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NEW AND NOTEWORTHY AMPHIBIANS AND REPTILES FROM BRITISH HONDURAS

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NEW AND NOTEWORTHY AMPHIBIANS AND REPTILES FROM BRITISH HONDURAS

WILFRED T. NEILL [1]

SYNOPSIS. *Syrrhophus leprus cholorum* new subspecies, *Ficimia publia wolffsohni* new subspecies, and *Kinosternon mopanum* new species are described. *Eleutherodactylus stantoni, Micrurus affinis alienus, Bothrops atrox asper,* and *Crocodylus moreleti barnumbrowni* are reduced to synonymy. *Anolis sagrei mayensis* is removed from synonymy. *Mabuya brachypoda* is recognized. *Ameiva undulata hartwegi* and *A. u. gaigeae* interdigitate rather than intergrade.

Eleutherodactylus r. rugulosus, Hyla picta, Anolis nannodes, Corytophanes hernandesii, Sibon n. nebulata, Micrurus nigrocinctus divaricatus, Bothrops nasutus, and *Kinosternon acutum* are added to the British Honduras herpetofaunal list. *Phrynohyas modesta, Anolis intermedius, Scaphiodontophis annulatus carpicinctus, Bothrops yucatanicus,* and *Staurotypus salvini* are deleted from the list. New records are presented for species whose existence in British Honduras was either recently discovered or inadequately documented: *Rhinophrynus dorsalis, Leptodactylus labialis, Hyla microcephala martini, Phrynohyas spilomma, Eumeces schwartzei, Clelia clelia, Elaphe flavirufa pardalina, Oxyrhopus petola aequifasciatus, Tropidodipsas s. sartorii,* and *Kinosternon c. cruentatum.*

Natural history notes are presented for 69 species of amphibians and reptiles, and a British Honduras checklist is appended.

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INTRODUCTION

In the summer of 1962 Thomas P. C. Monath and a party of friends collected amphibians and reptiles in British Honduras. The material they obtained was deposited in the Museum of Comparative Zoology at Harvard College and, through the kindness of Dr. Ernest E. Williams, was sent to me for study. The present paper analyzes this material, as well as pertinent specimens in the collections of the University of Florida and in my own collection.

Also included in the discussion are certain lizards and snakes, originally collected for a study of their protozoan parasites, and given to the Museum of Comparative Zoology by Major R. Hill. These reptiles were taken within a 10-mile radius of Central Farm, an agricultural station at Baking Pot, Cayo District, British Honduras. Major Hill's specimens are listed herein as from "Vicinity of Baking Pot."

Distances, directions, and place names in British Honduras were determined from the following maps: War Office GSGS 4767, Sheets 1-3, Edition 1; Surveyor General's 1933 map of forest types in British Honduras; Surveyor General's undated map of the entire country; the end map in Anderson (1958); and the detailed maps of the Direc-

torate of Overseas Survey, Series 449 and Misc. 8. A map (Fig. 8) shows localities mentioned in the present article.

Collecting dates have been omitted except where they provide information relating to seasonal activity or to the timing of reproductive cycles, but collectors' field notes pertaining to habits or habitat have generally been included.

Elsewhere I have categorized the major plant communities of British Honduras with special reference to the occurrence of amphibians and reptiles (Neill, 1960b; Neill and Allen, 1959a). These communities have been considered in detail by Bartlett (1935), Charter (1941), and Lundell (1934, 1937, 1940). My remarks here on habitats or on habits relate solely to British Honduras, and all localities mentioned are in British Honduras unless otherwise noted.

Herpetological collections have been abbreviated as follows: CNHM = Chicago Natural History Museum; MCZ = Museum of Comparative Zoology; UF = University of Florida; WTN = Wilfred T. Neill.

It is sometimes stated that the herpetofauna of British Honduras is virtually identical with that of the adjoining Guatemalan department, El Petén. While many species inhabit both regions, at least 18 amphibians and reptiles not reported from El Petén have been taken in British Honduras, and each collecting trip to British Honduras has revealed distributional and taxonomic phenomena that could not have been anticipated from the Guatemalan literature. It is felt that further studies in British Honduras will be useful; such studies are in progress.

ACKNOWLEDGMENTS

I am especially indebted to Dr. Ernest E. Williams of the Museum of Comparative Zoology for conveying to me the material taken by the Monath party. Thanks are also due to the personnel of that party—Messrs. Thomas P. C. Monath, John Monath, Michael Touff, John French, William Russell, Jeff MacNelly, and Robert Burgess—for their efforts. My thanks are likewise extended to Dr. Walter Auffenberg of the Florida State Museum for permission to examine material in his care; to Mrs. Anne M. Rick of the National Museum of Canada for bringing to my attention the material she collected at Tikal; to Mr. Ross Allen of Silver Springs, Florida, for his encouragement of my British Honduras studies; and to Mr. Anthony Wolffsohn of the British Honduras Forestry Department for specimens and information.

On behalf of the Monath party I wish to thank Messrs. A. Frith and O. N. D. Phillips of the British Honduras Forestry Department for permission to collect and to use the rest house at Augustine; the Belize Estates and Produce Company, and especially Mr. Colin Brooks, for permission to collect on company property and for the use of company guest houses, as well as for assistance in obtaining guides and transportation; Mr. Don Owen-Lewis, formerly Amerindian Development Agent in Toledo District, for arranging a stay in certain Kekchi villages; Mr. and Mrs. Harrison Burgess, of the American Consulate at Belize, for their hospitality and for many favors; and Dr. Williams for encouragement and support of the trip.

Finally, on behalf of the Museum of Comparative Zoology I should like to thank Major R. Hill, formerly of Central Farm, for the gift of reptiles taken in that vicinity.

ANNOTATED LIST

RHINOPHRYNIDAE

Rhinophrynus dorsalis Duméril and Bibron

MATERIAL EXAMINED. Cayo District: WTN 2708, Benque Viejo.

The species was but recently reported from British Honduras, at Gallon Jug (Fugler, 1960: 9).

BUFONIDAE

Bufo marinus (Linnaeus)

MATERIAL EXAMINED. Corozal District: MCZ 37903, Corozal, behind log beside house. Orange Walk District: MCZ 37904-06, Hill Bank, in wet, low grass be-

side lagoon at night, with *Bufo v. valliceps*. Cayo District: MCZ 37907-12, western side of Mountain Pine Ridge, 31 July 1962, on rocks bordering Belize River, calling by night. Stann Creek District: MCZ 37913-14, Mango Creek, under street light at night. Toledo District: MCZ 37993-99, San Pedro Columbia, around houses in Indian village.

Juveniles of the Central American giant toad have not been described, and most keys will not identify them correctly. MCZ 37913, snout-vent length 40 mm., might at first be taken for some other species. Cranial crests are absent; the parotoid gland lacks conspicuous pores, bears instead a few tubercles, is colored about like the remainder of the dorsum, and is smaller than the side of the head. Most of the under surfaces are spotted or marbled with gray on a white background, and there is a conspicuous black interorbital band. The hind limbs appear relatively small and weak. All these are juvenile characters. A somewhat larger toad, MCZ 37914, snout-vent length 60 mm., shows better development of the diagnostic features of the adult. Cranial crests are present although weakly developed, the parotoid is proportionately larger (although still smaller than the side of the head), the under surfaces are not dark-spotted, the interorbital band is less pronounced, and the hind limbs are proportionately somewhat stouter although not so stout as in the adult.

Bufo valliceps valliceps Wiegmann

MATERIAL EXAMINED. Corozal District: MCZ 37920-22, Corozal, in shade or under ground debris near houses; MCZ 37923, 3 miles south of Corozal, in wet, dead brush bordering track through canefield. Orange Walk District: MCZ 37943-44, Hill Bank, on dock at lagoon; MCZ 37924-25 (19 specimens), 37945-54, within 8 mile radius of Gallon Jug, under ground debris or in rain puddles, in town or along roads. Cayo District: MCZ 37955, 4 miles south of Cayo, in cow pasture at night, in rain; MCZ 37956, Augustine, in pool of creek; MCZ 37957-58 (31 specimens, mostly tadpoles and newly transformed individuals), western side of Mountain Pine Ridge, 1 August 1962, beside Belize River or in streamside pools. Stann Creek District: MCZ 37959-66, 3 miles south of Waha Leaf Creek, 3 August 1962, in grass at camp, on road at night, or calling in pool at night; MCZ 37967-78, 4 miles south of Waha Leaf Creek, in roadside rain puddles by day; MCZ 37979, 5 miles southwest of Mango Creek, in puddles along road. Toledo District: MCZ 37980-82, 2 miles west of Swasey Branch, in wet pine savanna; MCZ 37984-90, along road between Swasey Branch and Bladen Branch; MCZ 37983, 3 miles west of Swasey Branch, in puddle of road; MCZ 37991-99, San Pedro Columbia, in swampy area by creek; WTN 687, Old Toledo Settlement, under log in damp pasture; WTN 957-62, Punta Gorda, coastal flats beside brackish channels; WTN 1492-94, 1522-23, 2452, Columbia Branch Camp, around camp clearings in wooded region.

WTN 957-62, from supratidal habitats at Punta Gorda, may represent a distinct form. The 6 specimens range in snout-vent length

from 42 to 72 mm., are all very dark, show little trace of pattern, and have proportionately large heads. Toads from nearby inland areas, such as Old Toledo Settlement and Columbia Branch Camp, agree more closely with the norm of *Bufo v. valliceps*. A decision as to the status of the Punta Gorda population cannot be made until more is known of both geographic and individual variation in the *valliceps* complex. Probably several subspecies are recognizeable within the currently designated range of *Bufo v. valliceps*.

LEPTODACTYLIDAE

Eleutherodactylus rostralis (Werner)

MATERIAL EXAMINED. Orange Walk District: MCZ 37847, 2 miles north of Gallon Jug, in leaf litter of mahogany forest, at least a mile from any river or pond.

I follow Duellman (1963: 222) in applying the name *Eleutherodactylus rostralis* to the local representative of the *E. gollmeri* complex in northern Central America. Previous British Honduras records (Schmidt, 1941: 483) identify the frog as *E. rhodopis* (Cope).

Smith (1959: 211-212) has made a start toward classification of pattern phases in this variable species (as *Eleutherodactylus rhodopis*). MCZ 37847 agrees with Smith's variety A 1, except for the presence of a single quadrangular blotch on the dorsum.

Eleutherodactylus rugulosus rugulosus (Cope)

MATERIAL EXAMINED. Toledo District: WTN 1495, Columbia Branch Camp, on road overlooking Columbia Branch, by night.

Snout-vent length 27 mm. First finger slightly longer than second. Toes with vestigial web. A lateral glandular fold. A short, oblique dermal fold behind each eye. A dermal fold overhanging the tympanum. Tarsal fold extending about three-fourths the length of the tarsus. Tibiotarsal articulation extending slightly beyond tip of snout when hind limb is adpressed. Posterior surface of thigh (in preservative) grayish, with irregular yellowish mottling and with a few larger, well-defined yellowish spots. Throat light. Lips with 4 vertical dark bars, these separated by light interspaces.

The species has not previously been reported from British Honduras. It has been taken about 100 miles west by south of Columbia Branch Camp near the Alta Verapaz-El Petén border, Guatemala (Duellman, 1963: 223). The habitat in British Honduras is typical; Columbia Branch is a moderately swift, rocky stream bordered in many places by limestone outcroppings.

Eleutherodactylus laticeps (Duméril)

MATERIAL EXAMINED. Cayo District: MCZ 38000, 5 miles north of Millionario, in grass at roadside puddle, by day.

