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MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN, NO. 69

THE AMPHIBIANS AND REPTILES OF ALTA VERAPAZ GUATEMALA

BY

L. C. STUART

ANN ARBOR

UNIVERSITY OF MICHIGAN PRESS

JUNE 12, 1948

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INTRODUCTION

THE Department of Alta Verapaz occupies the mountains and adjacent lowlands of central Guatemala. To students of Central American zoology, the region is one of great interest. Owing largely to investigations by Europeans during the past century, the fauna of the area is relatively well known. For example, it is the type locality for 69 described herpetological forms, of which 47 are herein recognized as valid. But despite a good "species list" from the region, little is known of the distribution of the various species and subspecies within the area and still less of the fauna's affinities and origins.

In planning extensive studies on the herpetofauna of Guatemala I concluded some years ago that a thorough investigation of Alta Verapaz was a prerequisite to the ends I had in mind. Not only was most of the region's herpetofauna unrepresented in the museums of the United States, but, for the most part, the material lacked data sufficiently detailed to permit its use in geographic studies. My first purpose was to rectify this situation. The second purpose in the selection of Alta Verapaz as a site for study lay in its physical features. I suspected that an interesting mixture of faunal elements existed there, for it represents a part of an ancient positive area adjoining recently emerged lowlands and ranges in elevation from sea level to more than 2500 meters. Once the distribution and origin of those elements, which contrasted considerable age with recent origin and lowland entrants with highland entrants, had been explained, I assumed that many other geographical problems in Guatemala might be more readily solved.

Studies were carried on in the region in 1938 and 1940. During the course of the field investigations some 2200 specimens were collected, and geographic type studies were made not only in various parts of Alta Verapaz but in adjacent faunal areas. The results of some of the investigations have already appeared. Aside from descriptions and some revisionary work, Stuart (1943*a* and *b*) and Schmidt and Stuart (1941) have published the only papers directed toward my ultimate aim—a geographic study of the herpetofauna of Alta Verapaz.

The present study may be considered the first part of the final summation of the data secured in the field. It is an annotated list of the various forms of amphibian and reptilian life secured in the region. The introductory material, with the exception of the historical data, will be elaborated in the forthcoming geographic account of the herpetofauna. Inasmuch as the taxonomic data would be of interest only to specialists, it was deemed ad-

visable to separate it from the geographic material of more general interest. The geographic account is now being prepared for publication.

Although a complete list of acknowledgments will be given in my final report, I wish to record here my gratitude to those persons and institutions who have aided me in assembling the data contained in the following account.

My field work in Guatemala was made possible through grants received from the Baird Exploration Fund and the Horace H. Rackham School of Graduate Studies, both of the University of Michigan. To Mrs. Helen T. Gaige, formerly of the Museum of Zoology, University of Michigan, and to Dr. Norman E. Hartweg of the same institution, I am particularly indebted for the advice and data that they have placed at my disposal. For aid in solving taxonomic problems I wish, especially, to thank Dr. E. R. Dunn, of Haverford College, Mr. K. P. Schmidt, of the Chicago Natural History Museum, Dr. E. H. Taylor, of the University of Kansas, Dr. Hobart M. Smith, of the University of Illinois, and Dr. Joseph R. Bailey, of Duke University.

For the loan of material and permission to report upon unpublished data contained in their institutions, acknowledgment is made to the authorities of the American Museum of Natural History, the Academy of Natural Sciences of Philadelphia, the United States National Museum, the Chicago Natural History Museum, and the Museum of Comparative Zoology, Harvard University.

The text figures are the work of the late Miss Grace Eager, of the Museum of Zoology, University of Michigan.

I wish, finally, to thank Dr. A. V. Kidder, of the Carnegie Institution of Washington, and the staff of his laboratory in Guatemala City for their many courtesies and for permitting me to make use of the facilities in their charge.

Funds for the publication of this study, which was submitted for publication in May, 1946, were supplied by the Horace H. Rackham School of Graduate Studies, University of Michigan.

HISTORICAL ACCOUNT

Since much of the data on material now labeled "Alta Verapaz" or simply "Verapaz" is of no geographic value and since there are many instances in which confusion as to the origin of that material exists, it seems advisable to review the history of the assembling of the material and to allocate it more definitely wherever possible. For that reason the following, somewhat extended, account is presented.

Some fifteen years after the name "Verapaz" first appeared in zoological literature the locality became associated with herpetology. Duméril and Duméril (1851: 77) recorded the first species from Alta Verapaz. This was

Tropidolepis formosus (= *Sceloporus m. taeniocnemis*), specimens of which were collected by the French naturalist, Morelet, who in 1847–48 undertook an overland journey from southern Mexico, across the Yucatán Peninsula, through Alta Verapaz to Guatemala City. He collected at numerous stations, but the great majority of his herpetological specimens originated from the Petén. He entered Alta Verapaz along the Dolores–Cahabón trail, tarried briefly at Cahabón, and then pushed on by way of Lanquín to Cobán, where he spent several months (Morelet, 1857).

He returned to France too late to permit the inclusion of his specimens in the early volumes of the *Erpétologie générale* of Duméril, Bibron, and Duméril, but the 1854 volumes on ophidians include descriptions and figures of *Enicognathus annulatus* (= *Scaphiodontophis a. annulata*) and *Atrops mexicanus* (= *Bothrops mexicanus*). The remainder of Morelet's collection was described later in scattered papers. The first species to be described with Alta Verapaz as its type locality was Duméril's *Hyla moreletii* (= *Agalychnis moreletii*), based on material secured by Morelet.

In 1859 the great English naturalist Osbert Salvin, during the course of his exploration of Guatemala, paid a brief visit to Cobán and Lanquín and upon his return to England published (1860) the first general account of Guatemalan reptiles and amphibians. Included in his list are 19 species from Alta Verapaz. Of these, 3, *Typhlops tenuis*, *Thamnocenchris aurifer* (= *Bothrops n. aurifer*), and *Hyla holochlora* (= *Agalychnis moreletii*), were described as novelties.

His paper presents the first of a long series of distributional problems relating to the actual occurrence of certain species at various localities in Alta Verapaz. Listed, for instance, is *Cnemidophorus undulatus* (= *Ameiva u. hartwegi*) as of Cobán, a species I do not believe occurs on the pine-covered Meseta de Cobán. In an account of his sojourn in Alta Verapaz during 1860 Salvin (1861*a*) noted that he purchased many specimens from the Indians in Cobán. It is not improbable, therefore, that some Indian may have brought in this lizard from another district (such as the Cahabón Valley).

Salvin returned to Alta Verapaz in 1860, but, though he undoubtedly collected reptiles and amphibians during that journey, he recorded (1861*b*) only specimens secured by Robert Owen at "San Jerónimo and the neighboring mountains in the province of Vera Paz." Here again confusion as to the occurrence of certain species in Alta Verapaz arises. San Jerónimo lies in the desert basin of Salamá in Baja Verapaz, which is faunally quite different from the humid Alta Verapaz. *Crotalus horridus* (= *Crotalus d. durissus*), for example, does not in my opinion occur in the latter, and *Elaps corallinus* is unquestionably *Micrurus a. hippocripis*, a desert basin form. *Stenorhina ventralis* (= a spotted phase of *Stenorrhina degenhardtii*)

is definitely the Alta Verapaz variety, and *Emys venusta* (= *Pseudemys s. ornata*) suggests the Río Polochic. Thus, while certain species were undoubtedly derived from faunal Alta Verapaz, others were not, yet all these records have gradually crept into the literature, with the inference that they represent Alta Verapaz elements.

In 1861 Salvin was again in Alta Verapaz, this time accompanied by his colleague, Frederick Godman. They spent some time in Cobán and proceeded northward into the lowlands, where they established bases at Cubilguitz and Choctum. It is uncertain to what extent they made herpetological collections during that trip, but I suggest that all material in the British Museum (Natural History) labeled "Verapaz, low forest" originated from Choctum and Cubilguitz. Salvin and Godman utilized native bird collectors, who were stationed in the Polochic Valley as well as at Choctum; and some of the "low forest" specimens may have been secured by them. It seems improbable, however, that they would have entrusted alcohol for preservation to the natives, nor would these have devoted any great amount of energy to collecting reptiles and amphibians.

Salvin's last visit to Guatemala was in 1873. On this journey he visited Cobán, but he is not known to have secured any herpetological material during this trip.

In 1879–80, O. C. Champion visited Alta Verapaz in order to collect zoological material for Godman and Salvin. He worked in both the Cahabón and Polochic valleys and visited Cubilguitz. Though he is mentioned as a collector of reptiles by Günther (1902: iv), his name does not seem to have been associated with any Alta Verapaz specimens. The Alta Verapaz herpetological material secured by, or for, Salvin and Godman and eventually turned over to the British Museum (Natural History), was all recorded by Günther (1885–1902). A full account of Godman's and Salvin's explorations was published by Godman (1915).

The French government had undertaken the support of a scientific commission to Mexico, but the unsettled political situation of that country caused the directors to readjust their plans, and, accordingly, the commission was sent to Guatemala and to other Central American countries. Marie-Firmin Bocourt was in charge of this expedition, and he set out from France at the end of 1864. He visited Belize briefly and then proceeded to Guatemala, entering Alta Verapaz by way of Laguna de Yzabal and the Río Polochic. How long a time he spent in Alta Verapaz can only be inferred, but his entire stay in Guatemala extended probably from early in 1865 to June 11, 1866 (Vaillant, 1908: xii). It is suspected that he spent the dry season, which ends in May, and part of the wet season of 1865 in Panzós, for his collections of *Leptodactylus caliginosus* (= *Leptodactylus labialis*) and *Hyla pansosana* (= *Hyla baudinii*) indicate wet season conditions.

From Panzós, Bocourt proceeded to Cobán by way of Senahú. Cobán was unquestionably studied during the wet season, since Brocchi (1883: 116) stated in his comments on *Spelerpes mulleri* (= *Oedipus m. mulleri*) : "Il vit sous les pierres, près des endroits ou il se forme des lagunes au moment des pluies."

It is difficult to place the locale of many of Bocourt's specimens, which are labeled merely "Verapaz" or "haute Verapaz." The occurrence of these records with such precise data as "Marais de Pansos, près du rio Polochic," is puzzling. It is suggested that the more inadequately labeled material was purchased from Indians or that some may have been collected by Bocourt himself along the trails the location of which was not exactly known to him (during his journey from Panzós to Cobán). Certainly, the greater part of the "Verapaz" or "haute Verapaz" specimens must have come from the vicinity of Cobán as indicated by such species as *Spelerpes morio* (= *Oedipus helmrichi*), *Hyla moreletii* (= *Agalychnis moreletii*), *Anolis petersii, Thamnophis c. fulvus* (= *Thamnophis e. fulvus,* or *Streptophorus m. pavimentata* (= *Ninia m. pavimentata*). Bocourt's collection was summed up by Duméril, Bocourt, and Mocquard (1870–1909) and by Brocchi (1881–83).

During the period covered by these more extensive investigations, various other scientists transmitted casual herpetological collections to American and European museums from Alta Verapaz. The largest of these was sent by a Swiss physician, Dr. Gustav Bernoulli, to the Basel Museum. A resident of Mazatenango, Dr. Bernoulli made a number of trips to various parts of Guatemala and Mexico primarily to study Mayan ruins. He visited Alta Verapaz in 1870 and again in 1877. His material was labeled merely "Verapaz," and its variety indicates that it was collected both on the lowlands (most likely between Chisec and Cobán) and in the highlands (probably Cobán). It was recorded in various papers between 1878–90 by Müller, who also published an account of his travels (1878*a*).

Franz Sarg, the first German resident of Alta Verapaz, transmitted specimens to various German museums, particularly to Stuttgart. His material was haphazardly labeled. Some specimens recorded as of "Guatemala" unquestionably were taken on the plateau, as indicated by *Virginia fasciata* (= *Tropidodipsas fischeri*) and *Rhegnops sargii* (= *Adelphicos q. sargii*). Others must have been collected in Alta Verapaz (some are definitely labeled "Cobán"), where Sarg resided and was German consul (1879–84).

The eminent Mayan linguist, C. H. Berendt, made several collections of reptiles and amphibians during his travels in Guatemala. The great majority of these, now in the United States National Museum, were secured in the Petén, though it is not improbable that some specimens labeled "Guatemala" may have originated from Alta Verapaz, where he resided from 1874 until his death in 1878.

The name of Henry Hague occurs on a number of specimens in the United States National Museum. Hague's history is obscure, but Griscom (1932: 422) stated that he was at one time the manager of the great sugar plantation at San Jerónimo, Baja Verapaz, a position also held by Robert Owen. The specimens secured by Hague during the late 1860's are at present a source of confusion.

Hague unquestionably gathered material from a considerable part of Guatemala, for the west coast *Oedipus salvinii,* the upland Verapaz *Hypopachus inguinalis,* and the lowland Petén *Masticophis m. mentovarius* (type of *Bascanion suboculare* from "between Cobán and Clusec [Chisec]") are present in his collections. Whereas many specimens were well labeled, such as *Hypopachus inguinalis* and *Drymobius chloroticus* from "Cobán," others merely bore the label "Guatemala." Of the latter, some came from upland Alta Verapaz, for example, *Sceloporus m. taeniocnemis.* The "Cobán" localities for such species as *Ameiva undulata* subsp., *Cnemidophorus sackii* subsp., or *Crotalus durissus* subsp. are to be seriously questioned. Finally, many of Hague's original labels appear to have been lost. Specimens now tagged "Guatemala" in the United States National Museum were often listed by Cope (1887) with more precise data. Among these *Hypopachus inguinalis, Agalychnis moreletii, Drymobius chloroticus,* and *Trimorphodon biscutatus* subsp., originally listed as of "Cobán" or "Alta Verapaz" by Cope, today are labeled "Guatemala."

In gathering data for his classic works on the physical geography of Central America, the German Karl Sapper forwarded to Munich several collections of herpetological material. That with which I am primarily concerned was recorded by Werner (1903), who listed twenty-four forms as of Alta Verapaz, especially from Cobán and Finca Campur. I question the Cobán listing on some of this material, especially *Leptodeira a. polysticta, Thalerophis o. praestans,* and *Bothrops a. asper.* Although some of his material was labeled "Guatemala," there is little doubt but that many such specimens, such as those of *Spelerpes dofleini* (= *Oedipus dofleini*), *Atractus quadrivirgatus* (= *Adelphicos v. veraepacis*), *Lachesis aurifer* (= *Bothrops n. aurifer*), originated from Alta Verapaz.

During the years 1902, 1904–7, and 1914 the United States Department of Agriculture supported field investigations on rubber, cotton, palms, and other plants in Guatemala. In Alta Verapaz much work was done in the eastern part of the province, and herpetological material from Senahú, Treceaguas, Panzós, and several other localities was forwarded to the United States National Museum.

In 1924 A. W. Anthony initiated his ornithological investigations in Guatemala and between 1925 and 1928 visited numerous localities in Alta

Verapaz. During his travels he collected many herpetological specimens now in the Museum of Comparative Zoology, Harvard University. His collections from Alta Verapaz originated primarily from Fincas Chamá, Chimoxán, La Primavera, Secanquim, and Sepacuité. Griscom (1932) gave an extended account of Anthony's travels.

In late March and early April, 1934, K. P. Schmidt, accompanied by his brother, the late Franklin Schmidt, and Daniel Clark, made a small but very interesting collection at Cobán and at Finca Samac. This material was secured during the course of the Mandel Guatemala Expedition of Field Museum of Natural History (Chicago Natural History Museum), which confined its activities largely to the volcanoes of the southern coast.

My own work in Alta Verapaz began in March, 1938, when I arrived in Cobán. Collections were first made at Finca Panzamalá and later at Finca Samac. Early in May, before the rains, I proceeded to Finca Chamá and remained there until mid-June in order to be on hand for the emergence of the amphibian fauna. I then returned to Finca Samac for a brief period to study the wet season fauna of that locality.

After a short sojourn at San Jerónimo in the desert basin of Salamá, the results of which have already been published (Schmidt and Stuart, 1941), I proceeded northward on the Alta Verapaz lowlands, where 2 very disappointing weeks were spent at Fincas Samanzana and Cubilguitz. In mid-August I began working toward Panzós, stopping first at Finca Panzamalá and later at Finca Volcán, from whence a brief visit was paid to Finca Los Pinales in the Cahabón Valley. I arrived at Panzós in late August, and after an unprofitable 2 weeks in the flooded Polochic Valley I returned to the United States in mid-September.

Early February, 1940, found me again in Alta Verapaz. Studies were first carried on at Finca Los Alpes for several weeks. Late in February I proceeded to Panzós, remained there until the second week of March, and then crossed the mountains to Finca Volcán for some 3 weeks. Early in April I went to Finca Canihor on the Río Cahabón and returned to Cobán in mid-April. The season being particularly dry, collecting was unprofitable, and I devoted a month to brief excursions to various parts of the republic.

The breaking of the rains brought me back to Alta Verapaz, and the second half of May produced excellent results at Finca Chichén. After a week in early June at Finca Chejel above the Río Polochic, my studies in Alta Verapaz were concluded with 10 days at Finca La Primavera. I finally left Alta Verapaz in early July and proceeded overland to Nebaj in El Quiché, where data for a short paper on the Sierra de los Cuchumatanes (Stuart, 1943*b*) were secured.

THE NATURAL LANDSCAPE[1]

Alta Verapaz comprises some 8600 square kilometers, and represents the frayed eastern extremity of the most northern of the 3 mountain arcs that extend eastward from the plateau of Guatemala. This northern arc, in addition to the Alta Verapaz highland, contains also the Sierra de los Cuchumatanes to the west, but the 2 upland masses are separated by the deep gorge of the Río Negro.

Though a narrow bridge between the great loop of the Río Negro and the source of the Río Polochic connects the Alta Verapaz mountains with the Sierra de las Minas to the south, the valleys of the Ríos Polochic and Panimá separate the 2 uplands over most of their extent. Northward and eastward the Alta Verapaz highlands descend to the lowlands of the Petén and of the Yzabal depression, respectively.

Alta Verapaz is made up almost exclusively of limestone no younger than Miocene. The various beds were subjected to Pliocene faulting, which produced 4 orographic units. In the west lies a plateau-like region, the Meseta de Cobán, which averages some 1300 meters in elevation and which is surmounted by ranges of hills attaining 2000 meters. Three short and narrow mountain ranges extend eastward from the meseta and plunge in the same direction.

The backbone and central range of the region is the Sierra de Xucaneb, which reaches elevations of more than 2500 meters on Cerro Xucaneb. This range breaks off sharply in the east at the junction of the Rios Cahabón and Polochic. The lower, but somewhat more extensive Sierra de Pocolhá, flanks the Sierra de Xucaneb to the north and is separated from it by the rift valley of the Río Cahabón. Its maximum elevation is somewhat less than 2000 meters. In the south, divorced from the central range by the Polochic Valley, also a graben in part, and from the Sierra de las Minas by the Panimá Valley, the very short Sierra de Pansal attains elevations of slightly more than 2000 meters. It ends abruptly at the junction of the Rios Panimá and Polochic.

Four major lowlands surround and invade the Alta Verapaz mountain block. On the north the Sierra de Pocolhá drops off gradually on the base of the Yucatán Peninsula, which here averages some 300 meters in elevation, though locally higher hills surmount the lowlands proper. Generally speaking, they are poorly drained and often extensively inundated during the wet season. The Polochic Valley to the level of La Tinta is the major lowland area in the east. It is some 12 kilometers broad at the level of Panzós, lies below 100 meters, and is likewise flooded during the period of rains. Above La Tinta, the Polochic and Panimá valleys are narrow and steep-sided

[1] Most of the following material is a summation of Sapper 1901, 1932, and 1937.

and attain 1500 meters elevation at their western ends. The gorge of the Río Negro, not faunally a part of Alta Verapaz, is a V-shaped valley and delimits the department on the west and southwest. Within the Alta Verapaz highlands lies a fourth lowland, the Cahabón Valley. Entirely enclosed by mountains, it extends from the level of Finca Sasís to Taquincó. It is a rift valley and erosion and solution have produced extremely high relief. It averages some 500 meters in elevation and attains a maximum width of 10 kilometers.

Most of Alta Verapaz is limestone, and it has developed or is developing karst topography. Although well watered by surface streams, there is considerable subterranean drainage, and caves are not infrequent. Local sinks, called *sigüans,* often render field work hazardous.

The rugged terrain of the region produces, despite its small area, considerable climatic variation. Temperature ranges from an annual mean of about 25° C. on the lowlands to 18° C. at Cobán (1300 meters) and possibly drops to 10° C. on the highest peaks. Variation between the hottest and coldest months does not exceed 4° C. In relation to the distribution of the herpetofauna within Alta Verapaz the following temperature belts are useful as expressions of faunal limitations:

Tropical zone, 0–1300 m., frost free
  Lower Tropical zone, 0–600 m., temperature of coldest month at least 20° C.
  Upper Tropical zone, 600–1300 m., temperature of coldest month 16°–20° C.
Subtropical zone, above 1300 m., zone of occasional frosts, temperature of coldest month below 16° C.

Rainfall, carried by the trade winds, is exceptionally unevenly distributed over Alta Verapaz. The windward lowlands and mountain slopes receive as much as 4000 mm. (Cubilguitz) and occasionally more than 5000 mm. (Chinasayup). The partly protected Polochic Valley is somewhat drier (3300 mm. at Panzós), and the enclosed Cahabón Valley and rain-shadowed Río Negro gorge certainly receive less than 1500 mm. The Xucaneb and Pansal ranges, both shielded to some extent on the north, and the Meseta de Cobán are all drier than are the Pocolhá ranges. Though Panzamalá has an average annual precipitation of almost 4000 mm., at Cobán (Chimax) the figure approximates only 2500 mm. The rainy season extends from mid-May through November, during which period possibly 80 per cent of the total annual precipitation falls.

Although much of Alta Verapaz to an elevation of about 1500 meters has been cultivated at one time or another, records picture virgin conditions rather clearly. The lower Tropical zone with the exception of the lower Cahabón Valley, which probably supported pine savanna, was covered with tropical rain forest. The upper Tropical zone had several cover types. On

the 3 mountain ranges to about 1300 meters a rain forest undoubtedly existed, but to what extent this forest differed from that of the lowlands is unknown. On the Meseta de Cobán pine was the dominant cover. In the gorge of the Río Negro pine grew on the higher valley slopes, but on the valley floor the vegetation ranged from cacti and short grasses to savannas. Above 1300 meters a wet broadleaf, cloud forest was, and still is, the major floral type.

Where the lowlands have been cleared for cultivation, pastures, corn fields, and second-growth *monte* are dominant features. All are ecologically (from the herpetological standpoint) the equivalent of grasslands. Coffee, rubber, and cacao groves, because they offer more shade and are more permanent than are other types of cultivation, are roughly comparable to the forest or *montaña.* The upper Tropical zone is planted largely in coffee. Conditions in the groves, depending upon shade, range from those of grasslands to those of the virgin forest. The pine on the Meseta de Cobán, the cloud forest, the lower Cahabón Valley, and the Río Negro gorge have probably been changed from virgin conditions to a lesser extent than have the lowlands and coffee belt.

GEOGRAPHY OF THE HERPETOFAUNA

On the basis of its salamander fauna, the bulk of Alta Verapaz was designated a biotic area in Guatemala and was named the Quecchian Biotic Province (Stuart, 1942*a* and 1943*a*). An examination of the entire herpetofauna supports that conclusion. The province is bounded by 4 other biotic areas, the Caribbean lowlands on the north and east (designated the Petén), the Sierra de los Cuchumatanes (Cuchumatán) on the west, the interior desert basins (Zacapan) on the south and southwest, and the Sierra de las Minas (Sierran) on the south and southeast. From the surrounding areas the Quecchian is, with one exception, sharply differentiated.

Of a total of 129 forms known to occur in faunal Alta Verapaz, approximately 20 per cent are endemic. This low amount of endemism is owing to the fact that the lowland fauna of Alta Verapaz contains many forms which are widespread throughout Caribbean Central America, or at least its northern parts. At higher elevations in the region, where many of these widespread lowland forms are absent, endemism in the fauna exceeds 30 per cent. Viewed as a whole the Quecchian fauna stands out as a distinctive unit in that its endemics and derivatives from the Guatemalan Plateau to the west, despite their minority, are, for the most part, dominant elements of the fauna.

Of the surrounding biotic areas, the Quecchian most closely resembles the Petén faunally. Almost 60 per cent of the Alta Verapaz fauna is also known from the Petén, but a major part of the species common to the 2 areas

does not ascend beyond the 600 meter contour. From the Zacapan to the south the Quecchian differs in possessing a rich amphibian fauna and a great variety of anoles, both poorly represented or absent in the Zacapan. Differentiation has taken place in several of the other groups (such as *Hypopachus, Sceloporus, Stenorrhina,* and *Micrurus*) represented in both. The Cuchumatán to the west likewise supports an endemic fauna, and while sharing a number of forms with all of upland Guatemala, it is distinct from the Quecchian in the relatively poor development of its lowland element. Practically nothing is known of the Sierran to the south, but its mass and high elevation suggest a high degree of endemism. The boundaries of the Quecchian biotic region have been sketched in maps in previous papers (Stuart, 1942*a* and 1943*a*).

Within faunal Alta Verapaz 5 "life areas" may be recognized. These are roughly coincidental with the floral zones and may be outlined as follows:

Tropical zone, 0–1300 m.
  Lower tropical zone, 0–600 m.
    Corozo belt, humid
    Cahabon savannas, subhumid
  Upper tropical zone, 600–1300 m.
    Coffee belt, mountain slopes
    Pine belt, Meseta de Cobán
Subtropical zone, above 1300 m.
    Cloud forest

The corozo belt is the most extensive of the life areas. It includes the northern lowlands and invades the Polochic and Panimá valleys in the east. From this habitat some 93 forms are known and of these about 50 per cent do not extend beyond its limits; only about 5 per cent of its fauna reaches the cloud forest. The endemics of Alta Verapaz make up only 6 per cent of its fauna, and only 25 per cent of the Alta Verapaz endemics, none restricted, occur within this life area. More than 80 per cent of the corozo belt fauna is shared with the Petén biotic province, and it may, therefore, be regarded as the transitional area between this province and the Quecchian proper.

The Cahabón savannas are restricted to the lower Cahabón Valley. They support a very impoverished fauna of 27 forms, the majority of which are the more tolerant of the corozo belt species. Only 2 Alta Verapaz endemics enter the region.

The coffee belt has 64 forms and represents a transitional belt within the Quecchian. Only 1 form is restricted to it. Its fauna is made up of 1 element, which is of lowland origin and which persists, in part, up to an elevation of 1200 meters. Conversely, a number of cloud forest and pine belt

species descend to about 1000 meters. This distinct faunal assemblage is worthy of recognition.

Some 52 forms are known from the pine belt that is restricted to the Meseta de Cobán. Here, for the first time, the endemic Quecchian fauna becomes a dominant feature. Of the 24 Alta Verapaz endemics, 16 occur in the pine belt. Here, too, the lowland Caribbean element finds strong competition from the Guatemalan plateau element derived from the west. Some typical species of the cloud forest enter the pine zone along water courses, where broadleaf forests form highways down from the Subtropical zone.

The cloud forest is the only life area which does not form a continuous habitat. It occurs on the 3 mountain ranges stretching eastward from the Meseta de Cobán and on the crests of the hills rising above the general Meseta surface. This habitat has yielded 30 forms. Of these about 40 per cent are shared with the pine belt. About 30 per cent of its fauna is made up of Quecchian endemics, and the bulk of its forms have been derived from the plateau lands to the west. Its fauna is the most distinctive assemblage in Alta Verapaz.

It may be noted here that the political and faunal boundaries of Alta Verapaz, for the most part, coincide, except in the south. The dry gorge of the Río Negro represents a part of the Zacapan biotic area, and the northern slopes of the Sierra de las Minas—the Alta Verapaz political boundary runs along the crest in part—above 600 meters will probably be shown to be part of the Sierran. The Panimá Valley and half the Sierra de Pansal are a part of political Baja Verapaz.

As has been suggested the Quecchian herpetofauna has been derived from several sources. An upland element has entered from the highlands to the west. It is indicated that several faunal invasions have come from that direction. The presence of such well-differentiated forms as *Oedipus helmrichi, Rhadinaea hempsteadae,* and *Tropidodipsas kidderi,* derived from the plateau *Oedipus cuchumatanus,* the *Rhadinaea godmani* group, and *Tropidodipsas fischeri,* respectively, suggest an early immigration into Alta Verapaz. In contrast, *Anolis c. haguei, Sceloporus m. taeniocnemis,* and *Gerrhonotus m. moreletii* are poorly differentiated forms, indicating a more recent invasion. Alta Verapaz is a secondary peninsula reaching eastward from the "paleo-peninsula" of Central America described by Schmidt (1943: 250–52), and its faunal history has paralleled that of the main upland mass.

A second distinct element has invaded the Quecchian from the more recently formed lowlands upon which it rests. Most of the representatives of this element have as yet failed to invade the uplands of Alta Verapaz, and only a few, such as *Oedipus m. mulleri* and *O. m. odonnelli, Lampropeltis t. abnorma,* and *Micrurus a. apiatus,* have differentiated to even a slight extent.

ANNOTATED LIST OF SPECIES

Of the 136 species and subspecies listed, only 129 are known to inhabit the Quecchian biotic area. The remainder were secured in the Río Negro gorge of Alta Verapaz, a part of the Zacapan biotic province, and are included for the sake of presenting a complete report on my collections from the Verapaz region. A few specimens from Finca Chejel,[2] originated in Baja Verapaz, here faunally a part of the Quecchian, and in El Quiché just west of Finca Chamá.

Of the forms recorded I have collected 113 and have seen an additional 11 which are preserved in the museums of this country. I have not seen specimens of the remaining 12 forms reported from Alta Verapaz. These are in European museums.

This Alta Verapaz list is by no means complete, for such widespread items as *Xenodon* and *Pseustes* have not yet been secured there, and an unallocated *Plectrohyla* tadpole and tadpoles of 2 other hylids indicate that the amphibian list will continue to grow. The final count will probably reveal some 150 forms in this faunal area. Thus, the fauna of Alta Verapaz compares very favorably with that of the adjacent Caribbean lowlands (the Petén and British Honduras), from which 127 species and subspecies have been recorded.

Throughout the following list the complete reference to the original description of each species has been cited; Alta Verapaz records are more briefly noted since these sources are listed in the Literature Cited. Though many casual mentions of specimens from the region have undoubtedly been overlooked, an effort has been made to make these references as complete as possible. I have cited only references from which it is obvious that the author had before him Alta Verapaz specimens. Purely literary references have been omitted.

I have examined every specimen recorded by number. Unless otherwise indicated, all specimens are in the collections of the Museum of Zoology, University of Michigan. Abbreviations of other institutions whose material is listed are: U.S.N.M., United States National Museum; F.M.N.H., Chicago Natural History Museum; M.C.Z., Museum of Comparative Zoology, Harvard University. I believe that, with the exception of a few well-known species, I have examined all Alta Verapaz material contained in the museums of this country.

[2] For the location and other data concerning the various localities, the reader is referred to the "List of Localities," page 89.

