6, 83.3% have 7, and 1.1% have 8; (2) in *weneri* a single long scale (upper second temporal) borders the parietal in 69% of the specimens and there are two shorter scale in the same position in 31% whereas in *crassicaudatus* these proportions are reversed, only 9% having the long scale and 91% having the two short scales; (3) all *crassicaudatus* have two postoculars, while 5.5% of *weneri* have a single one.

There is a difference in size, *weneri* growing from a tiny snake 126 mm. long to adult male maximum of 300 mm., tail 25, and a female maximum of 340 mm., tail 24. Similar measurements for *crassicaudatus* are 142 mm. for young; 372 mm., tail 35 for male; 440 mm., tail 33 for female.

The two species occur together on the Sabana, but *crassicaudatus* is much more abundant and the only one taken so far in Bogotá itself. *A. crassicaudatus* is normally black above, with vivid narrow vertical bars of yellow on the sides. *A. weneri* has black markings, especially noticeable along the middle of the back, on a lighter background.

Atractus crassicaudatus (Duméril and Bibron).

Rabdosoma crassicaudatum Duméril and Bibron 1854, Erpet. Gén. 7, p. 103.

Atractus fuhrmanni Peracca 1914, p. 100.

TYPE LOCALITIES: *crassicaudatus*, Bogotá; *fuhrmanni*, "quebrada near Bogotá".

TYPE MATERIAL: of *crassicaudatus*, a series in Paris; of *fuhrmanni*, a single specimen.

BOGOTA AREA LOCALITIES:

"Savanna, 2600 m." (Werner 1900).

"Neighborhood of Bogotá" (Werner).

"Potrero near Bogotá" (Werner).

"Páramo of Monserrate, 2800 m." (Werner).

"Alto de Sibaté, 2800 m." (Werner).

Bogotá (ILS 6).

Bogotá Country Club (ICN 36).

Ciudad Universitaria, Bogotá (ICN 10).

Tabio (ICN 3).

Cogua (ILS 5).

Subachoque (ILS).

Facatativá (ICN).

Tequendama (ILS 2).

Sibaté (ILS 2).

Sumapaz (ILS).

RANGE OF SPECIES: East to Choachí, 1966 m. (ILS), and west to Arracachal, 2000 m. (ICN), and Aguadita, 2000 m. (ILS). Dr. Richter suggests that a specimen he took at Landázuri (900 m. in Santander) was washed down in a flood. Hmno. Nicéforo (1942, p. 93) records it from Gutiérrez, 2350 m., and Fusagasugá, 1746 m., in Cundinamarca, and from San Mateo, 2800 m., in Boyacá. It seems to be replaced to the north by a form with similar color but more ventrals and caudals, to which the San Mateo record may belong.

REMARKS: The chief color variations are an occasional tendency for the yellow markings to be linear instead of vertical; for the markings to be red instead of yellow; for the belly to be almost entirely black or almost entirely light, instead of about equally mixed. A specimen from the University grounds is erythristic above and below, with the black pigment very diffuse.

All specimens I saw in the field were in concealment under stones.

The type of *fuhrmanni* differed from the types of *crassicaudatus* only in having six upper labials.

Atractus weneri Peracca 1914, p. 102.

Atractus longimaculatus Prado 1939, Mem. Inst. Butantan 13, p. 17.

Atractus colombianus Prado 1939, p. 18.

TYPE LOCALITIES: *weneri*, Cafetal Argelia, near Viotá, 1830 m.; *longimaculatus*, Quindío, in errore, actually Pacho, 1860 m.; *colombianus*, Chocontá, 2685 m.

TYPE MATERIAL: A single specimen in each case. The types of Prado's two species are in the Instituto de La Salle.

BOGOTA AREA LOCALITIES:

Chocontá (ILS 2).

Cogua (ILS).

Tequendama (ILS 3).

Puente del Común (coll. Dr. M. L. Grant).

Sibaté (Hmno. Nicéforo 1942, p. 94 as *nicefori*).