The identity of *Eleutherodactylus laticeps* (Duméril, 1853: 179) has been uncertain. The name was based on a single specimen taken by P. M. A. Morelet in "Yucatan, Central America." Schmidt (1941: 483) described *E. stantoni* on the basis of two specimens from Valentin, Cayo District, British Honduras, but suggested that it might prove to be *laticeps*. Firschein (1951) undertook to show that *laticeps* and *stantoni* were different species. His concept of *laticeps* was based upon a single frog from Palenque ruins in the tropical rainforest of Chiapas, Mexico, and notes on the century-old type of uncertain source. His concept of *stantoni* was based upon a single frog from Finca Chichén in the subtropical cloud forest of Alta Verapaz, Guatemala, and Schmidt's two specimens from British Honduras. Firschein, and Stuart (1948: 25) before him, were hesitant in referring the cloud forest individual to *stantoni*.

MCZ 38000 agrees closely with Schmidt's description of *Eleutherodactylus stantoni*, with a few unimportant exceptions. A fold, extending backward along the side from the supratympanic fold, is weakly defined ("well-defined" according to Schmidt). Dorsally the fine rugosity of the skin extends onto the top of the head ("top of head smooth"). The forearm and the angle of the jaws are coarsely spotted with black ("finely spotted with brown" in the type after years of preservation). I would describe the loreal region as decidedly, not "slightly", concave, and the digital disks as medium, not "small;" but these differences are probably terminological.

The type of *Eleutherodactylus laticeps* and the Chiapas frog Firschein referred to *laticeps* were said to have a "transverse scapular fold," a structure supposedly lacking in the Alta Verapaz frog and not mentioned by Schmidt in his description of *stantoni*. This fold, at least on gross examination, is not glandular but cutaneous, a wrinkling of the skin. MCZ 38000, preserved with the head bent over and the dorsal skin tightly stretched, at first seemed to show no trace of this fold. However, when the frog's head was tipped up, releasing the tension on the dorsal skin, the fold made its appearance just as in the Chiapas individual. The fold may be seen in the accompanying photograph of MCZ 38000 (Fig. 1).

Firschein held that the legs were longer in *Eleutherodactylus stantoni* than in *E. laticeps*. In British Honduras specimens the tips of the fingers and the heel of the adpressed hind limb extend past the

snout, whereas in the Palenque frog and in the type of *laticeps* they do not. However, this condition reflects an enlarged head in the two latter individuals. In several species of *Eleutherodactylus* certain old individuals are characterized by an enlarged head (Schmidt, 1941: 484). It is probably significant that the Palenque specimen and the type of *laticeps* both exceed 71 mm. in snout-vent length; whereas the three British Honduras examples (Schmidt's type and paratype; MCZ 38000) measure respectively 52, 53, and 56 mm.

Schmidt described only the more outstanding features of the pattern in his two specimens of *Eleutherodactylus stantoni.* The same

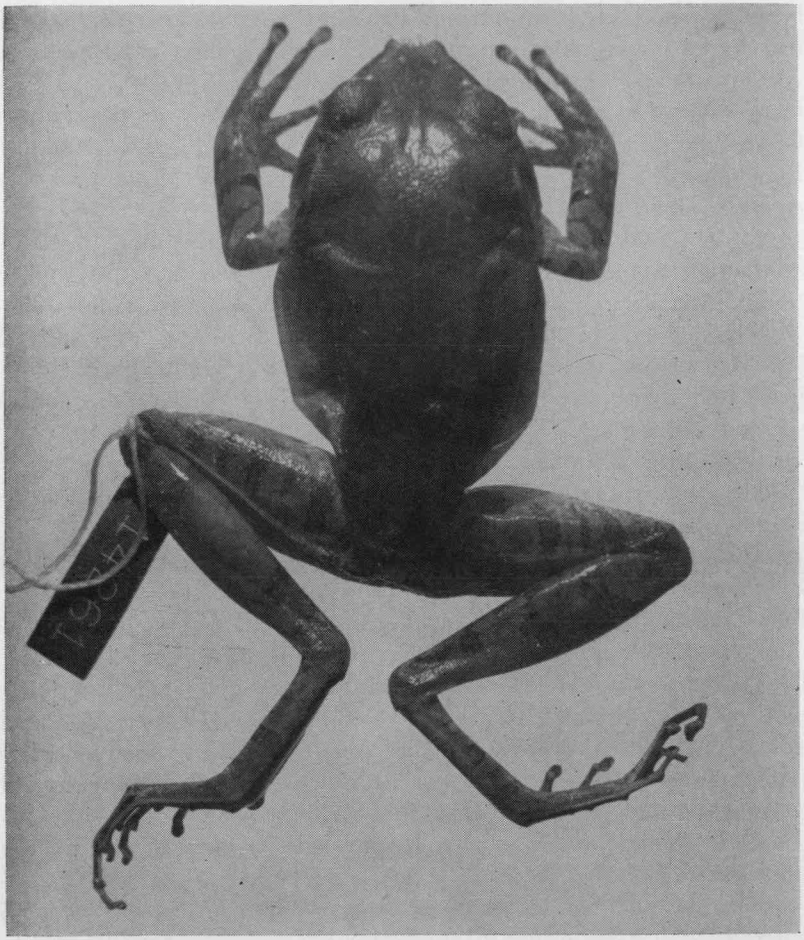

Fig. 1. MCZ 38000, *Eleutherodactylus laticeps.* (Tag bears field number.) Snout-vent length 56 mm. Note transverse scapular fold.

features are present in the Palenque frog. MCZ 38000 agrees with the Palenque *laticeps* even to some minute details of pattern: dorsal coloration gray-brown in alcohol; venter white with sparse spottings of brown on lateral areas of throat; areas immediately lateral to the outer margins of the ventral disk gray-brown with but slight indication of spotting; no posterior thigh reticulation; a washed brown area of small maculations on anteroventral surface of thigh; upper surfaces of legs weakly barred; under surface of tarsus and foot dark; a dark stripe on under side of antebrachium extending along outer margin of palm to disk of outer finger; antebrachium with a blackish spot, more distinct than any other dark marking; margin of upper jaw with indistinct, somewhat interrupted white line; side of head with a dark band beginning near tip of snout, involving the loreal region, extending posteriorly through eye, behind the eye following the supratympanic fold, terminating behind and on line with lower edge of tympanum; tympanum brownish.

The locality where MCZ 38000 was taken is not more than 18 miles east-northeast of Valentin, the type locality of *Eleutherodactylus stantoni,* and in the same uninterrupted expanse of forested hills. The specimen shows the transverse scapular fold supposedly diagnostic of *E. laticeps,* and agrees with the Palenque *laticeps* in minute details of pattern. It differs from the Chiapan and holotypic *laticeps* only in an individually variable character, degree of enlargement of the head. Accordingly *E. stantoni* Schmidt is reduced to the synonymy of *E. laticeps* (Duméril).

Until more specimens are taken, the status of the Alta Verapaz frog must remain unsettled. In view of its geographic and ecological isolation, it will probably not prove to be *Eleutherodactylus laticeps.*

MCZ 38000 had swallowed a large katydid.

Syrrhophus leprus cholorum new subspecies

TYPE. WTN 1525 (to be deposited in the collection of the University of Florida), adult male. Collected 3.9 miles north of San Antonio, Toledo District, British Honduras, 28 October 1959; Ross Allen, Thomas C. Allen, and Wilfred T. Neill, collectors.

DIAGNOSIS. Differing from *Syrrhophus l. leprus* in color and pattern. Dorsal ground color tan in life, chocolate brown in preservative; dorsum with about 20 to 30 very dark brown rounded spots which are mostly discrete. In *S. l. leprus* the darker dorsal markings are largely confluent, restricting the lighter areas to vermiculations of yellowish-green.

REMARKS. Elsewhere I have described the type specimen in detail (Neill and Allen, 1961a: 43). Additional examples are WTN 3405-06, from Columbia Branch Camp, Toledo District. They do not differ significantly from the type.

All specimens were found at night on dirt roads in a well-forested area with shale outcroppings nearby.

Individuals from Tikál, El Petén, Guatemala (Duellman, 1958: 8), and from the Alta Verapaz-El Petén border about 100 miles west by south of Columbia Branch Camp (Duellman, 1963: 223), seem referable to *Syrrhophus l. leprus* Cope. *S. l. cholorum* is probably confined to the region south of the Maya Mountains uplift in British Honduras.

I follow Firschein (1954) in applying the name *Syrrhophus* to a compact group of frogs inhabiting Mexico and nearby regions. *S. leprus cholorum* is the southernmost member of this genus.

The name *cholorum* alludes to a relict Indian group, the Chol, a few individuals of whom live near the type locality of the new subspecies.

Leptodactylus labialis (Cope)

MATERIAL EXAMINED. Orange Walk District: MCZ 37863, Gallon Jug, from rain puddle in road, by night. Stann Creek District: MCZ 37864-66 (transforming or newly transformed individuals), 4 miles south of Waha Leaf Creek, 4 August 1962, in roadside rain puddles, by day. Toledo District: MCZ 37867, 1 mile east of Swasey Branch, in roadside puddle, by day; MCZ 37872, 2 miles west of Swasey Branch, in area of wet pine savanna.

MCZ 37863 and 37872 are adult males with a prominent shelf around the margin of the upper jaw. Noble (1954: 120) stated that in species of this genus the shelf develops only during the breeding season. Certainly in *Leptodactylus labialis* the structure characterizes only the fully adult male, but there is no indication that the shelf vanishes after the frog has bred.

Although *Leptodactylus labialis* is thought to range from southern Texas southward at least into Panama, it has not been reported from a number of large intervening areas. It was but recently discovered in northern British Honduras (Fugler, 1960: 9; Neill and Allen, 1961a: 38-39), and the present specimens extend the known range into the southern part of the country.

Leptodactylus melanonotus (Hallowell)

MATERIAL EXAMINED. Orange Walk District: MCZ 37873-74, half mile north of Gallon Jug, under log in cow pasture, by day. Stann Creek District: MCZ 37875-76, 3 miles south of Waha Leaf Creek, in grass around road construction

camp; MCZ 37877-78, 4 miles south of Waha Leaf Creek, in shady, creek-fed swamp, by day; MCZ 37880-83, 2 miles south of Waha Leaf Creek, 4 August 1962, the largest specimen calling at dusk from roadside puddle in pine savanna; MCZ 37884, Mango Creek, in street puddle, by day.

Elsewhere I noted the orange color of certain ventral glandular areas in some *Leptodactylus melanonotus* from British Honduras (Neill and Allen, 1961a: 41). These areas are also orange or yellowish-brown in the only adult specimen in the series MCZ 37880-83. No British Honduras example has been seen with blackish ventral glands as Duellman (1961: 31-32) described in the closely related *L. occidentalis.*

HYLIDAE

Hyla microcephala martini Smith

MATERIAL EXAMINED. Orange Walk District: WTN 2809-11, Orange Walk, in loosely covered water drums beside houses, during the dry season. Cayo District: MCZ 37885-92, Norris Ranch, 4 miles south of Cayo, 28 July 1962, on leaves of "eel-grass" (collector's field notes) during a rainy night.

In MCZ 37885-92 the dorsal ground color in preservative is a light pinkish-orange. The thighs are unpigmented except at the knee. The dorsal pattern consists of brownish lines forming an X-shaped (4 specimens) or an irregular mark on the anterior part of the dorsum. There is also a somewhat broken but generally transverse brownish line on the posterior part of the dorsum. A lateral dark line extends from near the tip of the snout posteriorly about two-thirds the length of the body and then swings upward to fuse with the posterior dorsal marking. In the only female specimen the lateral dark line is better defined than in the males, and is light-bordered above from near the tip of the snout to a point just behind the tympanum.

The males of the MCZ series show collapsed vocal sacs. Evidently the frogs were taken from a breeding aggregation.