TABLE I

MATERIAL EXAMINED

Group	Genera	Forms	Specimens
Gymnophiona	1	1	1
Caudata	1	6	163
Salientia	9	27	846*
Testudinata	6	6	51
Crocodilia	1	2	2
Sauria	17	38	794
Serpentes	35	56	351
Totals	70	136	2208

* Tadpoles have been counted by lots rather than as individuals.

AMPHIBIA

GYMNOPHIONA

Gymnopis oligozona (Cope)

Siphonops oligozonus, Cope, *Proc. Amer. Phil. Soc.,* 17 (1877): 91 (type locality unknown).
Gymnopis oligozona, Dunn, 1942: 469 (Finca Volcán).

Finca Volcán, No. 90988.

This is the third specimen of this species to be collected and is the only one with locality data (Dunn, 1942: 470). It was brought to me by an Indian lad, who found it in the dust beside his hut at 900 meters. The decaying rubbish in an adjacent coffee grove was unsuccessfully searched for other specimens. The species is probably confined to the Tropical zone. Essential data for this specimen are: primaries, 128; secondaries (incomplete), 71; secondaries (complete), 20; length, 305 mm.; diameter, 7 mm., length/diameter, 44.

CAUDATA

Oedipus dofleini (Werner)

Spelerpes dofleini, Werner, *Abh. bayer. Akad. Wiss.,* 22 (1903): 352 (Guatemala [presumably Alta Verapaz]).
?*Spelerpes mulleri,* Brocchi, 1883: 116 (in part; Río de la Pasión [Alta Verapaz]).
Oedipus dofleini, Stuart, 1943*a*: 17, Pl. I, Fig. 3 (Finca Volcán).

Finca Los Alpes, from stomach of *Pliocercus e. salvinii,* No. 91052; Finca Volcán, Nos. 89119–25.

This species, fully discussed in a previous paper (Stuart, 1943*a*: 17–19), is probably a Tropical zone form, living below 1000 meters elevation on the ground in decaying vegetation.

Oedipus elongatus Schmidt

Oedipus elongatus, Schmidt, *Zool. Ser. Field Mus. Nat. Hist.,* 20 (17) (1936): 165 (Escobas, Guatemala); Stuart, 1943*a*: 19 (Finca Volcán).

Finca Volcán, No. 89126.

This representative of the Petén fauna has apparently invaded Alta Verapaz along the river valleys. It is typically a corozo belt form and barely enters the coffee belt. The above specimen was found in decaying rubbish in a coffee grove at 700 meters, where it was associated with *O. dofleini.*

Oedipus helmrichi Schmidt

Oedipus helmrichi, Schmidt, *Zool. Ser. Field Mus. Nat. Hist.,* 20 (17) (1936): 152, Fig. 18 (Finca Samac, Alta Verapaz, Guatemala, altitude, 5000 ft.); Stuart, 1943*a:* 15 (Fincas Samac, Volcán, and Chichén).

?*Spelerpes morio,* Brocchi, 1883: 113 (Alta Verapaz).

Finca Chichén, Nos. 89132–34, 89135 (2); Finca Samac, Nos. 80929 (paratype), 89136 (2) (topotypes), 89137 (12), 89138 (5); Finca Volcán, No. 89131.

Though occurring as low as 1300 meters at Finca Samac, *O. helmrichi is* apparently the common salamander of the cloud forest. Even at Finca Samac, where it occurred in bananas in the pine belt, it was still at the edge of the cloud forest. At both Fincas Volcán and Chichén it was taken only in the cloud forest.

Oedipus mexicanus mulleri (Brocchi)

Spelerpes mulleri, Brocchi, *Batrachia, Mission scientifique au Mexique,* 1883, p. 116 (in part), Pl. 20, Figs. 4–5 (several localities in Alta Verapaz; restricted to "the mountains above Cobán" by Stuart, 1943*a:* 12).

Spelerpes variegatus, Werner, 1903: 352 (Guatemala [unquestionably Alta Verapaz]).

Oedipus mulleri, Schmidt, 1936*a:* 150 (Finca Samac); Stuart, 1943*a:* 12 (Finca Samac).

Finca Samac, Nos. 89127–30.

This representative of the *mexicanus* group of *Oedipus* is a pine belt species, which may extend into the Subtropical zone. Brocchi (1883: 116) spoke of it as a ground form, but both Schmidt (1936*a*: 151) and Stuart (1943*a:* 13) secured it only in bromeliads on trees.

Oedipus mexicanus odonnelli Stuart

Oedipus odonnelli, Stuart, *Misc. Publ. Mus. Zool. Univ. Mich.,* 56 (1943*a*): 10, Pl. 2, Fig. 3 (Finca Volcán, Alta Verapaz, Guatemala).

Spelerpes mulleri, Brocchi, 1883: 116 (in part), Pl. 20, Fig. 3 (Alta Verapaz).

Finca Volcán, Nos. 89096 (holotype), 89097–89105 (paratypes); Finca Los Alpes, No. 89106.

Though it may descend as low as 900 meters in coffee groves, I have previously given my reasons for considering this a cloud forest form (Stuart, 1943*a:* 11). The specimen from Los Alpes at 600 meters may be an intergrade between the upland *O. m. odonnelli* and lowland *O. m. mexicanus.*

Though probably originally confined to bromeliads, this species now occurs most abundantly beneath the leaf sheaths of bananas. I have never found it on the ground.

Oedipus rufescens Cope

Oedipus rufescens, Cope, *Proc. Acad. Nat. Sci. Phila.,* 21 (1869): 104 (Vera Cruz, Mexico . . . Orizaba, Mexico); Dunn, 1926: 418 (Finca Treceaguas); Schmidt, 1936*a:* 151, Fig. 18 (Finca Samac and Cobán); Stuart, 1943*a:* 20 (Fincas Chejel, Los Alpes, Los Pinales, Samac, Santa Teresa, Volcán).

Cacao (Finca Treceaguas), U.S.N.M. Nos. 36620, 36622–27, 37844, 38138–39; Camp Coile near Panzós, U.S.N.M. No. 37845; Finca Chejel, Nos. 89151, 89156 (13); Finca Los Alpes, Nos. 89144 (9), 89145 (16); 89146 (9); Finca Los Pinales, No. 89142 (3); Finca Samac, Nos. 89139 (2), 89140 (5); Finca Santa Teresa, No. 89143 (3); Finca Volcán, Nos. 89141 (16), 89147–50, 89152 (8), 89153 (5), 89154 (4), 89155 (4), 89157 (2).

This species, the most abundant and widespread of the Alta Verapaz salamanders, is restricted to the Tropical zone and occurs most abundantly in the coffee belt. I found it only in bromeliads and banana plants, where it is associated with *O. m. mulleri, O. m. odonnelli,* and *O. helmrichi.* Taylor (1941: 145) has shown the Pacific coast population to be distinct.

SALIENTIA

Bufo marinus (Linnaeus)

Rana marina, Linnaeus, *Systema naturae,* 1758, p. 211 (America, since restricted to Surinam).

Bufo marinus, Boulenger, 1882: 315 (Lanquín); Günther, 1901: 249 (Lanquín, Cobán); Stuart, 1937: 68 (Río Chajchinic).

Bufo agua, Brocchi, 1877*b:* 188 (Cobán).

Finca Canihor, No. 90971 (5); Río Chajchinic, No. 79051 (10); Finca Chamá, Nos. 90963 (5), 90964 (7), 90965, 90966 (3); Finca Chejel, No. 90972, 1940–698 (tadpoles); Cobán, No. 90974; Finca Cubilguitz, No. 90967; Finca Panzamalá, No. 90970; Panzós, No. 90969 (2); Finca Los Pinales, No. 90968; Finca La Primavera, No. 90973.

Although Taylor and Smith (1945: 551–52) have split off the Mexican population of this complex species, I prefer to retain the name *Bufo marinus* for the Alta Verapaz specimens until a complete revision of the species is made.

Cobán appears to be the upper limit of this widespread Tropical zone species in Alta Verapaz. Since the Subtropical zone on the plateau and in the Sierra de los Cuchumatanes is dominated by *Bufo bocourti,* it is somewhat peculiar that the same zone of Alta Verapaz supports no species of *Bufo.*

Bufo valliceps Wiegmann

Bufo valliceps, Wiegmann, *Isis*, 1833, p. 657 (Mexico), not seen; Brocchi, 1881: 79 (Alta Verapaz); Boulenger, 1882: 319, and Günther, 1901: 252 (Verapaz); Stuart, 1937: 68 (Río Chajchinic).
Bufo nebulifer?, Müller, 1878*b*: 648 (Verapaz).
Bufo canaliferus, Müller, 1884: 279 (recorded previously as *B. nebulifer*).

Finca Los Alpes, Nos. 90985–86; Río Chajchinic, No. 79031; Finca Chamá, Nos. 90976 (3), 90977 (2), 90978–79, 90980 (many), 90981 (2); Finca Chejel, No. 90987 (11); Finca Cubilguitz, No. 90983 (4); Finca Panzamalá, No. 90975 (4); Panzós, No. 90984 (3); Finca Samanzana, No. 90982 (3).

This species is restricted to the corozo and coffee belts and reaches its upper limits at 1250 meters (Finca Panzamalá). Schmidt and Stuart (1941: 238) have already noted that it does not invade even slightly arid habitats in Guatemala. Its absence from the lower Río Cahabón Valley and the Río Negro gorge at La Primavera also indicates its lack of tolerance of arid regions.

Leptodactylus labialis (Cope)

Cystignathus labialis, Cope, *Proc. Amer. Phil. Soc.*, 17 (1877): 90 (Mexico?).
Cystignathus caliginosus, Brocchi, 1877*b*: 180 (Panzós).
Leptodactylus caliginosus, Brocchi, 1881: 17, Pl. 5, Fig. 1 (Panzós).

Panzós, Nos. 90961–62.

The occurrence of the genus *Leptodactylus* on only the eastern lowlands of Alta Verapaz is paralleled by several other species, such as *Sceloporus teapensis* and *Ameiva u. hartwegi*. In the Petén the genus breeds relatively early (Stuart, 1935: Fig. 1) and occurs in considerable abundance (Stuart, 1935: 36–37); its absence on the northern lowlands could hardly be owing to its having been overlooked in May, June, and July.

At Panzós *labialis* and the following species were relatively common and were heard calling both during the day and at night in pools as far up the Polochic Valley as Pancajché. The difference in the call of the 2 is readily distinguished, that of *labialis* being much deeper and more mellow than the shrill cry of *melanonotus*. *L. labialis* is apparently restricted to the corozo belt.

Leptodactylus melanonotus (Hallowell)

Cystignathus melanonotus, Hallowell, *Proc. Acad. Nat. Sci. Phila.*, 12 (1860): 485 (Nicaragua).

Panzós, No. 90960.

I heard this species calling throughout the corozo belt in the Polochic Valley in August, 1938, but its habits, like those of *L. labialis*, rendered it most difficult to secure.

Eleutherodactylus anzuetoi Stuart

Eleutherodactylus anzuetoi, Stuart, *Proc. Biol. Soc. Wash.*, 54 (1941): 197 (Nebaj, El Quiché, Guatemala).

Finca Chichén, Nos. 89912–13 (paratypes); Finca Samac, F.M.N.H. No. 20726.

This strictly terrestrial inhabitant of the cloud forest invades the pine belt wherever suitable habitats are present. The Museum of Zoology specimens were secured in the forest at 1600 meters; the Chicago Natural History Museum individual came from the same type of forest at a lower elevation.

Eleutherodactylus bocourti (Brocchi)

Hylodes bocourti, Brocchi, *Bull. Soc. Philom.*, 1877*a*: 130 (mountains of Cobán, Guatemala); Brocchi, 1881: 50, Pl. 16, 2 figs. (redescription of type).

Finca Chichén, No. 90957; Finca Volcán, No. 90956.

The larger of the above specimens agrees very closely with the description of the type. Günther (1900: 222) noted that Brocchi's later account and figures (1881) are not in accord with the type description. The tongue, described as not emarginate, is figured as notched posteriorly, as in my specimens. The head is broad, but less so than as figured by Brocchi, and the vomerine teeth are close together rather than widely separated.

E. bocourti seems to replace *E. spatulatus* Smith in the Alta Verapaz highlands. I question Günther's (1900: 222) identification of a specimen of *bocourti* from Costa Rica.

E. bocourti is a terrestrial inhabitant of the cloud forest.

Eleutherodactylus brocchi (Boulenger)

Hylodes brocchi, Boulenger, in Brocchi, *Batrachia, Mission scientifique au Mexique*, 1882, p. 60, Pl. 15, 3 figs. (Guatemala).

Finca Chichén, Nos. 90947, 90948 (9), 90949 (2), 90950 (9); Finca Samac, No. 90946 (3).

In a previous paper (Stuart, 1941*a*: 200) it was shown that Günther (1900: 236) misapplied Boulenger's name *brocchi* to the species I described as *xucanebi*. The type of *brocchi* was said by Boulenger to be "un peu détérioré," and allowing for such a condition, the above series answer the original description remarkably well.

The head-body length of 47 mm. in the type indicates a moderate-sized species. In my series the maximum length is 74 mm. in the females and 48 mm. in the males. The skin of the above specimens is smooth as described, and the vomerine teeth are in 2 triangular patches, as in *brocchi*. In coloration, especially on the throat, sides of head, and back of thighs, and in the size of tympanum, they are identical with those described by Boulenger. His brief description is amplified here.

Body stout; head broader than long. Vomerine teeth in 2 triangular patches at posterior level of choanae and very close together. Skin smooth above and below except in some instances in which scattered pustules occur dorsally. Tympanum slightly less than one-half the diameter of eye in females and slightly less than the diameter of eye in males. A prominent fold from posterior corner of eye directed backward above and behind tympanum. Several folds on shoulder region which usually form a W. Fingers free, the first shorter than the second in specimens under 37 mm. long and the first longer than the second in larger specimens. Terminal discs moderately developed. Toes free or with only the barest trace of a web; terminal discs small but conspicuous. A well-developed inner and an inconspicuous outer metatarsal tubercle. A strong tarsal fold. The leg varies in length, but shows no correlation with either age or sex. The heel may not quite reach the tip of the snout, or it may extend much beyond the snout (averages slightly beyond the tip of the snout).

Color variable, but in general following a definite pattern. Dorsum gray; a dark bar between the eyes; the W-shaped fold on the back dark and the postocular fold similarly darkened; 4 triangular vertical bars of dark gray on the upper lips. Back of the thighs, brownish gray irregularly spotted with white; arms and legs faintly barred. Underparts, grayish white with varying amount of dark spotting.

I know of nothing in northern Central America with which this species might be confused. Its size, free toes, and distinctive spotting of the thighs render it readily distinguishable.

At both Fincas Chichén and Samac this species was common in mountain brooks in the cloud forest and pine belt. It appeared to be almost entirely aquatic. At Finca Chichén it was very numerous in a stream within the cloud forest, but was absent from the same stream only a few meters lower, where it flowed through cleared land. The harsh quack could be heard even at midday in the dark forest. Females taken late in May were filled with eggs.

Eleutherodactylus rhodopis (Cope)

Lithodytes rhodopis, Cope, *Proc. Acad. Nat. Sci. Phila.*, 18 (1866): 323 (Veracruz, at Orizaba and Córdoba).

Hylodes sallaei, Günther, *Proc. Zool. Soc. London*, 1868, p. 487, Pl. 33, Fig. 3 (Mexico and Verapaz); Günther, 1900: 227 (redescription); Müller, 1882*a*: 139 (Verapaz, recorded as *H.* sp., 1878*b*: 649).

Finca Chamá, No. 90959 (5).

In my description of *E. anzuetoi* (Stuart, 1941*a*: 198) I suggested that *anzuetoi* is an upland representative of *E. rostralis* (Werner). What I formerly referred to *rostralis* I now list as *rhodopis*. I am not fully convinced that 2 very similar appearing eleutherodactylids have not been confused in

northern Middle America. One is unquestionably *rhodopis*. The other is a species with partly webbed toes, closely related to *E. gollmeri* (Peters) of lower Middle America and South America. Unfortunately, I do not have sufficient material from the Yucatán Peninsula to verify this hypothesis, so that for the present, I am referring all my dubious material to *rhodopis*.

The above species is an inhabitant of the virgin lowland forest, where it is associated with such forest index forms as *Ameiva f. edwardsii* and *Anolis h. uniformis*. I secured the above specimens, an adult male, an adult female, and 3 juveniles, within a radius of several feet on the forest floor.

Eleutherodactylus rugulosus (Cope)

Liyla rugulosa, Cope, *Proc. Amer. Phila. Soc.*, 11 (1869): 160 (Pacific region of the isthmus of Tehuantepec, Mexico).

Finca Chejel, No. 90955 (2); Finca Los Alpes, Nos. 90952-54; Samac-Chamá trail, No. 90951.

Two species of *rugulosus*-like eleutherodactylids were taken in Alta Verapaz. The one, referred to *E. brocchi* above, lacks webs between the toes except for a trace in the males and has a small inner metatarsal tubercle, a broad head, poorly developed supernumerary tubercles, and white spotting on the thighs. The other species has definite webs (even in the females), a large inner metatarsal tubercle (equal to diameter of tympanum in females and one-half the diameter of tympanum in males), a slender head (longer than broad), well-developed supernumerary tubercles, and the thighs finely flecked or reticulated with white.

This second species is very close to true *rugulosus*, which is an extremely variable form, the various populations of which have been referred to by many names, such as *natator, pittieri,* and *fleischmanni*. These populations have, for the most part, been diagnosed on the basis of various combinations of leg length, amount of webbing, and the size of the tympanum. Anyone familiar with this wide-ranging species is well aware that if 1 population is to be named, then practically every collection must be designated as a separate race. Although there has recently been a trend toward the designation of the variants, I prefer to disregard them taxonomically and await a thorough variational study.

The above specimens from Los Alpes and Chejel are very similar and differ, primarily in leg length, from the Samac-Chamá individual. To this latter Taylor's name *natator* unquestionably applies. To utilize that name, however, would require the naming of not only the other Alta Verapaz material but also specimens from the Sierra de los Cuchumatanes and the Salamá basin, which have already been commented upon (Stuart, 1943*b*: 16; Schmidt and Stuart, 1941: 239). I prefer, therefore, to use *rugulosus* in its broadest sense.

The species is both aquatic and terrestrial. I secured it only in the corozo and coffee belts up to 1250 meters.

Eleutherodactylus stantoni Schmidt

Eleutherodactylus stantoni, Schmidt, *Zool. Ser., Field Mus. Nat. Hist.*, 22 (8) (1941): 483 (Valentin, British Honduras).

Finca Chichén, No. 90958.

As noted by Schmidt in the original description, this species is either identical with or extremely close to *E. laticeps* (Duméril). I retain Schmidt's name provisionally because in both types of *stantoni* and in the above specimen the hind leg is considerably longer than that described in the type of *laticeps* (Kellogg, 1932: 93). Furthermore, as Schmidt noted, there is a strong development of the dorsolateral dermal folds in *stantoni*, a condition which apparently is not present in *laticeps*, unless the "post-tympanic dorsal dermal fold" of Kellogg be the same.

The geographic locale of the Alta Verapaz specimen casts some suspicion on its identification as *stantoni*. I found it on the ground in the cloud forest at 1600 meters, where conditions are quite unlike anything met on the lowlands of the Yucatán Peninsula.

In life the specimen was a rich reddish brown above with an irregular X on the back formed by black punctations. There was a dark band across the snout and another between the eyes, both outlined with black mottlings, and the legs were similarly banded. The sides of the head were black, with a very dark line extending along the canthus from the snout to the eye and from the eye back above the tympanum, thence ventrally to the arm insertions. The underparts were white; the ventral side of the legs was reddish, mottled with black.

The specimen, a female taken May 18, 1940, though fully adult (65 mm. head-body length), showed no signs of development of ova.

Eleutherodactylus xucanebi Stuart

Eleutherodactylus xucanebi, Stuart, *Proc. Biol. Soc. Wash.*, 54 (1941): 199 (Finca Volcán, Alta Verapaz, Guatemala, altitude, 1300 meters).

Hylodes brocchi, Günther, 1900: 236 (in part), Pl. 68, Fig. A (Verapaz).

Cobán, F.M.N.H. No. 20732; Finca Volcán, No. 89914 (holotype).

I believe this form to be primarily a Subtropical zone inhabitant, though, near Cobán, Schmidt collected a specimen along the Río Frío, which flows through the pine zone from the cloud forest above. My specimen was secured on the floor of the cloud forest far removed from water.

Centrolenella fleischmanni (Boettger)

Hylella fleischmanni, Boettger, *Ber. Senckenb. Gesellsch.*, 1893, p. 251 (San José Costa Rica).

Finca Panzamalá, No. 90924; Finca La Primavera, No. 90926; Finca Samac, No. 90923; Finca Santa Teresa, No. 90925 (2).

This widespread Central American species is apparently generally distributed throughout the Tropical zone in Alta Verapaz. Its distinctive, shrill call cannot be mistaken, and during the rainy season it may be heard in localities ranging from almost sea level to the base of the cloud forest. I doubt its occurrence to any extent in the cloud forest, for its habit of breeding in trees over streams probably excludes it from that region, which is almost without surface water. The few specimens I secured give no indication as to its relative abundance.

Hyla baudinii Duméril and Bibron

Hyla baudinii Duméril and Bibron, *Erpétologie générale*, 8 (1841): 564 (Mexico); Boulenger, 1882: 371 (Verapaz, Cobán); Brocchi, 1877*a*: 124, and 1881: 29, Pl. 14, Figs. 4 (Toucourou [=Tucurú]); Günther, 1901: 270, Pl. 71 (Verapaz).

Hyla pansosana, Brocchi, 1877*a*: 125 (Panzós), and 1881: 34, Pl. 12, Fig. 2 (type specimen).

Finca Canihor, No. 90908; Finca Chamá, Nos. 90895 (7), 90896 (5), 90897 (29), 90898 (13), 90899; Finca Chejel, Nos. 90909 (7), 90910 (3); Cobán, F.M.N.H. No. 21006; Finca Cubilguitz, No. 90902 (10); Panzós, No. 90904; Finca Los Pinales, No. 90903 (2); Finca Samac, No. 90900; Finca Samanzana, No. 90901 (6); Finca Volcán, 90905 (4), 90906–7.

Though common throughout most of the Tropical zone, the rarity of this species at Finca Samac and its absence at Finca Chichén, slightly higher, indicate that probably, owing to an absence of breeding sites, it does not enter the Subtropical zone.

It is the first hylid to emerge for breeding at the beginning of the rainy season and seems to breed for a considerable length of time. It lays its eggs in quiet water, generally in temporary ponds. I have never found it in running water.

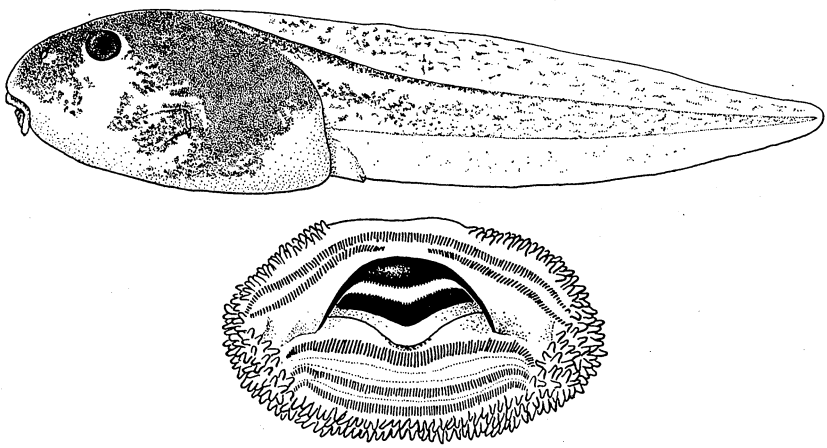
The tadpoles of *H. baudinii* are robust, less than twice as long as deep, about as broad as deep, and deepest posterior to mid-body. Eyes lateral, about one-third back on the body. Nostrils dorsolateral, half way between eyes and tip of snout. Spiracle sinistral, ventrolateral, and at least two-thirds back on the body. Anus dextral. Tail slightly more than 50 per cent longer than body; slightly more than twice as long as deep. Tail deepest about one-third posterior from the body, at which point the musculature comprises only one-fourth of the entire tail depth. Tail musculature not terminal; dorsal fin extending forward on body to about its mid-point.

Mouth subterminal, slightly overhung by snout; directed downward and slightly forward; one-third to one-half as wide as body. Lips fringed with a more or less double row of papillae except for the medial one-third of

anterior lip, where the outer tooth row forms the border. A large patch of papillae lateral to the beaks. Tooth rows 2/3. Anterior tooth rows subequal and longer than the inner and medial posterior rows, which are also subequal; the latter slightly longer than the outer posterior row. All tooth rows extending laterally beyond beaks. All tooth rows complete except the inner anterior one, which is broken medially. Anterior beak broadly arched; posterior one inverted chevron-shaped and enclosed by anterior. Anterior beak about one-half as wide as mouth. Both beaks armed with numerous, small peglike serrations.

Body dark brown above, transparent beneath. Tail musculature light, stippled with brown laterally and entirely brown along contact with upper fin. Fins transparent. The peritoneum of the heart, which appears as a triangular-shaped organ anterior to and partly concealed by the intestines, is densely melanistic.

The above description and Figures 1 and 2 are drawn from specimens



FIGS. 1 and 2. Lateral view and mouth parts of the tadpole of *Hyla baudinii*. Series No. 1940–698, Finca Chejel.

secured at Finca Chejel. Similar tadpoles were secured at numerous localities, but at several of these they were mixed with the larvae of either *H. picta* or *H. underwoodi* or both, although those from Finca Chejel and a series from Finca Chamá are unquestionably pure *H. baudinii*. I have also had comparative material from Finca Tesoro, El Quiché (Stuart, 1943*b*: 15).

These various series offer some data on variation and growth. Except for color, which probably varies both with soil color, turbidity of the water, and preservation, tadpoles of comparable size show no variation. Specimens from Finca Chamá, known to be 7 days old, have a maximum body length of 8 mm.; they are the only ones the age of which is known with certainty. The series indicates that the mouth parts are fully developed when a body length

of 5 mm. is attained. Smaller specimens have poorly developed papillae and outer posterior tooth rows. The hind legs first appear as buds in specimens with a body length of 10 mm. In my series, 4 mm. to 10 mm. in body length, the general body proportions are about the same.

It was hinted above that the differences between the tadpoles of *H. baudinii* and those of either *H. picta* or *H. underwoodi*, or both, are slight. At Finca Chamá collections were made in 3 ponds. In one of these all 3 species were breeding, in another only *H. baudinii*, and in the third only *H. picta* and *H. underwoodii*. As tadpoles from the third pond seem identical, no distinction can be made between the larvae of the 2 species. They are, however, slightly different from those known to be *H. baudinii*. Tadpoles of the *picta-underwoodi* series of 12 days of age are only as large as 7-day-old tadpoles of *H. baudinii*. Furthermore, the mouth of the latter is somewhat narrow, and the median break in the inner anterior tooth row is more extensive.

These various series of tadpoles have not been catalogued in the Museum of Zoology collections, but they have the following field numbers: *Hyla baudinii*, Finca Chamá, No. 1938–621; Finca Chejel, No. 1940–698. *Hyla* spp.; Finca Chamá, No. 1938–278, 1938–641; Finca Samanzana, No. 1938–1005.

Hyla bocourti (Mocquard)

Hyliola bocourti, Mocquard, *Bull. Soc. Philom.*, 1899, p. 341 (Alta Verapaz); Günther, 1901: 263 (Alta Verapaz).

Hyla regilla, Brocchi, 1877*a*: 127, and 1881: 31, Pl. 13, Figs. 2, (Cobán, Alta Verapaz).

Cobán, F.M.N.H. Nos. 20864–67; Finca Samac, No. 90870.

Taylor (1939: 427) tentatively synonymized *Hyla bocourti* Mocquard under *Hyla euphorbiacea* Günther. The re-establishment of the former as a valid species is, at this time, as tentative at was Taylor's procedure. The above specimens agree in many respects with the type description of *bocourti* and with that of Brocchi, who had previously referred Mocquard's type series to *H. regilla*. The problem is complicated by the fact that Brocchi's description and figures are not in agreement, and both differ in several respects from Günther's description of a specimen of the same series.

Between the above specimens and the type series there is agreement on the following: the size of the tympanum (about one-half the diameter of the eye, slightly more in my specimen); the nature of the vomerine teeth (in 2 distinct groups between the choanae); and coloration (a white-edged, dark line from the nostril, through the eye, across the tympanum and backward along the sides, several dark dorsal spots or lines, and the posterior surface of the thighs marbled with light and dark).

In the following features they differ from the several descriptions of the

type series: fingers one-third webbed (free, according to Günther and with a rudimentary membrane according to Brocchi), toes two-thirds webbed (one-half webbed in Brocchi's description and more fully webbed in the figure, and only one-third webbed in Günther), and the tarsal fold well developed in No. 90870, moderate in 3 specimens in the Chicago Natural History Museum, and absent in the other (more or less distinct in Mocquard's series and indistinct, if present, according to Günther).

The discrepancies as to the amount of webbing may be explained by the fact that the webs are deeply incised, although they extend rather well out on the toes. The appearance of the extent of the webbing also varies, depending upon whether the foot is viewed from above or below. The nature of the tarsal fold varies with preservation.

In view of the fact that in important features the above specimens are identical with the type series, and since the differences may be the result of the method of preservation and depend upon the judgment of the describer (and their descriptions indicate considerable differences in opinion), I believe that the application of the name *bocourti* is justifiable. Furthermore, the specimens originated from the same general area as did the type series. It would be far more likely to collect species which Bocourt found to be common than a species which he did not find. If these specimens are true *bocourti,* I believe that the species is much closer to *H. arboricola* Taylor than to *H. euphorbiacea.*

Three of the specimens in the Chicago Natural History Museum were taken beneath leaf sheaths of bananas. My specimen was taken from a bromeliad in late April, 1938, and contained partly formed eggs in its body. In the same clump of bromeliads, *H. bromeliacia* tadpoles were common.

H. bocourti is apparently restricted to the pine belt.

Hyla bromeliacia Schmidt

Hyla bromeliacia, Schmidt, *Zool. Ser. Field Mus. Nat. Hist.,* 20 (1933): 19 (mountains west of San Pedro, Honduras, altitude 4500 feet).

Finca Samac, Nos. 90911 (3), 90912 (2), 90913, and tadpoles Nos. 90914–17; Finca Volcán, remains in stomach of *Bothrops n. aurifer* No. 91081.