Zipaquirá (Hmno. Nicéforo 1942, p. 93).

RANGE OF SPECIES: I have examined specimens from Une, 2340 m. (ILS) and La Unión-Fómeque (ILS) to the east and Hmno. Nicéforo (1942, p. 93) records it from Choachí, 1966 m. To the west I took it at Arracachal, 2000 m. (ICN 27), and the La Salle has two from Pacho, 1860 m., one from La Mesa, 1320 m., and two from Pandi, 1025 m.

REMARKS: Extreme color variations of this species look very different from each other, but all intermediate stages may be found. At one extreme (type of *longimaculatus*) the black pigment is concentrated in streaks or lines, leaving the rest of the dorsal surface almost a light straw color. At the other extreme (types of *weneri* and *colombianus*) the black pigment is more uniformly spread, producing an almost uniform dark dorsal color with a darker vertebral line. The amount of dark

and light on the belly shows the same variability as in *crassicaudatus*. The type of *weneri* had a single postocular, the other types had two.

One of the Tequendama specimens (in the dark phase) in the Instituto de La Salle was identified as *indistinctus* and so reported by Hmno. Nicéforo (1942, p. 93). This form, described from Ocaña, is of similar coloration but has a different ventral and caudal count. I think it probable that a similar specimen from Sibaté may have served as the basis for the record of *nicefori*, a form described from Jericó in the western Andes. The color is similar but *nicefori* has 15 scale rows instead of the 17 of the two Bogotá species.

To the north in the eastern Andes *weneri* is replaced by forms of similar coloration but with different ventral and caudal counts.

The specimens I took at Arracachal were in hiding under stones.

Specimens of the eighteen species discussed above may be examined in the collection of the Instituto de Ciencias Naturales. No other collection contains specimens of all these species.

COMPARISON OF THE BOGOTÁ FAUNA WITH THAT OF OTHER COLOMBIAN HIGHLAND AREAS

Northern Boyacá and Norte de Santander.

The fauna of the northern part of the eastern Andes at high elevations is known from specimens in the Instituto de La Salle from San Mateo (2800 m.), Chita (3005 m.), and La Uvita (2408 m.) in Boyacá; Pamplona (2340 m.) and Páramo de Tamá in Norte de Santander. The material includes a single frog of the genus *Gastrotheca*, from Tamá, not yet taken in the Bogotá region. It does not include any *Eleutherodactylus*, *Hyloscirtus*, *Atelopus*, *Anolis*, or *Proctoporus*. I cannot find any differences between the *Hyla*, the *Leiocephalus*, or the *Leimadophis* of the two areas, but the species of *Phylllobates*, *Phenacosaurus*, *Anadia*, and *Atractus* are not the same.

The Santa Marta Range.

The fauna of this area, which was worked from sealevel to snowline by Ruthven and Carriker (Ruthven 1922, Misc. Publ. Mus. Zool. Univ. Michigan 8, pp. 1-69, pl. 1-12), is, at high elevations, decidedly different from that of the Bogotá region. Above 2400 meters the fauna consists of five species of frogs: three *Eleutherodactylus*, a *Geobatrachus*, and an *Atelopus*. The *Atelopus* reaches snowline at 4857 meters. None of the species are the same as those of the eastern Andes, and the genus *Geobatrachus* is endemic to the Santa Marta range. While some of the Bogotá genera occur on these mountains between 2000 and 2400 meters the species are mostly different and there is no upland *Hyla*, no *Phenacosaurus*, and no upland *Leiocephalus*.

The Central Andes.

The Instituto de La Salle has large collections from the uplands of the Central Andes in Antio-

quia (Santa Rosa de Osos, 2640 m., San Pedro, 2560 m., Sonsón, 2410 m., and a number of other localities above 2000 m.). Some material from these localities was sent to the American Museum of Natural History, and lizard records from them appear in Burt and Burt (1931). Unfortunately, I think some mistake occurred and that some specimens from elsewhere were erroneously accredited to Santa Rosa. Hmno. Nicéforo has published a number of snake records from these localities (1942). A small amount of material and some records are available for the Central Andes south to Bordoncillo on the Ecuadorian border.