Hyla picta (Günther)

MATERIAL EXAMINED. Cayo District: MCZ 37893-95, Norris Ranch, 4 miles south of Cayo, 28 July 1962, on leaves of "eel-grass" during a rainy night.

The specimens in preservative are a medium pinkish-brown. The characteristic dorsolateral white stripe is bordered weakly above and strongly below with dark brown. Vomerine teeth are lacking.

The largest example measures 20.6 mm. in snout-vent length; it is a female with eggs showing through the body wall. The other two are males with prominent vocal sacs. Evidently the specimens were taken from a breeding aggregation.

The species has not been reported previously from British Honduras.

Hyla staufferi Cope

MATERIAL EXAMINED. Cayo District: MCZ 37896-97, Norris Ranch, 4 miles south of Cayo, 28 July 1962, on leaves of "eel-grass" during a rainy night. Stann Creek District: MCZ 37898, 3 miles south of Waha Leaf Creek, in grass around road construction camp.

MCZ 37898 is a female containing eggs; MCZ 37896-97 are males with prominent vocal sacs. The latter specimens were accompanied by *Hyla picta* and *H. microcephala martini,* all three species apparently breeding.

Phrynohyas spilomma (Cope)

MATERIAL EXAMINED. Corozal District: MCZ 37899, 2 miles south of Corozal, 7 July 1962, resting on branch of tree in scrubby forest patch near canefield. Belize District: WTN 729, 4 miles west of Boom.

Other British Honduras specimens I have examined I have listed elsewhere (Neill and Allen, 1959a: 24-26; 1959b: 235-236). In this country the dorsal pattern varies considerably. The dark dorsal patch may be (1) fairly well defined, broadly interrupted in the sacral region by a regular, transverse band of light color, as in *Phrynohyas inflata;* (2) fairly well defined, very narrowly interrupted by an irregular light band; (3) well defined, continuing without interruption to vent; (4) fairly well defined, uninterrupted, but centrally lightened with pale brown, and bearing many circular spots of dark brown in the pale area; (5) almost absent anterior to a brown transverse sacral band; or (6) reduced to a negligible scattering of black dots, somewhat as in *P. modesta.* When the dark dorsal band is reduced in intensity, the intensity of the limb bands is reduced to a comparable degree.

Fugler (1960: 10) reported a range extension for *Phrynohyas modesta* (Taylor and Smith), on the basis of one specimen from "Melina" (Melinda) Forestry Station, a savanna area in northeastern Stann Creek District. The frog differed from usual *modesta* in being more profusely warted, like *P. spilomma.* A male 66 mm. in snout-vent length, it is exceptionally large for a *modesta* and very close to the average size of *spilomma* males in British Honduras. I have not seen the Melinda example, but suspect it to be another nearly patternless *spilomma. P. modesta* in Central America seems confined to the Pacific slope, and for the present should not be included in the British Honduras herpetofaunal list.

In British Honduras *Phrynohyas spilomma* has been found only

in the drier and more open habitats: savanna, scrubby woodland, cleared land, beach with coconut trees, and around buildings.

Smilisca baudinii (Duméril and Bibron)

MATERIAL EXAMINED. Orange Walk District: MCZ 37848-55, Gallon Jug, 20-22 July 1962, in trees by day, in puddles or wet grass by night, some males calling. Cayo District: MCZ 37856, Norris Ranch, 4 miles south of Cayo, in cow pasture on rainy night; MCZ 37857-58, western edge of Mountain Pine Ridge, on rock or in pool beside Belize River. Stann Creek District: MCZ 37859, 3 miles south of Waha Leaf Creek, 3 August 1962, calling beside rain puddle at night. Toledo District: MCZ 37860-62, San Pedro Columbia, in swampy area near creek, by night.

In British Honduras *Smilisca baudinii* may be a mimic of the poisonous *Phrynohyas spilomma*. In this country *S. baudinii* resembles the local *Phrynohyas* in being brownish or grayish, usually with an irregular dark marking on the dorsum of head and body. In southern Texas, where no *Phrynohyas* occurs, *S. baudinii* is often marked with yellow, green, fawn, or cinnamon; dorsal markings may be present, but do not form a distinct blotch on the upper surfaces of head and body.

I have suggested that *Smilisca* and *Phrynohyas* in British Honduras tend to replace each other temporally by having their respective peaks of activity at different times of year (Neill and Allen, 1959a: 67). It is therefore interesting to note that in July and August the Monath party found only one *Phrynohyas*, but took 15 *Smilisca* at five scattered localities.

Several recent workers have referred to the Mexican treefrog as "*Smilisca b. baudinii*," but the species is monotypic; *Hyla b. dolomedes* Barbour (1923: 11) is *S. phaeota* (Dunn, 1931: 413).

RANIDAE

Rana palmipes Spix

MATERIAL EXAMINED. Cayo District: MCZ 37900, western edge of Mountain Pine Ridge, in pool beside Belize River, at night. Toledo District: MCZ 37901 (a recently transformed individual), San Pedro Columbia, 20 August 1962, in pool of Columbia Branch.

Rana pipiens Schreber

MATERIAL EXAMINED. Stann Creek District: MCZ 37902, 3 miles south of Waha Leaf Creek, in grass by small stream, at night. Toledo District: WTN 988, Punta Gorda; WTN 1524, 1976-77, Columbia Branch Camp; WTN 1531, 4 miles southeast of San Antonio.

These specimens from south of the Maya Mountains do not exhibit the characters ascribed to *Rana pipiens austricola* Cope, and for the present the trinomial must be omitted.

GEKKONIDAE

Coleonyx elegans elegans Gray

MATERIAL EXAMINED. Cayo District: MCZ 71405-06, vicinity of Baking Pot. Toledo District: MCZ 71407-08, San Antonio, under logs in grassy field; WTN 1532, Columbia Branch Camp, on dirt road at night.

The specimens show no approach to *Coleonyx mitratus* (Peters) of Honduras. The claw tips are concealed or barely showing; the first infralabial is triangular; the postnasal depression is distinct.

Coleonyx e. elegans reaches a greater size than is generally realized; in MCZ 71407 the snout-vent length is 91 mm. In large examples the dark borders of the transverse light dorsal bands are widened, almost fusing with each other, and all the light markings of the juvenile have become darkened to some degree.

Sphaerodactylus glaucus glaucus Cope

MATERIAL EXAMINED. Orange Walk District: MCZ 71361, Gallon Jug, 21 July 1962, on side of house by day.

This very young individual shows the bright juvenile pattern. It is interesting to note that the specimen was abroad by day, for in British Honduras the drab adults are then quite secretive. In a related species, *Sphaerodactylus cinereus*, the brightly banded young are often diurnal and the brownish adults are largely nocturnal.

IGUANIDAE

Anolis biporcatus (Wiegmann)

MATERIAL EXAMINED. Toledo District: WTN 693, Columbia Branch Camp, sleeping by night on bushes at top of declivity overlooking river.

Anolis humilis uniformis Cope

MATERIAL EXAMINED. Cayo District: MCZ 71601, 3 miles north of Millionario, on leaf litter of jungle floor beside logging road. Toledo District: MCZ 71602, just west of Lubaantun Ruins near San Pedro Columbia, in thick rainforest amid vines and bushes, near ground; MCZ 71603, just west of San Miguel, 3 miles northeast of San Pedro Columbia, jumping on low vegetation in thick rainforest.

Elsewhere (Neill and Allen, 1959a: 42) I have suggested that the axillary pocket of this anole serves to lure ectoparasitic mites away

from more vulnerable areas such as the eyes, ear openings, or vent. MCZ 71603 has mites in its axillary pockets.

Anolis limifrons rodriguezi Bocourt

MATERIAL EXAMINED. Corozal District: MCZ 71604-05, 2 miles southwest of Corozal, on limbs of small trees in dense forest with heavy undergrowth and lianas.

The yellow-fan anole has previously been reported only from Belize and Cayo Districts; the present specimens are the first from the northern part of the country.

Anolis lemurinus bourgeaei Bocourt

MATERIAL EXAMINED. Orange Walk District: MCZ 71594-95, 8 miles north of Gallon Jug, on muddy logging road or on sapling in rainforest; MCZ 71596-98, Gallon Jug, on fence, stump, or tree, in town, field, or cow pasture; MCZ 71599, half mile north of Gallon Jug, on ground in shady forest on side of steep hill. Cayo District: MCZ 71593, vicinity of Baking Pot. Toledo District: MCZ 71600, just west of Lubaantun Ruins near San Pedro Columbia, on vines and bushes near ground.

The pattern varies greatly in the Gallon Jug area. One specimen has five dark crossbars on the body; another has six such bars and a light lateral stripe. Yet another lacks the crossbars but has a straight-edged, rust-colored vertebral stripe, narrow dark bands forming a zigzag down each side of the body, and light lines forming a scalloped pattern on the hind part of the body adjacent to the vertebral stripe. Still another has a brown vertebral stripe with scalloped, yellow-bordered edges; the sides of the body are gray, and there is a lateral light stripe. Other variations exist in specimens from Belize; and my "*Anolis* species" with a pattern like that of *Basiliscus vittatus* (Neill and Allen, 1959a: 37) also is *A. l. bourgeaei*.

The throat fan of the male is always red in life.

Anolis sagrei mayensis Smith and Burger

MATERIAL EXAMINED. Corozal District: MCZ 71468-503, Corozal, on dead vegetation, piles of coconut fronds, or tree trunks, around houses; MCZ 71466-67, 2 miles south of Corozal, in scrubby forest near canefield. Belize District: MCZ 71546-65, Ambergris Cay at San Pedro, on coconut palm trunks and surrounding brush along beach; MCZ 71504-23, Ambergris Cay, 2 to 3 miles south of San Pedro, on coconut palm trunks along beach; MCZ 71525-44, Ambergris Cay, 1 to 2 miles north of San Pedro, on coconut palm trunks and in dry leaves at their bases; WTN 233-87, 758-801, 967-73, 1454-61, 1565-89, 1605-07, 1744-45, 1767, Belize, on fences, buildings, and garden shrubs in town, or in red mangrove

swamp, or around sedges on mud flats, or in strand vegetation. Stann Creek District: MCZ 71566-82, 71584, 71586-92, Mango Creek, on boards and lumber piles around sawmill; WTN 1462-63, Stann Creek, on fences in town. Toledo District: WTN 975-78, 1985-2014, Punta Gorda, about yards, fences, and buildings.

In the large series from Corozal four females and one young are patterned, though not brightly; the remaining 31 individuals, ranging in snout-vent length from 24.6 to 59 mm., are uniformly dark, without pattern. In the large series from San Pedro one female is patterned, not brightly so; the remaining specimens, all adults, are uniformly dark and without pattern. The Mango Creek specimens, like those from Corozal and San Pedro, are dark, patternless, and of large size for *Anolis sagrei*. With the exception of MCZ 71466-67 which are very distinctly patterned, all the MCZ individuals agree well with those from Stann Creek, Punta Gorda, and Belize described elsewhere (Neill and Allen, 1962: 80-82).

Previously I noted (*idem*) that *Anolis sagrei mayensis* is not confined to man-made situations but also occurs in natural supratidal environments, and so may have been able to spread coastally from one point of introduction. The present specimens bear this out; they fill in several gaps of known distribution, nearly all closely resemble individuals from other British Honduras mainland localities, and some were found in situations not of man-made origin.

The marked homogeneity of the mainland population is not consistent with any theory of numerous separate introductions from the West Indies; the wide distribution of this population and its several unique features argue against its introduction in recent times. Of course additional and relatively unsuccessful introductions may have occurred later. MCZ 71466-67 somewhat resemble West Indian specimens, as do certain individuals from outermost islands of the British Honduras barrier reef.