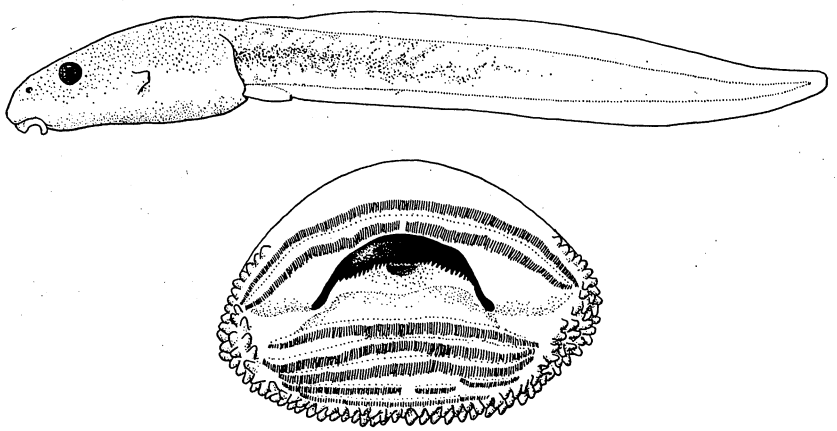
The above specimens check perfectly with a paratype in the Museum of Zoology collections (No. 80917). This species and *H. spinipollex* suggest some faunal similarity between the Sierra de Merendón and the Cuchumatán–Alta Verapaz range, and the Chuacús–Minas–Mico range, since the species are known from all of these east-west ranges, which are isolated one from the other except where they adjoin the Guatemalan plateau, and there *H. bromeliacia* and *H. spinipollex* are unknown.

H. bromeliacia occurs throughout the cloud forest and descends into the pine zone to which it is probably not endemic. It is difficult to believe that

previous collectors who secured such rarities as *O. m. mulleri* and *H. bocourti* could have missed this species in the Cobán region had it occurred there, for its tadpoles are present in almost any bromeliad, and it is equally abundant beneath the leaf sheaths of bananas. I suggest that it is another example of a form which has invaded the pine zone through use of the banana habitat, as I have previously noted (Stuart, 1943*a*: 31).

Schmidt, in the original description, briefly mentioned the tadpoles of this species and I described the eggs (1943*b*: 14). I describe here a series of tadpoles that I secured (Figs. 3 and 4).

Body much depressed, oval in outline, only about two-thirds as deep as broad and less than one-half as deep as long. Body about two-thirds to three-quarters as broad as long. Tail more than twice the body length.



FIGS. 3 and 4. Lateral view and mouth parts of the tadpole of *Hyla bromeliacia*. Series No. 90916, Finca Samac.

Tail heavily muscular proximally and continuous dorsally on the body as 2 heavy muscles which extend forward almost to the level of the eyes. Tail fins narrow proximally, not extending on the body, somewhat deeper distally and surrounding the muscle at the tip. Eyes dorsolateral, directed upward, situated about one-third of the way back on the body. Spiracle sinistral, about two-thirds posteriorly on the body. Anus dextral, enclosed in a heavy fold of tissue. On the belly 2 broad but thin sheaths of muscle extending from the base of the tail forward and expanding considerably on the abdomen, to the level of the eyes. Color in formalin and in life, cream, the body and tail minutely punctated with brown; tail fins almost clear.

Mouth not terminal, directed downward, about one-half as wide as the body. Anterior lip large and fleshy, posterior one thin. Papillary fringe well developed on posterior lip but bordering the anterior lip only laterally. Tooth rows 2/4 or 2/5, the anterior ones subequal and extending almost

to the edge of the mouth; the first 2 interior-posterior rows also subequal but much shorter, and exterior 2 rows decreasing in length. Beaks well developed, enclosed by the tooth rows; the upper broadly arched, about one-half the mouth width; beaks armed with small denticles.

The breeding season of this species apparently extends throughout the year; in April, 1938, I found eggs as well as tadpoles ranging from very small to almost ready to transform. The tadpole cycle is accompanied by few changes. The smallest individual I preserved measured 6.5 mm.; its mouth parts are fully formed. In small specimens the body is somewhat pear-shaped when viewed from above, being broader anteriorly, but the oval outline appears in specimens of about 8 mm. in body length. Other proportions remain about the same throughout the cycle. Leg buds first appear in specimens about 8 mm. in body length and are well developed when the body is 10 mm. long. The largest tadpole I secured measured 12.5 mm. in body length. In this specimen the forelegs are plainly visible through the body wall, and absorption of the tail had begun, since it is not quite twice the body length. This specimen had a very poorly developed accessory row of teeth at the edge of the posterior lip.

Hyla loquax Gaige and Stuart

Hyla loquax, Gaige and Stuart, *Occ. Papers Mus. Zool. Univ. Mich.*, 281 (1934): 1 (La Libertad, El Petén, Guatemala).

Finca Chamá, Nos. 90890 (20), 90891 (21), 90892 (2), 90893 (7), 90894 (38); uncatalogued, 3; eggs, No. 1938–557.

A fine series of this species was secured shortly after the rains broke in mid-May of 1938. It appears to be largely arboreal and is rarely present in the water of ponds. Of its tadpoles I was able to learn nothing. It is unquestionably restricted to the lower Tropical zone.

Hyla picta (Günther)

Hylella picta, Günther, *Biologia Centrali-Americana*, 1901, p. 286, Pl. 73, Fig. C (Jalapa, Mexico).

Finca Chamá, Nos. 90918, 90919 (31), 90920 (16), 90921 (16), 90922 (8).

About 15 per cent of this series of specimens lack vomerine teeth, in the remaining specimens these teeth vary as follows: developed on one side only, about 30 per cent; weakly developed on both sides, about 45 per cent; and strongly developed on both sides, 10 per cent. They are clearly visible only when strongly developed on both sides; in the remainder their presence or absence was determined by the use of a fine probing needle.

In a series (No. 88818) from Vera Cruz, Mexico, the same proportion existed, except that none showed the strong development present in the Alta Verapaz series. Thus, *picta* may be a true *Hyla*.

This species is strictly a corozo belt inhabitant. It breeds early, emerging with *Hyla underwoodi* Boulenger, which it closely resembles in call and behavior. It frequents grass and low plants in shallow pools. I have commented above on the eggs and tadpoles (see *H. baudinii*).

Hyla spinipollex Schmidt

Hyla spinipollex, Schmidt, *Proc. Biol. Soc. Wash.,* 49 (1936): 45 (mountains behind Ceiba, Atlantida, Honduras).

Finca Chichén, No. 90876 (tadpoles), adult (uncatalogued) from stomach of *Thamnophis e. fulvus,* No. 91050; Finca La Primavera, No. 90877 (tadpoles); Finca Los Alpes, Nos. 90873, 90874 (4), and 90875 (tadpoles); Finca Panzamalá, No. 90878 (tadpoles).

It is with some hesitancy that I identify these specimens as *H. spinipollex.* Arthur Loveridge, of the Museum of Comparative Zoology, kindly compared some of the Alta Verapaz specimens with the type of *spinipollex* and reported several differences. He noted that the toe discs are larger in the Alta Verapaz specimens, which have a spotted ventral surface as compared with an immaculate belly in the type, and in my specimens there is a fine, white semicircle around the anal region, which is absent in the type. With only a single specimen from the type locality, and in view of faunal relationship between the mountains of Honduras and Alta Verapaz, it seems best to apply the name *spinipollex* to the Guatemalan material until a larger series is available from both areas.

Schmidt's brief color description may be supplemented with notes from living specimens. The species is olive-brown above, the upper surfaces of the limbs somewhat lighter. The belly white, yellowish orange posteriorly and lightly flecked with black spots. The sides and undersurfaces of the legs are orange-yellow.

The tadpoles of this species are widely distributed throughout the mountain streams (primarily at the base of the cloud forest) of Alta Verapaz. The following is a description of this larva.

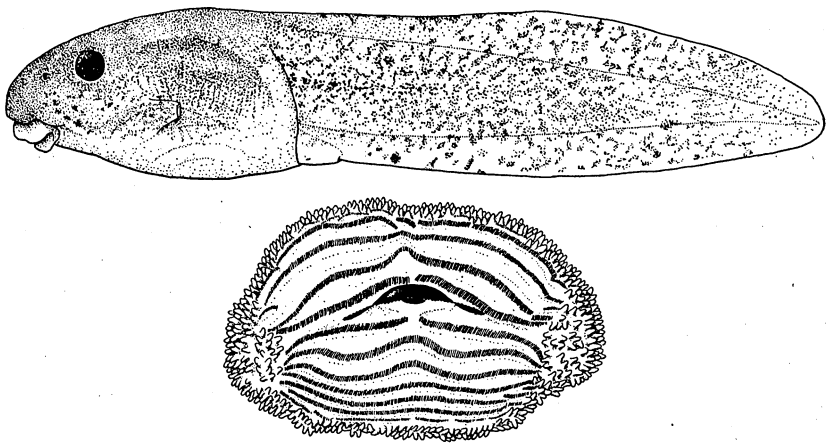
Body robust; deepest just posterior to mid-body; oval in outline when viewed from above. Eyes lateral; about one-third the way back on the body. Nostrils dorsolateral, slightly closer to eye than to tip of snout. Spiracle lateral; about two-thirds the way back on body. Anus dextral. Tail slightly less than to slightly more than twice the body length; slender; less than one-third as deep as long. Greatest depth at about mid-point, where musculature comprises about one-half the depth. Fins narrow, becoming proportionally deeper posteriorly and terminating with the musculature. Dorsal fins barely reaching the body.

Snout projecting slightly over mouth, which is directed downward. Mouth slightly more than one-half as wide as body. Lips fringed with

double row of papillae and a large lateral patch of papillae on either side. Tooth rows typically 4/6 (see discussion below); subequal in length; extending laterally to the papillary patches. Innermost upper and lower tooth rows interrupted medially, others complete. Beaks well developed; upper beak broadly arched; both with numerous, fine serrations on edge.

Body dark brown above; transparent below. Tail musculature light brown; fins transparent and speckled with brown (Figs. 5 and 6).

Except for an increase in the diameter of the eye, bringing its anterior border closer to the tip of the snout, the proportions described above remain about constant in my series of tadpoles from the main mountain mass of the Alta Verapaz. The only significant age variation is in the tooth rows. In 2 specimens with body lengths of 7.3 and 7.8 mm. the tooth formula is 4/6.



FIGS. 5 and 6. Lateral view and mouth parts of the tadpole of *Hyla spinipollex*. Series No. 90876, Finca Chichén.

In specimens larger than these an accessory row of teeth begins to appear between the normal lower, outer tooth row and the edge of the lip. This is present as a broken line of small teeth in varying degrees of completeness, depending on size, and forms a complete row when a body length of 15 mm. is attained. A similar accessory row begins to develop between the upper, outer tooth row and the edge of the upper lip when the body length attains 10 mm. This upper accessory row is, however, never as complete as is the lower accessory row. Limb buds are present first in a specimen of 14 mm. body length, but several specimens of more than 15 mm. have no traces of them. Well-formed hindlegs are present in most of the specimens over 15 mm. in body length. Forelegs still enclosed but well formed are present in my largest specimen, which has a body length of 16.2 mm. From my data it is indicated that the tadpole ceases growth at about that length, and devel-

opment alone continues. The speckling on the tail also increases in intensity with age.

On February 10, 1940, tadpoles 7.3 to 15.4 mm. long were obtained at Finca Los Alpes. A fairly long breeding season is thus indicated.

In a previous paper (1943*b*: 16) I stated that in the Sierra de los Cuchumatanes I collected tadpoles similar to the above. Since then I have studied a series from Finca La Primavera which leads me to believe the Cuchumatán specimens to be mere geographic variants. Both the Cuchumatán and La Primavera specimens are identical with the above individuals in bodily proportions and in the positions of various structures. They do, nevertheless, show variation in the tooth rows. The La Primavera specimens, with the exception of a single specimen, have no trace of the upper accessory tooth row, and the lower accessory tooth row is absent except in 1 individual. Small individuals have a tooth formula of 4/5, plus an accessory lower row (equivalent to row 6 in the Finca Chichén and Finca Los Alpes specimens). The Cuchumatán material normally has 5 well-developed upper tooth rows (the outer being equivalent to the accessory row in the Chichén and Los Alpes specimens). In this same material there are 7 well-developed tooth rows and another accessory row in larger specimens. The normal tooth row formulae may be summed up as follows: Alta Verapaz proper, 4/6; La Primavera, 4/6; Cuchumatanes, 5/7.

The double rows of papillae fringing the lips are reduced in Cuchumatán specimens to a single or, at most, broken double row.

Hyla spinipollex is apparently restricted to the headwaters of mountain brooks above approximately 1000 meters elevation (Los Alpes). To judge by the abundance of tadpoles, it must be fairly common, though adults were secured at only 1 locality. In behavior the species resembles *Plectrohyla quecchi,* remaining wedged between stones in the current and calling from that precarious position. Because of its color and current-inhabiting tendencies it is most difficult to find. A female secured February 16, 1940, was filled with eggs. The spinous patch on the thumb is a male character.

Hyla staufferi Cope

Hyla staufferi, Cope, *Proc. Acad. Nat. Sci. Phila.,* 1865, p. 195 (Orizaba, Mexico).

Finca Cubilguitz, Nos. 90871, 90872 (5), 91379 (2).

The above specimens are identical with El Petén material. The species is widely and apparently sporadically distributed. On the basis of my observations in the Petén (Stuart, 1935: Fig. 1) and in the Salamá basin (Schmidt and Stuart, 1941: 239) this species is an early breeder and should have been taken at Finca Chamá had it occurred there. Since it was secured rather late in the season at Finca Cubilguitz, its breeding season must also be extensive. This species is not a typical ground form. In the Salamá

basin it occupied low bushes, and at Finca Cubilguitz it was in the thatch of huts. Though I found it at 1000 meters in the Salamá basin, it was restricted to the corozo belt in Alta Verapaz.

Hyla underwoodi Boulenger

Hyla underwoodi, Boulenger, *Ann. Mag. Nat. Hist.,* 7, 3 (1899): 277, substitute name for *Hyla microcephala* Boulenger, *Proc. Zool. Soc.,* 1898, p. 481, Pl. 39, Fig. 3 (Bebedero, Costa Rica) preoccupied by *Hyla microcephala,* Cope, *Proc. Amer. Phil. Soc.,* 23 (1886): 281.

Finca Chamá, Nos. 90879 (13), 90880 (4), 90881, 90882 (28), 90883 (12), 90884 (46), 90885 (39), 90886 (20); Finca Cubilguitz, Nos. 90887, 90888 (4); Panzós, No. 90889 (2).

This is another widespread hylid restricted to the corozo belt. The above series differs little from specimens taken in other parts of the extensive range of the species. It is a ground form that breeds early in shallow pools and emerges suddenly in tremendous numbers.

Agalychnis callidryas (Cope)

Hyla callidryas, Cope, *Proc. Acad. Nat. Sci. Phila.,* 14 (1862): 359 (Panamá).

Finca Chamá, Nos. 90933 (6), 90934 (19), 90935 (17), 90936 (15), 90937 (5), 90938 (4), and 90940 (eggs); Finca Samanzana, No. 90939 (tadpoles); Semococh, U.S.N.M. No. 35907.

This entirely arboreal species of the corozo belt, unlike *A. moreletii,* appears to have a very short breeding season, for though tadpoles were present at Finca Samanzana 2 months after the first breeding date, no adults were either seen or heard. This may account for my not having secured it at other lowland localities. At Finca Chamá specimens appeared in great abundance about a week after the rains had set in.

The eggs, like those of *A. moreletii,* are laid in large clusters. They are bright green at one pole and yellowish at the other, with a definite dividing line between the colors at the equator of the egg.

Gaige (1936: 29) has described tadpoles of this species in detail. My 2 are in agreement. They were secured in a muddy pool in the low bush at Finca Samanzana. They measure only 12.5 and 13.7 mm. in body length, and neither has any indication of hind legs. Compared with tadpoles of *A. moreletii* of about comparable size and stage (described below) they lack lateral patches of papillae in the mouth, the upper beak is more strongly arched, and the eye is set farther forward. The most striking difference between the 2 was their color. Tadpoles of *A. moreletii* are purplish brown in life, whereas those of *A. callidryas* are almost white and readily visible in muddy water. They were taken July 24, 1938. No tadpoles at a later stage of development were seen, indicating that development in this lowland form is slower than in the upland *A. moreletii.*

Breder (1946: 418) has figured a tadpole believed to be of this species. Since his is the only *Agalychnis* tadpole described as having a complete papillary border on the upper lip and in which the spiracle is decidedly lateral, there is a possibility that his tadpole is that of some other hylid.

Agalychnis moreletii (Duméril)

Hyla moreletii, Duméril, *Ann. Sci. Nat.,* 3 (19) (1853): 169 (Verapaz); Brocchi, 1877*a*: 122, and 1881: 31, Pl. 13, Fig. 1 (references to type).
Hyla holochlora, Salvin, 1860: 460, Pl. 32, Fig. 2 (Cobán).
Agalychnis moreletii, Boulenger, 1882: 422 (Cobán); Günther, 1901: 289 (Verapaz); Werner, 1903: 351 (Cobán).

Finca Chichén, No. 90929 (5); Finca La Primavera, No. 90928; Finca Samac, Nos. 90930 (2), 90931, 90941 (tadpoles); Senahú, U.S.N.M. No. 35923; Finca Volcán, Nos. 90927, 90932 (2).

Although recorded from the lowlands of adjacent regions, this species replaces the foregoing in the upper Tropical and Subtropical zones in Alta Verapaz. Nowhere was it ever as abundant as was *A. callidryas* at Finca Chamá. In the above series the tarsal fold is sometimes lacking; when present, it varies markedly in development.

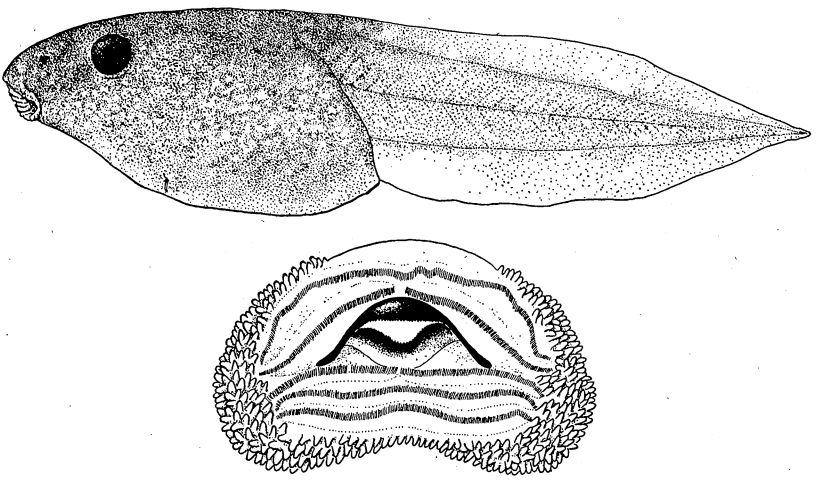
On June 30, 1938, adults, eggs, and tadpoles of this species were collected in a small, water-filled depression at the base of the cloud forest above Finca Samac. Egg masses were attached to the undersides of leaves on bushes overhanging the puddle. These masses resembled bunches of grapes in shape and consisted of about 75 eggs firmly fixed in a gelatinous matrix. Like those of *A. callidryas,* they are bright, pale green at one pole and cream at the other.

In the pool itself were tadpoles ranging in body length from less than 5 mm. to about 25 mm., the maximum size. This suggests an extensive breeding season as well as rapid development, for, although this pool was not visited in the dry season, its very nature precluded any chance of its being permanent. The date on which these well-formed tadpoles were secured was only 1½ months after the first breeding opportunity. The following is a description of the tadpoles of this species.

Body robust; deepest posteriorly and strongly compressed anteriorly; dorsal surface almost plane; oval in outline when viewed from above; slightly broader than greatest depth. Eyes lateral. Nostrils almost terminal, directed upwards. Spiracle ventral and slightly sinistral to the body axis; slightly more than one-half the way posterior on the body. Anus median (?); enclosed in a broad fold formed by a lateral extension of the ventral fin where it fuses to the body. Tail between 1½ and 2 times the body length; about one-half as deep as long; its greatest depth at approximately its mid-point. Fins comprising at least two-thirds of the tail depth at mid-point.

Musculature strongly developed; terminating posteriorly in a point with fins and joining the body abruptly anteriorly. Dorsal fin not extended on body.

Mouth terminal; directed forward; one-third to one-half the body width. Laterally, a patch of papillae arranged in 4 or 5 rows which reduce in number above and below to form a single papillary row bordering the lips. The middle one-half of the upper lip lacking the papillary border. Beaks well developed; upper broadly arched; about one-third the width of the mouth; both with numerous, fine serrations. Tooth rows 2/3; all subequal and extending laterally to the patches of papillae. Outer, upper row forming edge of lip, where papillary fringe is absent. Inner upper and inner lower rows slightly interrupted medially; others complete. All teeth set on heavy folds of skin (Figs. 7 and 8).



FIGS. 7 and 8. Lateral view and mouth parts of the tadpole of *Agalychnis moreletii*. Series No. 90941, Finca Samac.

The above proportions are typical of fully formed tadpoles (body length 15 to 25 mm.). In very small tadpoles the tail is proportionally shorter, the tooth rows, especially the outer lower, are less extensive, and the lateral papillary patches are less well developed. Hind legs are present in specimens more than 20 mm. in body length. The tadpoles, apparently, do not grow much beyond that stage, for specimens with the forelegs hidden, yet well-developed, measure 20 to 25 mm. A specimen 22 mm. in body length forced out its forelegs in a collecting bag shortly after it was removed from the water. In these specimens in which the forelegs are about to break through, the tail length is about proportionate to that described above. Except for the greater development of papillae in *A. moreletii*, the tadpoles seem almost identical with those of *A. dacnicolor* described by Taylor (1942: 40–42, Pl. II, Figs. 2, Pl. III, Fig. 2).

In life the tadpoles are purplish brown, the tail fins clear or darkened slightly midway back. The specimens in which the forelegs broke through assumed the green adult coloration, but, unlike the adults, reverted to purple-brown when preserved.

Plectrohyla quecchi Stuart

Plectrohyla quecchi, Stuart, *Occ. Papers Mus. Zool. Univ. Mich.*, 455 (1941): 1 (Finca Los Alpes, Alta Verapaz, Guatemala).

Finca Chichén, Nos. 89090–91; Finca Los Alpes, Nos. 89086 (holotype), 89087–89.

This recent discovery has been fully discussed in the original description. Since no further material has been forthcoming, the perplexing problem of the allocation of tadpoles described as forms *x* and *z* is still unsettled. For the sake of completeness I list these latter: form *x*, Finca Chichén, No. 90219 (13); form *z*, Finca Chichén, No. 90223 (3); Finca Los Alpes, No. 90224 (4).

This species, *Rana macroglossa*, *Hyla spinipollex*, and *Eleutherodactylus brocchi* constitute the dominant amphibian elements of the mountain streams of Alta Verapaz in the upper Tropical (down to 1000 meters) and Subtropical zones.

Hyla spp.

In the streams of Alta Verapaz I collected tadpoles of 2 hylids which I have been unable to allocate owing to their immaturity. I know of only 1 hylid living in the vicinity of these streams whose tadpole is unknown, namely *Centrolenella fleischmanni*. I have examined very young specimens of the larvae of this form (A.M.N.H. No. 40460), and by no stretch of the imagination could my unallocated tadpoles be conspecific with them.

Specimens of one species, collected in the swift mountain arroyo of Las Palmas at Finca Los Alpes on February 10, 1940, were associated with tadpoles of *Hyla spinipollex* and *Plectrohyla* sp. The 2 specimens are well formed, the largest measuring 29 mm. body-tail length, and the other is slightly smaller. Neither shows any development of even hindleg buds.

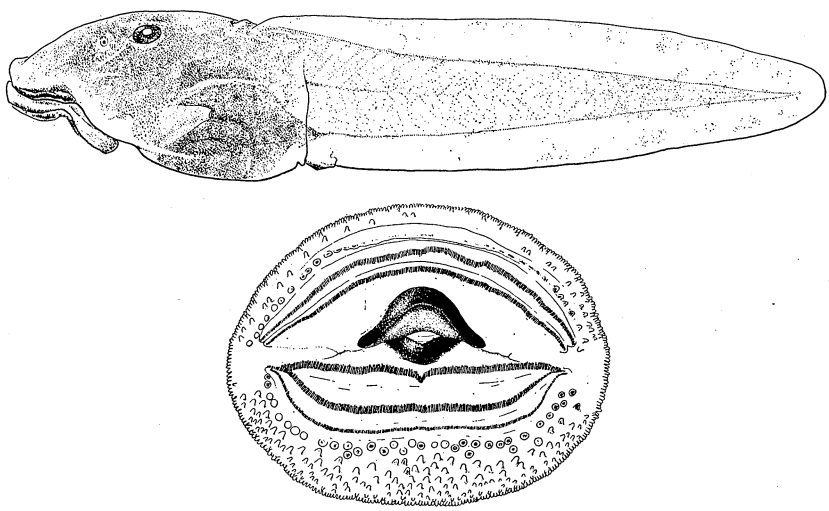
The specimens are of particular interest owing to the tremendous development of the mouth, to form a sucking disc. Moreover, the lips are very broad and set with numerous, large papillae. These characters seem to indicate that the tadpole is specially adapted to life in swift waters, and the adults of so modified a tadpole undoubtedly live within the stream itself or in the vegetation above it.

The specimens are uncatalogued in the Museum of Zoology collections, but their field number is 1938–22. The following is a description of this interesting larva (Figs. 9 and 10).

Body slightly compressed; elongately oval in outline when viewed from

above; broader than deep. Eyes and nostrils directed upward, the eyes more than one-third of the way back on the body and the nostrils set much closer to the eyes than to the tip of the snout. Spiracle sinistral and lateral, two-thirds of the way back on the body. Anus dextral. Tail almost twice as long as body; about one-third as deep as long. Fins comprising two-thirds of the tail depth. Tail musculature surrounded by fin posteriorly at tip. Dorsal fin not extended on the body.

Mouth very large, as broad as head and directed downward. Lips very broad, completely fringed with a single row of papillae. On the broad, flattened surface of the posterior lip are irregularly placed, enlarged papillae; a single row of papillae occupies the narrower anterior lip. No papillary



FIGS. 9 and 10. Lateral view and mouth parts of the tadpole of an unknown hylid showing stream adaptations. Series No. 1940–22.

patches laterally on the lips. Beaks massive; about one-third the width of the mouth and set with small, stout serrations. Tooth rows 2/3, all complete and extending laterally almost to the edges of the mouth.

Color in preservative, light brown above and darker below. The fins are transparent and unpigmented.

The second species of tadpoles was secured in the quieter parts of a stream above Finca La Primavera. The 2 large specimens measure 46 mm. and 51 mm., respectively. That the adults represent a large species is indicated by the fact that the hindleg buds of these tadpoles are undeveloped. Unlike the preceding species, the second form appears to be adapted to less swift streams, for the mouth is small and the fringing papillae of the lips are poorly developed as compared with those of such swift water types as *Hyla spinipollex* or *Plectrohyla* sp.

Body robust, oval when viewed from above; not compressed, though slightly broader than deep. Eyes and nostrils directed dorsolaterally; the former about one-third back on the body and the latter slightly closer to the end of the snout than to the eyes. Spiracle sinistral and lateral, two-thirds back on the body. Anus dextral. Tail 1½ times as long as body, slightly less than one-half as deep as long. Tail musculature extremely well developed and comprising almost one-half of the tail depth at deepest point on tail. Musculature not quite terminal. Dorsal fin not extending on body.

Mouth not quite one-half as wide as body; subterminal and directed downward. Lower lip fringed with a double row of papillae; upper lip similarly fringed only at outer edges. A lateral patch of papillae on either side of the tooth rows. Beaks well developed; upper broadly arched and about one-half as wide as mouth; both set with stout, peglike serrations. Tooth rows 5/4. The 2 outer, anterior rows complete, the inner 3 decreasing in length posteriorly, and all 3 set lateral to beaks; the innermost very short. Inner posterior tooth row broken centrally; others complete. All tooth rows extending laterally beyond beaks to about the same point.

In spirits the body is dark brown, the underlying musculature being somewhat lighter; both are mottled with darker shades. Tail musculature brownish white, mottled with darker brown. Fins transparent and mottled with brown.

In the same stream I collected smaller tadpoles (total length to 20 mm.), which I might have considered a different species were it not for a collection taken from the quiet waters of a brook at Finca Samac in 1938 and which bridge the differences between the former 2 series.

In the entire series ranging from 15 mm. total length to the large specimens described above, the body proportions remain about the same, but the mouth anatomy changes considerably. In specimens of 15 mm. total length, the lower lip is fringed by but a single row of papillae and the tooth rows are 3/4, the inner, anterior row being represented by a mere trace of teeth. In specimens of 20 mm. total length a single row of papillae fringes the lower lip, but there are 4 well-developed anterior tooth rows. The trace of a fifth anterior tooth row is present in a specimen measuring 20 to 22 mm. total length. The formula 5/4 is attained in specimens of 38 mm. total length, and the lower lip is partly fringed with a double row of papillae.

The adults of this species seem to breed throughout the year, for specimens ranging from 15 to 51 mm. total length were secured at Finca La Primavera, June 21–24, 1940, and specimens with a total length of 15 to 38 mm. were taken at Finca Samac on April 19, 1938. None of the above are catalogued in the Museum of Zoology collections, but their field numbers are as follows: Finca Samac, No. 1938–74; Finca La Primavera, No. 1940–777 and 818.

Rana macroglossa Brocchi

Rana macroglossa, Brocchi, *Batrachia, Mission scientifique au Mexique,* 1881, p. 12, Pl. 3, Fig. 1 (Guatemala).

?*Rana palmipes,* Boulenger, 1882: 48 (Lanquín).

?*Rana melanosoma,* Günther, 1900: 203 (in part; Lanquín specimen possibly referable to this species).

?*Rana clamata,* Müller, 1882*a:* 130 (Verapaz).

?*Rana nigriscens,* Müller, 1884: 277 (recorded as *R. clamata,* Müller, 1882: 130).

Finca Chichén, Nos. 90834 (2), 90835, 90836 (2), 90837 (4), 90838 (2), 90839 (4), 90840 (10), 90841 (2), 90842 (3), 90843 (19), 90844; Finca La Primavera, Nos. 90845 (2), 90846 (4); Finca Samac, Nos. 90831 (2), 90832–33.

Schmidt and Stuart (1941: 239–41) in discussing the ranas of the Salamá Basin of Guatemala removed this name from the synonymy of *Rana pipiens* Schreber and presented a complete description of the species. At that time the Salamá specimens were contrasted with those of *R. pipiens,* but the Alta Verapaz series shows definitely that these frogs are much closer to the wide-ranging form, *R. palmipes* Spix.

The differences between *macroglossa* and *palmipes* are slight but constant. The tympanum measures about two-thirds of the diameter of the eye in the former and at least three-fourths in the latter. The dorsolateral glandular folds of *palmipes* are more pronounced, as are the dermal ridges on the legs. In *macroglossa* the upper lip has a dark edge. Above this a rather sharply demarked light streak extends from the nostril to the angle of the jaws. The sides of the head above this streak are very dark. In *palmipes* the sides of the head are much lighter, so that the lighter streak, if present at all, is inconspicuous. The dorsum of *palmipes* is, in preservative, brownish gray with a few scattered dark spots posteriorly. The dorsum of *macroglossa* is generally a much darker reddish or bluish gray, heavily mottled or spotted with darker. The maximum head-body length of adult females in the above series is 80 mm., whereas in *palmipes* females commonly exceed 125 mm.