The fauna differs mainly in that many more lowland genera seem to occur between 2000 and 2640 meters in the Central Andes than in the Eastern. Twenty-five genera have been recorded from Santa Rosa and San Pedro as against thirteen for the Bogotá area. Two lizard genera, *Leiocephalus* and *Anadia*, have not been taken in the central Andes, but two frog genera, *Centrolene* and *Certhyla*, unknown from the eastern Andes, are present. The other Bogotá genera are mostly represented by different species.

The Western Andes.

What little material has been seen from the western Andes above 2000 meters (6 species) indicates a close similarity to the fauna of the central Andes. Three genera of frogs have been taken on Cumbal at 3500 meters. A *Euspondylus*, a *Dipsas* and a *Rhadinaea*, all of species known from the Central Andes of Antioquia, were found at Munchique, Cauca, 2200 meters.

II. Species described from "Bogotá" which remain known only from the original description.

Pantodactylus nicefori Burt and Burt 1921, Bull. Amer. Mus. Nat. Hist. 61, 7, p. 360, ff. 12-13. Type locality "Bogotá". Type AMNH 1082 and paratype 1083, from the Maximilian (Wied) collection purchased by the American Museum.

While the species was described only twenty years ago the collection of Wied dates back a hundred more years, and I never heard that he was in Bogotá. Nothing like this has been taken since in Colombia. The figure 12 does not agree with the description, and if the figure is correct the animal is probably not a *Pantodactylus* as the nasals are figured as in contact and the scales back of the parietals are very small. The paper of Burt and Burt is available for consultation in Bogotá at the Instituto de Ciencias Naturales.

III. Species described from "Bogotá" which have not been found since in the Bogotá area, but which are known from elsewhere.

Bufo glaberrimus Günther 1868, Proc. Zool. Soc. London, p. 483.

Authentic localities for this toad are Pipiral, Medina, Villavicencio and Guacaramo at the

eastern base of the Andes in Cundinamarca, Meta, and Boyacá.

Hyloxalus granuliventris Boulenger 1919, p. 81.

Authentic Colombian localities for this frog are on the eastern slope of the Andes at Choachí (1965 m.), Quetame (1539 m.), and Buenavista (1230 m.). See Caldasia 9, p. 398.

Anolis frenatus Cope 1899, p. 6, pl. 2, f. 2.

Authentic Colombian localities for this lizard, which also occurs in Panamá and possibly in Costa Rica and Venezuela, are Pueblorrico (1516 m.) in Caldas, El Centro (150 m.) and San Gil (1095 m.) in Santander, Muzo (824 m.) in Boyacá. I found it not uncommon at El Centro.

Anolis sulcifrons Cope 1899, p. 6, pl. 2, f. 1.

At present I cannot distinguish this lizard from *A. pentaprion* Cope (1862, Proc. Acad. Nat. Sci. Philadelphia, p. 178) described from the Truandó R., and ranging from Nicaragua to Ecuador. I have taken it at Andagoya, Chocó, and at Mariquita, Tolima, and seen specimens from the "eastern base of the Andes" (? Villavicencio) and Mocoa, Putumayo, 560 meters.

Anolis apollinaris Boulenger 1919, p. 79, f. 4.

The Instituto de La Salle has a specimen of this lizard (described from "near Bogotá") from Paimé, Cundinamarca, 1038 meters. A number of students have overlooked the statement that this is a large *Anolis* (type head-body length 106 mm.) and misapplied the name. Thus the "*Anolis apollinaris*" of Burt and Burt (1921, p. 255) is not Boulenger's species but a composite of the two smaller species *incompertus* Barbour from Villavicencio and *mariarum* Barbour from Medellín. True *apollinaris* is allied to *solifer* of Santa Marta and *copei* of Central America.