Stuart (1955: 22) tentatively synonymized *Anolis sagrei mayensis* with the Cuban *A. s. sagrei*, pending the acquisition of more information about the Central American population. I have examined the 299 British Honduras specimens cited above, and the following 339 Cuban examples of *A. s. sagrei*:

Habana Province: WTN 312-56, between Güines and Playa de Rosario; WTN 725, Habana; WTN 1356-1431, Catalina de Güines. Piñar del Rio Province: WTN 364-580, Rancho Mundito (formerly the Batista estate) near Consolación del Sur.

The Central American and the West Indian series are immediately separable. The Cuban specimens are small, light in color, and

almost always patterned. The British Honduras specimens attain a much greater size, are much darker, and usually patternless. The ground color of the throat fan is brick red or orange-red in Cuban males, but a dark red, approximately garnet, in the British Honduras males.

Thus it seems desirable to retain the name *Anolis sagrei mayensis* for the mainland population. This taxonomic arrangement is biogeographically defensible, the distributional pattern having counterparts among other organisms. Thus the West Indian gekkonid genus *Aristelliger* is represented by a distinct species (with two subspecies) on islands off the coast of Central America and the Yucatán Peninsula, from San Andres to Cozumel (Hecht, 1951: fig. 8); the *Phyllodactylus* of Half Moon Cay off the British Honduras coast has its closest affinities with West Indian species and not with the common *Phyllodactylus* of the British Honduras mainland (Dixon, 1960: 8-10).

Contrary to Stuart (1963: 65), the mainland population of *Anolis sagrei* is not known to range southward into South America; the southernmost acceptable record is for Punta Gorda, British Honduras. For a discussion of this topic see Neill and Allen (1962: 80-81).

Anolis nannodes Cope

Fugler (1960: 11) added a Costa Rican and Panamanian species, *Anolis intermedius* Peters, to the British Honduras herpetofaunal list on the basis of a single specimen from Chiquibul Forest, Cayo District. The example was atypical and was found in a habitat not characteristic of the species. Fugler held the specimen to extend the known range of *A. intermedius* northward by about 500 miles. (Actually the British Honduras locality is nearly 600 miles northwest by west of the nearest Costa Rican locality). I should like to offer a different interpretation:

A single phylogenetic line with a notably discontinuous distribution is represented by *Anolis intermedius* in Costa Rica and Panama, *A. nannodes* on the Caribbean slope of Guatemala, and *A. laeviventris* (Wiegmann) in Mexico. A population of this line resident in the Chiquibul Forest area would logically be closest to and most likely conspecific with *A. nannodes* (including *A. cortezi* Stuart and *A. stuarti* Smith and Taylor) which has been reported from Chiapas to Alta Verapaz.

Basiliscus vittatus Wiegmann

Material Examined. Orange Walk District: MCZ 71417-19, 71421-36, 71440-46, Gallon Jug or a half mile north thereof, 22-23 July 1962, on fences, trees,

brush, leaf litter, or houses, in town, brushy areas, fields of high grass, or sunny openings in forest; MCZ 71437-39, 8 miles south of Gallon Jug, in open sandy patches beside road. Cayo District: MCZ 71448, Xunantunich, on rock pile; MCZ 71447, Augustine, swimming in creek. Stann Creek District: MCZ 71449-52, 3 miles south of Waha Leaf Creek, on dry brush by stream or on dead vegetation beside road; MCZ 71458-63, Mango Creek, 7-8 August 1962, on lumber piles at sawmill. Toledo District: MCZ 71453-54, 1 mile east of Swasey Branch, on brush bordering road; MCZ 71455-57, 4 miles east of Swasey Branch, on lumber piles at old sawmill; MCZ 71464-65, San Antonio, on house.

On 29 October 1959, I saw what must have been thousands of hatchling *Basiliscus vittatus* scampering bipedally across the road from San Antonio to Punta Gorda along a stretch of about 15 miles in Toledo District. The circumstance led me to suppose that the species has a definite breeding season, most hatchlings appearing at about the same time. The MCZ specimens to some extent bear this out, as seven adult females contain large eggs. MCZ 71433, which may have nearly completed oviposition when taken, contained but one egg, on the left side. The others contained four to six eggs, never more than two in the left oviduct. However, MCZ 71427, an adult female, contained no eggs, and MCZ 71426 is a hatchling 38 mm. in snout-vent length, with a yolk scar. As the Gallon Jug series includes non-oviferous and oviferous females as well as a hatchling, the breeding season there is probably not extremely restricted.

MCZ 71460, an adult male, has a bright pinkish suffusion of the venter. I have seen this suffusion in a few other adult males. Its significance is unknown; it might develop at the peak of breeding condition.

Maturana (1962) recently reviewed the species of *Basiliscus*, but he was unfamiliar with the habits of *B. vittatus*. Contrary to his statement, lizards of this species will skitter across the surface of the water, and will also dive into the water and swim away. However they rarely do either, for they are generally found on bushes over land, though water is often nearby.

This supposedly arboreal species was extremely abundant in a broad, treeless wet savanna about 4 miles southeast of San Antonio. The habitat is so unusual as to merit illustration (Fig. 2). The Monath party also took specimens in fields of high grass.

The striped basilisk takes alarm readily. This probably explains why it is uncommon in Belize even though the city is well vegetated. The species does take up residence about yards and buildings, but mostly around isolated homesteads.

Very rarely is the striped basilisk found in vegetation at heights of more than 20 feet, or on large trees at any height, or in dense

forest with heavy shade, or in dry savanna. Captive individuals dessicate readily, and must be kept in a humid atmosphere if they are to thrive.

Fig. 2. Treeless wet savanna, 4 miles southeast of San Antonio, Toledo District, British Honduras. Unusual habitat for *Basiliscus vittatus*, present in great numbers. *Leptodactylus melanonotus* and *Rana pipiens* also present.

Corytophanes cristatus (Merrem)

MATERIAL EXAMINED. Toledo District: MCZ 71362, just west of San Miguel, about 3 miles northeast of San Pedro Columbia, in thick rainforest.

The generic name *Corytophanes* Boie has generally been emended to the etymologically correct *Corythophanes*. Article 32 of the Règles Internationales de la Nomenclature Zoologique now prohibits emendation to correct an error of transliteration. That "*Corytophanes*" was an erroneous transliteration and not merely a typographical error is shown by Boie's continued use of this spelling. See Smith and Taylor (1950: 68-69) for further remarks on this topic.

Corytophanes hernandesii (Wiegmann)

MATERIAL EXAMINED. Orange Walk District: WTN 3949, Gallon Jug, on logging road in forest.

Although known from El Petén, the species has not previously been reported from British Honduras.

Ctenosaura similis similis (Gray)

MATERIAL EXAMINED. Belize District: MCZ 71393-98, Ambergris Cay, within a 2-mile radius of San Pedro, 14 July 1962, in sand strand, coconut stands, or red mangrove swamp. Stann Creek District: MCZ 71399, 4 miles north of Mango Creek, at roadside; MCZ 71401-02, 71404, Mango Creek, on pine stump at edge of town, or on lumber piles at sawmill; MCZ 71403, 1 mile west of Mango Creek, in thick brush beside road.

MCZ 71393-95 are very young, ranging in snout-vent length from 53 to 56 mm. The recently healed yolk scar is distinct. These juveniles were found among dry fallen coconut fronds along the beach.

Sceloporus teapensis Günther

MATERIAL EXAMINED. Cayo District: MCZ 71363, vicinity of Baking Pot; MCZ 71364-69, Xunantunich, around ruins, or on logs bordering trail leading thereto; MCZ 71370-80, Augustine, on rocks, burned tree stump, or fence posts. Stann Creek District: MCZ 71382-83, Mango Creek, at sawmill. Toledo District: MCZ 71384-85, 2 miles west of Swasey Branch, along road; MCZ 71386-92, 4 miles east of Swasey Branch, on lumber at abandoned sawmill.

The specimens from Toledo District extend the known distribution about 30 miles southeastward in British Honduras.

Previously I suggested (Neill and Allen, 1959a: 68) that *Sceloporus teapensis* and the rather similar *S. chrysostictus* Cope replace each other temporally, having their respective peaks of activity at different times of year. It is thus interesting to note that in July and August the Monath party collected 28 *teapensis* at five localities, but no *chrysostictus*.

TEIIDAE

Ameiva festiva edwardsi Bocourt

MATERIAL EXAMINED. Toledo District: MCZ 71606-07, 1 mile east of Swasey Branch, in brush along fire control road.

In both specimens: outer row of ventral scutes reduced; one large preanal scute; two rows of tibials; last sublabial divided into three parts; a grayish-blue middorsal stripe, sinuous, from rostral to rump; a dorsolateral light stripe broken into dashes; a lateral light stripe, also broken; a few small, upright, bluish bars in and just behind the axilla.

The only previous British Honduras records are for Stann Creek District (Schmidt, 1941: 495).

Ameiva undulata hartwegi Smith

MATERIAL EXAMINED. Corozal District: MCZ 71610, half mile north of Corozal, beside stone wall. Orange Walk District: MCZ 71612-17, Gallon Jug or a half

mile north thereof, 21-23 July 1962, under house, on fence, in field of high grass in town, or sunning on leaf litter in forest; MCZ 71618, Miss Marchand's Farm at Orange Walk, 24 July 1962, by house. Belize District: MCZ 71611, Ambergris Cay, 2 miles north of San Pedro, in dry vegetation of sand strand behind beach; WTN 1202, 13 miles west of Belize, 25 April 1960, in "oak island" of the palm and pine savanna. Cayo District: MCZ 71619-21, Xunantunich, 29 July 1962, in brush or beside log along trail; MCZ 71622-24, Augustine, under boards and sheet metal in yards; MCZ 71608-09, vicinity of Baking Pot. Stann Creek District: MCZ 71625, 4 miles south of Waha Leaf Creek, in pile of dead wood at edge of road; MCZ 71626, 5 miles southwest of Mango Creek, basking on fire control road at midday; MCZ 71627-28, Mango Creek, basking on ground near sawmill. Toledo District: MCZ 71629, 1 mile west of Swasey Branch, basking beside road.

This material solves a problem to which I previously called attention (Neill and Allen, 1961a: 49). WTN 1202, only 56 mm. in snout-vent length, displayed no trace of lateral dark and light lines, supposedly characteristic of all *Ameiva undulata* when young. Instead the specimen was olive dorsally and reddish-brown laterally. The lizard exhibited the scale characters of the local population of *A. u. hartwegi*, and I suggested that this color pattern, very concealing in the reptile's habitat, might characterize *hartwegi* juveniles in British Honduras. It is now evident that this is indeed the case. A slightly larger specimen, MCZ 71621, snout-vent length 66 mm., exhibits the same pattern but with the addition of a single row of light spots on the sides. MCC 71612, snout-vent length 79 mm., is patterned like MCZ 71621 but the lateral light spots, about 14 or 15 in number, are more suggestive of a line. MCZ 71627 has a lateral light line broken into spots only near the insertions, and shows a trace of a second light line above the lateral stripe and a trace of a third below it.

Apparently the ontogenetic change is from unstriped hatchling to light-striped subadult to light-barred adult, but the rate at which this change takes place varies. MCZ 71614, a female of 115 mm. snout-vent length, displays no vertical light bars but only a lateral light line broken into about 15 spots.

MCZ 71623-24 are notably aberrant. The first, 34 mm. in snout-vent length and with a barely evident yolk scar, has four light lines on each side. The other, also a juvenile, has three lines on each side. The two are from Mountain Pine Ridge, an unusual area biotically.