Rana macroglossa appears to be an upland form of *palmipes,* and I have traced it from Alta Verapaz into Honduras (Copán). In these highland populations there appears to be some variation, since specimens from Salamá have a smaller tympanum and more tubercles than do specimens from Alta Verapaz. The use of the name *macroglossa* is, as previously pointed out (Schmidt and Stuart, 1941), questionable, because the types of both *macroglossa* and *maculata* (Brocchi, 1877: 178) are inadequately described.

Ecologically, the species differs from *palmipes.* It inhabits the upper reaches of mountain brooks down to 1200 meters, whereas *palmipes* is restricted to quiet water of the lowlands. Where the fall of the stream

decreases and pools form, *macroglossa* is replaced by *pipiens*. There is, nevertheless, some overlap with the latter. At Finca Samac the 2 species occurred side by side, but at Finca Chichén a small stream on the cloud forest slopes was inhabited by specimens of *macroglossa;* in the quieter waters through a pasture both *macroglossa* and *pipiens* occurred in equal numbers, and further downstream in even quieter water *pipiens* only was present. I have never taken specimens of *macroglossa* in water holes, in which *pipiens* abounds, and the specimens secured at Salamá on the valley flats (Stuart and Schmidt: 1941) had very probably been washed down from the mountain arroyos by flood water. Günther's record from Lanquín does not seem too unlikely, since, despite its low elevation, streams in the surrounding hills appear to offer an excellent habitat for the species. His record must, however, be considered to be for the coffee belt rather than for the Cahabón savanna.

Rana palmipes Spix

Rana palmipes Spix, *Species novae testudinum (—ranarum . . .) Braziliam*, 1824, p. 29, Pl. 5, Fig. 1 (Amazon River), not seen; Boulenger, 1882: 48, and Günther, 1900: 202 (Verapaz).

Finca Chamá, No. 90847.

An apparently rare species in the corozo belt of Alta Verapaz.

Rana pipiens Schreber

Rana pipiens Schreber, *Der Naturf.* (Halle), 18 (1782): 185, Pl. 4 (North America, probably New York, *fide* Kauffeld, 1936: 11).

Rana halecina, Brocchi, 1881: 10 (Cobán); Boulenger, 1882: 41, and Günther, 1900: 198 (Cobán and Lanquín); Werner, 1903: 351 (Cobán).

Finca Chichén, Nos. 90855, 90856 (2), 90857, 90858 (3), 90859–60, 90861 (3), 90862, 90863 (3), 90864, 90865 (11); Finca Chamá, No. 90853; Finca Panzamalá, No. 90848 (8); La Primavera, Nos. 90867 (4), 90868, 90869 (tadpoles); Finca Samac, Nos. 90849 (5), 90850 (2), 90851 (7), 90852 (2); Finca Samanzana, No. 90854; Finca Volcán, No. 90866 (4).

The name *pipiens* for the Alta Verapaz population of this species is used merely to avoid further confusion in the synonymy.

Aside from a tendency toward a darkening of the throat, the Alta Verapaz population does not seem to differ from populations from adjacent areas, such as El Petén and the Sierra de los Cuchumatanes.

This species was most abundant in water holes and quiet streams in the Tropical zone. Like so many amphibians, it is only sporadically distributed through the Subtropical zone owing to the absence of breeding sites over most of that area. On the lowlands it was extremely rare. I secured tadpoles of small size at Finca La Primavera in late June, 1940.

Hypopachus inguinalis Cope

Hypopachus inguinalis, Cope, 1869: 166 (Verapaz, near the ruins of Cobán); Boulenger, 1882: 160, Günther, 1900: 211, Parker, 1934: 112 (Cobán); Müller, 1884: 275 (Verapaz, recorded as *Engystoma* sp.), 1878*b*: 647, and 1882: 137; Schmidt. 1939: 4.
Engystoma carolinense, Salvin, 1860: 460 (Cobán).
Hypopachus variolosus inguinalis, Cope, 1887: 18 (reference to type).

Finca Chichén, Nos. 90944, 90945 (27); Cobán, Nos. 90943, F.M.N.H. Nos. 20524–25, 20729; Finca Samac, No. 90942; "Guatemala," U.S.N.M. No. 6792 (type—original label lost).

This species seems to be endemic to Alta Verapaz. It was secured only in the pine belt and may prove to be restricted to it. It is not present at lower altitudes, and there are few if any breeding sites for it in the cloud forest. The specimen from Finca Samac was collected in decaying rubbish in a coffee grove.

The species appears with the first rains, but apparently does not breed immediately, since the females are extremely slow in emerging. In the series from Finca Chichén all are males with 1 exception. The same preponderance of males early in the breeding season was noted with respect to *H. championi* Stuart in the Salamá basin (Stuart, 1940*a*: 21). There is considerable sexual difference in size in this species. In the series from Finca Chichén the largest male has a head-body length of 34 mm., whereas the female measures 41 mm.

I am unable to distinguish any differences in the calls of the 4 species of *Hypopachus* (*inguinalis, simus, championi,* and *cuneus nigroreticulatus*) which I have collected in Guatemala.

REPTILIA

TESTUDINATA

Staurotypus triporcatus (Wiegmann)

Terrapene triporcata, Wiegmann, *Isis*, 1828, p. 364 (Río Alvorado, Mexico), not seen.
Staurotypus salvinii, Bocourt, 1870: 22, Pl. 5, Figs. 3 (Verapaz, Guatemala).

Bocourt's record is the only one from Alta Verapaz. With the exception of Günther's questionable record of *Cinosternun cobanum* [= *K. leucostomum*] from Cobán, all aquatic turtles in Alta Verapaz seem to be restricted to the lower Tropical zone.

Dermatemys mawii Gray

Dermatemys mawii, Gray, *Ann. Mag. Nat. Hist.*, 1, 20 (1847): 60 (South America, in error); Stuart, 1937: 70 (Río de la Pasión at San Diego).

Panzós, Nos. 91345–46; Río de la Pasión at San Diego (on El Petén border), Nos. 79129–30.

This distinct Petén element invades Alta Verapaz along the lowland

streams. A Panzós specimen was secured in an oxbow swamp of the Río Polochic, and another is from the river itself. According to the Indians this species is much less common than is *Pseudemys s. ornata.*

Chelydra rossignonii (Bocourt)

Emysaurus rossignonii, Bocourt, *Reptilia, Mission scientifique au Mexique,* 1870, p. 12, Pl. 5, Fig. 2 (Panzós; Mexico).

Panzós, No. 91351.

The above specimen is a juvenile with a carapace length of 45 mm. Bocourt figures a specimen from Panzós, and the type locality may be restricted to that place. I secured it along a trail in the flooded second growth close to the Río Polochic. The species is rare at Panzós.

Kinosternon leucostomum (Duméril)

Cinosternum leucostomum, Duméril and Duméril, *Catalogue méthodique . . . reptiles,* 1851, p. 17 (New Orleans; Mexico; Río Usumacinta; North America; Magdalena Valley, Bogotá, Colombia), restricted to Río Usumacinta, El Petén, Guatemala by Schmidt, *Zool. Ser., Field Mus. Nat. Hist.,* 22 (1941): 488; Bocourt, 1870: 25 (low Verapaz); Boulenger, 1889: 42 (Cobán and Cahabón, Verapaz).

Cinosternum cobanum, Günther, *Biologia Centrali-Americana,* 1885, p. 18, Pl. 18, Fig. B (Cobán and Cahabón, Verapaz).

Finca Chamá, Nos. 89585–91; Panzós, Nos. 89592–89624.

Norman Hartweg informed me that Günther's diagnosis of *cobanum* as possessing an immovable posterior plastral lobe is based on a juvenile characteristic occasionally persistent in adults. Günther's specimens were juveniles. I question the Cobán record.

This species occurs in relative abundance during the rainy season. At Finca Chamá it was secured in shallow water holes and at Panzós was common in flooded second growth. During the dry season it was present in a spring at Panzós.

Neither *K. acutum* Gray nor *K. cruentatum* Duméril were secured at Panzós, though both are abundant in the Petén to the north (Stuart, 1935: 55).

Pseudemys scripta ornata (Gray)

Emys ornata, Gray, *Synopsis reptilium . . . ,* 1831, p. 30 (Mazatlán).
Emys venusta, Duméril and Bocourt, 1870: 13 (Río Polochic).

Panzós, Nos. 91347–49, 91350 (shell).

My colleague, Norman Hartweg, pointed out that there is some question as to the proper allocation of the name *ornata.* Material from the west coast of Mexico certainly differs from Caribbean lowland specimens. If more than 1 Central American population is taxonomically distinguishable the name for the Caribbean material will be *P. scripta venusta* (Gray).

This species is highly prized as food by the Alta Verapaz residents. In Cobán, where the preparation and drinking of incomparable turtle soup is almost ritualistic, a large specimen sells for a dollar. It is becoming rare, primarily because the Indians dig up the eggs. In the environs of Panzós the species has already been almost eliminated, although further down the Río Polochic it is still relatively abundant.

Geoemyda areolata (Duméril and Duméril)

Emys areolata, Duméril and Duméril, *Catalogue méthodique . . . reptiles,* 1851, p. 10 (El Petén, Guatemala).

Finca Canihor, Nos. 91352–53; Panzós, No. 91354 (shell).

This lowland species, common on the Petén savannas (Stuart, 1935: 56), apparently reaches its southern limits in or near the Río Polochic Valley.

CROCODILIA

Crocodylus acutus Cuvier

Crocodilus acutus, Cuvier, *Ann. Mus. Hist. Nat.,* 10 (1807): 55, Pl. 1, Fig. 3, Pl. 2, Fig. 5 (Santo Domingo).

Panzós, Nos. 91343, 91344 (skull).

This species is abundant in the Río Polochic. A commercial license is necessary for hunting crocodiles, but the law is rarely enforced, and local "sportsmen" slaughter considerable numbers of the animals. The lower Río Polochic and its tributaries, especially those of the Zarco (a lake south of the Río Polochic below Panzós) region, seem to show no effects of this sporadic slaughter.

Crocodylus moreletii Duméril

Crocodilus moreletii, Duméril and Duméril, *Catalogue méthodique . . . reptiles,* 1851, p. 28 (Lake Flores Petén, Yucatán); Duméril and Bocourt, 1873: 37, Pl. 8, Fig. 1, Pl. 9, Figs. 2–3 (Río Polochic, Guatemala); Müller, 1878: 640 (Verapaz).

Duméril and Bocourt's record for Alta Verapaz need not be questioned. I saw a number of crocodiles in a small lake just west of Seboquil, but was unable to secure any specimens. Since *C. moreletii* is an inland form as compared with the coastal *acutus,* there is little question that the Seboquil population represents the former.

SAURIA

Phyllodactylus lanei Smith

Phyllodactylus lanei, Smith, *Univ. Kansas Sci. Bull.,* 22 (6) (1935): 125 (Tierra Colorado, Guerrero, Mexico).

Phyllodactylus tuberculosus, Cope, 1887: 28 (Cobán).

I did not find this species at Cobán or elsewhere in Alta Verapaz, but records indicate that it should occur throughout the Tropical zone.

Thecadactylus rapicaudus (Houttuyn)

Gekko rapicauda, Houttuyn, *Verhand. Genoot. Vlissing.* (Middelburg), 1782, p. 322, Pl. 3, Fig. 1 (West Indies).

Thecadactylus rapicaudus, Cope, 1887: 28 (Cobán).

Like *Phyllodactylus tuberculosus* this species is apparently rare in Alta Verapaz.

Sphaerodactylus glaucus Cope

Sphaerodactylus glaucus, Cope, *Proc. Acad. Sci. Phila.,* 17 (1865): 192 (Merida, Yucatán); Boulenger, 1885 (I): 221, Pl. 18, Fig. 3, and Günther, 1893: 82 (Verapaz, low forest).

Cacao, U.S.N.M. No. 38135.

The Río Polochic Valley is apparently the southern limit of this northern Central American species. It is probably restricted to the corozo belt.

Sphaerodactylus lineolatus Lichtenstein

Sphaerodactylus lineolatus, Lichtenstein, *Nomenclator Reptilium et Amphibiorum . . . ,* 1856, p. 6 (Veragua, Panamá); Müller, 1890: 289 (Verapaz, recorded as *S.* sp., 1878*b:* 708).

Cacao, U.S.N.M. No. 38136; Panzós, No. 91148.

This and the preceding species are probably much more widely distributed through the lower Tropical zone of Alta Verapaz than the few records indicate.

Anolis biporcatus (Wiegmann)

Dactyloa biporcatus, Wiegmann, *Herpetologica mexicana,* 1834, p. 47 (Mexico).

Anolis copei, Bocourt, *Reptilia, Mission scientifique au Mexique,* 1873, p. 77, Pl. 15, Fig. 10 (Panzós, Guatemala).

Anolis copii, Boulenger, 1885 (II): 65, and Günther, 1885: 47 (Verapaz low forest and Alta Verapaz).

Anolius copei, Müller, 1878*b:* 633, and 1882*a:* 160 (Verapaz).

Finca Los Alpes, Nos. 91154–55; Finca Chamá, Nos. 91156–57.

In his account of the herpetology of British Honduras, Schmidt (1941: 491) used Wiegmann's name "*biporcatus*" for what has generally been known as Bocourt's "*copei,*" and noted that I suggested the change. Briefly, there are 3 reasons for my suggesting this shift in names. The type of *biporcatus,* according to Wiegmann, has a head-body length of 3¼ inches. Of all the specimens of *biporcatus* I have examined, the largest has a head-body length of 2⅞ inches. Specimens of *copei* (*auct.*) with a length of 4 inches are not uncommon.

Moreover, in comparing the length of the hind leg to the heel with that of the head and body, in *copei* (*auct.*) the leg varies 35 to 40 per cent of the head-body length, whereas in *biporcatus* the variation is 45 to 55 per cent. Roger Conant has examined the type of *biporcatus,* and according to his measurements the leg length of the type comprises 40 per cent of the head-body length.

Finally, Wiegmann's description of the color of *biporcatus,* "virescenti-griseus, fusco maculatus," is far more applicable to the green (in life) of *copei* (*auct.*) than to yellowish or brown *biporcatus.*

Hobart Smith (*in litt.*) suggested that *biporcatus* (*auct.*) may be *petersii* of Bocourt, a large species also common in south Mexico, but Wiegmann's description, "supercilis medio clypeolis polygonis crebis carinatis tecta," eliminates *petersii* from consideration. The latter often shows rugosity of the superciliaries, but never carination.

Because of its arboreal habits and brilliant green color this Tropical zone species is difficult to collect.

Anolis capito Peters

Anolis (*Draconura*) *capito,* Peters, *Monatsbr. Berl. Acad.,* 1863, p. 142 (Costa Rica); Bocourt, 1873: 101, Pl. 16, Fig. 7 (Alta Verapaz, Guatemala).

Anolis capito, Boulenger, 1885 (II): 94, and Günther, 1885: 52 (Verapaz, low forest; lower Verapaz—types of *A. carneus*).

Anolis carneus, Cope, *Proc. Acad. Nat. Sci. Phila.,* 1864, p. 171 (Lower Verapaz forest).

Finca Chamá, No. 91158; Senahú, from stomach of *Imantodes c. leucomelas,* U.S.N.M. No. 35922.

The Finca Chamá specimen was collected at the edge of the virgin forest. Records indicate that it is a lower Tropical zone form.

Anolis cobanensis Stuart

Anolis cobanensis, Stuart, *Occ. Papers Mus. Zool. Univ. Mich.,* 464 (1942): 6 (Finca Samac, Alta Verapaz, Guatemala [type locality]; Finca Chichén, Alta Verapaz).

?*Anolis schiedii,* Bocourt, 1873: 64, Pl. 14, Fig. 19 (Cobán, Alta Verapaz).

Finca Chichén, Nos. 90233–38 (10) (paratypes); Finca Samac No. 90232 (holotype).

This species and *Anolis crassulus haguei* Stuart are the common cloud forest anoles of western Alta Verapaz. Occasional specimens are secured in broadleaf areas near streams in the pine zone.

Anolis cortezi Stuart

Anolis cortezi, Stuart, *Occ. Papers Mus. Zool. Univ. Mich.,* 464 (1942): 8 (Finca Los Alpes, Alta Verapaz, Guatemala).

Finca Los Alpes, No. 90542 (holotype).

This species, known only from the unique type, was secured in the coffee belt at 1000 meters.

Anolis crassulus haguei Stuart

Anolis haguei, Stuart, *Occ. Papers Mus. Zool. Univ. Mich.,* 464 (1942): 3 (Finca Chichén, Alta Verapaz, Guatemala).

Anolis crassulus Boulenger, 1885 (II): 81, and Günther, 1885: 50, Pl. 27, Fig. 7 (Cobán, Guatemala).

Finca Chichén, Nos. 90226 (holotype), 90227–31 (23) (paratypes).

Reduction to subspecific status of this form is based upon its slight differentiation and in anticipation of intergradation with the typical form in El Quiché to the west.

This species is a conspicuous element in the cloud forest in western Alta Verapaz. It is one of the species which, like *Bothrops godmani* (Günther) and *Thamnophis e. fulvus* Cope, barely enters Alta Verapaz from the west.

Anolis humilis uniformis Cope

Anolis uniformis, Cope, *Proc. Amer. Phil. Soc.,* 22 (1885): 392 (Yucatán and Guatemala).
?*Anolius humilis,* Müller, 1878*b*: 633 (Verapaz).
Anolis humilis, Boulenger, 1885 (II): 82, and Günther, 1885: 50 (Verapaz).
Anolis ruthveni, Stuart, 1937: 68 (Ceiba).

Cacao (Treceaguas), from stomach of *Imantodes c. leucomelas,* U.S.N.M. No. 38132. Finca Chamá, Nos. 91226, 91227 (3), 91228–29, 91230 (2), 91231 (2), 91232 (9), 91233 (7); Ceiba, No. 79074; Panzós, No. 91236; Finca Samanzana, Nos. 91234, 91235 (2).

Barbour (1934) suggested the recognition of subspecies in the mainland members of the genus *Anolis.* With this step I heartily concur, since anyone familiar with the genus can readily recognize many relationships not expressed in our classification. In some instances subspecific status may be proved, but in others complete demonstration of intergradation must await further exploration. Certain chains of forms are so obvious that their retention as full species obscures their phylogenetic relationships and unbalances the geographical picture. Such forms in Alta Verapaz are *haguei, rodriquezii, uniformis,* and *bourgeaei.* In the *uniformis* series there is a considerable gap in material through Honduras, but so similar is it to the more southern *humilis* that I do not hesitate to express their relation. That the species is a deep forest form may account for the lack of specimens from poorly explored Honduras.

Gaige, Hartweg, and Stuart (1937: 9) suggested that *quaggulus* may differ slightly from *humilis.* I now suggest the recognition of the *uniformis-quaggulus-humilis* relationship. From the 2 more southern races *uniformis* differs in its much larger ventrals (35 to 45 between forelegs and hindlegs as compared with more than 50 in *humilis* and *quaggulus*) and in the presence of a brilliant purple spot on the dewlap.

A. h. uniformis and *Ameiva f. edwardsii* apparently constitute the best reptilian indices of virgin forest in the corozo belt of Alta Verapaz. The 2 are always present even in very small relict patches of high forest and are apparently wholly unable to adjust themselves to dense second growth.

Females taken in mid-May, 1938, contained well-developed eggs in their bodies.

Anolis lemurinus bourgeaei Bocourt

Anolis bourgeaei, Bocourt, *Reptilia, Mission scientifique au Mexique,* 1873, p. 76, Pl. 15, Fig. 9 (Huatusco, Vera Cruz, and Orizaba).

Anolis biporcatus, Bocourt, 1873: 98, Pl. 15, Fig. 9 (Tucurú, Panzós); Boulenger, 1885 (II): 88, and Günther, 1885: 52 (Lower Verapaz and Río Polochic); Stuart, 1937: 68 (Ceiba); Müller, 1890: 290, and 1878: 633 (Verapaz, recorded as *A.* sp. 1878*b:* 633).

Anolis ustus verae-pacis, Barbour, *Proc. New Eng. Zool. Club,* 12 (1932): 98 (in part; Hacienda Chimoxán, Alta Verapaz, Guatemala).

Finca Los Alpes, Nos. 91168–70; Finca Canihor, Nos. 91178 (5), 91179 (2), 91180 (3), 91181 (6), 91183, 91184 (7); Ceiba, No. 79080; Finca Chamá, Nos. 91159, 91160 (3), 91161 (3), 91162–64, M.C.Z. Nos. 27633–34, 27636; Finca Chimoxán, M.C.Z. Nos. 22327–29, 22331 (paratypes of *A. u. veraepacis*); Finca Cubilguitz, No. 91166; Panzós, Nos. 91171–73; Finca Samanzana, No. 91165; Finca Sepacuité, M.C.Z. Nos. 22308–16; Finca Volcán, Nos. 91167, 91174–75, 91176 (3), 91177 (5).

Schmidt (1941: 491) has shown that *lemurinus bourgeaei* is the proper name for *"biporcatus."* The use of the trinomial needs no explanation to those familiar with *lemurinus* and *bourgeaei.* My data indicate that the main differences between the 2 are: a slightly longer leg in *bourgeaei,* scales between supraorbital semicircles generally 2 in *bourgeaei* and 1 in *lemurinus,* and a red dewlap in *bourgeaei* as compared with a paler dewlap with black flecks in *lemurinus.* The specimens from the Río Polochic and Cahabón Valley intergrade slightly, for some have the dark fleckings on the dewlap and the shorter leg of *lemurinus* while retaining 2 interorbital scales and the brilliant red in the dewlap. Intergradation unquestionably occurs over a wide area, possibly from the lower Río Motagua Valley through northern Honduras.

The relative rarity of the form at Panzós and Finca Chamá and its abundance in the Cahabón Valley indicates that *bourgeaei* is less tolerant to the more humid habitats, and I observed this same condition in the Petén (Stuart, 1935: 41–42). It is especially abundant in open country and completely absent in the virgin forest. As it reaches its upper limits at about 1000 meters, it does not enter the pine belt of the Tropical zone.

Females secured in early May, 1938, had well-developed eggs in their bodies.

Anolis limifrons rodriquezii Bocourt

Anolis rodriquezii, Bocourt, *Mission scientifique au Mexique,* 1873, p. 62, Pl. 13, Fig. 1a (Panzós).

?*Anolius baccatus,* Müller, 1882*a:* 161 (Verapaz).

Finca Los Alpes, Nos. 91185 (3), 91186–87; Finca Canihor, No. 91195; Cobán, M.C.Z. No. 24398; Finca Chejel, No. 91196 (2); Finca Panzamalá,

Nos. 91197–91200, 91201 (2); Panzós, Nos. 91188–90; Finca Volcán, Nos. 91191–92, 91193 (2), 91194 (2).

An examination of material of *limifrons*-like forms (*bransfordii, trochilus,* etc.) from many parts of the range convinces me that we are dealing with a vicarious species. I believe that the above specimens are identical with what has heretofore been known as *aureolus*. This northern race ranges from Honduras to southern Mexico.

This little species is wide-ranging in the drier parts of the Tropical zone and seems to avoid the very wet forest, for it is absent at Finca Chamá, Samanzana, and Cubilguitz. The Sapper specimen recorded from Cobán was, I feel certain, captured elsewhere.

Anolis nannodes Cope

Anolis nannodes, Cope, *Proc. Acad. Nat. Sci. Phila.,* 16 (1864): 173 (Cobán, Verapaz; Arriba, Costa Rica; Jalapa, Mexico. Here restricted to Cobán, Alta Verapaz); Bocourt, 1873: 71, Pl. 15, Fig. 5 (Cobán, Guatemala).

Anolis intermedius, Boulenger, 1885: 78, and Günther, 1885: 49 (Cobán, types of *nannodes*).

Finca Chichén, No. 91207; Finca Panzamalá, No. 91203 (3); Finca Samac, Nos. 91204–6.

In describing *nannodes,* Cope unquestionably confused 3 species. Dunn (1930: 18) has shown the Costa Rican cotype to be conspecific with *A. intermedius* Peters. The Mexican type is now lost, but anyone familiar with Mexican anoles can readily understand how Verapaz *nannodes* or Costa Rican *intermedius* might be confused with the Mexican form currently known as *A. laeviventris* (Wiegmann). Cope's description of the Alta Verapaz specimens in the British Museum is sufficiently detailed to leave little doubt in my mind but that they are of the same species as my material from Alta Verapaz. The name *nannodes* is therefore applied to this population, the British Museum specimens are designated lectotypes, and the type locality is restricted to Cobán, Alta Verapaz.

A rather distinct group of Middle American anoles now becomes distinguishable. Though there are links unknown in Honduras and Nicaragua, *intermedius, nannodes, laeviventris,* and *dunni* are extremely closely allied and *nebuloides* and *nebulosus* are not every different.

Anolis nannodes is an arboreal species. It is known only from a narrow belt at 1200 to 1300 meters at the base of the cloud forest which is probably its normal habitat. Female specimens secured in the month of May contained several well-developed eggs.

Anolis pentaprion Cope

Anolis (Coccoesus) pentaprion, Cope, *Proc. Acad. Nat. Sci. Phila.,* 14 (1862): 178 (Truando River, Colombia).

Anolis pentaprion, Stuart, 1937: 68 (Ceiba).

Ceiba, No. 79081.

As the above specimen agrees well with material from southern Central America, it does not aid in clarifying the relation of *A. pentaprion* to *A. beckeri* Boulenger, which occurs farther north. It is apparently a corozo belt form.

Anolis petersii Bocourt

Anolis petersii, Bocourt, *Mission scientifique au Mexique,* 1873, p. 79, Pl. 13, Fig. 2, Pl. 15, Fig. 11 (Alta Verapaz, Guatemala).

Finca Samac, No. 91202.

The identity of this species has been somewhat uncertain. With an excellent photograph of the type before me, I am certain of the allocation of the single specimen collected. Barbour (1934: 128) suggested that *petersii* may represent a northern race of *copei* (= *biporcatus*), but this is not the case. I know of no anole in lower Central America to which it may be related, and only *A. loveridgei* Schmidt from Honduras need be considered in upper Central America. Specimens from Vera Cruz in the United States National Museum are identical with the Verapaz material.

The above specimen was found dead on a trail and, though partly eaten by ants, it is readily identifiable. I believe it to be restricted to the pine forest on the Meseta de Cobán.

Anolis sericeus Hallowell

Anolis sericeus, Hallowell, *Proc. Acad. Nat. Sci. Phila.,* 8 (1856): 227 (Jalapa, Vera Cruz, Mexico).

Anolis sallaei, Boulenger, 1885: 79, and Günther, 1885: 49, Pl. 27, Fig. B (Lower Verapaz).

Anolis ustus verae-pacis, Barbour, *Proc. New Eng. Zool. Club,* 12 (1932): 98 (in part; paratypes from Chimoxán and Sepacuité, Alta Verapaz).

Finca Chamá, Nos. 91209 (2), 91210 (5), 91211–12, 91213 (3), 91214 (4), 91215 (5), 91216 (2), 91217, 91218 (3), 91219 (2), 91220 (4), 91221–22; Finca Chimoxán, M.C.Z. Nos. 32325, 32330 (paratypes of *A. u. veraepacis*); Finca Cubilguitz, No. 91223, Panzós, Nos. 91224–25; Finca Sepacuité, M.C.Z. No. 22306; Finca Volcán, No. 91208 (2).

As noted by Schmidt (1941: 493), the holotype and several of the paratypes of *A. u. veraepacis* Barbour are referable to *A. l. bourgaei* and the remaining paratypes to *A. sericeus.*

Anolis sericeus is widespread throughout the more humid parts of the Tropical zone up to 800–1000 meters, with the exception of the pine belt. It is not present in the virgin forest, but appears in the second growth. It is most frequently on the branches of low bushes along the trails.

Basiliscus vittatus Wiegmann

Basiliscus vittatus, Wiegmann, *Isis,* 1828, p. 373 (Mexico) not seen; Günther, 1885: 55, Pl. 28, and Boulenger, 1885: 109 (low forest of Verapaz, Lanquín).
Corythaeolus vittatus, Müller, 1878*b:* 632 (Verapaz).

Finca Los Alpes, Nos. 91367–68; Finca Canihor, Nos. 91372, 91373 (6); Finca Chamá, Nos. 91358 (5), 91359 (3), 91360 (3), 91361 (3), 91362, M.C.Z. Nos. 28104–5; Finca Chejel, No. 91374 (2); Finca Chimoxán, M.C.Z. No. 28106; Finca Cubilguitz, No. 91364 (2); Finca Panzamalá, Nos. 91355–57; Panzós, No. 91369 (4), 91370, 91366; Finca Los Pinales, No. 91365 (3); Finca La Primavera, Nos. 91375–76, M.C.Z. No. 28103; Finca Samanzana, Nos. 91363, 91378; Finca Volcán, Nos. 91371, 91377.

This, the most widely distributed and abundant of the Tropical zone lizards, ranges to about 1000 meters.

Laemanctus deborrei Boulenger

Laemanctus deborrei, Boulenger, *Bull. Soc. Zool. France,* 1877, p. 460, Pl. 7, Fig. 1 (Tabasco); Müller, 1890: 290 (recorded as *L. longipes,* Müller, 1882*a:* 160).
Laemanctus longipes, Müller, 1882*a:* 160 (Verapaz).
Laemanctus deborrii, Boulenger, 1885: 106, and Günther, 1885: 54 (Verapaz, Cobán); Werner, 1904: 344 (''Chiacany,'' Cobán).

Panzós, No. 91153.

This species is apparently widely distributed throughout the Alta Verapaz with the exception of the cloud forest. The specimen was sunning on a broad leaf in dense second growth. Its brilliant green concealed it admirably, and my Indian helper had to touch it with a stick before I could discern it. Preserved, it is purple above and lighter below.

Corythophanes cristatus (Merrem)

Agama cristatus, Merrem, *Versuch eines Systems der Amphibien,* 1820, p. 50 (Ceylon, in error).
Corythophanes cristatus, Boulenger, 1885: 101, and Günther, 1885: 53 (Verapaz, low forests); Cope, 1877: 33 (Verapaz).
?Corythophanes mexicanus, Müller, 1882*a:* 160 (Verapaz).

Finca Volcán, No. 91152 (2).

This species is apparently restricted to the humid lowlands in the Alta Verapaz. My specimens were secured in the gorge of the Río Chiacté (just west of Finca Volcán), which, though a tributary of the dry Cahabón Valley, is humid.

Corythophanes percarinatus Duméril

Corythophanes percarinatus, Duméril, *Description des reptiles,* 1856, p. 518, Pl. 20, Figs. 3 (Escuintla, probably Chiapas, Mexico); Bocourt, 1874: 120, Pl. 17, Fig. 2 (Cobán, Alta Verapaz); Boulenger, 1885: 102, and Günther, 1885: 53 (Lanquín, Verapaz); Werner, 1903: 343 (''Chiacany,'' Cobán).

Finca Chichén, No. 91151; Finca Samac, Nos. 91149–50.

Occurring only in the pine and pine-savanna lands of the Tropical zone of Alta Verapaz, specimens of *C. percarinatus* frequent open habitats and at Finca Samac are not uncommon in the cane fields. Females taken in mid-April, 1938, and mid-May, 1940, had fully formed eggs in their bodies.

Iguana iguana rhinolopha Wiegmann

Iguana rhinolopus, Wiegmann, *Herpetologica mexicana,* 1834, p. 44 (Mexico).