Euspondylus argulus (Peters).

Cercosaura (*Pantodactylus*) *argulus* Peters 1862, Abh. Ak. Berlin, p. 217, pl. 1, f. 3.

While in the type the prefrontals were separated and black dorsal striping was quite definite, I refer five recent specimens with prefrontals in contact and very indefinite dorsal striping to *argulus*. (The prefrontals are either separate or in contact in *E. vertebralis*, a widespread Colombian form of the mountains, which I found not uncommon at Arracachal, the electric plant below Tequendama Falls). Recent specimens of *E. argulus* come from Pto. Asís (Putumayo), Villavicencio (498 m.), Muzo (824 m.), and Fusagasugá (1746 m.).

Bachia bicolor Cope 1899, p. 9, pl. 3.

Heterodonium bicolor Cope 1899, p. 9, pl. 3.

This species is known from the low country of the Caribbean coast, from Cúcuta, and from Mariquita. In the Santa Marta region it has been taken as high as 1524 m. at Palomina; in the Central Andes at Sto. Domingo at 1970 m., and in the eastern Andes at San Gil in Santander, 1095 m.

Liotyphlops anops (Cope).

Helminthophis anops Cope 1899, p. 10, pl. 4, f. 1.

The only additional material of this species is two specimens in the Instituto de La Salle, one from San Vicente (Santander, 692 m.) and one from Paimé (Cundinamarca, 1038 m.). See Caldasia 11, p. 48.

Dipsas triseriatus (Cope).

Leptognathus triseriatus Cope, 1899, p. 13, pl. 4, f. 3.

Leptognathus nigriceps Werner 1916, p. 309.

Dipsas nicefori Prado, 1940, Mem. Inst. Butantan 14, p. 14.

Dipsas tolimensis Prado, 1941, Ciencia 2, p. 345, f. 1.

The type of *nigriceps* came from "Cañón del Tolima, 1700 m." (central Andes above Ibagué); the type of *nicefori* came from "Quindío", also central Andes above Ibagué; the type of *tolimensis* was from El Líbano in Tolima (1585 m.). I shall substantiate the above synonymy elsewhere.

***Dromicus multilineatus* var. B.** Peters 1863, Mon. Ak. Berlin, p. 279.

I regard this as a synonym of *Rhadinaea lateristriga* (Berthold) 1859. As stated in Caldasia 10 p. 493, Popayán (1760 m.) is the highest locality from which this snake has been recorded, but as this refers to the Berthold type specimen "Popayán" may be as vague as "Bogotá".

Sasaima (1225 m.) is the highest certain altitude at which it has been taken. To the localities listed in the Caldasia account should be added Andagoya (Chocó). A local specimen was preserved in the dispensary there.

Leptophis urostictus Peters 1873, Ak. Berlin p. 606, pl. 5.

This is usually considered to be a synonym of *L. occidentalis* Günther 1859. The 13 scale rows (as against the 15 normal in *Leptophis*) may denote a freak specimen or an error of counting or printing. *L. occidentalis* is a common and widespread snake in Colombia. While it has been recorded from as high as Sonsón (2410 m.) in the central Andes, the highest locality in the eastern Andes is Sasaima (1225 m.).

Himantodes platycephalus Cope 1899, p. 15, pl. 4, f. 4.

I regard this as a straight synonym of *Imantodes cenchou* (Linné), which is a very common and widespread lowland snake in Colombia, and which has been reported from as high as 1920 m. (Pensilvania) in the central Andes, and 1746 m. (Fusagasugá) in the eastern Andes.

IV. Species reported from "Bogotá", in my opinion erroneously.

Unless otherwise stated these records are from the 1899 paper of Cope. Only a very few merit any

extended consideration. I list most of them in the order used by Cope, giving the names used by him (and by other authors), and placing the more correct name, where necessary, in parentheses and in **bold type**.

Eleutherodactylus cornutus (Jiménez de la Espada).