The specimens from Corozal District in extreme northeastern British Honduras show an approach to *Ameiva undulata gaigeae* Smith and Laufe. In MCZ 71610, a female 95 mm. in snout-vent length, the central gular scales are but weakly and gradually enlarged; the

upper lateral bars number about 15. MCZ 71611, a small male, has weakly and gradually enlarged central gulars and about 13 or 14 upper lateral bars. In the Gallon Jug area of Orange Walk District the central gulars tend to be somewhat more enlarged, though not abruptly so, but the upper lateral bar count is still high and *gaigeae*-like, 12 to 16, mode 15. Yet MCZ 71618, the only specimen from Orange Walk, Orange Walk District, does not conform to expectation; the bars number 8 or 9 on one side, about 10 on the other. In Cayo District the bars range from 8 to 13, the mode 9 or 10. The examples from Toledo and Stann Creek Districts are young and have not developed bars.

Specimens from the northern half of British Honduras thus suggest that the transition from *Ameiva undulata gaigeae* to *A. u. hartwegi* is not smooth but exhibits some interdigitation.

MCZ 71615, an adult male from near Gallon Jug, shows a bright pinkish-red suffusion on the edge of the gular fold, throat, chest, anterior surfaces of the upper arm, and sublabial scales. This is true also of MCZ 71618, an adult male from Orange Walk, and MCZ 71617, an adult male from Gallon Jug. However, MCZ 71616, a somewhat smaller adult male from Gallon Jug, has a light yellow suffusion of the gular and nearby regions; while MCZ 71620, an adult male from Xunantunich, shows no gular suffusion. Lack of suffusion in an adult male no doubt characterizes the non-breeding condition, but it is not clear why breeding males should be both yellow-throated and red-throated.

Scincidae

Eumeces schwartzei Fischer

Material Examined. Orange Walk District: WTN 3783, Gallon Jug, in litter at base of large tree beside clearing in mahogany forest.

Only one other specimen has been reported from British Honduras (Schmidt, 1941: 496).

Mabuya brachypoda Taylor

Material Examined. Orange Walk District: MCZ 71409-12, Gallon Jug, around buildings. Belize District: WTN 223, Bakers, on ground in brushy border of savanna pond; WTN 1510, 1594, Belize, around buildings. Cayo District: MCZ 17413-14, Xunantunich, basking on rock at summit of ruins; WTN 222, 7 miles east-northeast of Cayo, on building. Toledo District: WTN 1216, Old Toledo Settlement, under pile of logs in cow pasture.

Several workers have continued to apply the name *Mabuya mabouya* to lizards from southern Mexico and northern Central America.

However, British Honduras specimens conform well to Taylor's (1956: 308) diagnosis of *M. brachypoda*, with the unimportant exception that in young individuals the tips of the digits barely overlap when the limbs are adpressed. MCZ 71409, snout-vent length 92.5 mm., is larger than any of Taylor's examples.

I previously suggested that the two lygosomine skinks of British Honduras, a *Mabuya* and a *Lygosoma*, have their respective peaks of activity at different times of year (Neill and Allen, 1959a: 68). In late July the Monath party took six *Mabuya* at two localities, but no *Lygosoma*.

Boidae

Boa constrictor imperator Daudin

Material Examined. Orange Walk District: MCZ 71669, Gallon Jug, in tall grass by building.

Colubridae

Scaphiodontophis annulatus annulatus (Duméril and Bibron)

Material Examined. Cayo District: MCZ 71679, vicinity of Baking Pot.

Black cap followed by a red area, then by a triad (two black bands inclosing a brown one). Three other similar triads on neck, separated by red interspaces. Scales of red interspaces with black spots. Remainder of body brownish with five dotted dark lines; three zigzag lines on tail. Head mostly dark, the postocular dark mark not distinct from head cap. Subocular dark marks extensive.

In pattern this specimen approaches *Scaphiodontophis carpicinctus* Taylor and Smith. Alvarez del Toro and Smith (1958: 17) are correct in suggesting that *S. carpicinctus* and *S. annulatus* are conspecific, but more material is necessary to determine whether the name *carpicinctus* may be retained for a subspecies of *annulatus*. If *carpicinctus* proves to be a valid subspecies, it probably ranges no farther south than Tikal, El Petén, Guatemala. The reference of all British Honduras material to *S. a. carpicinctus* (Duellman, 1963: 246-247) is not justified.

The species of *Scaphiodontophis* are remarkable for many stub-tailed individuals. The condition was at first attributed to a disease (Taylor and Smith, 1943: 304), but Taylor (1954: 686) found evidence that *S. venustissimus* deliberately breaks its tail when restrained by that appendage. In MCZ 71679 the tail tip is broken and healed over.

Clelia clelia (Daudin)

MATERIAL EXAMINED. Cayo District: WTN 955 (a skin), 6 miles south-southeast of Cayo at base of Mountain Pine Ridge, on trail through hardwood forest, by day.

WTN 955, a female, was 2471 mm. in total length before skinning. The dorsal scales were completely black, without trace of darker tips. The venter was white.

I have examined the peritoneum of most of the snakes known from British Honduras. This is the only species found to have a black pigmentation of the visceral peritoneum as well as of the parietal peritoneum.

Coniophanes imperialis clavatus (Peters)

MATERIAL EXAMINED. Cayo District: MCZ 71670-71, vicinity of Baking Pot.

In both individuals: a dorsal dark stripe but vaguely indicated. Lateral dark stripe wide, distinct its full length. Ventrally a sprinkling of dark dots extends from mental to about the 40th ventral scute. A dorsolateral light stripe begins on snout, extends posteriorly onto neck, and there vanishes. This stripe interrupted on posterior part of head by a conspicuous light-centered and dark-bordered ocellus.

The two nuchal ocelli viewed from above resemble staring eyes. Similar ocelli are also present in several other species of *Coniophanes* and in some species of the related genus *Urotheca* (often called *Rhadinaea*). Possibly these eye-like spots afford an example of deflective or "parasematic" coloration (Cott, 1940: 372), and serve to "misdirect the attack of enemies by misrepresenting the posture of their prey". "False eyes" are thought to have this function in other groups of animals (*cf.* Clay, 1953).

Dryadophis melanolomus subspecies

MATERIAL EXAMINED. Cayo District: MCZ 71672, vicinity of Baking Pot; WTN 2848, Augustine, 23 August 1963.

MCZ 71672 is an adult male. It has been somewhat darkened by preservatives. Apparently it was grayish above, unicolor except for a trace of black edging on most of the scales. Other adults from British Honduras are similarly patterned.

Duellman (1963: 238-239) listed El Petén specimens as *Dryadophis melanolomus laevis* (Fischer). British Honduras examples should be referable to this same form, or to intergrades between *D. m. laevis* and *D. m. melanolomus* (Cope). But the situation is complex, for Stuart

(1941: 90-91, map 4) noted that British Honduras and El Petén specimens are intermediate between *D. m. melanolomus* and *D. m. alternatus* (Bocourt), in spite of the geographic anomaly implicit in such an arrangement. Also, *D. m. laevis* has a red phase (Stuart, *op. cit.*: 87), as does *D. m. alternatus* (Neill and Allen, 1961a: 46; Neill, 1963: 204; Duellman, *loc. cit.*), but no reddish individual has been reported in British Honduras.

The British Honduras population of *Dryadophis melanolomus* may be a relict one associated with the geologically ancient Maya Mountains uplift, just as *D. m. laevis* is associated with the Alta Verapaz uplands, and a more *alternatus*-like population with the Honduranean highlands.

WTN 2848 is a juvenile male, 382 mm. in total length. It probably hatched in the month of collection, August; it thus bolsters previous conclusions (Neill, 1962) regarding the reproductive cycle of most snakes in British Honduras.

The pattern of the hatchling has not been described. In WTN 2848 the dorsum is marked with a row of bluish-gray transverse bands separated by narrow grayish-white interspaces. The markings become obscure posteriorly; about 40 spots can be counted on the anterior half of the body, while the tail and posterior portion of the body are uniform grayish dorsally. Lateral stripes are not evident. On the anterior two-thirds of the animal the ventral plates bear dark lines or spots, one such marking on each outer end of a scute. The black marking of a scute is rarely aligned with the marking of either adjacent scute; rather the markings form a staggered pattern down the ventrals. The ventral pattern becomes obscure on the posterior third of the animal, and the under surface of the tail is whitish, unmarked. The top of the head is dark, the chin and throat unspotted yellowish-white. The supralabials are yellowish-white, each with a dark spot toward the posterior border. A well-defined dark band crosses the back of the head.

Drymarchon corais melanurus (Duméril, Bibron, and Duméril)

MATERIAL EXAMINED. Belize District: WTN 956 (a skin), Belize, in black mangrove forest.

The specimen is a male. Before skinning it measured 2790 mm. in total length. So great a size has not been reported reliably for the Floridian *Drymarchon corais couperi* (Holbrook), but is exceeded by the South American *D. c. corais* (Boie). This is one of the few colubrid species in which the males grow longer than the females.

Drymobius margaritiferus margaritiferus (Schlegel)

MATERIAL EXAMINED. Orange Walk District: MCZ 71644-45, just north of Gallon Jug, 22 July 1962, under rock by sandstone cliff, or in rain puddle of cow pasture. Cayo District: MCZ 71643, vicinity of Baking Pot; WTN 2765, Augustine, 11 August 1963.

MCZ 71645 and WTN 2765 are hatchlings, respectively 308 and 301 mm. in total length. The collecting dates of these two are in accord with a previous contention that the young of British Honduras snakes generally appear around August, perhaps a little sooner or later (Neill, 1962).

The pattern of the juvenile is much like that of the adult, but the hatchling has narrow dark crossbands separated by still narrower light interspaces on the anterior portion of the body. At a point about two head-lengths behind the head this arrangement of dark and light pigments changes and throughout the rest of the body each dorsal scale is dark-bordered and light-centered. The juvenile pattern of *Drymobius* is of interest, for juveniles of *Dryadophis, Masticophis,* and *Coluber* (*sensu stricto*) are also cross-banded anteriorly, further evidence of a close relationship among these genera.

Elaphe flavirufa pardalina (Peters)

MATERIAL EXAMINED. Cayo District: MCZ 71673, vicinity of Baking Pot; WTN 2688, Augustine.

MCZ 71673 is a female; total length 603, tail length 134 mm. About 40 blotches on body, 19 on tail. Dorsal spots separated from ventral scutes by about 6 scale rows, these spots mostly fusing to form a zigzag or sinuous line. Head pattern very distinct for this species. Scale rows 29 at midbody; ventrals 255, subcaudals 115. First 8 dorsal scale rows smooth. Preoculars 2-1.

WTN 2688 is a female; total length 730, tail length 150 mm. About 40 blotches on body, 20 on tail. Dorsal spots separated from ventral scutes by about 5 scale rows, these spots mostly fusing to form a zigzag or sinuous line. Head pattern very distinct. Scale rows 29 at midbody; ventrals 262, subcaudals 111. First 6 dorsal scale rows smooth. Preoculars 2-2. On one side of the head the loreal divided vertically to form two shields.

According to Dowling (1952) *Elaphe flavirufa* is related to *E. guttata.* A difference between these two species, not previously mentioned in the literature, is the great size of the *flavirufa* hatchling. MCZ 71673 has a well defined umbilical scar on five ventral plates, and could hardly have been more than about three weeks old when

preserved. WTN 2688 has a fairly well defined umbilical scar on four ventral plates. Evidently the size at hatching is about that of hatchling *Drymarchon corais couperi*, one of the largest colubrids. In contrast, the hatchlings of *E. g. guttata* are about 315 to 320 mm. in total length, to judge from a Florida series in my collection. It is not known whether the large size of the *E. flavirufa* hatchling indicates a large adult size. No very large individual has been reported.