Panzós, Nos. 91338–42.

This widespread Central American form is relatively abundant on the Río Polochic lowlands, but, strangely enough, along water courses on the northern lowlands of Alta Verapaz it is extremely rare. Carl Hubbs informed me that the species is common along the Río de la Pasión in El Petén. At Finca Cubilguitz it was reported as formerly abundant along the Río Icvolai.

At Panzós a small population of iguanas inhabited a group of palms at the edge of the town. Along the Río Polochic this form was abundant beyond the region affected by the settlement at Panzós. Extensive use of the species as a food has apparently greatly reduced the populations of *Iguana* in many areas.

Sceloporus serrifer plioporus Smith

Sceloporus serrifer plioporus, Smith, *Zool. Ser. Field Mus. Nat. Hist.,* 26 (445), (1939): 212 (Encero, Vera Cruz), other specimens from Finca La Primavera, Alta Verapaz.

Finca La Primavera, Nos. 91251 (2), 91252 (6), 91253, 91254 (3), 91255, M.C.Z. Nos. 28153–59.

With both *S. v. olloporus* and *Cnemidophorus s. motaguae* abundant in the Río Negro gorge, I had also expected to find their associate, *S. lunaei.* It was a considerable surprise to find *serrifer plioporus.* The next record farther north for this species is for Zotz, in El Petén. The presence of this isolated colony in the arid gorge of the Río Negro is an enigma. Certainly, it does not occur farther north along the Río Negro (at Finca Chamá) nor on the humid lowlands (Fincas Cubilguitz and Samanzana), and entrance from the east is similarly impossible. Its presence in the area may account for the absence of *S. lunaei* of the interior desert basins, with which it would compete.

Sceloporus malachiticus taeniocnemis Cope

Sceloporus taeniocnemis, Cope, *Proc. Amer. Phil. Soc.,* 22 (1885): 399 (Guatemala).
Tropidolepis formosus, Duméril and Duméril, 1851: 77 (Alta Verapaz).
Sceloporus formosus, Werner, 1903: 344 (Campur, Cobán); var. B, Bocourt, 1874: 184 (Alta Verapaz).
Sceloporus acanthinus, Müller, 1878*b*: 634 (Verapaz).

Sceloporus lunaei, Günther, 1900: 67 (Cobán).
Sceloporus formosus smaragdinus, Smith, 1939: 41 (Cobán).
Sceloporus malachiticus taeniocnemis, Smith, 1942*d:* 356 ("Cobán area").

Finca Chichén, Nos. 91245 (4), 91246, 91247 (2), 91248, 91249 (2), 91250; Cobán, Nos. 91237, F.M.N.H. Nos. 21003, 20533; Finca Samac, Nos. 91238 (3), 91239 (4), 91240–41, 91242 (4), 91243 (16), 91244 (5).

This is the most abundant saurian of the pine belt. It also occurs sparingly in cleared areas in the cloud forest. The species is definitely scansorial and is abundant around buildings.

Juveniles were taken at Finca Chichén in mid-May, 1940.

Sceloporus teapensis Günther

Sceloporus teapensis, Günther, *Biologia Centrali-Americana,* 1890, p. 75 (Teapa, Tabasco); Smith, 1939: 256 (Sepacuité, Secanquim, Chicmoxán, Cobán).
Sceloporus variabilis, Bocourt, 1874: 200, Pl. 18 *bis,* Fig. 1, Pl. 19, Fig. 2 (Río Polochic); Werner, 1904: 344 (Campur); Müller, 1878*b:* 634 (Verapaz).

Finca Los Alpes, Nos. 91263 (3), 91264 (5); Finca Canihor, Nos. 91271, 91272 (2), 91273 (6), 91274 (2), 91275 (5); Finca Chimoxán, M.C.Z. Nos. 28188–92; Cobán, Nos. 91276 (2), F.M.N.H. No. 21004; Finca Panzamalá, Nos. 91277 (3), 91278 (6), 91279, 91280 (5), 91281 (5); Panzós, Nos. 91265 (14), 91266 (6), 91267 (16), 91285, 91286 (8); Finca Los Pinales, Nos. 91282 (12), 91283 (4); Finca Secanquim, M.C.Z. Nos. 28165–75; Finca Volcán, Nos. 91268 (6), 91269 (3), 91270 (20), 91284.

This species, a Petén element, has entered the Alta Verapaz by way of the Yzabal embayment. It has traveled up the valleys of the Ríos Polochic and Cahabón and is widespread in these areas to the base of the cloud forest. Cobán is definitely at its upper limit, and I found there only a very isolated colony. It is absent from both Finca Samac and Finca Chichén. This form is strictly an open country type; it was not present in the virgin forest at Panzós.

Freshly hatched young were secured at Finca Los Pinales in late August, 1938.

Sceloporus variabilis olloporus Smith

Sceloporus variabilis olloporus, Smith, *Occ. Papers Mus. Zool. Univ. Mich.,* 358 (1937): 11 (San Juanillo, Costa Rica); Smith, 1939: 282 (La Primavera).
Sceloporus variabilis, Bocourt, 1874: 200 (in part), Pl. 18 *bis,* Figs. 1, and Pl. 19, Fig. 2 (near the Río Negro, Guatemala).

Finca La Primavera, Nos. 91256 (11), 91257 (7), 91258 (9), 91259 (5), 91260 (4), 91261 (5), 91262 (4), M.C.Z. Nos. 28180–87.

The occurrence of *Sceloporus v. olloporus* at Finca La Primavera brings out the similarity of the faunas of the Río Negro gorge and of the interior desert basins. Through such valleys as those of the Ríos Salamá, and

Cubulco, the 2 regions are continuous. This species does not inhabit the sides of the gorge above 1200 meters and is thus effectively isolated from the Verapaz proper. Smith's queried allocation (1939: 283) of Bocourt's Río Polochic record to this species is evidently erroneous. Bocourt unquestionably had *S. teapensis*.

Freshly hatched juveniles were taken late in June, 1940.

Lepidophyma flavomaculatum flavomaculatum Duméril and Duméril

Lepidophyma flavomaculatum, Duméril and Duméril, *Catalogue methodique . . . reptiles*, 1851, p. 137 (El Petén); Stuart, 1937: 69 (Río Pasión near the Petén–Alta Verapaz border).

Lepidophyma sp., Müller, 1878*b*: 706 (Verapaz).

Finca Volcán, Nos. 91145–47; Río Pasión near the Petén–Alta Verapaz border, No. 79072.

This lizard is held in much respect by the Indians, who know it under the name of *"reina de culebra."* It was not uncommon in the coffee groves, along trails, and around the outbuildings at Finca Volcán. It is probably widespread through the Tropical zone with the exception of the pine belt.

A female secured March 29, 1940, contained 6 eggs.

Mabuya mabouya mabouya (Lacépède)

Lacertes mabouya, Lacépède, Histoire naturelle des quadrupèdes ovipares et des serpens, 2 (1788): 378, Pl. 24 (in part; Antilles and Sardinia, restricted to the lesser Antilles, Dunn, *Proc. Acad. Nat. Sci. Phila.*, 87, 1935 [1936]: 544).

Panzós, No. 91144.

My specimen came from a tree on the banks of the Río Polochic. It is probably a lower Tropical zone species, though it may well invade the coffee belt.

Eumeces sumichrasti (Cope)

Plistodon sumichrasti, Cope, *Proc. Acad. Nat. Sci. Phila.*, 18 (1866): 321 (Orizaba).

Finca Chamá, No. 91140.

This form is known from Honduras from specimens described as *E. schmidti* by Dunn and Emlen (1932: 30). This specimen is the first to bridge the gap between southern Mexico and Honduras. I concur with Taylor (1935: 185) in considering this species as a corozo belt form.

Many of these little skinks were observed, but they are so agile that only a single half-grown specimen was secured. The species is most frequently observed in the grass at the edge of second growth along the trails.

Lygosoma cherriei cherriei (Cope)

Mocoa cherriei, Cope, *Proc. Amer. Phil. Soc.*, 31 (142), (1893): 340 (Palmar, Costa Rica).
Mocoa lateralis, Müller, 1878*b*: 628 (Verapaz).

Lygosoma assata, Müller, 1882*b*: 172 (Verapaz).
Lygosoma (Mocoa) assata, Bocourt, 1881: 450, Pl. 22, Fig. 7 (Alta Verapaz).
Lygosoma assatum brevis, Werner, *Abh. bayer. Akad. Wiss.,* 22 (1903): 345 (Cobán).

Cobán, F.M.N.H. No. 21005; Finca Los Alpes, from stomach of *Scaphiodontophis a. annulatus,* No. 91071; Finca Samac, No. 91141; Finca Volcán, Nos. 91142 (2), 91143 (2).

The above specimens were on the ground in rubbish in coffee groves. The specimens, like those of *L. c. stuarti* Smith, have blue tails, but have fewer dorsal scales. Smith (1946*b*: 110–11) identified these 2 races as subspecies of *cherriei.*

Lygosoma incertum Stuart

Lygosoma incertum, Stuart, *Occ. Papers Mus. Zool. Univ. Mich.,* 421 (1940): 10 (Volcán Tajumulco, Guatemala, at 5500 feet), paratype from Finca Samac, Alta Verapaz.

Finca Samac, F.M.N.H. No. 20728 (paratype).

I have collected no further specimens of this species in the Alta Verapaz. It is apparently restricted to the pine belt in Alta Verapaz.

Ameiva chaitzami Stuart

Ameiva chaitzami, Stuart, *Proc. Biol. Soc. Wash.,* 55 (1942): 143 (Finca Canihor, Alta Verapaz, Guatemala).

Finca Canihor, Nos. 90638[3] (holotype), 90639–43 (paratypes).

No further data have been forthcoming on this species, which is endemic in the lower Cahabón Valley. The species frequents the second growth and appears to occupy about the same niche as *A. u. hartwegi.*

Ameiva festiva edwardsii Bocourt

Ameiva edwardsii, Bocourt, *Ann. Sci. Nat., Zool. Ser.,* 5, 17 (1873): 2 (eastern Guatemala, Yzabal, and Panzós).
Ameiva festiva, Günther, 1885: 24, and Boulenger, 1885: 347 (Verapaz, low forests).
Ameiva festivus, Bocourt, 1874: 260, Pls. 20, Fig. 2; 20A, Fig. 10; 20D, Fig. 6 (types of *edwardsii*); Müller, 1882*a*: 157 (Verapaz).

Finca Chamá, Nos. 91319, 91320 (2), 91321 (2), 91322 (2), 91323 (3), 91324 (2), 91325 (2), 91326 (4), 91327, 91328 (3), 91329 (3), 91330, 91331 (11), 91332, M.C.Z. Nos. 28452–64; Finca Cubilguitz, Nos. 91334, 91335 (2), 91336 (2); Panzós, No. 91337; Finca Samanzana, No. 91333 (4); Finca Sepacuité, M.C.Z. No. 27511.

This form, as I have previously noted, is an index species of virgin forest in the Tropical zone.

[3] Through an error the number of the holotype was given as 90368 in the original description.

Ameiva undulata hartwegi Smith

Ameiva undulata hartwegi, Smith, *Proc. Biol. Soc. Wash.,* 53 (1940): 55 (Chiapas, Mexico, across Río Usumacinta from Piedras Negras, Guatemala).
Cnemidophorus undulata, Slevin, 1860: 454 (Cobán, Lanquín).
Ameiva undulata, Günther, 1885: 23 (Cobán, Lanquín).

Cacao, U.S.N.M. No. 36618; Finca Canihor, Nos. 91305 (21), 91306 (3), 91307 (4), 91308; Finca La Primavera, Nos. 91309 (5), 91310 (2), 91311 (2), 91312 (4), 91313 (6), 91314, 91315 (2), M.C.Z. No. 28451; Finca Los Alpes, Nos. 91296 (3), 91297, 91298 (12), 91299; Panzós, Nos. 91300 (9), 91301 (8), 91302 (3), 91303 (2), 91317 (2), 91318; Finca Los Pinales, No. 91316 (2); Semococh, U.S.N.M. No. 35904; Finca Sepacuité, M.C.Z. No. 27521–40; Finca Volcán, No. 91304 (4).

The above specimens are not quite typical *hartwegi,* and some slightly approach *pulchra.*

The specimens from La Primavera present a problem. The species is unknown on the northern lowlands of Alta Verapaz and could not have entered the Río Negro gorge recently from the east, since it does not cross the highlands of the Cobán region (I reject the British Museum record). The gorge population may be connected with the interior basin fauna (such as *Sceloporus v. olloporus* and *Cnemidophorus s. motaguae*) or may be a relict colony derived from the north (see *Sceloporus s. plioporus* and *Adelphicos q. visoninus*). Although the Río Negro gorge is not a part of the Alta Verapaz faunal area, its proximity to the area and its peculiar faunal elements may eventually lead to the solution of the problem of the impoverished fauna of the northern lowlands of Alta Verapaz.

This is an open country form, abundant in the second growth and absent from heavy forest. It is restricted to the Tropical zone, rarely ascending above 1000 meters.

Cnemidophorus sackii motaguae Sackett

Cnemidophorus motaguae, Sackett, *Not. Natur. Acad. Nat. Sci. Phila.,* 77 (1941): 1, Figs. 1–3 (Motagua River Valley, about 10 kilometers northeast of Zacapa, Department of Zacapa, Guatemala).
Cnemidophorus communis, Cope, *Proc. Amer. Phil. Soc.,* 17 (1877): 95 (in part; many specimens from various localities in Mexico and Guatemala, some labeled Guatemala, others Cobán, Guatemala; this name and the following one had best be restricted to a Mexican population); Cope, 1887: 44 (Cobán).
Cnemidophorus communis copei, Gadow, *Proc. Zool. Soc. London,* 1906 (I): 346, Fig. 78 A, C, E, (in part; specimens from many Mexican localities and those referred to *communis* by Cope as of Cobán not seen by Gadow).

Finca La Primavera, No. 91380 (6).

The use of the name *s. motaguae* for the population in the Río Negro gorge is arbitrary. *C. sackii* breaks up into numerous races, but a choice

of name for this particular population will be provisional until the ranges of the various races are properly defined and the nomenclatorial confusion is untangled.

It is evident that *sackii* shows definite geographic variation in numerous characters, which, when properly studied and plotted, should serve to define the various races. The postantebrachials show latitudinal trends (Schmidt and Stuart, 1941: 245); femoral pores have similar variation (Burt, 1931: 112); and the number of scutes around the body (Sackett, 1941: 2), the dorsal pattern, and the ventral pattern of adults are all promising characters to study. The pattern characters must be used with care, since they show ontogenetic change in many instances (such as stripes in young and irregular spotting in large adults) and may change seasonally. With regard to these problems it should be pointed out that the types of *motaguae*, definitely striped with spots between the stripes, do not exceed 110 mm. in head-body length. In a series of specimens from Sacapulas, Guatemala, to the west of Finca La Primavera, this same pattern prevails in specimens of 100 mm. in head-body length; in larger specimens the stripes disappear to leave a spotted pattern such as was described by Schmidt and Stuart (1941: 244–45) in Salamá basin material. Inasmuch as the latter populations contain specimens to 140 mm. in length, Sackett's types were by no means full grown.

The ventral coloration is also variable. Some adult specimens from various localities have dark chests, others dark bellies, and in still others the entire undersurface is heavily pigmented. In a series of adults from a single locality there may be considerable variation in the intensity of the pigmentation of the undersurfaces. In general, juveniles and half-grown specimens are never as dark as are adults. This suggests first, an ontogenetic increase in ventral pigmentation and, second, a possible seasonal variation in adults. A certain amount of ventral darkening is associated with sexual activity in various lizards. The types of *motaguae* are not particularly darkened ventrally, whereas specimens of what is probably the same race from the Salamá basin are very dark; the former were collected in mid-March, well before the start of the breeding season, and the latter were taken in July at the height of breeding activities.

The pattern of very large males in the Río Motagua Valley population is unknown, but to judge from Sackett's figures it would seem that the end condition would be a sparsely spotted dorsum. This, as well as all morphological characters, agrees with the pattern of the interior basin population.

A strikingly similar population of *sackii* occurs in the interior valley of Chiapas (examined through the courtesy of N. E. Hartweg). This population is more heavily spotted dorsally and may represent still another race. Until further material is forthcoming from the Motagua Valley it seems best

to utilize the name *motaguae* for the Alta Verapaz specimens. It is interesting to note that this race has little or nothing in common with the Yucatán and El Petén race to the north (*angusticeps* Cope).

C. s. motaguae is not an inhabitant of the Alta Verapaz biotic region, but like *Sceloporus v. olloporus* has traversed the Río Negro gorge from the interior desert basins to the south. At Finca La Primavera I found it only in the lower savanna-covered sections of the gorge below 950 meters. It apparently does not invade the oak-pine zone. This is the only species of *Cnemidophorus* in the Alta Verapaz. It is strange that *Cnemidophorus d. cozumelae*, common in the Petén forest to the north, was not secured on the northern or eastern lowlands where conditions similar to those of the Petén prevail.

Gerrhonotus auritus Cope

Gerrhonotus auritus, Cope, *Proc. Acad. Nat. Sci. Phila.*, 20 (1868): 306 (forests of Verapaz); Cope, 1887: 41 (reference to type).

Gerrhonotus (*Abronia*) *auritus*, (*non* Cope), Bocourt, 1878: 337, Pl. 21, Fig. 2, Pl. 21A, Fig. 7 (pine forests of Alta Verapaz).

Gerrhonotus fimbriatus, Cope, *Proc. Amer. Phil. Soc.*, 22 (1885): 171 (type = Bocourt's *auritus*, see above).

Verapaz, U.S.N.M. No. 6769 (type).

As I collected only *G. m. moreleti* in Alta Verapaz, I know the above from the type alone. My colleague, N. E. Hartweg, suggested to me that *auritus* and *fimbriatus* are synonymous. This seems reasonable considering the confusion which the 2 caused in early literature. Records indicate that the species is a pine belt form.

Gerrhonotus moreleti moreleti Bocourt

Gerrhonotus moreleti, Bocourt, *Nouv. arch. mus. hist. nat. bull.*, 7 (1871): 102 (Petén and pine forest of Alta Verapaz, Guatemala), and 1878: 349, Pl. 21, Fig. 1 and Pl. 21B, Fig. 5 (reference to types); O'Shaughnessy, 1873: 48; Boulenger, 1885: 278, and Günther, 1885: 41, Pl. 24, Fig. c (Lanquin, Verapaz); Müller, 1882*a*: 157 (Alta Verapaz).

Gerrhonotus wiegmanni, Salvin, 1860: 454 (Lanquín, Verapaz).

?*Gerrhonotus fulvus*, Müller, 1882*a*: 157 (Alta Verapaz).

Finca Chichén, Nos. 91287 (2), 91289 (4), 91290 (5), 91291 (3), 91292 (2), 91293 (8), 91294, 91295 (27).

K. P. Schmidt has furnished me with the above name. He regards this form as very closely allied to *G. m. fulvus* of the Guatemalan plateau.

The British Museum's Lanquín record does not bear out my own observation on the habitat of this form. I found it almost entirely restricted to clearings in the cloud forest above Finca Chichén, a habitat remarkably like the high meadows of the Subtropical zone in the Sierra de los Cuchumatanes, where *C. m. fulvus* was observed (Stuart, 1943*b*: 20). Occasionally, a strag-

gler was secured in the pine zone at the base of the cloud forest, but it was certainly not a conspicuous pine forest element, and I never observed it in the dry Cahabón Valley just east of Lanquín. Inasmuch as it has been recorded from the Petén, for the present it must be considered a widespread form.

This ovoviviparous lizard bears its young about mid-May, when the heavy rains begin. Newly born juveniles were found first on May 21, 1940, and the same day a female with 9 fully formed young in her body was taken. These still retained an external yolk sac.

Celestus enneagrammus (Cope)

Siderolamprus enneagrammus, Cope, *Proc. Acad. Nat. Sci. Phila.*, 1860, p. 368 (Jalapa, Veracruz).

Diploglossus steindachneri, Günther, 1885: 34, Pl. 22, Fig. A (Verapaz, low forest); Boulenger 1885: 293 (Verapaz, low forest).

I have never collected this species, but there is no reason for questioning the identity of the Verapaz specimens in the British Museum (Natural History). It is very probably restricted to the corozo belt.

Xenosaurus rackhami Stuart

Xenosaurus rackhami, Stuart, *Proc. Biol. Soc. Wash.*, 54 (1941): 47 (Finca Volcán, Alta Verapaz, Guatemala).

Finca Volcán, No. 89072 (holotype).

This specimen was secured near the base of the cloud forest. I believe that the species is an inhabitant of the Subtropical zone. I take this opportunity to call attention to an error in the original description. Under the diagnosis, "possessing smaller gular scales" should read "possessing larger gular scales." Hobart Smith informed me that he secured a specimen of this species at Comitán, Chiapas, Mexico.

SERPENTES

Leptotyphlops phenops phenops (Cope)

Stenostoma phenops, Cope, *Journ. Acad. Nat. Sci. Phila.*, 27 (1875): 128 (Tehuantepec and Cobán), and 1887: 63 (reference to paratype from Cobán).

Cobán, U.S.N.M. No. 6760 (paratype).

Miss Doris Cochran sent me the following essential data on the above paratype: scales around body, 14; scales, head to anus, 246; scales, anus to tip of tail, 14; body length/body diameter, 57; body length/tail length, 22. Records indicate that this species is extremely tolerant. It may occur throughout Alta Verapaz.

Typhlops tenuis Salvin

Typhlops tenuis, Salvin, *Proc. Zool. Soc.*, 1860, p. 454 (Cobán, Guatemala); Günther, 1893: 86, and Boulenger, 1893: 28 (Cobán, type); Werner, 1903: 345 (Cobán).

Cobán, No. 89085; Finca Volcán, No. 89084.

Taylor (1940) has indicated that a confusing situation exists in the allocation of 4 specific names applied to the Middle American *Typhlops* with 18 scale rows. These forms are *T. tenuis* Salvin, *T. basimaculatus* Cope, *T. perditus* Peters, and *T. praelongus* Müller. Although retaining Cope's name for the Mexican population, Taylor suggested close relationship between these forms and the Guatemalan *tenuis*. Though I cannot settle this question, the specimens before me throw some light on the problem.

Unless one is to consider Bocourt's specimens (Duméril, Bocourt, and Mocquard, 1883: 449, Pls. XXIX and XXX, Fig. 3) from Guatemala as representatives of *tenuis* and not of *T. reticulatus* (to which he referred them), *T. tenuis* has not been collected from Guatemala since its original description. I have a juvenile specimen in good condition from Cobán, the type locality of *tenuis*, presented to me by the late William Bird of that city, and an adult from Finca Volcán in a rather poor state of preservation. These 2 specimens agree with Salvin's description of *tenuis*, though the latter was described as having 17 rows of body scales, probably an error for 18. In other features of scutellation they seem identical with all 4 descriptions, and both Taylor's and Bocourt's illustrations (1883: Pl. XXIX, Fig. 3, and Pl. XXX, Fig. 3) might well have been drawn from the specimens before me. The absence of any trace of the eye, by which *praelongus* was diagnosed, very probably refers to eye pigmentation, which might well be the result of poor preservation. The main differences in the 4 descriptions lie in the dorsal pattern. In all 4 species the dorsal color was described either as solid brown or as each scale with a brown center and lighter border, as in my specimens. Taylor's specimens are described as possessing a pattern of larger dark spots with intervening reticulations. Aside from these variations all known specimens of the 4 species appear identical.

My specimens agree with the details of cephalic scutellation figured by Taylor and both have 18 rows of body scales. Other morphological features are as follows: No. 89085, body scales, rostral-tail, about 395; beneath tail, 10; total length—average diameter, $122/2.25 \times 54$ mm. No. 89084, body scales, rostral-tail, about 425; beneath tail, 9; total length—average diameter, $312/5.3 \times 59$ mm.

Each dorsal scale of the larger specimen is dark brown with a narrow white border; beneath and tip of tail, pale yellow.

Available records indicate that *tenuis* is wide ranging throughout the Tropical zone.

Constrictor constrictor imperator (Daudin)

Boa imperator, Daudin, *Histoire naturelle des reptiles*, 1803, p. 150 (Chocó, Colombia); Boulenger, 1893: 119 (Verapaz, low forest); Günther, 1895: 181 (Verapaz).

Finca Canihor, No. 91136; Finca Chamá, Nos. 91137–39.

In Alta Verapaz this species is apparently restricted to the lower Tropical zone, where it is more frequently taken in second-growth than it is in the virgin forest. Specimen No. 91136, collected in early April, 1940, contained 11 well-developed eggs.

TABLE II

SCUTELLATION OF *C. constrictor imperator*

Number	Sex	Dorsals	Abdominals	Subcaudals
91136	♀	*ca.* 65 (Maximum)	240	54
91137	♀	*ca.* 67 (Maximum)	237	55
91138	♀	*ca.* 65 (Maximum)	237	54
91139	♀	*ca.* 63 (Maximum)	239	53

Scaphiodontophis annulatus annulatus (Duméril and Bibron)

Enicognathus annulatus, Duméril and Bibron, *Erpétologie générale*, 7 (1), (1854): 335, Pl. 80, Fig. 1 (Cobán, Alta Verapaz).

Henicognathus annulata, Cope, 1887: 79 (Cobán).

Henicognathus annulatus, Bocourt, 1886: 626, Pl. 40, Fig. 6 (Alta Verapaz); Günther, 1893: 107 (Verapaz).

Polydontophis annulatus, Boulenger, 1893: 189 (Verapaz, low forest).

Scaphiodontophis annulatus annulatus, Taylor and Smith, 1943: 312 (Alta Verapaz).

Finca Los Alpes, Nos. 91070–71; Alta Verapaz, U.S.N.M. Nos. 35915–17.

Two specimens of this species were secured in the coffee belt below 1000 meters, but it is reliably recorded as widespread throughout the Tropical zone. A skink, *Lygosoma c. cherriei*, was taken from the stomach of specimen No. 91070.

TABLE III

SCUTELLATION OF *S. annulatus annulatus*

Number	Sex	Dorsals	Abdominals	Subcaudals
91070	♂	17	144	Broken
91071	♂	17	147	Broken
U.S.N.M. 35915	♂	17	141	Broken
U.S.N.M. 35916	♂	17	145	Broken
U.S.N.M. 35917	♂	17	140	Broken

Thamnophis eques fulvus (Bocourt)

Eutaenia cyrtopis var. *fulvus*, Bocourt, *Mission scientifique au Mexique*, 1893, p. 777, Pl. 57, Fig. 2 (Alta Verapaz).

Eutaenia cyrtopis var. *sumichrasti*, Bocourt, 1893: 775, Pl. 57, Fig. 3 (Cobán, Alta Verapaz).

Finca Chichén, Nos. 91049–51.

Like *Anolis cobanensis* and *Bothrops godmani* this species represents a western element barely entering Alta Verapaz. I found it only sparingly along streams in the pine belt at the very base of the cloud forest. It is apparently restricted to the uplands.

Specimen No. 91049, a female, taken May 17, 1940, contained fully formed young about ready for birth. In the stomach of No. 91050 there were remains of a specimen of *Hyla spinipollex*.

TABLE IV

SCUTELLATION OF *T. eques fulvus*

Number	Sex	Dorsals	Abdominals	Subcaudals
91050	♂	19–17	143	68
91049	♀	19–17–15	139	63
91051	♀	19–17	141	66

Storeria dekayi tropica Cope

Storeria tropica, Cope, *Proc. Amer. Phil. Soc.*, 22 (1884): 175 (Petén, Guatemala).
Ischcognathus dekayi, Salvin, 1860: 456, and Günther, 1894: 136 (Cobán).
Storeria dekayi, Bocourt, 1893: 742, Pl. 53, Figs. 1–2 (Cobán).
Storeria dekayi tropica, Trapido, 1944: 77 (Samac, Senahú).

Finca Samac, F.M.N.H. No. 20527; Senchu (= Senahú), U.S.N.M. No. 35921.

The specimen in the Chicago Natural History Museum, a female collected March 27, 1934, contained well-formed eggs. The species occurs only in the Tropical zone.

TABLE V

SCUTELLATION OF *S. dekayi tropica*

Number	Sex	Dorsals	Abdominals	Subcaudals
F.M.N.H. 20527	♀	17	140	.....
U.S.N.M. 35921	♀	17–15	135	46

Dendrophidion vinitor Smith

Dendrophidion vinitor, Smith, *Proc. Biol. Soc. Wash.*, 54 (1941): 74 (Piedras Negras, Guatemala).
Dendrophidion dendrophis, Bocourt, 1873: 730 (in part; Verapaz).
Drymobius dendrophis, Günther, 1894: 127 (in part; several localities in Verapaz); Boulenger, 1894: 15 (in part; Verapaz, low forest).

I have not seen specimens of this species from Alta Verapaz, but there is no reason why it should not occur in the region in the Tropical zone. Smith (1941*d*: 75) questioned the identity of the specimens cited by Bocourt and Boulenger.

Drymobius chloroticus (Cope)

Dendrophidium chloroticum, Cope, *Proc. Amer. Phil. Soc.*, 23 (1886): 278 (Cobán by later designation, Guatemala).

Herpetodryas brunneus, Salvin, 1860: 456 (Lanquín).

Drymobius chloroticus, Cope, 1887: 69 (Cobán, Guatemala, type); Bocourt, 1890: 718, Pl. 50, Fig. 7 (Alta Verapaz).

Drymobius dendrophis, Boulenger, 1894: 15, and Günther, 1894: 127 (possibly in part; Verapaz, low forest).

Finca Chichén, Nos. 90990–92; Finca Los Alpes, No. 90989.

This species was not uncommon in the pine belt, the coffee belt, and in the cloud forest to at least 1700 meters. Females secured in mid-May, 1940, contained well-formed eggs in the body. Specimen No. 90992 had eaten an *Eleutherodactylus bocourti*.

TABLE VI

SCUTELLATION OF *D. chloroticus*

Number	Sex	Dorsals	Abdominals	Subcaudals
90990	♀	17–15	160	119
90991	♀	17–15	157	.....
90989	♂	17–15	153	126 + tip
90992	♂	17–15	158	126 + tip

Drymobius margaritiferus margaritiferus (Schlegel)

Herpetodryas margaritiferus, Schlegel, *Essai sur la physionomie des serpens*, 1837, p. 184 (Nouvelle Orleans, in error, restricted to Veracruz, Mexico [Smith, 1942: 383]).

Finca Chichén, Nos. 90993–95; Finca Cubilguitz, No. 91012; Finca La Primavera, Nos. 91001–3; Finca Los Alpes, Nos. 91996–97; Finca Panzamalá, Nos. 91004–8; Finca Samac, Nos. 91009–10, F.M.N.H. No. 20529; Finca Samanzana, No. 91011; Senahú, U.S.N.M. No. 35913; Finca Volcán, Nos. 91998–91000.

This common Central American ground snake is abundant in the Tropical zone of Alta Verapaz. It is more frequently met in second growth than it is in forest; it is generally in the vicinity of water. Females taken in May and June possessed well-developed eggs.

Dryadophis melanolomus laevis (Fisher)

Herpetodryas laevis, Fischer, *Arch. Natur.*, 1881, p. 227 (Guatemala); Cope, 1887: 70 (Cobán).