Limnophrys cornutus Jiménez de la Espada 1870, Journ. Sci. Math. Phys. Nat. Lisboa, 3, p. 60.

This species, described from Rio Suno, near San José de Moti, eastern Ecuador, was recorded as *Hylodes cornutus* from Bogotá by Boulenger (1882, Cat. Batr. Grad. Brit. Mus., ed. 2, p. 220) on the basis of a young specimen. Peracca (1914) recorded a 40 mm. specimen from Camelia (1720 m. near Angelópolis) in Antioquia. Dr. Martin L. Grant recently took a 55 mm. specimen at San Isidro, Cundinamarca (2350 m., 8 km. north of Gachalá).

Bufo granulosus. Known from Fusagasugá (1746 m.) and lower localities on both sides of the eastern Andes.

Caecilia gracilis (= **C. thompsoni**). Examination of the specimen mentioned by Cope indicates that his identification was wrong. This species in the Magdalena valley occurs as high as La Mesa (1320 m.) and La Esperanza (1280 m.).

Polychrus marmoratus. Known from both sides of the eastern Andes, but the highest locality is Sasaima (1225 m.).

Norops auratus. Widespread in the low country. Said to reach 2409 m. (Pueblo Viejo) in the Santa Marta mountains and Finca Camelia (1820 m.) and Santa Rosa (2640 m.) in the central Andes. I am inclined to doubt the two higher records.

Gonatodes caudiscutatus. Werner (1900) records "junges von Bogotá". The specific identification of young *Gonatodes* is very questionable, and otherwise the highest records for *Gonatodes* in the eastern Andes are Ocaña (1200 m.) for *vittatus*, and Garagoa (1730 m.) for *caudiscutatus*. These small lizards might be accidentally transported.

Thecadactylus rapicaudus. This low country lizard has been taken as high as La Mesa (1320 m.).

Ameiva surinamensis (**Ameiva ameiva ameiva**). A common lizard of the llanos.

Ameiva ameiva praesignis. Burt and Burt (1921, p. 306) mention AMNH 24211 and 24214 with locality "Bogotá" sent by Hmno. Nicéforo María. I can only suspect some shifting of labels or erroneous cataloguing, as this lizard of the Magdalena valley has not otherwise been found in the eastern Andes higher than Sasaima (1225 m.).

Ameiva undulata (? **Ameiva festiva nicefori**). Peracca (1914, p. 97) records a specimen of *A. undulata* from "Bogotá, 2700 m.". *A. undulata* is a Central American and Mexican form, and this constitutes the only South American record. It is possible that the specimen was the form of *festiva* recently described by me, which has a dorsal coloration similar to that of *undulata* and which occurs on the west slopes of the eastern Andes at Muzo (824 m.), Sasaima (1225 m.), and Pacho (1859 m.). I doubt very much if it reaches the Sabana level.

Cnemidophorus minimus (**C. murinus**). The specific name was a typographical error, and besides, the species is known only from the Dutch Leeward islands.

Cnemidophorus lemniscatus. This lizard, abundant in hot country on both sides of the eastern Andes, is known to reach the altitude of Sasaima (1225 m.).

Tretioscincus bifasciatus. Magdalena valley, up to Muzo (824 m.) and Sasaima (1225 m.).

Mabuia agilis (**Mabuya mabouya mabouya**). This lizard, known from Villavicencio and Mariquita, has not otherwise been recorded higher in the eastern Andes nor in Santa Marta, but Peracca (1914) report it from "Angelópolis, 2000 m." in the central Andes.

Amphisbaena fuliginosa. This widespread form has been taken in the eastern Andes as high as 1540 m. (4 km. east of El Peñón, Cund.). I am very sceptical of a report of 2560 m. (San Pedro) in the central Andes.

Glauconia macrolepis (**Leptotyphlops m.**). Occurs up to Barichara (1336 m.).

Glauconia albifrons (**Leptotyphlops goudotii**). Occurs up to Bucaramanga (1018 m.).