Only one example of *Elaphe flavirufa* has previously been taken in British Honduras, and it was reported from "Belize" at a time when the whole country was called by this name.

Ficimia publia wolffsohni new subspecies

TYPE. MCZ 71668, adult female (Fig. 3). Gallon Jug, Orange Walk District, British Honduras, 23 July 1962. Collected by a local resident for the Monath party. Field number 14197.

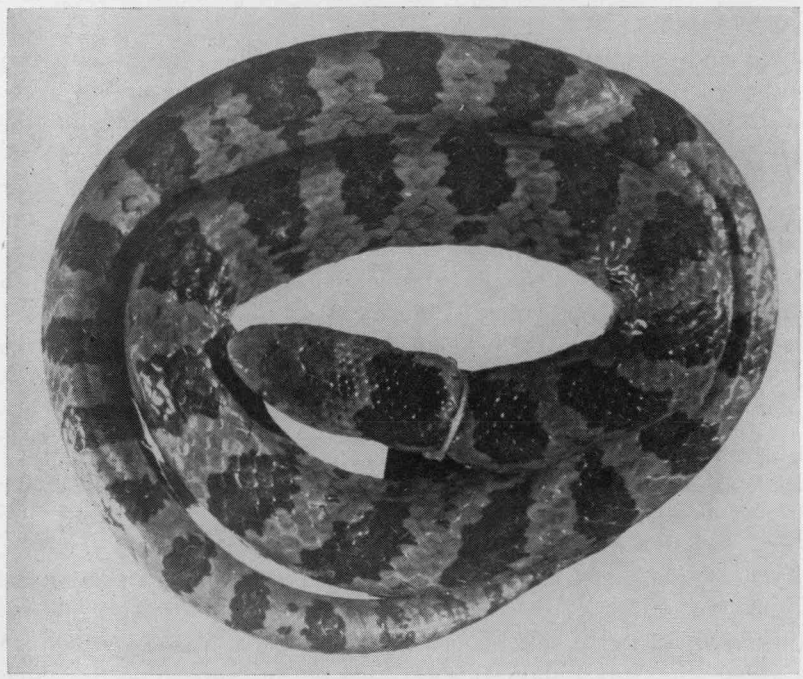

Fig. 3. MCZ 71668, *Ficimia publia wolffsohni* new subspecies, type specimen. Total length 461 mm.

DIAGNOSIS. Distinguished from *Ficimia p. publia* Cope by features of pattern as follows: (1) Dorsum with squarish, black blotches, these markings not light-centered, not light-edged, and usually not fusing with the lateral dark markings; (2) ground color red or pinkish-orange, in older specimens lightly suffused with brownish on some of the lateral scales, but mostly bright and clear at least in the dorsal interspaces; (3) lateral dark markings small and well separated; (4) ventrolateral dark markings small, separated by about three to four ventral scutes; (5) dark head markings including only a subocular spot and an irregular, poorly defined patch on the crown. Distinguished from *F. p. taylori* Smith by the presence of a pair of internasals and of two postoculars, as well as by details of color and pattern.

DESCRIPTION OF TYPE. Total length 461, tail length 66 mm. Dorsal scale rows 17. Ventrals 139; anal divided; subcaudals 37, paired; tail terminating in a blunt spine. Rostral in contact with frontal; internasals present. Supralabials seven, the third and fourth subocular, the first fused with the nasal. Infralabials seven. Postoculars two.

Ground color (in preservative) pinkish, weakly suffused with grayish-brown on some of the lateral scales, but the dorsal interspaces mostly clear. Blotches on dorsum of body 23, mostly squarish in outline, mostly terminating laterally on scale row V; the blotches black, faintly lightened toward the center. Dorsal blotches about four scales long on the dorsal midline; interspaces two to three scales long. Sides with short, dark streaks, coinciding with or alternating with the dorsal blotches. Small ventrolateral dark spots, separated by three to four ventral scutes. Remainder of venter white. Tail with eight black blotches above, white below. Top of head with vague grayish area; a dark subocular mark.

VARIATION. Additional specimens are as follows:

Orange Walk District: MCZ 71667, Gallon Jug, in high grass beside road, by day; WTN 2852, Gallon Jug, 23 August 1963, on logging road in morning; CNHM 69232, Gallon Jug (see Neill and Allen, 1961a: 46). Cayo District: MCZ 71666, vicinity of Baking Pot.

These specimens and the type are consistent in scutellation and pattern. In three females the ventrals range from 139 to 144, the subcaudals 33 to 37. In two males the ventrals are respectively 137 and 140, the subcaudals 37 and 40. In the entire lot the dorsal blotches vary in number from 23 to 26 on the body, 7 to 9 on the tail. The low number of dorsal body blotches may prove diagnostic when

more is learned about variation in all parts of the species' range. The dorsal blotches may be wholly black, or may be slightly lightened to a sepia toward the center. The dorsal ground color may be clear or suffused laterally with brownish. The dark patch on the crown varies from indistinct to fairly distinct, but is always irregular and less distinct than a body spot.

REMARKS. Smith and Taylor (1941: 363) noted that differentiation in the genus *Ficimia* was accomplished largely through modification of the color pattern. They indicated the probability that *F. publia* would eventually be partitioned on color characters, drawing special attention to the squarish black blotches, obscure head pattern, and reduced lateral markings of more southerly (Honduranean) specimens.

An adult (UF 13825) from Tikal, El Petén, Guatemala, exhibits the characters of the new form. Smith and Taylor (*supra cit.*) described *wolffsohni*-like specimens from La Ceiba, Honduras, and one from Piedras Negras, El Petén.

The new subspecies is the *Ficimia* of damp, well forested areas at the base of the Yucatán Peninsula. This population is probably a primitive one, and ancestral to *F. p. publia* (type locality Yucatán) which inhabits the relatively arid and geologically younger peninsula proper. The Veracrucian *F. p. taylori* is more highly specialized than either *publia* or *wolffsohni*, having lost the internasals and one postocular.

Among snakes generally the juvenile pattern is apt to be primitive and to afford a clue as to the direction of relationships. It is not known whether the hatchling of *Ficimia p. publia* is more *wolffsohni*-like than the adult, but the juvenile of *wolffsohni* shows no approach toward *F. p. publia*. WTN 2852, a hatchling, displays the *wolffsohni* pattern. The dorsal blotches are deep black without a trace of central lightening; the ground color is clear pinkish; a marking on the crown is asymmetric and not sharply defined.

In British Honduras *Ficimia publia wolffsohni* is vernacularly known as "barber pole" in allusion to its bright red and black coloration. The name is applied to the coral snakes, *Micrurus*, and their supposed mimics.

The new subspecies is named for Anthony Wolffsohn, Assistant Conservator of Forests in British Honduras, the first to discover the presence of *Ficimia publia* in that country.

I illustrate a logging road of the Gallon Jug area (Fig. 4), for such roads yielded not only *Ficimia publia* but many other species discussed in this paper.

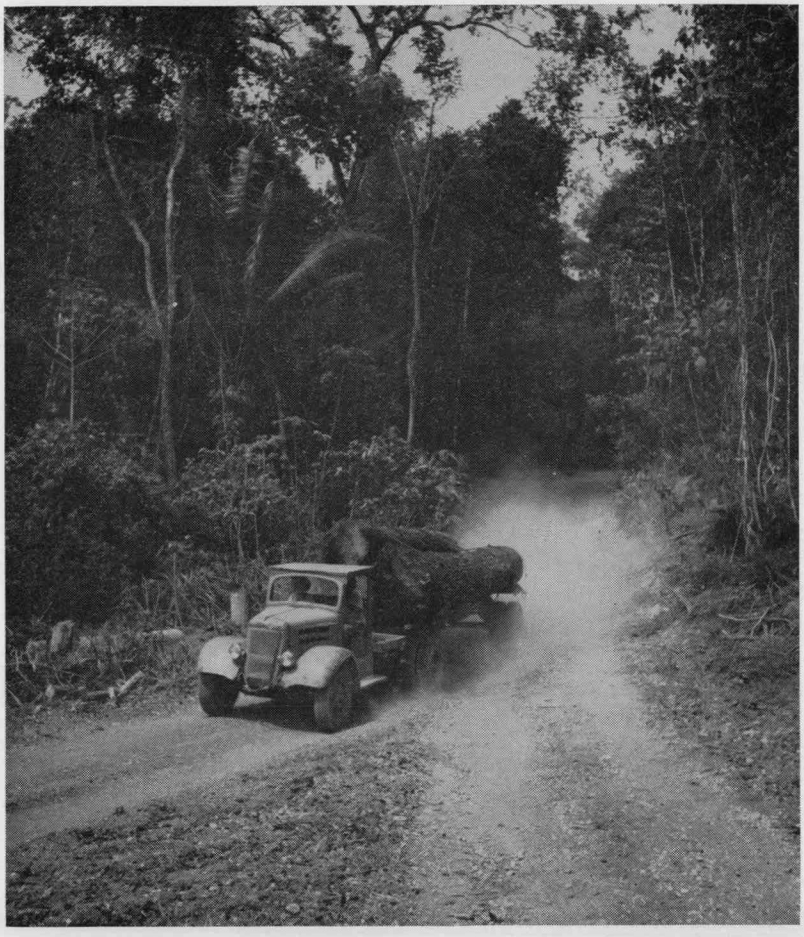

Fig. 4. A logging road of the Gallon Jug area, Orange Walk District, British Honduras. *Bufo valliceps, Leptodactylus labialis, Smilisca baudinii, Anolis lemurinus, Basiliscus vittatus, Ameiva undulata, Ficimia publia, Micrurus nigrocinctus,* and *Geoemyda areolata* are among the species collected in or beside such roads.

Leptodeira septentrionalis polysticta Günther

MATERIAL EXAMINED. Cayo District: MCZ 71674-75, vicinity of Baking Pot; WTN 2853, Augustine, 5 August 1963.

WTN 2853 is a hatchling 322 mm. in total length. The umbilical scar is fairly distinct on five ventral scutes. MCZ 71675 is a juvenile 419 mm. in total length, with umbilical scar barely evident on three ventral scutes. It is tagged with the date 21 August. These speci-

mens accord with evidence that the young of British Honduras snakes mostly appear around August.

Leptophis ahaetulla praestans (Cope)

MATERIAL EXAMINED. Cayo District: MCZ 71648, vicinity of Baking Pot.

A large male, about 1825 mm. in total length.

Leptophis mexicanus mexicanus Duméril, Bibron, and Duméril

MATERIAL EXAMINED. Orange Walk District: MCZ 71649-50, Gallon Jug, in tall trees by houses. Stann Creek District: MCZ 71651, Mango Creek, in lumber pile at sawmill.

In MCZ 71649, an adult female, the lateral dark stripe on the posterior third of the body occupies the upper half of scale row II and the lower half of III; ventrals number 161, subcaudals 160. In MCZ 71650, also an adult female, the lateral dark stripe is as in MCZ 71649; ventrals 164, subcaudals 154. In MCZ 71651, an adult male, the lateral dark stripe on the posterior third of the body occupies only the upper half of scale row II; ventrals 159, subcaudals 165. In all three snakes the head is greenish-blue, the body bronze, the lateral stripe black with blue areas. When the stratum corneum is peeled off, the bronze becomes pale blue-green, the black a medium blue. All three examples are referable to the subspecies *Leptophis m. mexicanus;* they show no approach toward *L. m. yucatanensis* Oliver, the characters of which were duplicated in a specimen from Mountain Pine Ridge, Cayo District (Neill and Allen, 1962: 86-87).