Dromicus coeruleus, Fischer, *Jahr. Anst. Hamburg*, 1885, p. 103, Pl. 4, Fig. 7 (Cobán, Guatemala).

Drymobius boddaertii, Boulenger, 1894: 11, and Günther, 1894: 124 (Verapaz, low forest).

Drymobius boddaerti var. *modesta*, Werner, *Abh. bayer. Akad. Wiss.*, 22 (1903): 346 (Cobán, Guatemala).

Dryadophis melanolomus laevis, Stuart, 1941*b*: 86 (Chamá, Panzamalá, Semococh, above Panzós, Senahú, Sepacuité, Verapaz, low forest).

TABLE VII

SCUTELLATION OF *D. margaritiferus margaritiferus*

Number	Sex	Dorsals	Abdominals	Subcaudals
90997	♀	17–15	151	119
91009	♀	17–15	152	115
91010	♀	17–15	153	.....
90995	♀	17–15	156	.....
91001	♀	17–15	152	.....
91003	♀	17–15	151	.....
91011	♀	17–15	153	.....
91012	♀	17–15	152	.....
91006	♀	17–15	152	.....
91007	♀	17–15	150	.....
91008	♀	17–15	151	.....
U.S.N.M. 35913	♀	17–15	153	.....
91004	♂	17–15	153	119
91005	♂	17–15	153	.....
90996	♂	17–15	151	123
90998	♂	17–15	149	128
90999	♂	17–15	154	123
91000	♂	17–15	151	117
90993	♂	17–15	148	.....
90994	♂	17–15	151	124
91002	♂	17–15	153	128 + tip
F.M.N.H. 20529	♂	17–15	153	118

Finca Chamá, Nos. 91015–17; Finca Canihor, Nos. 91021–23; Finca Los Alpes, Nos. 91018–19; Finca Panzamalá, Nos. 91013–14; Semicoch, U.S.N.M. No. 35903; Senahú, U.S.N.M. No. 35192; Finca Sepacuité, M.C.Z. No. 24945; Finca Volcán, No. 91020.

This form is endemic to Alta Verapaz and is common throughout the Tropical zone. It is present more frequently in second growth than it is in

TABLE VIII

SCUTELLATION OF *D. melanolomus laevis*

Number	Sex	Dorsals	Abdominals	Subcaudals
91015	♀	17–15	181	125
91020	♀	17–15	178	119
91016	♀	17–15	181	.....
91017	♀	17–15	175	124
U.S.N.M. 35903	♀	17–15	183	.....
91018	♂	17–15	177	.....
91013	♂	17–15	171	.....
91019	♂	17–15	175	120 + tip
91021	♂	17–15	178	130
91022	♂	17–15	169	.....
91023	♂	17–15	176	124
91014	♂	17–15	174	.....
M.C.Z. 24945	♂	17–15	181	136
U.S.N.M. 35912	?	.....	.....	114

virgin cover. From the stomach of No. 91020 I removed a specimen of *Sceloporus teapensis*. A female, No. 91017, taken June 11, 1938, contained well-formed eggs. I have previously commented upon the various color and pattern phases of this species (Stuart, 1941*b*: 86–87).

Masticophis mentovarius mentovarius (Duméril and Bibron)

Coryphodon mentovarius, Duméril and Bibron, *Erpétologie générale*, 7 (1) (1854): 187 (Mexico).

Bascanion suboculare, Cope, *Proc. Acad. Nat. Sci. Phila.*, 1866, p. 319 (between Cobán and Clusec [= Chisec]).

Masticophis mentovarius, Ortenburger, 1928: 138 (reference to type of *suboculare*).

Between Cobán and Chisec U.S.N.M. Nos. 6753 and 6762 (cotypes of *suboculare*).

It is surprising that this wide-ranging species has not been secured more often in Alta Verapaz. At Finca Canihor I saw a badly charred specimen which may have been this form.

Spilotes pullatus mexicanus (Laurenti)

Cerastes mexicanus, Laurenti, *Synopsin reptilium*, 1786, p. 83 (Mexico), not seen.

Spilotes salvini, Günther, *Ann. Mag. Nat. Hist.*, 9, 1 (1862): 125, Pl. 9, Fig. 5 (Yzabal, Guatemala), and 1894: 116, Pl. 42 (reference to type of *salvini*).

Coluber novae-hispaniae, Boulenger, 1894: 33 (reference to type of *salvini*).

Spilotes pullatus mexicanus × *S. p. argrisiformis*, Amaral, 1929: 294 (Sepacuité, Guatemala).

Finca Canihor, No. 91125; Pancajché, No. 91123; Finca Panzamalá, Nos. 91126–27; Finca Sepacuité, M.C.Z. No. 24844; Finca Volcán, Nos. 91124, 91128.

The above name is tentative since Amaral's review of the genus (1929) leaves the taxonomy of the Central American forms confused. In Alta Verapaz this snake is not uncommon in the Tropical zone up to 1200 meters, where it occupies much the same habitat as do specimens of *Drymarchon corais melanurus*. The remains of a mammal identified by William H. Burt as *Reithrodontomys* were removed from the stomach of No. 91126.

TABLE IX

SCUTELLATION OF *S. pullatus mexicanus*

Number	Sex	Dorsals (Maximum)	Abdominals	Subcaudals
91126	♂	19	211	.....
91123	♂	18	210	133
91124	♂	19	208	136
91127	♀	18	208	127
91128	♀	19	217	132
91125	♀	18	217	133
M.C.Z. 24844	♀	18	212	134

Drymarchon corais melanurus (Duméril and Bibron)

Spilotes melanurus, Duméril and Bibron, *Erpétologie générale,* 7 (1), (1854): 224 (Mexico).
Spilotes corais var. *melanurus,* Bocourt, 1888: 687, Pl. 44, Fig. 1 (Verapaz).
Spilotes corais, Günther, 1894: 116 (Lanquín, Guatemala).
Coluber corais, Boulenger, 1894: 31 (Lanquín, Guatemala).
Coluber corais var. *melanurus,* Werner, 1903: 347 (Campur, Cobán).

Finca Canihor, No. 91133; Finca Chamá, No. 91129; Finca Chejel, No. 91134; Finca Chipoc, M.C.Z. No. 28097; Finca Cubilguitz, No. 91130; Finca La Primavera, No. 91135; Finca Panzamalá, No. 91131; Panzós, No. 91132.

This wide-ranging form is generally distributed throughout Alta Verapaz in the Tropical zone with the exception of the pine belt (I question Werner's Cobán record). It is found in second growth rather than in virgin forests. Specimen No. 91134, taken in early June, 1940, contained some partly formed eggs and the tail of a specimen of *Pliocercus e. salvinii* in its stomach.

TABLE X

SCUTELLATION OF *D. corais melanurus*

Number	Sex	Dorsals	Abdominals	Subcaudals
M.C.Z. 28097	♂	17–15	198	80
91129	♂	17–15	198	.....
91130	♂	17–15	193	79
91131	♂	17–15	200	78
91132	♂	17–15	197	.....
91133	♀	17–15	201	73 + tip
91134	♀	17–15	204	73 + tip
91135	♀	17–15	210	.....

Thalerophis mexicanus mexicanus (Duméril and Bibron)

Leptophis mexicanus, Duméril and Bibron, *Erpétologie générale,* 7 (1), (1854): 536 (Mexico); Günther, 1894: 129 (Lanquín); Bocourt, 1897: 831, Pl. 64, Figs. 4*a*–4*g* (Cobán); Werner, 1903: 347 ("Chiacany").
Leptophis mexicanus mexicanus, Oliver, 1942: 10 (cites range of race).

Finca Chamá, Nos. 91024–25, M.C.Z. No. 28094; Finca Chejel, No. 89977; Finca Los Alpes, No. 89975; Finca Samanzana, No. 91026; Finca Sepacuité, M.C.Z. No. 24947; Finca Volcán, No. 89976.

This common species is restricted to the Tropical zone in Alta Verapaz, with the exception of the pine belt. Usually it does not go much above the lower division of that zone. I cannot accept Bocourt's record from Cobán. The stomach of No. 89975 contained a specimen of *Oedipus rufescens* and that of No. 91025 a specimen of *Hyla loquax.* No. 91024, a female captured June 4, 1938, had 9 fully formed eggs in her body.

TABLE XI

SCUTELLATION OF *T. mexicanus mexicanus*

Number	Sex	Dorsals	Abdominals	Subcaudals
91024	♀	15–11	160	.....
91025	♀	15–11	159	162
89976	♀	15–11	.....	168
M.C.Z. 28094	♀	15–11	156	.....
89975	♂	15–11	155	175
89977	♂	15–11	154	165
91026	♂	15–11	157	158
M.C.Z. 24947	♂	15–11	156	149

Thalerophis occidentalis praestans (Cope)

Thrasops praestans, Cope, *Proc. Acad. Nat. Sci. Phila.*, 20 (1868): 309 (near Petén, Guatemala).

Thrasops (Ahaetulla) sargii, Fischer, *Arch. f. Natur.*, 1881, p. 229, Pl. 11, Figs. 7–9. (Cobán, Guatemala).

Leptophis occidentalis, Werner, 1903: 347 (Cobán).

Leptophis occidentalis praestans, Oliver, 1942: 16 (cites range of race).

Finca Chamá, No. 89974; Senahú, U.S.N.M. No. 35911.

The Finca Chamá specimen was in the bushes along a trail in the virgin forest. It appears to be a Tropical zone form. Like that for the preceding species, the Cobán record seems improbable.

TABLE XII

SCUTELLATION OF *T. occidentalis praestans*

Number	Sex	Dorsals	Abdominals	Subcaudals
89974	♀	17–13	177	184
U.S.N.M. 35911	♀	15–11	154	.....

Elaphe flavirufa flavirufa (Cope)

Coluber flavirufus, Cope, *Proc. Acad. Nat. Sci. Phila.*, 18 (1866): 319 (Yucatán).

Elaphis rodriguezi, Bocourt, *Mission scientifique au Mexique*, 1888, p. 683, Pl. 46, Fig. 1 (Panzós).

Bocourt's excellent description leaves no doubt that this species inhabits the corozo belt of Alta Verapaz.

Elaphe triaspis mutabilis (Cope)

Coluber mutabilis, Cope, *Proc. Amer. Phil. Soc.*, 22 (1885): 175 (Verapaz).

Natrix mutabilis, Cope, 1887: 71 (types).

Scotophis mutabilis, Bocourt, 1888: 680, Pl. 46, Fig. 2 (Verapaz).

Elaphe chlorosoma, Smith, 1941*c*: 134 (types of *mutabilis*).

Verapaz, U.S.N.M. Nos. 24729–30, 61066 (paratypes).

Smith (1941*c*) reviewed the Mexican species of *Elaphe* and synonymized *mutabilis* under *triaspis*. I cannot agree either with his observations or with his conclusions. To quote Smith directly (1941*c*: 134):

> There are six paratypes of *mutabilis:* one from Guanajuato (U.S.N.M. No. 11354), which is a typical subadult *chlorosoma;* one from Tehuantepec, probably also *chlorosoma* (not seen by me); one from Costa Rica (U.S.N.M. No. 9777) and four from Guatemala (U.S.N.M. No. 24729–30, 61066), all typical with well-developed patterns.

I have examined the Guatemalan and the Costa Rican specimens and, except in No. 24730 which is a half-grown individual, I find no trace of a dorsal pattern. The type of *mutabilis* (No. 6745) was described as without dorsal pattern. Smith suggested that the type may be an albino, but it seems hardly possible that all 3 adults known from Alta Verapaz should be albinos. Fading of pattern through preservation and storage does not offer an explanation for the unicolored adults, since the half-grown specimen, presumably collected with, and preserved with, 1 of the adults (No. 24729), has a very definite dorsal pattern. Finally, E. R. Dunn's notes (*in litt.*) on specimens from Costa Rica definitely state: "Adult uniform, young spotted." A juvenile specimen from Nicaragua in the Museum of Zoology (No. 56496) is brightly spotted.

I conclude that *mutabilis* is a valid race of *triaspis,* ranging from the Petén forest southward to Costa Rica on the Caribbean side of Central America. The species seems to parallel *chlorosoma* in ontogenetic loss of pattern. As noted by Smith (1941*c*: 136) the spotted young of *chlorosoma* may be separated from those of *triaspis* and *mutabilis* by their greater number of dorsal blotches. There is apparently no way by which the young of *mutabilis* and *triaspis* can be distinguished. The adults of *chlorosoma* and *mutabilis,* moreover, seem to be morphologically inseparable. Preserved specimens indicate that the dorsal color of the latter is brown in life as compared with the green of *chlorosoma* (*fide* N. E. Hartweg). When additional material is available, *chlorosoma, mutabilis,* and *triaspis* will unquestionably be shown to be subspecies.

This arrangement is somewhat complicated by Bocourt's description of specimens of *Scotophis mutabilis* as being spotted. His collection included all 3 races, with specimens from Alta Verapaz, Tehuantepec, and Yucatán. An adult from Tehuantepec and 1 from Yucatán are said to have had a faded dorsal pattern. There was no comment as to the Alta Verapaz specimens. Since Bocourt specifically stated that the former 2 were adults, it is entirely possible that the Alta Verapaz specimens were juveniles or subadults with the spotted pattern.

I have not collected this species, but records list it as a corozo belt form.

TABLE XIII

SCUTELLATION OF THE ALTA VERAPAZ PARATYPES OF *E. triaspis mutabilis*

Number	Sex	Dorsals (Maximum)	Abdominals	Subcaudals
U.S.N.M. 24729	♂	33	257	104
U.S.N.M. 24730	♂	31	241	113
U.S.N.M. 61066	♀	31	278	99

Lampropeltis triangulum abnorma (Bocourt)

Coronella formosa var. *abnorma*, Bocourt, *Mission scientifique au Mexique*, 1886, explanation of Pl. 39, Fig. 4 (substitute name for *Coronella formosa* var. *anomala*, Bocourt, 1886: 614, Alta Verapaz, preoccupied by *Coronella anomala*, Günther, *Catalogue of the Colubrine Snakes in the British Museum*, 1858, p. 37).

Coronella formosa, Bocourt, 1886: 612, Pl. 39, Fig. 3 (Alta Verapaz).

Coronella micropholis, Werner, 1903: 347 (Cobán).

Finca Chamá, No. 91100; Finca Chejel, No. 91099; Finca Panzamalá, Nos. 91102–3; Finca Xicacao, No. 91101.

The splitting of *L. polyzona* by Dunn (1937) and Smith (1942*b*) makes it necessary to recognize the Alta Verapaz population as distinct. Bocourt's name for a very abnormal specimen must be applied to the race. From typical *polyzona* of Vera Cruz and of the Petén, as well as from specimens which may eventually prove to be a distinct race from Honduras and Nicaragua, *abnorma* differs only in pattern. This variation consists of an expansion of the black annuli toward each other to pinch out the enclosed yellow annulus. In 1 specimen the yellow has been reduced to such an extent that it is evident only as a narrow border on black scales. This pattern is frequent in *annulata* (Blanchard, 1921: 160, Fig. 66; Günther, 1893: Pl. 38, Fig. B), which differs from *abnorma* in lacking the light snout band. Werner (1903) suggested a pattern similar to that of my specimens in several from Cobán in stating, "oben sehr dunkel."

This species seems to be more or less widespread throughout the Tropical zone. The stomach of No. 91101 contained the remains of a mammal identified as a shrew of the genus *Cryptotis* by my colleague, William Burt; from No. 91099 I removed fragments of egg shells.

TABLE XIV

SCUTELLATION OF *L. triangulum abnorma*

Number	Sex	Dorsals	Abdominals	Subcaudals
91099	♂	19–21–19	227	.....
91100	♂	21–23–21–19	233	60
91101	♀	21–23–21–19	234	53
91102	♀	19–21–19	230	53
91103	♀	21–23–21–19	234	54

Pliocercus elapoides salvinii Müller

Pliocercus salvinii, Müller, *Verhand. Naturf. Gesell. Basel,* 4 (1878): Taf. II, A (explanation, p. 709); recorded as *Pliocercus aequalis* var., p. 662 (Verapaz).

?*Pliocercus sargii,* Fischer, *Arch. f. Natur.*, 1881, p. 225, Pl. XI, Figs. 1–3 (in part; Cobán, Guatemala).

?*Liophis elapoides* var. *aequalis,* Bocourt, 1886: 637, Pl. 41, Fig. 7 (in part; Alta Verapaz).

Finca Chamá, No. 91055; Finca Chejel, tail from stomach of *Drymarchon c. melanurus,* No. 91134; Finca Los Alpes, No. 91052; Finca Volcán, Nos. 91053–54. Alta Verapaz, uncatalogued skeleton.

The use of the above name for the specimens at hand demands explanation. As noted by Smith (1941*a*) there are unquestionably 2 species groups of *Pliocercus* in Middle America. One, *euryzonus,* is characterized by a pattern of alternating red and black annuli and is largely southern; the other, *elapoides,* with red, yellow, and black annuli, is entirely northern.

Only the *euryzonus* group had been recorded from the Alta Verapaz before my own collecting, and I collected only the *elapoides* type. Of the *euryzonus* group, 2 species have been described from Verapaz, *aequalis* Salvin and *sargii* Fischer. The former, with 25 to 27 black annuli on the body, is unquestionably a valid form of the *euryzonus* group, and the latter, with only 20 black annuli, suggests a faded *salvinii,* since the number of body annuli of that group reaches a maximum of 23. The yellow annuli bordering the primary black rings fade rapidly in preservative, and it is not improbable that the type of *sargii,* with its relatively low number of annuli, may be a faded *elapoides,* as may also be true of a part of Bocourt's *aequalis* (1886: 637). Since this is a questionable point, I retain *sargii* in the *euryzonus* group and allocate it to the synonymy of *aequalis. Pliocercus e. aequalis* is, therefore, fairly well defined, and intermediate between *bicolor* to the north and *dimidiatus* to the south.

The representative of the *elapoides* group in Alta Verapaz offers a somewhat more complex problem not entirely clarified by recent investigations. Smith (1942*c*) recognizes 4 races of *elapoides: elapoides* in Veracruz, *diastemus* in Pacific Chiapas and Guatemala, *laticollaris* in Tabasco through British Honduras, and *schmidti* in Yucatán.

The Alta Verapaz population differs slightly from Smith's *laticollaris* in possessing a few more black body annuli (13–18, average 15 in Smith's *laticollaris;* 15–23, average 19 in the Alta Verapaz specimens) and fewer infralabials (9 as compared with 10 generally and 9 occasionally in *laticollaris*). From *schmidti* with 9 infralabials, the Alta Verapaz specimens differ in having a greater number of black annuli. I am of the opinion that the Alta Verapaz population represents a distinct race, whereas the types of *laticollaris* are somewhat intermediate between the Alta Verapaz race and *elapoides* of Veracruz and possibly *schmidti* of Yucatán. Regardless of these other populations, the Alta Verapaz population must be known as *salvinii.*

Smith (1941*a*) seems to have erred in considering all of Bocourt's specimens of *elapoides* to be *laticollaris* (= *salvinii*), for 4 of those specimens originated from western Guatemala (Bocourt, 1886: 636), the locale of *diastemus*. Although faded *salvinii* may resemble *aequalis*, Smith referred all of Bocourt's *aequalis* to the *elapoides* group, despite the fact that 2 were from the Alta Verapaz and all were described as having only red and black annuli. Until this material is re-examined, the Alta Verapaz specimens must be considered true *aequalis* and the Mexican specimen probably *bicolor*.

Pliocercus e. salvinii is restricted to the Tropical zone in Alta Verapaz. From the stomach of No. 91038 was taken a specimen of *Oedipus m. odonnelli* and from No. 91052 fragments of *Oedipus dofleini*.

TABLE XV

SCUTELLATION OF *P. elapoides salvinii*

Number	Sex	Dorsals	Ventrals	Subcaudals	Annuli
91052	♀	17	131	105	15
91053	♂	17	126	.....	18
91055	♂	17	131	.....	23 (9 complete)
91054	♂	17	122	.....	18

Pliocercus euryzonus aequalis Salvin

Pliocercus aequalis, Salvin, *Proc. Zool. Soc.*, 1861, p. 227 (either San Gerónimo or the mountains of Verapaz).

Pliocercus sargii, Fischer, *Arch. f. Natur.*, 1881, p. 225, Pl. XI, Figs. 1–3 (Cobán, Guatemala).

Liophis elapoides, var. *aequalis*, Bocourt, 1886: 637, Pl. 41, Fig. 7 (Alta Verapaz).

Elapochrus aequalis, Günther, 1893: 106, Pl. 36, Fig. A (Verapaz).

?Urotheca elapoides, var. *B.*, Boulenger, 1894: 182 (Verapaz, low forest).

Urotheca elapoides aequalis, Werner, 1903: 347 (Cobán).

The status of this Tropical zone form has been commented upon above.

Rhadinaea decorata decorata (Günther)

Coronella decorata, Günther, *Catalogue of the Colubrine Snakes in the British Museum*, 1858, p. 35 (Mexico).

Cacao (Treceaguas), U.S.N.M. No. 38133; Finca Volcán, No. 91046.

This wide-ranging form occurs in the broadleaf forests of the Tropical zone in Alta Verapaz.

TABLE XVI

SCUTELLATION OF *R. decorata decorata*

Number	Sex	Dorsals	Abdominals	Subcaudals
91046	♂	17	110	.....
U.S.N.M. 38133	♀	17	121	.....

Rhadinaea hempsteadae Stuart and Bailey

Rhadinaea hempsteadae, Stuart and Bailey, *Occ. Papers Mus. Zool. Univ. Mich.*, 442 (1941): 2 (Finca Chichén, Alta Verapaz, Guatemala).

Finca Chichén, Nos. 89080 (holotype), 89081 (paratype); Finca Volcán, uncatalogued (fragment).

This species is unquestionably restricted to the cloud forest. Inasmuch as *R. hempsteadae* appears to be secretive and terrestrial in habits, it is difficult to explain the presence of a specimen of the arboreal *Oedipus helmrichi* in the stomach of the type.

TABLE XVII

SCUTELLATION OF *R. hempsteadae*

Number	Sex	Dorsals	Abdominals	Subcaudals
89080	♀	19	163	94
89081	♂	19	166	93

Rhadinaea veraepacis Stuart and Bailey

Rhadinaea veraepacis, Stuart and Bailey, *Occ. Papers Mus. Zool. Univ. Mich.*, 442 (1941): 9 (Finca Chichén, Alta Verapaz, Guatemala).

Finca Chichén, No. 89077 (holotype).

This Verapaz endemic may be restricted to the pine belt. Nothing is known of its habits. The holotype, a juvenile male, has 17 dorsals, 145 abdominals, and 80 subcaudals.

Sibon nebulatus (Linnaeus)

Coluber nebulatus, Linnaeus, *Systema Naturae*, I (1758): 222 (America).
Petalognathus nebulatus, Boulenger, 1894: 293, and Günther, 1894: 139 (north of Cobán, Guatemala).

I did not collect this species, which is apparently restricted to the corozo belt in Alta Verapaz.

Tropidodipsas kidderi Stuart

Tropidodipsas kidderi, Stuart, *Proc. Biol. Soc. Wash.*, 55 (1942): 177 (Finca Samac, Alta Verapaz, Guatemala, altitude, about 1500 meters).

Finca Samac, Nos. 91065 (holotype), 91064 (paratype).

This bromeliad species is known only from the cloud forest of Alta Verapaz. It is molluscivorous. I have commented upon it at length in the original description.

TABLE XVIII

SCUTELLATION OF *T. kidderi*

Number	Sex	Dorsals	Abdominals	Subcaudals
91064	♀	17	182	62
91065	♂	17	185	76

Tropidodipsas sartorii sartorii Cope

Tropidodipsas sartorii, Cope, *Proc. Acad. Nat. Sci. Phila.*, 15 (1863): 100 (Mirador, Vera Cruz); Boulenger, 1892: 296 (Cubilguitz, Verapaz).
Leptognathus semicinctus, Bocourt, *Bull. Soc. Philom.*, 7 (1884): 139 (Alta Verapaz).
Leptognathus cuculliceps, Müller, *Verhand. Natur. Gesell. Basel*, 8 (1890): 273 (Verapaz).
Tropidodipsas dumerlii, Günther, 1894: 140, Pl. 50, Fig. A (Cobán, miscitation of locality of specimen recorded by Boulenger).
Tropidodipsas semicinctus, Moquard, 1908: 874, Pl. 71, Fig. 1 (types of *semicinctus*).

Finca Chamá, Nos. 91066–67; Finca Chejel, No. 91069; Finca Volcán, No. 91068.

This species is widespread throughout the Tropical zone with the exception of the pine belt. I have taken slugs from the stomachs of specimens. A male, No. 91066, collected May 29, 1938, has its chin and snout covered with breeding tubercles.

TABLE XIX

SCUTELLATION OF *T. sartorii sartorii*

Number	Sex	Dorsals	Abdominals	Subcaudals
91068	♀	17	180	65
91066	♂	17	179	.....
91067	♂	17	185	71
91069	♂	17	174	68

Ninia diademata Baird and Girard

Ninia diademata, Baird and Girard, *Catalogue of North American Reptiles*, 1 '(1853): 49 (Orizaba, Mexico).

Finca Aetelá, U.S.N.M. No. 35858; Finca La Primavera, No. 91122 (2).

These 3 male specimens serve to connect *diademata* and *plorator* from Durango, Hidalgo, Mexico. The former has abdominals 136 to 145 and the latter, 123 to 125. The range in my 3 specimens is 127 to 135. As they come from the center of the range of *diademata*, I question the validity of *plorator*.

Though hundreds of specimens of *Ninia s. sebae* (Duméril and Bibron) were present in the rubbish in the cane fields at La Primavera, only 2 specimens of the above species were secured in the same habitat. It is probably restricted to the Tropical zone with the exception of the pine belt.

TABLE XX

SCUTELLATION OF *N. diademata*

Number	Sex	Dorsals	Abdominals	Subcaudals
91122 (*a*)	♂	19	128	91
91122 (*b*)	♂	19	135	88
U.S.N.M. 35858	♂	19	127	106

Ninia maculata pavimentata (Bocourt)

Streptophorus maculata var. *pavimentata*, Bocourt, *Mission scientifique au Mexique*, 1883, p. 549, Pl. 32, Fig. 8, Pl. 33, Fig. 2 (Alta Verapaz).

Finca Chichén, No. 89083.

The distinction of Bocourt's "*jolie variete*" was not evident in the field, where I assumed it to be a very dark specimen of *Ninia diademata* Baird and Girard. As a result I failed to take detailed notes on its color in life, which is unusual according to Bocourt's figure. Dunn, in his revision of the genus *Ninia* (1935: 12), was unable to allocate this form. An examination of the specimen before me clearly indicates that it is distinct, though close to the type species.

That it is close to *Ninia m. maculata* (Peters) is evident from the 19 rows of scales and the absence of a yellow collar. From typical *maculata* it differs in possessing a more heavily pigmented belly and a very distinctive high, short loreal. This character is shown in Bocourt's figure (1883: Pl. XXXII, Fig. 8*a*). From Bocourt's colored figure of *pavimentata* (1883: Pl. XXXIII, Fig. 2) it differs in the absence of the green crossbands bordering the black bands.

The specimen at hand, a female, has 19 rows of heavily keeled dorsal scales, 145 abdominal scutes, and a single anal. The tail is incomplete. The specimen is aberrant in having only 6 supralabials, but the very large third labial is partly divided on both sides, indicating the normal condition.

The ground color (in spirits) above is a dark purple, with 52 dark crossbands on the back. These bands are not offset or broken dorsally. They are 1 scale in width; the color, being confined to a single scale, produces a jagged outline. The crossbands have obscure, narrow, light borders. The labials are white with broad dark borders. The entire undersurface is black checkered with white. Anteriorly, the white exceeds the black, decreasing posteriorly to leave the tail solid black near its tip.

A considerable gap exists between Dunn's (1935: 11) most northern record of *maculata* in Nicaragua and Alta Verapaz, but *pavimentata* is morphologically so close to the former that intergrading specimens from the intervening area are to be expected.

My specimen was found beneath a log in a *milpa* in the heart of the pine belt, at approximately 1300 meters altitude.

Ninia sebae sebae (Duméril and Bibron)

Streptophorus sebae, Duméril and Bibron, *Erpétologie générale*, 7 (1), (1854): 515 (Mexico); Bocourt, 1883: 546, Pl. 32, Fig. 7, and Pl. 33, Fig. 1 (Verapaz).
Ninia atrata sebae, Cope, 1887: 74 (Cobán).

Cacao (Treceaguas), U.S.N.M. Nos. 38130–31; Finca Canihor, No. 91116; Finca Chamá, Nos. 91109–10; Finca Chejel, No. 91118; Finca Chichén,

TABLE XXI

VENTRAL SCUTELLATION OF *N. sebae sebae*

Number	Sex	Abdominals	Subcaudals
91104	♂	149	55
91105	♂	136	62
91106	♂	141	57
91106	♂	145	62
91106	♂	141	63
91108	♂	137	56
91108	♂	135	61
91108	♂	136	57
91108	♂	139	59
91108	♂	135	59
91113	♂	148	65
91114	♂	143	67
91118	♂	140	59
91119	♂	136	56
91120	♂	137	51
91120	♂	141	60
91120	♂	138	56
91120	♂	135	54
91120	♂	142	62
91120	♂	137	52
91120	♂	132	54
91121	♂	139	53
91121	♂	139	60
91121	♂	151	56
91121	♂	139	54
91121	♂	145	.....
91121	♂	143	52
91121	♂	135	58
91121	♂	137	55
91121	♂	140	54
91121	♂	141	55
91121	♂	137	.....
91121	♂	141	53
91121	♂	136	.....
91121	♂	140	59
91121	♂	146	60
91121	♂	142	58
91121	♂	140	58
91121	♂	142	55
91121	♂	148	59
91121	♂	138	55
91121	♂	143	57
91121	♂	148	55
91121	♂	141	54
91121	♂	147	61
U.S.N.M. 35918	♂	136	.....
U.S.N.M. 35920	♂	141	61
U.S.N.M. 38130	♂	133	63
91105	♀	141	61
91105	♀	139	57
91105	♀	145	52
91106	♀	137	52
91107	♀	137	47
91107	♀	140	52
91107	♀	140	58

TABLE XXI (*Cont.*)

Number	Sex	Abdominals	Subcaudals
91108	♀	140	52
91108	♀	145	48
91108	♀	142	49
91108	♀	144	51
91108	♀	142	49
91108	♀	142	49
91108	♀	145	52
91108	♀	138	48
91108	♀	138	48
91114	♀	141	53
91115	♀	145	54
91116	♀	149	56
91117	♀	146	52
91109	♀	136	50
91110	♀	134	48
91111	♀	141	47
91119	♀	145	50
91120	♀	147	51
91120	♀	139	.....
91121	♀	147	.....
91121	♀	147	.....
91121	♀	148	47
91121	♀	142	44
91121	♀	144	52
91121	♀	141	45
F.M.N.H. 20534	♀	142	53
U.S.N.M. 35919	♀	134	.....
U.S.N.M. 38131	♀	134	58

No. 91117; Finca Panzamalá, Nos. 91104, 91105 (4), 91106 (4), Panzós, No. 91112; Finca La Primavera, Nos. 91119 (2), 91120 (9), 91121 (30); Finca Samac, Nos. 91107 (3), 91108 (13), 91111, F.M.N.H. No. 20534; Senahú, U.S.N.M. Nos. 35918–20; Finca Volcán, Nos. 91113, 91114 (2), 91115.