Epicrates cenchris (**E. cenchria maurus**). It is very doubtful if this snake occurs as high as Medellín (1538 m.), whence it has been reported.

Liophis albiventris (**Leimadophis epinephalus**). This has been taken as high as Pamplona (2340 m.).

Acanthophallus colubrinus (**Xenodon rabdocephalus**). This has been taken in the eastern Andes at Paime (1038 m.), and in the central Andes at Yarumal (2300 m.) and at San Pedro (2560 m.).

Leptognathus catesbyi (**Dipsas c.**). Known only from the llanos and the Amazon forest.

Petalognathus nebulatus (**Dipsas n.**). Widespread, occurring up to Fusagasugá (1746 m.) in the eastern Andes and to Sonsón (2410 m.) in the central Andes.

Drymobius bivittatus (**Dendrophidion b.**). This has been taken at Santandercito (Cund. 1770 m.) and at Yarumal (Ant. 2300 m.).

Drymobius boddaertii rapii and *D. b. boddaertii* (**Dryadophis b. b.**). In the eastern Andes up to Choachí (1966 m.) and La Mesa (1320 m.) and in the central Andes to San Pedro (2560 m.).

Spilotes pullatus. Upper limits of the known range are Villeta (1842 m.) in the eastern Andes, Filadelfia (1600 m.) in the central Andes, and Jericó (1967 m.) in the western Andes.

Herpetodryas carinatus (**Chironius c.**) Sasaima (1225 m.) is the highest locality for the eastern Andes, Sonsón (2410 m.) for the central and Jericó (1967 m.) for the western.

Leptophis occidentalis. Sasaima and Medellín are the highest stations.

Ninia atrata atrata. Barichara (1336 m.) and Medellín (1538 m.) are the highest stations.

Erythrolamprus asculapii (**E. bizonus** or **E. mimus micrurus** or both). The former reaches 2409 m. in the Santa Marta (Pueblo Viejo), 1920 m. in the central Andes (Pensilvania), and 1746 m. in the eastern (Fusagasugá). The highest records for the latter is also Fusagasugá.

Oxyrhopus cloelia (**Clelia clelia**). Reaches an elevation of 2180 m. (La Ceja) in the central Andes and 1040 m. (Paime) in the eastern.

Oxyrhopus petola (**O. petola sebae**). To Yarumal (2300 m.) in the central Andes and Paime (1040 m.) in the eastern.

Scytale neuvidii (**Pseudoboa neuwiedii**). Up to Medellín in the central Andes and Sasaima in the western slope of the eastern Andes.

Rhinostoma guianense. (**Phimophis g.**). Not known from above Honda (229 m.).

Tantilla longifrontale. Up to Jericó (1967 m.) in the western Andes, to Santa Rosa (2640 m.) in the central, and San Gil (1095 m.) in the eastern Andes.

Stenorhina degenhardtii. Up to Urrao (1885 m.) in the western Andes, Sonsón (2410 m.) in the central, and Pacho (1859 m.) in the eastern.

Sibon albofuscum (**Leptodeira annulata**). Up to Jericó in the western Andes, Sonsón in the central, and Paime in the eastern.

Himantodes cenchoa (**Imantodes c.**). To Pensilvania (1920 m.) in the central Andes and Fusagasugá (1746 m.) in the eastern.

Oxybelis acuminatus (**O. aeneus**). To San Pedro (2560 m.) in the central Andes and Sasaima (1225 m.) in the eastern.

Oxybelis argenteus. Known only from the lowlands east of the Andes.

Elaps fulvius, var. (**Micrurus antioquiensis**). Up to Medellín in the central Andes and to Fusagasugá in the eastern.

Elaps mipartitus (**Micrurus m.**). Up to Jericó (1967 m.) in the western Andes, Sonsón (2410 m.) in the central, Anolaima (1726 m.) and Choachí (1966 m.) in the eastern.

Lachesis lanceolatus (**Bothrops atrox**). The highest Colombian record is Fómeque (Cund. 1933 m.).