Ninia sebae sebae (Duméril, Bibron, and Duméril)

MATERIAL EXAMINED. Belize District: WTN 700, Mussel Creek, 5 miles west of Boom, under leaf litter in streamside thicket. Cayo District: MCZ 71654-59, vicinity of Baking Pot; WTN 1212, Xunantunich, under rock beside trail through hardwood forest; WTN 1215, 1466-67, 7 miles east-northeast of Cayo, under boards around farm; WTN 1815, Augustine, 1500 feet elevation, abroad in morning. Toledo District: MCZ 71660, 1 mile east of Swasey Branch, under board in overgrown field; MCZ 71661, San Antonio, under log in grassy field; MCZ 71662, San Pedro Columbia, under log in cornfield; WTN 685, 950-53, Old Toledo Settlement, under log pile in cow pasture; WTN 701, 1034, Columbia Branch Camp, in road through wooded area, by night.

British Honduras examples of *Ninia sebae,* exhibiting a pattern of black crossbars with yellow borders, closely resemble a coral snake, *Micrurus affinis,* with which they are associated. North of the Maya Mountains uplift in British Honduras, where the coral snake occasionally exhibits a reduction of its black rings to dorsal saddles

(*M. affinis "alienus"*), the *Ninia* shows comparable or even greater reduction of the black markings. Elsewhere I have mentioned this situation briefly (Neill, 1963: 206, 211), but without citing specimens. Of the present series, all those from Toledo District south of the uplift are crossbanded the full length of the body; those from Belize and Cayo Districts north of the uplift display slight (two examples) or great (ten examples) reduction of the black bands posteriorly.

Oxybelis aeneus aeneus (Wagler)

MATERIAL EXAMINED. Cayo District: MCZ 71652, vicinity of Baking Pot.

The eye diameter is 4.2, the internasal length 4.0 mm. Accordingly, the specimen is referred to the nominate subspecies, the only one so far noted in British Honduras.

Oxybelis fulgidus (Daudin)

MATERIAL EXAMINED. Cayo District: MCZ 71653, vicinity of Baking Pot.

The species is usually described as being green with a white lateral stripe (Schmidt and Inger, 1957: 216). In life, however, only the dorsum is green; the sides and venter are sky blue; the lateral stripe is bright yellow anteriorly, becoming white posteriorly; the supralabials are pale yellowish-green, the iris reddish.

Although these reptiles are primarily arboreal, they were several times seen on the ground in Toledo District.

A specimen from Belize fed on anoles in captivity.

Oxyrhopus petola aequifasciatus Werner

MATERIAL EXAMINED. Cayo District: MCZ 71678, vicinity of Baking Pot; WTN 2854, Augustine.

MCZ 71678 is a small female. Ventrals 200; subcaudals 77, divided. Scale rows 19-17. Supralabials 8. Preocular barely separated from frontal. Body with 23 black and 23 red crossbands. Black bands about six scales long on anterior part of body, about five on posterior part. About eight of the black bands somewhat diagonal, but the general impression is of regularly transverse banding. Red scales with a trace of brownish (not black) edging. Yellow nuchal collar about three scales long, but narrowing to one scale at the dorsal midline. Black dorsal bands barely tinging the ends of the ventral scutes, which are otherwise white. Tail with 11 black and 10 red crossbands, the black ones continued as grayish markings across the under side of the tail.

WTN 2854 is a larger female, 675 mm. in total length. Ventrals 206; subcaudals 80, divided. Scale rows 19-17. Supralabials 8; but two tiny scales, one above the other, interposed between the rostral and the first supralabial, on the left side of the head only. Preocular well separated from frontal. Body with 20 black and 20 red crossbands. Black bands about seven scales long on anterior part of body, about five on posterior part. About six of the black bands somewhat diagonal, but the general impression is of regularly transverse banding. Most red scales black-tipped. Yellow nuchal collar about two and a half scales long, but narrowing to one scale at the dorsal midline. Black dorsal bands barely tinging the ends of the ventral scutes; toward the posterior part of the body, the red dorsal ground color separated from the light ventral color by small grayish spots, one such spot on each end of a ventral scute. Venter of body otherwise whitish, unmarked. Tail with 10 black and 9 red crossbands; the red bands barely tinging the ends of the subcaudals, but the black ones continuing across the under side of the tail, where the dark pigment is concentrated mainly at the bases of the subcaudal scutes.

Only one other specimen has been reported previously from British Honduras. Like it, the present two show an approach toward *Oxyrhopus baileyi* (Smith) which I have previously suggested is but a subspecies of *O. petola* (Neill and Allen, 1959a: 55-56); Duellman (1963: 246) later expressed the same view.

WTN 2854 had recently swallowed a large mouse. The mammal measured about 75 mm. from snout to rump and 170 mm. in total length.

Sibon nebulata nebulata (Linnaeus)

MATERIAL EXAMINED. Cayo District: MCZ 71680, vicinity of Baking Pot.

A juvenile male, total length 294 mm. About 47 black dorsal spots, only the nuchal one enlarged; about 30 spots on tail.

The species has not previously been reported from British Honduras.

Spilotes pullatus mexicanus (Laurenti)

MATERIAL EXAMINED. Cayo District: MCZ 71681, vicinity of Baking Pot.

This specimen may be a full-term embryo removed from the egg. Total length 477 mm. It has 29 dark crossbands on the body, well defined except toward the neck, and 14 well defined dark bands on the tail. This juvenile pattern is quite different from the adult pattern figured elsewhere (Neill and Allen, 1960: 152-153).

Stenorrhina freminvillei Duméril, Bibron, and Duméril

MATERIAL EXAMINED. Cayo District: WTN 2855, Augustine, 23 August 1963.

The specimen is a hatchling, 159 mm. in total length. The pattern consists of five sharply defined narrow black lines on a gray background.

I have suggested that *Stenorrhina freminvillei* exhibits polymorphic pattern alternatives, red vs. gray, and also the alternatives lined vs. unlined (Neill, 1963: 204, 206). Stuart (1963: 117) recently emphasized the variation that may obtain at one locality, and formally synonymized all previously recognized races of this species. As unlined specimens seem concentrated toward the northern part of the species' range, it may yet prove desirable to recognize subspecies of S. *freminvillei,* but for the present I follow Stuart.

Thamnophis proximus rutiloris (Cope)

MATERIAL EXAMINED. Belize District: WTN 684, Belize, by weed-choked pool in town; WTN 949, 20 miles west by south of Belize, under log in pine savanna; WTN 1972, Maskalls, on grassy riverbank. Stann Creek District: MCZ 71646, just northwest of Mango Creek, at pond. Toledo District: MCZ 71647, 4 miles east of Bladen Branch, in swampy area of pine savanna.

All British Honduras records of this species are from a savanna belt that stretches from northeastern Orange Walk District southward into northeastern Toledo District.

Tropidodipsas sartorii sartorii Cope

MATERIAL EXAMINED. Cayo District: MCZ 71682, vicinity of Baking Pot.

Adult male; ventrals 173, subcaudals 58. Scale rows 17-17. Body with 20 black crossbands separated by light ones, the latter not complete across the black venter. A light band across back of head; head otherwise black. Tail with 6 black bands separated by light ones. A small unpaired median scale just in advance of and in contact with the frontal.

Only one other specimen of *Tropidodipsas sartorii* has previously been reported from British Honduras (Neill and Allen, 1961b: 97).

The trivial name has often been emended to *sartori* which is incorrect because the name honors Sartorius.

Xenodon rabdocephalus mexicanus Smith

MATERIAL EXAMINED. Cayo District: MCZ 71683, vicinity of Baking Pot.

A hatchling, total length about 217 mm. Ventrals about 127 (a break in the body wall precludes an exact count); subcaudals 38.

Body with 14 hourglass-shaped dark crossbands; three dark bars on tail.

A living adult from British Honduras has been figured (Neill, 1960b: fig. 3). The pattern, especially in the juvenile, is strikingly reminiscent of that of a fer-de-lance, *Bothrops atrox*.

Elapidae

Micrurus affinis hippocrepis (Peters)

Material Examined. Cayo District: MCZ 71676-77, vicinity of Baking Pot.

Schmidt (1933: 36) described the British Honduras coral snake as *Micrurus affinis stantoni*, but later (1936: 212) decided it should be called *M. affinis alienus* (Werner). Both names were based on specimens in which the black rings were reduced to dorsal blotches. The two present examples show no such reduction. The evidence indicates that this reduction is but a pattern variant; it appears in only one out of nine British Honduras coral snakes I have examined. The variant also occurs in the closely related *M. fulvius* (Neill, 1963: 206, 209-210, fig. 4). As I noted previously (Neill and Allen, 1959a: 57) ringed examples from British Honduras agree with Schmidt's definition of *M. a. hippocrepis* (Peters), an older name than *alienus*. Stuart (1963: 126) agrees that *alienus* is probably identical with *hippocrepis*, and further suggests that both of these may be identical with *M. affinis aglaeope* (Cope), an older name than *hippocrepis*.

Micrurus nigrocinctus divaricatus (Hallowell)

Material Examined. Orange Walk District: WTN 2856, Gallon Jug, on logging road by day.

Schmidt (1941: 508) mentioned but did not identify a British Honduras coral snake with supra-anal tubercles, from "Corozal Island." Previously I suggested that this locality might be Corosalito, or Isla Corozal, on the Rio Hondo in Orange Walk District, and that the snake might be *Micrurus nigrocinctus*, although at that time this species was not known definitely to range so far east (Neill and Allen, 1959a: 57-58). Gallon Jug, the collecting station for WTN 2856, is about 30 miles southwest by south of Isla Corozal, and in the Rio Hondo drainage.

The specimen is a female; total length 317, tail length 47 mm. Dorsal scale rows 15; ventrals 212, subcaudals 49. Black rings 10 on body, these rings 5½ to 8 scales long. Each black ring with yellow borders, each yellow ring about 2½ scales long. Scales of red inter-

spaces uniformly tipped with black, but no other black pigment in the red areas. Tail with 4 black rings separated by yellow interspaces. All rings complete and regularly transverse. Snout completely black; a yellow band across back of head extending anteriorly to posterior margin of eye.

The specimen is tentatively referred to the subspecies *Micrurus nigrocinctus divaricatus* (Hallowell), previously known from northeastern Nicaragua, northern Honduras, and the lowlands of eastern Guatemala (Schmidt, 1933: 34). It agrees with *divaricatus* in ventral count and in having wide yellow rings, but disagrees in having a high subcaudal count and in the distribution of black pigment in the red zones, as well as in having a low number of black rings. It shows no approach to *M. n. zunilensis* Schmidt, the only subspecies included in the Guatemalan list by Stuart (1963: 127).

CROTALIDAE

Bothrops atrox (Linnaeus)

MATERIAL EXAMINED. Orange Walk District: MCZ 71664, 8 miles southwest of Gallon Jug, in mahogany forest under fallen tree. Cayo District: MCZ 71663, vicinity of Baking Pot.

MCZ 71664 is an adult female, total length about 1760, tail length 223 mm. Ground color grayish-brown; body with about 25 brownish-black crossbands outlined brightly with yellow. Tail with 9 crossbands on the proximal part and 10 or 12 irregular, narrow bands on the distal part. Lateral markings of the body between the crossbands indistinct. Venter heavily mottled with brownish-black on an ivory ground.

Some recent workers have referred to the fer-de-lance of Guatemala and nearby regions as *Bothrops atrox asper* (Garman), apparently assuming that the population of Mexico and Central America is subspecifically different from that of South America. The name *asper* Garman (1888: 124) was proposed on the basis of a supposed difference in the carination of the dorsal scales, a dubious taxonomic character at best. Amaral (1954: 214) found *asper* to be unrecognizeable.