This form is by far the most common snake in Alta Verapaz, ranging throughout the Tropical and Subtropical zones. It appears to be most abundant in the coffee belt, which offers it optimum conditions, perhaps because of the abundant litter. At La Primavera the dead leaves in the cane fields were literally alive with this species, and the Indians brought in hundreds of specimens, of which, unfortunately, the greater majority were too hopelessly mangled to warrant preservation.

This snake seems to pass its entire life in concealment, and it was only occasionally that it could be found on the surface of the ground even at night. It reaches maturity, as indicated by the presence of eggs in the females and breeding tubercles on the chins of males, when a total length of about 250 mm. is attained. The breeding season is apparently extensive. Females taken from March to June had eggs in their bodies, and a juvenile captured in early June showed the umbilical scar. Adult males taken during the same period all possessed well-developed breeding tubercles.

The dorsal scale formula is generally 19–19–19, occasionally 17–19–19, and in a few instances 19–19–17 or 19–19–18. A single specimen had 17 scale rows throughout its entire body length. The abdominals ranged 132 to 151 in males and 134 to 149 in females; the subcaudals, 51 to 67 in males and 44 to 61 in females.

Adelphicos veraepacis veraepacis Stuart

Adelphicos veraepacis, Stuart, *Occ. Papers Mus. Zool. Univ. Mich.,* 452 (1941): 5 (Finca Samac, Alta Verapaz, Guatemala), specimens from Finca Chichén, Verapaz.
?Adelphicos quadrivirgatum, Bocourt, 1883: 554, Pl. 32, Fig. 11 (Alta Verapaz).
Adelphicos veraepacis veraepacis, Smith, 1942*a:* 180 (lists types).

Finca Chichén, Nos. 89074–76 (paratypes); Finca Samac, No. 89073 (holotype).

Though occurring in both the cloud forest and in the pine belt, at low altitudes this form may be replaced by *A. q. visoninus* Cope. It is secretive, occurring in rubbish in the forest and in cleared areas. As noted in the original description (Stuart, 1941: 7) the species is oviparous. The eggs are deposited just before the start of the rainy season in May.

TABLE XXII

SCUTELLATION OF *A. veraepacis veraepacis*

Number	Sex	Dorsals	Abdominals	Subcaudals
89073	♂	15	124	40
89074	♂	15	125	40
89075	♀	15	132	30
89076	♀	15	139	28

Adelphicos quadrivirgatus visoninus (Cope)

Rhegnops visoninus, Cope, *Proc. Acad. Nat. Sci. Phila.,* 18 (1866): 128 (Belize).

Finca La Primavera, Nos. 91047–48.

Like *Sceloporus serrifer plioporus,* this is a Petén form that invades the Río Negro gorge where it comes in contact with the Zacapan fauna. The above specimens were in the rubbish in a cane field associated with *Ninia s. sebae, Ninia diadematа,* and *Coniophanes imperialis clavatus.*

TABLE XXIII

SCUTELLATION OF *A. quadrivirgatus visoninus*

Number	Sex	Dorsals	Abdominals	Subcaudals
91047	♀	15	139	41
91048	♀	15	140	Broken

Dipsas dimidiatus (Günther)

Leptognathus dimidiatus, Günther, *Ann. Mag. Nat. Hist.,* 4, 9 (1872): 31 (Mexico); Mocquard, 1908: 893 (types of *multifasciatus,* see below).

Petalognathus multifasciatus, Bocourt, *Bull. Soc. Philom.*, 7 (1884): 139, Figs. 1–3 (Verapaz, Guatemala).

I do not know this species, but its wide range would seem to verify Bocourt's record.

Conophis pulcher pulcher Cope

Conophis pulcher, Cope, *Proc. Acad. Nat. Sci. Phila.*, 1868, p. 308 (near the Petén, Verapaz).

Conophis pulcher pulcher, Smith, 1941*b*: 121 (types: miscitation of locality, records specimens as of Petén, Guatemala).

The species is apparently endemic to Petén, barely entering Alta Verapaz.

Coniophanes bipunctatus bipunctatus (Günther)

Coronella bipunctatus, Günther, *Catalogue of the Colubrine Snakes in the British Museum*, 1858, p. 36 (locality unknown).

Panzós, No. 91031.

The above specimen was found dead in the flooded second growth along the Río Polochic. The species is restricted to humid areas in the Tropical zone. It is a female with a dorsal scale formula 21–19–17, 137 abdominals, and an incomplete tail.

Coniophanes fissidens fissidens (Günther)

Coronella fissidens, Günther, *Catalogue of the Colubrine Snakes in the British Museum*, 1858, p. 36 (Mexico).

Erythrolamprus fissidens, Boulenger, 1896: 207 (Verapaz).

Tachymenis fissidens, Günther, 1895: 161 (Verapaz, low forest).

Erythrolamprus proterops, Cope, 1887: 77 (Cobán, Guatemala).

Coniophanes f. fissidens, Bailey, 1939: 14 (Alta Verapaz).

Finca Chamá, Nos. 91032–33; Alta Verapaz, U.S.N.M. No. 37842.

The 2 Chamá specimens were both secured in the deep virgin forest. They have been identified by Joseph Bailey, who revised the genus (1939). The species is probably confined to the corozo belt.

TABLE XXIV

SCUTELLATION OF *C. fissidens fissidens*

Number	Sex	Dorsals	Abdominals	Subcaudals
91032	♀	21–19–17	123	70
91033	♂	21–19–17	115	78
U.S.N.M. 37842	♂	21–19–17	120	.....

Coniophanes imperialis clavatus (Peters)

Dromicus (Dromicus) clavatus, Peters, *Monats. Akad. Wiss. Berlin*, 1864, p. 388 (Mexico).

Finca La Primavera, No. 91030.

The specimen of this common, widespread, Tropical zone form was taken in the rubbish in a cane field and was associated with *Ninia s. sebae, Ninia diademata,* and *Adelphicos q. visoninus.* It is a female with a dorsal scale formula 19–17–15, 129 abdominals, and 75 subcaudals.

Trimorphodon biscutatus quadruplex Smith

Trimorphodon biscutatus quadruplex, Smith, *Proc. U. S. Nat. Mus.,* 91, 3130 (1941): 157 (Esteli, Nicaragua).

Dipsadomorphus biscutatus, Salvin, 1860: 475 (between Cobán and Lanquín).

Trimorphodon biscutatus, Günther, 1895: 174, and Boulenger, 1896: 54 (Lanquín, same specimen as recorded by Salvin); Cope, 1887: 68 (Cobán).

In his account of the genus *Trimorphodon* Smith (1941*e*) listed no specimens from the Caribbean drainage below Vera Cruz. Salvin (1860 and 1861*b*: 288) recorded some specimens from the Cahabón Valley and from San Gerónimo (collected by Owen) in the Caribbean drainage, both taken in arid or semiarid regions. *T. b. quadruplex* evidently crosses the Guatemalan plateau to invade the dry interior basins as well as the Cahabón Valley. I have seen neither of the above specimens, but there is little question that, unless they represent an undescribed form, they must be *quadruplex.* The total number of abdominals and subcaudals listed by Boulenger (1896) is less than the number recorded by Smith (1941*e*: 159) for *biscutatus,* but well within the range of *quadruplex.* Furthermore, one of the paratypes of the latter (U.S.N.M. No. 6805) listed by Smith originated in "Guatemala" and was collected by Hague. Very probably, this same specimen was recorded by Cope (1887: 68) as of Cobán. While accepting it as an Alta Verapaz record, I question Cobán as its source.

Imantodes cenchoa leucomelas (Cope)

Himantodes leucomelas, Cope, *Proc. Acad. Nat. Sci. Phila.,* 13 (1861): 296 (Mirador, Vera Cruz).

Dipsas cenchoa, Günther, 1895: 175 (Cobán).

Himantodes cenchoa, Boulenger, 1896: 84 (Verapaz, low forest, Cobán); Werner, 1903: 348 (Cobán).

Cacao, U.S.N.M. No. 38132; Finca Chamá, No. 91076; Finca Chejel, No. 91074; Finca Los Alpes, No. 91072; Finca Samac, No. 91075; Senahú, U.S.N.M. No. 35922; Finca Volcán, No. 91073.

This race is apparently widespread in Alta Verapaz throughout both the Tropical and Subtropical zones. Specimen No. 91075 was secured in a bromeliad well off the ground in the cloud forest. Females taken late in April and in mid-June of 1938, carried well-formed eggs. The stomach of No. 38132 contained *Anolis h. uniformis* and that of No. 35922 a specimen of *Anolis capito.*

TABLE XXV

SCUTELLATION OF *I. cenchoa leucomelas*

Number	Sex	Dorsals	Abdominals	Subcaudals
91075	♀	17	227	147
91073	♀	17	234	144
91074	♀	17	231	153 + tip
91076	♀	17	228	142 + tip
U.S.N.M. 35922	♀	17	233	145 + tip
U.S.N.M. 38132	♀	17	241	164
91072	♂	17	242	158

Leptodeira annulata polysticta Günther

Leptodeira polysticta, Günther, *Biologia Centrali-Americana,* 1895, p. 172 (in part), Pl. 55, Fig. A (Jalapa, Oaxaca, Honduras, Belize, Panamá restricted to Jalapa, Oaxaca, Honduras, and Belize by Dunn, 1936: 693).

Leptodeira albofusca, Werner, 1903: 348 (Cobán).

Finca Chamá, Nos. 91056–57; Panzós, No. 91058.

I secured this widespread form only in the corozo belt to which I believe it to be restricted. I question the Cobán record. Specimen No. 91057 was taken from a bromeliad on a tree while in the act of swallowing a specimen of *Hyla loquax.*

TABLE XXVI

SCUTELLATION OF *L. annulata polysticta*

Number	Sex	Dorsals	Abdominals	Subcaudals
91056	♂	21–23–21–19–17–16	200	96
91058	♂	21–23–21–19–17–16	204	96
91057	♀	21–23–21–19–17–15	203	85

Oxyrhopus petola aequifasciatus Werner

Oxyrhopus petola aequifasciata, Werner, *Mitt. Natur. Mus. Hamburg,* 24 (1909): 231 (Cobán, Guatemala).

Oxyrhopus petolarius, Günther, 1895: 167, and Boulenger, 1896: 101, var. D (Verapaz, low forest).

Joseph R. Bailey regards the above name as applicable to specimens reported from Alta Verapaz. I have not seen this form from Alta Verapaz, but the above references leave no doubt as to the identity of the specimens. The species may be confined to the Tropical zone.

Oxybelis aeneus auratus (Bell)

Dryinus auratus, Bell, *Zool. Journ.,* 2 (1825): 324–26, Pl. 12 (Mexico).

Finca La Primavera, No. 91027; Senahú, U.S.N.M. No. 35914 (*fide* D. Cochran).

The La Primavera specimen was secured in a cane field. It is a female, with a dorsal scale formula 17–15, 183 abdominals, and 187 + tip subcaudals. The species is apparently a Tropical zone form.

Oxybelis fulgidus (Daudin)

Coluber fulgidus, Daudin, *Histoire naturelle des reptiles*, 6 (1803): 352, Pl. 80 (Santo Domingo, in error; Schmidt, 1941: 506, suggested Surinam).

Finca Canihor, No. 91028; Finca La Primavera, No. 91029.

This species is found mostly in the drier parts of the Tropical zone of Alta Verapaz. No. 91028, a female, was secured in mid-April and had well-developed eggs. The stomach of No. 91029 contained the remains of a bird identified by Pierce Brodkorb as the fringillid, *Spinus notatus*.

TABLE XXVII

SCUTELLATION OF *O. fulgidus*

Number	Sex	Dorsals	Abdominals	Subcaudals
91028	♀	17–15–13	212	151 + tip
91029	♂	17–13	202	163

Tantilla bairdi Stuart

Tantilla bairdi, Stuart, *Occ. Papers Mus. Zool. Univ. Mich.*, 452 (1941): 1 (Finca Chichén, Alta Verapaz, Guatemala).

Finca Chichén, No. 89223 (holotype).

Superficially, this species resembles *T. schistosa* (Bocourt), and it apparently occupies much the same habitat; both are present in the pine belt. The above specimen, an adult female, has 15 dorsals, 163 abdominals, and 34 subcaudals.

Tantilla phrenitica Smith

Tantilla phrenitica, Smith, *Zoologica*, 27 (7), (1942): 39 (Cualtlapan, Veracruz, Mexico).

Semacock (= Semococh), U.S.N.M. No. 20835 (paratype).

The occurrence of 3 very similar species of *Tantilla* in the Alta Verapaz does little to clarify the relationships within this complex genus, especially since *phrenitica* and *schistosa* have both been taken at Semococh and the latter and *T. bairdi* from the pine belt. The above species is probably a Petén element that invades Alta Verapaz along the Río Polochic Valley.

Tantilla schistosa (Bocourt)

Homalocranion schistosum, Bocourt, *Mission scientifique au Mexique*, 1883, p. 584, Pl. 36, Fig. 10 (Alta Verapaz and Mexico; here restricted to Alta Verapaz); Müller, 1890: 261 (Verapaz).

Finca Panzamalá, Nos. 91059–60; Finca Samac, Nos. 91061–63; F.M.N.H. No. 20526; Semococh, U.S.N.M. No. 38124.

This topotypic material agreed exactly with the description of the type. In life the dorsal color varies from olive-green to reddish brown, each scale margined with black. The collar and anterior part of the ventrum is lemon-yellow, grading into brilliant orange beneath the tail. Smith (1942*e*: 39) suggested that Bocourt's Mexican cotype may be *phrenitica,* and I, therefore, take this opportunity to restrict the type locality of *schistosa* to Alta Verapaz.

All the specimens were taken beneath decaying rubbish in coffee groves. Specimens Nos. 91061–62, collected June 25, 1938, are juveniles not many days old. The species is apparently restricted to the Tropical zone.

TABLE XXVIII

SCUTELLATION OF *T. schistosa*

Number	Sex	Dorsals	Abdominals	Subcaudals
91059	♂	15	129	34
91061	♂	15	130	35
91062	♂	15	121	39
91063	♂	15	123	40
91060	♀	15	129	36
F.M.N.H. 20526	♀	15	134	.....
U.S.N.M. 38124	♀	15	130	37

Stenorrhina degenhardtii (Berthold)

Calamaria degenhardtii, Berthold, *Abh. Kon. Ges. Wiss. Göttingen,* 1846, p. 8, Taf. 1, Figs. 3–4 (Colombia).

Stenorhina ventralis, Duméril and Bibron, *Erpétologie générale,* 7 (2), (1854): 867 (Cobán, Alta Verapaz).

Stenorhina degenhardti, var. Y. Günther, 1895: 158–59 (Verapaz, low forest).

Stenorhina degenhardtii, Boulenger, 1896: 229 (Verapaz, low forest); Bocourt, 1886: 594, Pl. 37, Fig. 7 (type of *ventralis*).

Finca Chichén, from stomach of *Micrurus e. verae-pacis* No. 91044; Finca Panzamalá, No. 91034; Finca Volcán, No. 91035.

That several forms are included in the catch-all name *degenhardtii* is evident, and Smith and Taylor (1945: 132–33) have made an arrangement of the Mexican forms. Two major types seem to sort out in Guatemala; one, either unicolored or striped with a relatively large number of abdominals, and another, spotted or mottled, with fewer abdominal scutes.

The 2 groups apparently occupy about the same geographic range, but may differ ecologically. The above specimens, which are of the mottled type with a very dark ventral surface, seem to be restricted to the Tropical zone in Alta Verapaz. On the adjacent lowlands of the Yucatán Peninsula only the striped or unicolor variety is known to occur (Stuart, 1935: 54; Schmidt, 1941: 506–7). This latter form is also present in the interior

desert basins to the south of Alta Verapaz (Schmidt and Stuart, 1941: 245–46).

The 2 specimens before me were secured in the coffee zone.

TABLE XXIX

SCUTELLATION OF *S. degenhardtii*

Number	Sex	Dorsals	Abdominals	Subcaudals
91034	♀	17	158	35
91035	♀	17	159	37

Amastridium sapperi (Werner)

Mimometopon sapperi, Werner, *Abh. bayer. Akad. Wiss.,* 22 (2), (1903): 349, Taf. 1, Figs. 3–5 (Guatemala).

Finca Chamá, M.C.Z. No. 28095.

Anthony collected this rare species on the northern lowlands. Nothing is known of its habits nor of its ecological distribution. The specimen is a female with 17 dorsals, 154 abdominals, and 85 subcaudals.

Micrurus affinis apiatus (Jan)

Elaps apiatus, Jan, *Rev. mag. zool.,* 1858–59, p. 11 (separate pagination; Veracruz, *lapsus* for Verapaz, *fide* Schmidt, 1933: 38).

Elaps fulvius apiatus, Werner, 1903: 350 (Cobán).

Micrurus affinis apiatus, Schmidt, 1933: 37 (various localities in Alta Verapaz).

Elaps fulvius, Salvin, 1860: 458 (Lanquín); Günther, 1895: 182, and Boulenger, 1896: 422 (Verapaz, low forest).

Elaps aglaeope, Günther, 1895: 184 (Lanquín).

Elaps guatemalensis, Ahl, *Zool. Anz.,* 70 (9–10), (1927): 251 (Guatemala).

Alta Verapaz, U.S.N.M. No. 37841; Finca Canihor, No. 91039; Finca Chamá, No. 91042; Finca Chipoc, M.C.Z. No. 28096; Finca Los Alpes, No. 91036; Finca Los Pinales, U.S.N.M. No. 37840; Finca Panzamalá, Nos. 91040–41; Finca Sepacuité, M.C.Z. No. 24946; Finca Volcán, Nos. 91037–38.

This race is the most distinct of the *affinis* group, exceeding in number of black body rings (40 to 61) all other subspecies of *affinis,* and differing further in the absence of yellow rings. For this reason intergrades between it and *alienus,* with yellow rings and a relatively low number of black annuli, are readily identifiable. Unfortunately, the occurrence of such intergrades causes some confusion wherever the normally yellow-ringed *hippocrepis* is also adjacent to the expected limits of *apiatus.* Thus, specimens recorded by Salvin (1861*b*: 209) as of "San Geronimo and the neighboring mountains in the province of Vera Paz" under the name *E. corallinus* have generally been referred to *apiatus.* K. P. Schmidt, to whom problems concerning *Micrurus* must always eventually be referred, agrees with me in considering Salvin's specimens as *M. a. hippocrepis* (see following species).

This allows Salvin's yellow-ringed specimens of "Vera Paz, low forest" and another similarly colored individual from Finca Los Alpes to stand as *apiatus* approaching *alienus*. Boulenger (1896: 425) described a specimen from "Vera Paz, low forest," as having 21 to 24 yellow-edged black annuli on the body. It is questionable whether this specimen could be differentiated from typical *alienus*. This author described (1896: 426) 5 specimens from the same locality as having the same color as his other specimen but with the annuli numbering 24–62, thus approaching *apiatus*. The "Vera Paz, low forest" population must, therefore, be considered to be intergradient. My specimen from Finca Los Alpes, which has 38 black annuli narrowly edged with yellow, is unquestionably an intergrade, though closer to *apiatus* than to *alienus*. According to a more exact definition of *hippocrepis* it is possible that the Los Alpes specimen may approach this form rather than *alienus*. A British Museum specimen from Yzabal, Guatemala, was referred to *hippocrepis* by Schmidt (1936*b*: 213).

Micrurus a. apiatus has been considered an Alta Verapaz endemic, but Hobart Smith has secured it on the Caribbean slopes of the Chiapas mountains in Mexico. Thus, this form follows the mountains westward into the Sierra de los Cuchumatanes and thence northward into Mexico.

The race is relatively abundant in Alta Verapaz. It is most frequent beneath decaying rubbish in coffee groves, but I have seen it crawling openly on the trails. It occurs throughout the Tropical zone, with the exception of the pine belt (I do not accept the Cobán record). A female secured April 4, 1938, contained well-formed eggs within the body cavity.

TABLE XXX

SCUTELLATION OF *M. affinis apiatus*

Number	Sex	Dorsals	Abdominals	Subcaudals
91036	♂	15	203	50
91037	♂	15	202	49
91038	♂	15	207	55
91039	♂	15	206	52
91040	♂	15	194	47
91042	♂	15	209	55
M.C.Z. 24946	♂	15	204	52
M.C.Z. 28096	♂	15	205	51
U.S.N.M. 37841	♂	15	206	49
U.S.N.M. 37840	♀	15	222	38
91041	♀	15	228	41

Micrurus affinis hippocrepis (Peters)

Elaps hippocrepis, Peters, *Monatsb. Akad. Wiss. Berlin*, 1861, p. 925 (Santo Tomás, Guatemala).

Elaps corallinus, Salvin, 1861*b*: 228 (San Gerónimo and the neighboring mountains in the province of Verapaz).

Finca La Primavera, No. 91045.

As I have previously indicated, much of Owen's material, reported by Salvin (1861), was probably collected in the dry basins of Baja Verapaz. It is, therefore, questionable whether this race enters biotic Alta Verapaz. My specimen was secured in the arid Río Negro gorge in the Zacapan biotic area.

Micrurus a. hippocrepis is as yet poorly understood. As it is known primarily from the wet, lower Río Motagua Valley, its occurrence in these arid regions presents a geographic problem. K. P. Schmidt has suggested (*in litt.*) that the arid valleys may be its center and that the more humid Caribbean lowlands represent the fringes of its range.

The above specimen, a female, has 15 rows of dorsals, 228 abdominals, 36 subcaudals, and 21 black, yellow-edged annuli on the body.

Micrurus elegans verae-pacis Schmidt

Micrurus elegans verae-pacis, Schmidt, *Field Mus. Nat. Hist. Zool. Ser.*, 20 (1933): 32 (Campur, Alta Verapaz, Guatemala). Specimens from Verapaz, low forest, and Alta Verapaz; Schmidt, 1936*b*: 214 (Cobán-Samac road: Samac).

Elaps elegans, Müller, 1878*b*: 616 (Verapaz); Günther, 1895: 186, and Boulenger, 1896: 418 (Verapaz, low forest); Werner, 1903: 350 (Cobán); Mocquard, 1908: 922 (Alta Verapaz).

Finca Chichén, No. 91044; Finca Panzamalá, No. 91043; Finca Samac, F.M.N.H. Nos. 20531–32; Cobán, F.M.N.H. Nos. 20530, 20497.

Though apparently most abundant in the pine belt, this form seems to be generally distributed throughout Alta Verapaz, with the exception of the cloud forest. The specimen from Finca Chichén, a female, secured May 21, 1940, had 4 well-formed eggs in her body and a juvenile *Stenorrhina degenhardtii* in her stomach.

TABLE XXXI

SCUTELLATION OF *M. elegans verae-pacis*

Number	Sex	Dorsals	Abdominals	Subcaudals
91043	♂	15	202	47 + tip
91044	♂	15	225	31 + tip
F.M.N.H. 20530*	♂	15	.....	46
F.M.N.H. 21531*	♂	15	210	48
F.M.N.H. 20497*	♂	15	.....	48
F.M.N.H. 20532*	♀	15	225	34

* *Fide* K. P. Schmidt (*in litt.*).

Bothrops atrox asper (Garman)

Trigonocephalus asper, Garman, *Mem. Mus. Comp. Zool., Harvard Univ.*, 8 (1883): 124 (Obispo, Panama).

Bothrops atrox, Günther, 1895: 187 (Verapaz, low forest; Cobán).
Lachesis lanceolatus, Boulenger, 1896: 535 (Verapaz); Werner, 1903: 350 (Campur).
Lachesis atrox, Boulenger, 1896: 537 (Cobán); Werner, 1903: 350 (Cobán, Campur).

Finca Canihor, No. 91094; Finca Chamá, Nos. 91095–96; Finca Los Alpes, Nos. 91088–90; Finca Panzamalá, No. 91097 (head only); Panzós, No. 91091; Senahú, U.S.N.M. No. 35910; Finca Volcán, No. 91092–93.

This wide-ranging form, which occurs up to about 1000 meters in Alta Verapaz, shows no habitat preference. I question the Cobán record. Mammalian remains were removed from the stomachs of several of the specimens, and one specimen contained a *Lygosoma c. cherriei.*

TABLE XXXII

SCUTELLATION OF *B. atrox asper*

Number	Sex	Dorsals (Maximum)	Abdominals	Subcaudals
91088	♀	27	210	61
91089	♀	27	210	66
91090	♀	27	209	62
91094	♀	27	219	69
91097	♀	29	217	70
U.S.N.M. 35910	♀	27	217	66
91091	♂	25	218	70
91092	♂	27	214	69
91093	♂	25	209	69
91096	♂	25	212	70

Bothrops godmani (Günther)

Bothreichis godmanni, Günther, *Ann. Mag. Nat. Hist.,* 3, 12 (1863): 364, Pl. 6, Fig. 6 (Dueñas and tableland of Guatemala).

Finca Chichén, Nos. 91079–80.

This species seems to occur only in the cloud forest in western Alta Verapaz. Like *Thamnophis e. fulvus* and *Anolis c. haguei,* it apparently represents a plateau element that barely reaches the Alta Verapaz.

TABLE XXXIII

SCUTELLATION OF *B. godmani*

Number	Sex	Dorsals	Abdominals	Subcaudals
91079	♂	21–19–17	145	33
91080	♀	21–19–17	141	30

Bothrops nasutus Bocourt

Bothrops nasutus, Bocourt, *Ann. Sci. Nat.,* 10 (1868): 202 (Panzós, Guatemala).
Bothrops lansbergi, Müller, 1878*b*: 703 (Verapaz).
Bothrops brachystoma, Müller, 1882: 154 (Verapaz).
Bothreichis lansbergii, Günther, 1895: 190 (in part; Verapaz, low forest).

Lachesis brachystoma, Boulenger, 1896: 547 (in part; Verapaz, low forest).
Trimerusurus brachystoma, Mocquard, 1909: 945, Pl. 75, Figs. 4 (in part; Panzós, Guatemala).

Finca Chamá, Nos. 91077–78.

This species is restricted to the Caribbean lowlands of Central America. It is well known to the natives. A specimen was brought to me by an Indian, who had killed it inside his hut. In the forest it is almost as inconspicuous as *B. mexicanus.*

TABLE XXXIV

SCUTELLATION OF *B. nasutus*

Number	Sex	Dorsals	Abdominals	Subcaudals
91077	♀	25–23–21–19	143	29
91078	♂	23–21–19	142	38

Bothrops nigroviridis aurifer (Salvin)

Thamnocenchris aurifer, Salvin, 1860: 459, Pl. 32, Fig. 1, and 1861: 325 (Cobán, Verapaz).
Bothriechis aurifera, Günther, 1895: 189 (Cobán).
Lachesis aurifer, Boulenger, 1896: 568 (Cobán, Verapaz).

Finca Volcán, No. 91081.

The single specimen of this species was secured from a bromeliad in the cloud forest. It is a male with a dorsal scale formula of 19–17, 154 abdominals, and 67 subcaudals. In the stomach of the specimen were fragments of what was unquestionably *Hyla bromeliacia.*

TABLE XXXV

SCUTELLATION OF *B. nigroviridis aurifer*

Number	Sex	Dorsals (Maximum)	Abdominals	Subcaudals
91082	♀	27	128	29
91083	♀	27	131	31
91085	♀	25	129	34
91086	♀	25	129	31
91084	♂	25	124	36
91087	♂	25	130	32

Bothrops mexicanus (Duméril and Bibron)

Atropes mexicanus, Duméril and Bibron, *Erpétologie générale,* 7 (1845): 1521, Pl. 83 bis, Figs. 1–2 (Verapaz).
Bothriechis nummifera notata, Fischer, *Arch. f. Natur.,* 46 (1880): 222 (Cobán).
Bothrops mexicanus, Müller, 1882: 154 (Verapaz).
Bothriechis nummifera, Günther, 1895: 191 (Cobán).
Lachesis nummifer, Boulenger, 1896: 544 (Verapaz, low forest).

Finca Los Alpes, Nos. 91082–83; Finca Chichén, No. 91085; Finca La Primavera, Nos. 91086–87; Finca Volcán, No. 91084.

This species was secured at all altitudes. Mammalian remains were found in the stomachs of adults, and in a young individual (No. 91084) orthopteran fragments were present.

Crotalus durissus durissus Linnaeus

Crotalus durissus, Linnaeus, *Systema Naturae*, I (1758): 214 (America); Cope, 1887: 89 (Cobán).

Finca La Primavera, No. 91098.

The Cobán record is questionable. The species apparently inhabits only the arid gorge of the Río Negro; it is unknown in biotic Alta Verapaz. It is said to be not uncommon in the Río Negro Valley. The specimen at hand is a male with dorsal scale formula of 25–27–25–23–21–19, 173 abdominals, and 28 subcaudals.

LIST OF LOCALITIES

Because several localities from which herpetological material has been secured are not recorded on maps and others have been misidentified by previous writers, it seems advisable to include in this work a list of all localities from which Alta Verapaz herpetological material has originated. Wherever possible I have added brief notes on the terrain of the localities, given the elevations, and included the names of the collectors who visited them. Dates with no other information are those of my visits to the various localities. Wherever possible I have given Sapper's elevations (1902: Karte 3) instead of my own data, since the aneroid which I used in the field proved to be not too reliable. All elevations of fincas refer to the altitude of the *casa grande*.

Map 1 is based upon Sapper's magnificent plan of Alta Verapaz. Unfortunately, Sapper's scale of kilometers was constructed for latitude 0°, an error which I have corrected on my map. All distances in the following list are measured in a straight line.

Actelá, Finca.—A coffee plantation about 36 kilometers east-southeast of Cobán. It lies above La Tinta on the north slopes of the Polochic Valley. Conditions there are similar to those encountered at Finca Los Alpes. Altitude, about 800 meters.

Cacao.—According to Caudell (1908: 169) this locality lies "between Panzós and Senahú at an altitude of about 900 feet near the foot of the waterfalls above which the coffee plantation of Treceaguas is situated." Treceaguas itself lies within a tributary valley of the Río Polochic 48 kilometers east and slightly south of Cobán. It is separated from the Polochic Valley by a ridge. The valley slopes are extremely steep, and the country is very rugged. It is planted in coffee and corn with much brushland along the streams. Schwarz and Barber collected here in 1906. I have passed through the region.

Campur, Finca.—A coffee plantation lying almost on the crest of the divide between the Río Cahabón and the Río de la Pasión, 30 kilometers northeast of Cobán. I have never visited this locality, but since it is one of the oldest and best-known of the Verapaz coffee plantations, all virgin country has probably long since disappeared. A Sapper locality, it lies in what was originally the broadleaf forest of the upper Tropical zone. Altitude, about 850 meters.

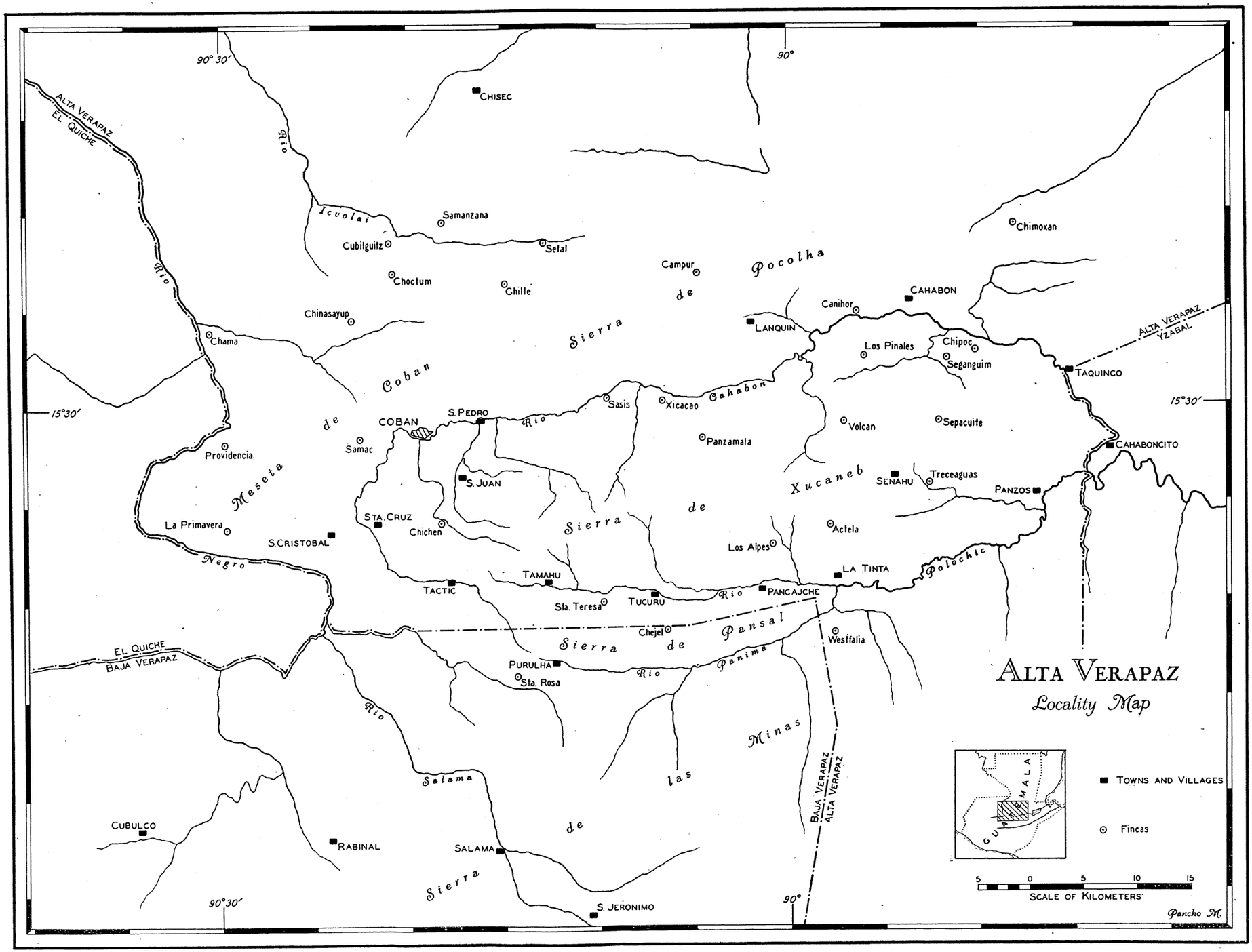
Canihor, Finca.—A small cacao plantation on the banks of the Río Cahabón, 41 kilometers east-northeast of Cobán. The valley here is about 10 kilometers broad and is rolling terrain broken by longitudinal ridges and erosional remnants rising some 200 meters above the river. Little of the region remains virgin, and the heavily cultivated area is burned over every few years. The virgin cover was probably pine savannas, a few local areas of which may still be seen. Along the Río Cahabón is some broadleaf forest. The dominant vegetation of the valley is now savanna grasses with some pine and a little *nance* (*Byrsonima*) and *sahá* (*Curatella*). Altitude, probably about 270 meters. April 3–17, 1940.

Ceiba.—A station on the upper Río de la Pasión about 44 kilometers northeast of Cobán. Henry van der Schalie, who collected here, informed me that the land is high, well-drained, rugged, and covered with virgin rain forest. Altitude, about 250 meters.

Chajchinic.—A station at the junction of the Río de la Pasión and the Arroyo Chajchinic some 75 kilometers northeast of Cobán. According to van der Schalie the terrain is not unlike that at Ceiba. Altitude, probably about 200 meters.

Chamá, Finca.—A lowland farm devoted primarily to corn, cattle, and pigs, but with some coffee, cacao, and a fine grove of rubber. It is 23 kilometers northwest of Cobán in the triangle formed by the junction of the Río Negro and Río Seniso (Salbá). It lies on an extensive bench, broken by erosional remnants, and possibly represents an ancient flood plain of the Río Negro. Surrounding this bench the hills rise steeply, particularly to the north and south, to some 450 meters above the valley. Though heavily cultivated with corn, it contains considerable areas of dense second growth and pastures. Along the Río Seniso is some high forest. The hills above the valley support virgin forest. Some collecting was done in the forested area to the west of Rio Negro in the department of El Quiché. Anthony visited this locality in April and May, 1928 (Griscom, 1932: 15). Altitude, 290 meters. May 9–June 20, 1938.

Chejel, Finca.—A coffee plantation 30 kilometers southeast of Cobán on the Alta Verapaz–Baja Verapaz border in the Sierra de Pansal. This ridge is heavily planted in coffee, especially on its northern face. There is no virgin forest in this area; wherever coffee is not grown is either pasture or



MAP 1. Alta Verapaz and adjacent territory.

very dense second growth. Originally, it was largely broadleaf forest except at its eastern end, where pine is still dominant. Altitude, 920 meters. June 5–9, 1940.

Chiacany.—I have been unable to locate this station, and I suggest that Werner (1903) badly garbled the original label.

Chichén, Finca.—A tract of land devoted to Indian holdings. It is in the pine zone 8 kilometers due south of Cobán. To the north the terrain is rolling with numerous conical, erosional remnants and cut with several fine streams; to the south Cerro Chichén rises abruptly. The farm is on the border of the pine zone and the cloud forest. To the north the country, though still supporting a few virgin pine groves, is devoted largely to corn fields and pastures, or is overgrown with considerable second growth. On Cerro Chichén there are a few corn fields, but, for the most part, virgin cloud forest is the dominant cover. Altitude, 1410 meters. May 13–27, 1940.

Chimoxán, Finca.—A locality visited by Anthony in September-October, 1928. It is 58 kilmometers east-northeast of Cobán and at the base of the northern mountain complex of the Alta Verapaz. The vegetation is typical of the lowland forest (*fide* Anthony, in Griscom, 1932: 15). Altitude, 350 meters.

Chipoc, Finca.—According to Anthony (in Griscom, 1932: 415) this locality lies "a few miles north of Finca Sepacuité . . . mostly brushland with some forest along the river [Cahabón] a mile below." This should not be confused with the better-known Finca Chipoc, which is situated on the outskirts of Cobán. Altitude, 620 meters (*fide* Griscom).

Chisec.—A settlement on the lowlands 33 kilometers north-northeast of Cobán. Sapper (1894: Taf. 3) mapped this district as "*baum-savannen,*" but to the north and south the lowland rain forest is dominant. Situated on the main trail between Cobán and Petén, it has been a stopping place for many naturalists, including Salvin and Hague. Altitude, about 190 meters.

Cobán.—The capital and largest city of Alta Verapaz, at approximately 15° 30′ north, 90° 20′ west, is situated in a well-watered section of the pine zone among rolling hills dominated by ranges of knobby, erosional relicts. The heavily cultivated and grazed region contains fine groves of virgin pine, especially to the west and southwest. Records in literature of such lowlands forms as *Cnemidophorus sackii* subspecies, *Cinosternon cobanum* (= *K. leucostomum*), and especially *Crotalus d. durissus,* occurring only in the Río Negro gorge, lead me to question all older material preserved in museums with "Cobán" as the locality. The city was an important center for "trade-skins," and scientific specimens collected by Hague, Sarg, Berendt, Owen, Sapper, and other German settlers were shipped from there. Many specimens now carrying the label "Cóban" originated from other sec-

tions of Verapaz. Altitude, about 1325 meters. Cóban served as my base both in 1838 and 1940, but I did very little collecting in the immediate vicinity.

Coile, Camp.—I have been unable to locate this station. George P. Goll collected here, and his original labels read "Camp Coile, near Panzós."

Cubilguitz, Finca.—A corn and cattle plantation on the lowlands at the base of the Sierra de Pocolhá. It is 18 kilometers almost due north of Cobán on the banks of a small tributary of the Río Icvolai. The surrounding terrain is rolling and is largely in pastures, corn fields, and second growth, but some virgin forest is still present. Both Salvin and Godman and their collector Champion spent considerable time at this place, and I am of the opinion that material labeled "Vera Paz, low forest" originated from here or from near-by Choctum. Altitude, 300 meters. July 24–28, 1938.

Lanquín.—A small village in the valley of the Río Cahabón 33 kilometers east-northeast of Cobán. The valley here is very rugged and cut by ridges and small hills. The vicinity of the village is heavily cultivated and contains areas of second growth. The remnants of the virgin cover indicate that it was originally pine savanna. Salvin stopped here in 1859 and 1860. I passed through the village in 1940. Altitude, 380 meters.

La Primavera, Finca.—Originally a monastery, this historic site has been a sugar plantation for almost a century. It is 21 kilometers southwest of Cobán on a bench in the gorge of the Río Negro. Surrounding the finca are pine-clad hills with some broadleaf forests along the courses of streams, and on the mountain crests is the cloud forest. Much of the region is under cultivation, and there are large tracts of very dense second growth. In the gorge below 850 meters the vegetation changes to savanna and is dominated by long grasses, *sahá* and *nance*. Champion visited this locality in February, 1880, and Anthony in March-April, 1925, and February-March, 1928. Altitude, probably about 1100 meters. June 17–25 and July 2–3, 1940.

Los Alpes, Finca.—A coffee plantation on the north slopes of the Río Polochic Valley, 34 kilometers east-southeast of Cobán. The slopes here are extremely steep and are entirely in coffee groves, though a few local patches of virgin forest are available. Owing to a series of cliffs, the cloud forest above is almost inaccessible. Altitude, probably about 1000 meters. February 8–19, 1940.

Los Pinales, Finca.—A corn farm in the Cahabón Valley almost directly across the river from Finca Canihor, and 43 kilometers east and slightly north of Cobán. The vegetation is similar to that encountered at Finca Canihor. The terrain is also similar except that it is more rugged. Altitude, probably about 675 meters. August 24–26, 1938.

Pancajché.—A settlement at the upper end of the Verapaz Railroad, 35

kilometers east-southeast of Cobán on the Río Polochic, which is here a narrow, swift-running stream whose valley is narrow and steepsided. Most of the area is in dense second growth with little virgin forest remaining. Altitude, 225 meters. I passed through this place many times, but never collected in it.

Panzamalá, Finca.—A coffee plantation on the south slopes of the Río Cahabón Valley, 27 kilometers due east of Cobán in a valley tributary to that of the Río Rubel Cruz and shielded from the Cahabón Valley by a low ridge. The very steep surrounding hills are planted in coffee and corn, mixed with much second growth and pasture. The little remaining virgin forest is not readily accessible. Originally, this locality represented the base of the cloud forest. Altitude, 1250 meters. March 24–April 16 and August 18–19, 1940.

Panzós.—A village at the upper limit of navigation on the Río Polochic and the lower terminus of the Verapaz Railroad. It is 58 kilometers east and slightly south of Cobán. Here the Polochic Valley is some 12 kilometers broad, and the river, at this point, flows close to its northern side. The country is remarkably level and so low as to be flooded annually by the river. The numerous streams from the surrounding mountains flow through the region. To the north of the river the country is heavily cultivated in corn, and burning and cultivation have caused most of the forest to be replaced by dense second growth dominated by *ceiba* (*Ceiba*), *flor de verano* (*Cochlospermum*), and corozo (*Orbignya*). Some virgin rain forest is on the south side of the Río Polochic. This locality was a major station of the French scientific mission in 1864 and is important as a type locality. Altitude, 36 meters. September 2–7, 1938, and February 23–March 9, 1940.

Samac, Finca.—A coffee finca in the pine zone 6 kilometers due west of Cobán. The very rugged terrain is dotted with numerous, small, conical, erosional remnants and is dominated to the west by the high block of Cerro Chitú. Except for a small stream there is no surface water in the region. Coffee, corn, and sugar are extensively cultivated, but despite these and considerable pasture and second growth some very fine stands of virgin pine occur in the area. On the crests of the higher ridges are tracts of virgin cloud forest. This was one of Schmidt's main bases in 1934. Altitude, 1300 meters. April 18–30 and June 23–30, 1938.

Samanzana, Finca.—A corn and mule farm on the lowlands 19 kilometers due north of Cobán. In terrain and vegetation Finca Samanzana is similar to Finca Cubilguitz, except that there is more virgin forest in the region. Altitude, probably about 400 meters. July 18–24, 1938.

Santa Teresa, Finca.—A coffee plantation on the south slopes of the valley of the Río Polochic 23 kilometers southeast of Cobán. The valley here is narrow with steep slopes and is heavily planted in coffee. Not

much collecting was done at this locality. Altitude, probably about 750 meters. August 29–30, 1938.

Secanquim.—An Anthony locality 50 meters east-northeast of Cobán on the south slope of the Rio Cahabón Valley. The area is covered with pine and oak forest and much brush (*fide* Anthony, in Griscom, 1932: 13). I have never visited the locality. Altitude, 550 meters.

Semococh.—There are numerous localities of this name in Alta Verapaz, and O. F. Cook of the United States Department of Agriculture, has furnished me the following information: "Our (United States National Museum) Semococh was a few miles east of Treceaguas 48 kilometers east and slightly south of Cobán in the district of Senahú . . ."

This region is now heavily cultivated, especially in coffee. The valley in which Semomoch lies is all in second growth. G. P. Goll collected in the region in February, 1905, and I have passed through it. Altitude, probably about 500 meters.

Senahú.—A village 44 kilometers east and slightly south of Cobán. This important coffee and trading center lies on a rolling plateau which is heavily cultivated and overgrown in brushland mixed with open pastures. There is little virgin forest in this region. Paul Hasse collected specimens for the United States National Museum at this locality, probably before 1905. I have often passed through the village. Altitude, 990 meters.

Sepacuité, Finca.—A large coffee finca 49 kilometers due east of Cobán. Contrary to Anthony's note that it lies on the divide between the watersheds of the Río de la Pasión and the Río Polochic (Griscom, 1932: 13), it is entirely within the Polochic drainage basin on the divide between the Ríos Polochic and Cahabón. Much of this area is devoted to coffee groves and pastures, but on the crests of the higher hills there are remnants of cloud forest. Anthony visited the locality in April–June and December, 1925. I have passed the locality several times, without collecting in it. Altitude, 1020 meters.

Treceaguas, Finca.—A coffee plantation 50 kilometers almost due east of Cobán. The terrain is like that at Cacao. Although I have traveled through the region, I have never stopped at this locality. Altitude, 870 meters.

Tucurú (Toucourú, Tucurub).—A village near the head of the Polochic Valley 22 kilometers southeast of Cobán. The river here is little more than a freshet, and the valley slopes are very steep. The lower slopes are planted in coffee and corn and were probably originally in pine. Above the slopes is the virgin cloud forest. The French scientific mission collected in this locality. As the village is on the main road between Cobán and Panzós I passed through it many times, but never stopped. Altitude, 480 meters.

Volcán, Finca.—A coffee finca on the southern slopes of the valley of the Río Cahabón 39 kilometers due east of Cobán. The steep valley slope is

planted in coffee and corn, though considerable second growth is to be found. The virgin cloud forest is readily accessible from these slopes. Originally, the locality was in broadleaf forest, which is in contact with the savannas of the lower Cahabón at about 600 meters altitude. Altitude, probably about 925 meters. August 22, 25, 1938, and March 15–29, 1940.

Xicacao, Finca.—A coffee plantation on the southern slopes of the Cahabón Valley 24 kilometers almost due east of Cobán. Originally, this region supported pine cover, but today little pine remains, and pasture, coffee groves, and second growth dominate the area. I have stopped at the finca on several occasions, but have never collected there. Altitude, 1000 meters.

LITERATURE CITED

AMARAL, AFRANIO DO

1929 Estudos sobre ophidios neotropicos XIX—Revisao do genero *Spilotes* Wagler, 1830. Mem. Ist. Butantan, 4: 273–98, Figs. 1–8.

BAILEY, JOSEPH R.

1939 A Systematic Revision of the Snakes of the Genus Coniophanes. Papers Mich. Acad., 24 (1938): 1–48, Pls. 1–3, Figs. 1–5.

BARBOUR, THOMAS

1934 The Anoles, II. The Mainland Species from Mexico Southward. Bull. Mus. Comp. Zool., Harvard Univ., 72: 121–55.

BLANCHARD, FRANK N.

1921 A Revision of the King Snakes: Genus Lampropeltis. Bull. U. S. Nat. Mus., 114: 1–260 + vi, Figs. 1–78.

BOULENGER, GEORGE A.

1882 Catalogue of the Batrachia Salientia S. Ecaudata in the Collections of the British Museum. 2d ed.; London: British Museum. Pp. 1–503 + xvii, Pl. 1–30.

1885–87 Catalogue of Lizards in the British Museum (Natural History). 2d ed.; London: British Museum. 3 vols.

1889 Catalogue of the Chelonians, Rhynchocephalians, and Crocodiles in the British Museum (Natural History). London: British Museum. Pp. 1–311 + x.

1893–96 Catalogue of the Snakes in the British Museum (Natural History). London: British Museum. 3 vols.

BREDER, C. M., JR.

1946 Amphibians and Reptiles of the Rio Chucumaque Drainage, Darien, Panama, with Notes on Their Life Histories and Development. Bull. Amer. Mus. Nat. Hist., 86, 8: 479–85, Pls. 42–60.

BROCCHI, P.

1877*a* Note sur quelques batraciens hylaeformes recueillis au Mexique et au Guatemala. Bull. soc. phil. Paris, pp. 122–32.

1877*b* Sur quelques batraciens raniformis et bufoniformes de l'Amérique Centrale. *Ibid.*, pp. 175–97.

1881–83 Étude des batraciens de l'Amérique Centrale. Mission scientifique au Mexique . . . Paris: Imprimerie Nacionale. 3 (2): 1–122, Pls. 1–21.

BURT, CHARLES E.

1931 A Study of the Teiid Lizards of the Genus Cnemidophorus with Special Reference to Their Phylogenetic Relationships. Bull. U. S. Nat. Mus., 154: 1–286 + viii, Figs. 1–38.

CAUDELL, ANDREW N.
1908 On Some Earwigs (Forficulidae) Collected in Guatemala by Messrs. Schwarz and Barber. Proc. U. S. Nat. Mus., 33: 169–76.

COPE, EDWARD D.
1887 Catalogue of Batrachians and Reptiles of Central America and Mexico. Bull. U. S. Nat. Mus., 32: 1–98.

DUMÉRIL, C., and D. DUMÉRIL
1851 Catalogue méthodique de la collection des reptiles. Paris: Gide et Baudry. Pp. 1–224 + iv.

DUMÉRIL, C., G. BIBRON, and A. DUMÉRIL
1834–54 Erpétologie générale ou histoire naturelle complete des reptiles. Paris: Librarie Encyclopédique de Roret. 10 vols. + Atlas.

DUMÉRIL, A., M. BOCOURT, and F. MOCQUARD
1870–1909 Études sur les reptiles. Mission scientifique au Mexique et dans l'Amérique Centrale, Recherches zoologiques. Paris: Imprimerie Nationale. Pt. 3, 1: 1–1012, i–xiv, Pls. 1–77.

DUNN, EMMETT R.
1926 The Salamanders of the Family Plethodontidae. Northampton, Mass.: Smith College. Pp. 1–441 + viii, 86 figs. + 3 pls.
1930 Notes on Central American Anolis. Proc. New Eng. Zool. Club, 12: 15–24.
1935 The Snakes of the Genus Ninia. Proc. Nat. Acad. Sci., 21 (1): 9–12.
1937 Notes on Tropical *Lampropeltis*. Occ. Papers Mus. Zool. Univ. Mich., 353: 1–11.
1942 The American Caecilians. Bull. Mus. Comp. Zool., Harvard Univ., 91 (6): 439–540.

DUNN, EMMETT R., and JOHN T. EMLEN, JR.
1932 Reptiles and Amphibians from Honduras. Proc. Acad. Nat. Sci. Phila., 84: 21–32.

GAIGE, HELEN T.
1936 Some Reptiles and Amphibians from Yucatan and Campeche, Mexico. Carnegie Inst. Wash. Publ., 454: 289–304.

GAIGE, HELEN T., NORMAN HARTWEG, and L. C. STUART
1937 Notes on a Collection of Amphibians and Reptiles from Eastern Nicaragua. Occ. Papers Mus. Zool. Univ. Mich., 357: 1–18, map.

GODMAN, FREDERICK D.
1915 (Introductory volume.) Biologia Centrali-Americana. Pp. 1–150, Maps 1–8.

GRISCOM, LUDLOW
1932 The Distribution of Bird-Life in Guatemala. Bull. Amer. Mus. Nat. Hist., 64: 1–459, Figs. 1–11, 2 maps.

GÜNTHER, ALBERT C. L. G.
1885–1902 Reptilia and Batrachia. *In* Biologia Centrali-Americana. Pp. 1–326 + xx, Pls. 1–76.

KAUFFELD, C. F.
1936 New York the Type Locality of Rana pipiens Schreber. Herpetologica, 1: 11.

KELLOGG, REMINGTON
1932 Mexican Tailless Amphibians in the United States National Museum. Bull. U. S. Nat. Mus., 160: 1–224 + iv, Pl. 1, Figs. 1–24.

MORELET, ARTHUR
1857 Voyage dans l'Amerique Central. Paris. 2 vols.

MÜLLER, F.
1878*a* [Necrology of] Dr. Gustav Bernoulli. Verhand. Natur. Gesell., 6: 710–37.

1878*b* Katalog der im Museum und Universitatskabinet zu Basel aufgestellten Amphibien und Reptilien nebst Anmerkungen. *Ibid.*, 6: 557–709, Pls. 1–3.

1882*a* Erster Nachtrag zum Katalog der herpetologischen Sammlung des Basler Museums. *Ibid.*, 7: 120–65.

1882*b* Zweiter Nachtrag zum Katalog der herpetologischen Sammlung des Basler Museums. *Ibid.*, pp. 166–74.

1884 Dritter Nachtrag zum Katalog der herpetologischen Sammlung des Basler Museums. *Ibid.*, pp. 74–299.

1890 Fumfter Nachtrag zum Katalog der herpetologischen Sammlung des Basler Museums. *Ibid.*, 8: 249–96, Pls. 1–3.

OLIVER, JAMES A.

1942 A Check List of the Snakes of the Genus *Leptophis*, with Descriptions of New Forms. Occ. Papers Mus. Zool. Univ. Mich., 462: 1–19.

ORTENBURGER, ARTHUR I.

1928 The Whip Snakes and Racers Genera Masticophis and Coluber. Univ. Mich. Studies, Mem. Univ. Mich. Mus., I: 1–247 + xviii, Pls. 1–34, Figs. 1–64.

O'SHAUGHNESAY, A. W. E.

1873 Herpetological Notes. Ann. Mag. Nat. Hist., (4), 12: 44–48.

PARKER, H. W.

1934. A Monograph of the Frogs of the Family Microhylidae. London: British Museum. Pp. 1–208 + viii, Figs. 1–67, 2 maps.

SACKETT, J. TOWNSEND

1941 A New Teeid Lizard of the Genus *Cnemidophorus*. Not. Natur. Acad. Nat. Sci. Phila., 77: 1–4, Figs. 1–3.

SALVIN, OSBERT

1860 On the Reptiles of Guatemala. Proc. Zool. Soc. London, pp. 451–61, Pl. 32.

1861*a* Quesal-Shooting in Vera Paz. Ibis, 3: 138–49.

1861*b* On a Collection of Reptiles from Guatemala. Proc. Zool. Soc. London, pp. 227–29.

SAPPER, KARL

1894 Grundzuge der physikalischen Geographie von Guatemala. Petermann's Mitteil., 113: 1–59, 4 Karten.

1902 Die Alta Verapaz. Mitt. Geogr. Gesell. Hamburg, 17: 78–244, Karte 3–6.

1932 Klimakunde von Mittelamerika. *In* Hand. Klimat., 2 (H): 1–74, Figs. 1–13.

1937 Mittelamerika. *In* Hand. Reg. Geol., 8 (4): 1–160, Figs. 1–15, Taf. 1–11.

SCHMIDT, KARL P.

1933 Preliminary Account of the Coral Snakes of Central America and Mexico. Zool. Ser., Field Mus. Nat. Hist., 20: 29–40.

1936*a* Guatemalan Salamanders of the Genus Oedipus. *Ibid.*, pp. 135–66.

1936*b* Notes on Central American and Mexican Coral Snakes. *Ibid.*, pp. 205–16, Figs. 24–27.

1939 New Central American Frogs of the Genus Hypopachus. *Ibid.*, 24: 1–4, Fig. 1.

1941 The Amphibians and Reptiles of British Honduras. *Ibid.*, 22: 475–510.

1943 Corollary and Commentary for "Climate and Evolution." Amer. Midland Nat., 30: 241–53.

SCHMIDT, KARL P., and L. C. STUART

1941 The Herpetological Fauna of the Salama Basin, Baja Verapaz, Guatemala. Field Mus. Nat. Hist., Zool. Ser., 24: 233–47, Figs. 21–22.

SMITH, HOBART M.

1939 The Mexican and Central American Lizards of the Genus Sceloporus. Zool. Ser., Field Mus. Nat. Hist., 26: 1–397, Pl. 1–31.

1941*a* On the Mexican Snakes of the Genus Pliocercus. Proc. Biol. Soc. Wash., 54: 119–24.

1941*b* Notes on Snakes of the Genus Conophis. Journ. Wash. Acad. Sci., 31: 117–24.

1941*c* Notes on Mexican Snakes of the Genus *Elaphe*. Copeia, 3: 132–36, Figs. 1–2.

1941*d* A New Name for the Mexican Snakes of the Genus Dendrophidion. Proc. Biol. Soc. Wash., 54: 73–76.

1941*e* Notes on the Snake Genus Trimorphodon. Proc. U. S. Nat. Mus., 91, 3130: 149–68.

1942*a* A Review of the Snake Genus Adelphicos. Proc. Rochester Acad. Sci., 8: 175–95, Figs. 1–6.

1942*b* Remarks on the Mexican King Snakes of the Triangulum Group. *Ibid.*, pp. 196–207, Pl. 1.

1942*c* Additional Notes on Mexican Snakes of the Genus Pliocercus. Proc. Biol. Soc. Wash., 55: 159–64.

1942*d* Mexican Herpetological Miscellany. Proc. U. S. Nat. Mus., 92: 349–95, Pl. 37.

1942*e* A Resume of the Mexican Snakes of the Genus Tantilla. Zoologica, 27: 33–42.

1946 Notes on Central American Leiolopisma. Herpetologica, 3, 4: 110–11.

SMITH, HOBART M., and EDWARD H. TAYLOR

1945 An Annotated Checklist and Key to the Snakes of Mexico. U. S. Nat. Mus. Bull. 187: 1–239 + iv.

STUART, L. C.

1935 A Contribution to a Knowledge of the Herpetology of a Portion of the Savanna Region of Central Petén, Guatemala. Misc. Publ. Mus. Zool. Univ. Mich., 29: 1–56, Pl. 1–4, Fig. 1, map.

1937 Some Further Notes on the Amphibians and Reptiles of the Petén Forest of Northern Guatemala. Copeia, 1: 68–70.

1940*a* A New Hypopachus from Guatemala. Proc. Biol. Soc. Wash., 53: 19–22.

1940*b* Notes on the "Lampropholis" Group of Middle American *Lygosoma* (Scincidae) with Descriptions of Two New Forms. Occ. Papers Mus. Zool. Univ. Mich., 421: 1–16, 1 fig.

1941*a* Two New Species of *Eleutherodactylus* from Guatemala. Proc. Biol. Soc. Wash., 54: 197–200.

1941*b* Studies on Neotropical Colubrinae. VIII. A Revision of the Genus *Dryadophis* Stuart, 1939. Misc. Publ. Mus. Zool. Univ. Mich., 49: 1–106, Pls. 1–4, Figs. 1–13, Maps 1–4.

1942*a* Una descripción preliminar de las provincias bioticas de Guatemala. . . . Anal. Soc. Geogr. Hist. Guatemala, 18: 29–38, map.

1942*b* Comments on the Undulata Group of *Ameiva* (Sauria). Proc. Biol. Soc. Wash., 55: 143–50.

1943*a* Taxonomic and Geographic Comments on Guatemalan Salamanders of the Genus *Oedipus*. Misc. Publ. Mus. Zool. Univ. Mich., 56: 1–33, Pl. 1–2.

1943*b* Comments on the Herpetofauna of the Sierra de los Cuchumatanes of Guatemala. Occ. Papers Mus. Zool. Univ. Mich., 471: 1–28, Pl. 1, Figs. 1–6, map.

TAYLOR, EDWARD H.

1935 A Taxonomic Study of the Cosmopolitan Scincoid Lizards of the Genus Eumeces with an Account of the Distribution and Relationships of Its Species. Bull. Univ. Kansas, 23: 1–643, Pls. 1–43, Figs. 1–84.

1939 Frogs of the *Hyla eximia* Group in Mexico, with Descriptions of Two New Species. Univ. Kansas Sci. Bull., 25 (1938): 441–45, Pls. 46–48.

1940 Mexican Snakes of the Genus Typhlops. *Ibid.*, 26: 441–44, Figs. 1–2.

1941 New Amphibians from the Hobart M. Smith Mexican Collections. *Ibid.*, 27: 141–67, Pls. 7–11, Fig. 1.

1942 Tadpoles of Mexican Anura. *Ibid.*, 28 (1): 37–55, Pls. 1–3.

TAYLOR, EDWARD H., and HOBART M. SMITH

1943 A Review of the American Sibynophine Snakes, with a Proposal of a New Genus. Univ. Kansas Sci. Bull., 29: 301–37, Figs. 1–9, Pls. 21–25.

1945 Summary of the Collections of Amphibians Made in Mexico Under the Walter Rathbone Bacon Traveling Scholarship. Proc. U. S. Nat. Mus., 95: 521–613, Pls. 18–32.

TRAPIDO, HEROLD

1944 The Snakes of the Genus Storeria. Amer. Midland Nat., 31: 1–84, 61 figs.

VAILLANT, LÉON

1908 Avant-propos. In Duméril, Bocourt, and Mocquard, *q.v.*, pp. i–xiv, map.

WERNER, FRANZ

1903 Ueber Reptilen und Batrachier aus Guatemala und China. Abhand. der k. bayer. Akad. Wien., 22: 343–84, pl.

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