More significantly, the type locality of *asper* is Obispo, Isthmus of Darién, Panamá, near the Colombian border. The Panamanian snake fauna as a whole is strongly South American in affinity (see list in Smith, 1958); and if the species can be partitioned into Central American and South American moieties, the Obispo population will almost surely have a closer affinity with the South American. Finally,

the type locality of *B. atrox* (Linnaeus), originally given as "Asia," was subsequently designated as Surinam in northern South America (Schmidt and Walker, 1943: 295), and the designation has met with general acceptance. Thus, use of the name *asper* for the British Honduras *Bothrops atrox* would be possible only if the species underwent a subspecific change between Surinam and northwestern Colombia, and none between Colombia and northern Central America.

Bothrops nasutus Bocourt

MATERIAL EXAMINED. Cayo District: WTN 2707, Xunantunich, beside trail to ruins.

Only one example of a hog-nosed viper has been recorded previously from British Honduras (Schmidt, 1941: 509). It was reported at a time when little was known of variation and distribution in this group of pit-vipers. On geographic grounds Schmidt assigned the specimen to *Bothrops yucatanicus* (Smith). It is now known that the hog-nosed viper of forested areas in British Honduras and El Petén is *B. nasutus*. *B. yucatanicus* seems confined to the arid outer part of the Yucatán Peninsula.

Schmidt's example was listed as from Benque Viejo, Cayo District. It may actually have been from the nearby Mayan ruins of Xunantunich, for these have generally been called Benque Viejo in the archeological and popular literature. The ruins lie atop a high, wooded hill, about two miles north by east of the village of Benque Viejo and one mile west of Succoths.

WTN 2707 is a young male, total length 341, tail length 44 mm. Rostral height 5 mm.; rostral width 2.5 mm. at the gape, narrowing to 1.6 mm. Body with 17 crossbands, these markings dark at the edges but lightened centrally. A narrow whitish line following the keels of the vertebral scale row splits each dorsal band into right and left components; these components mostly not aligned but slightly offset. Venter heavily stippled with grayish-brown, the pigment concentrated toward the free edge of each ventral scute. Chin, throat, and infralabials blackish, with four white streaks extending downward from the gape on each side of the head. A dark subocular spot, white-bordered anteriorly and posteriorly; a grayish-white line extending along the last four supralabials. Top of head with a dark, sagittate marking, the point directed anteriorly.

In a review of the caudal lure among snakes (Neill, 1960a), I had no data on the color of the tail in juveniles of any hog-nosed viper. In WTN 2707 the appendage is muscular. Two dark crossbands

resembling the body bands occupy the proximal half of the tail, but the distal half is yellowish-white, and the terminal scute is tipped with brown. The appendage resembles the tails of the juvenile pit-vipers that carry on luring.

Bothrops nummifer nummifer (Rüppel)

MATERIAL EXAMINED. Cayo District: MCZ 71665, vicinity of Baking Pot.

A young specimen, tail tip yellow. About 20 dorsal spots, 5 of them discrete but the others fusing longitudinally to form a zigzag pattern down the back. The discrete dorsal spots about 4 to 5 scales long. About 12 dorsal spots fused with the lateral spots on one side of the body, about 5 so fused on the other side. Postocular dark stripe extending diagonally downward in a straight line to a point well below the level of the rictus. Two nasorostral scales on one side, 3 on the other. Lower preocular absent.

Stuart (1963: 128, 130-131) has recognized a subspecies inhabiting the Pacific slope of Central America, *Bothrops nummifer affinis* Bocourt, characterized by small, round lateral spots that do not fuse with the dosal markings. The population on the Caribbean slope thus becomes *B. n. nummifer*. This arrangement has more to recommend it than previous ones. In British Honduras examples the lateral spots mostly form upright bars that fuse with the dorsal spots.

CROCODYLIDAE

Crocodylus moreleti Duméril and Duméril

MATERIAL EXAMINED. Cayo District: MCZ 71630-31, vicinity of Baking Pot.

The specimens are heads only, of young examples.

Mook (1959) based *Crocodylus moreleti barnumbrowni* on a single incomplete left maxillary bone, thought to be of Pleistocene age, from "Treasure Island, Guatemala," somewhere in El Petén. He compared the fossil maxillary, that of a large adult, only with Schmidt's (1924) illustrations of the skull of a single juvenile *moreleti*. The premaxillo-maxillary suture of the fossil indeed associates the specimen with *Crocodylus moreleti*, not with *Crocodylus acutus* Cuvier which also inhabits El Petén. Mook distinguished the fossil from modern *Crocodylus moreleti* by two supposed diagnostic features: First, the width of the maxillary plate, between the palatine fenestra and the 10th and 11th maxillary alveoli, was variable (wider anteriorly) in the fossil, uniform in the modern skull. This difference reflects only a slight difference in the level at which the external mar-

gin of the palatine fenestra begins turning inward to form the anterior margin of the opening. Mook stated that the fenestra must not have extended as far forward in the fossil as in the modern skull, yet also stated that in the fossil the opening extended at least as far forward as the level of the posterior border of the 8th maxillary alveolus. These interpretations are contradictory, as in the modern skull the fenestra extends anteriorly only to the level of the posterior border of the 9th maxillary alveolus. Actually only a small part of the fenestral border was preserved, and accurate interpretation of fenestral shape is impossible.

The other diagnostic character of the fossil was the angular external border of the maxillary bone, which did not appear in the modern skull he compared it with. This, as mentioned above, was a small one. Individuals of the modern population comparable to the fossil in size commonly exhibit an angular exterior border of the maxillary bone, as shown in Figure 5, a living adult of *Crocodylus moreleti* from Orange Walk District. Thus I consider *Crocodylus moreleti barnumbrowni* Mook a synonym of *C. moreleti* Duméril and Duméril.

Emydidae

Geoemyda areolata (Duméril and Bibron)

Material Examined. Orange Walk District: MCZ 71632, 8 miles north of Gallon Jug, 20 July 1962, in rain puddle of logging road; MCZ 71633, 1 mile north of Gallon Jug, on logging road bordered by rainforest.

MCZ 71632 is a juvenile, carapace length 64 mm. It is interesting to note its occurrence in a rainwater pool, for the adults are terrestrial.

MCZ 71633, a medium-sized adult, has a tick attached to the seam between the fourth marginal and first lateral on the right side. Schmidt (1946: 8) called attention to the turtle-shell ticks that parasitize *Geoemyda*.

Pseudemys scripta ornata (Gray)

Material Examined. Stann Creek District: MCZ 71641, 3 miles south of Waha Leaf Creek, in roadside rain pool; MCZ 71642, 2 miles south of Waha Leaf Creek, in puddle of pine savanna.

I follow Williams (1956) in considering this turtle to be a subspecies of *Pseudemys scripta*.

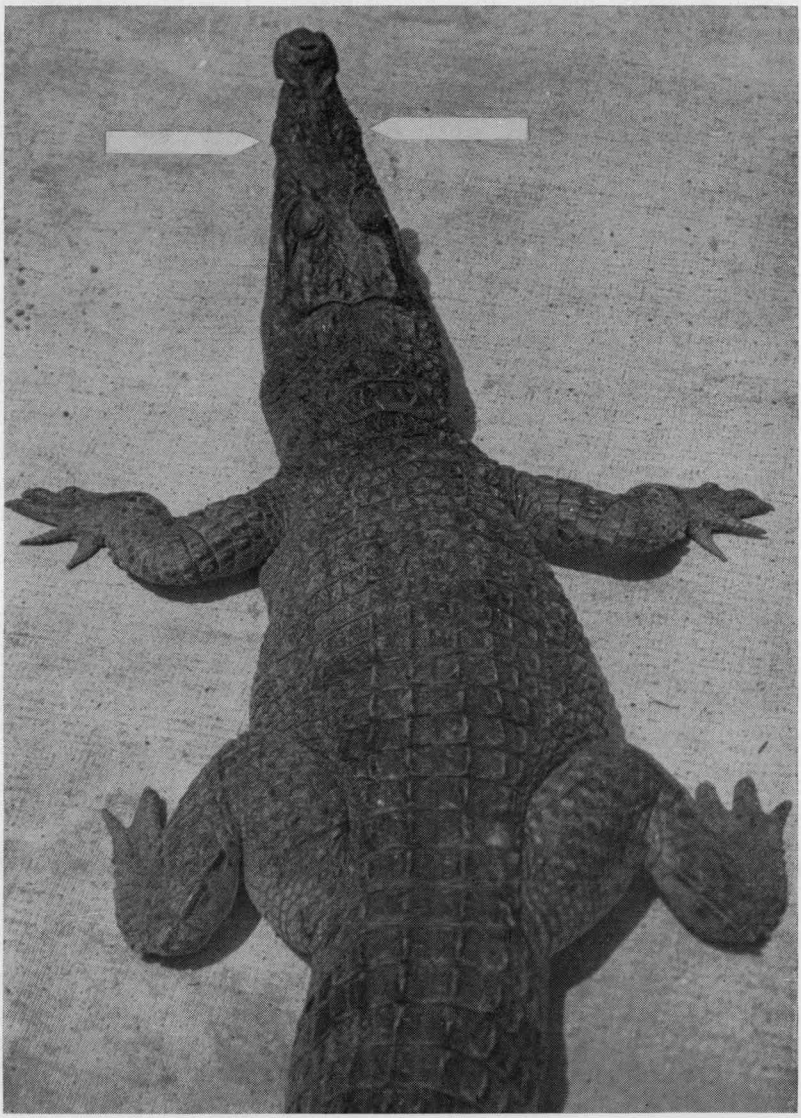

Fig. 5. Living *Crocodylus moreleti* from Orange Walk District, British Honduras. Total length about 5 feet. Arrows indicate angular external border of maxillary bone.

KINOSTERNIDAE

Kinosternon acutum Gray

MATERIAL EXAMINED. Orange Walk District: WTN 2858, Gallon Jug.

The present concept of this species is based largely upon Mexican material. Smith and Taylor (1950: 23) restricted the type locality to Cosamaloapam, Veracruz. Schmidt (1941: 488) included *Kinosternon acutum* in the herpetofaunal list for British Honduras, but no actual specimen has previously been reported from there. When Gray (1831: 34) described this species he did not know the type's source, but thought it might have been from either Honduras or South America. Stejneger (1941: 458) supposed Honduras to have been more likely because F. Siebenrock had seen material from El Petén. Schmidt (*supra cit.*) then assumed that by "Honduras," Stejneger meant British Honduras.

WTN 2858 is shown in Fig. 6. The species is discussed further in connection with the description of a new *Kinosternon* below.

Kinosternon cruentatum cruentatum Duméril and Bibron

MATERIAL EXAMINED. Stann Creek District: MCZ 71639-40, Mango Creek, in mud puddle.

In both specimens the anterior lobe of the plastron is decidedly longer than the fixed portion. The color of the light head markings in life cannot be determined as the preservatives have bleached them.

Belize is the only other definite locality known for the species in British Honduras (Schmidt, 1941: 488).

Kinosternon leucostomum Duméril and Bibron

MATERIAL EXAMINED. Orange Walk District: MCZ 71634, Gallon Jug, found at night. Stann Creek District: MCZ 71636, 3 miles south of Waha Leaf Creek, in roadside ditch. Toledo District: MCZ 71637-38, Swasey Branch, swimming in stream.

MCZ 71634, an adult male, shows three small eroded areas near the midventral line of the plastron. Such areas have been reported in other species of the genus, but what causes them is unknown. In *Kinosternon subrubrum* the holes are sometimes infested with dipteran larvae, but these might be secondary invaders.

Kinosternon mopanum new species

TYPE. MCZ 71635, adult female (Fig. 6, righthand specimen; Fig. 7). Waha Leaf Creek, southern Stann Creek District, British

Honduras; 3 August 1962. Collected by the Monath party. Field number 14267.

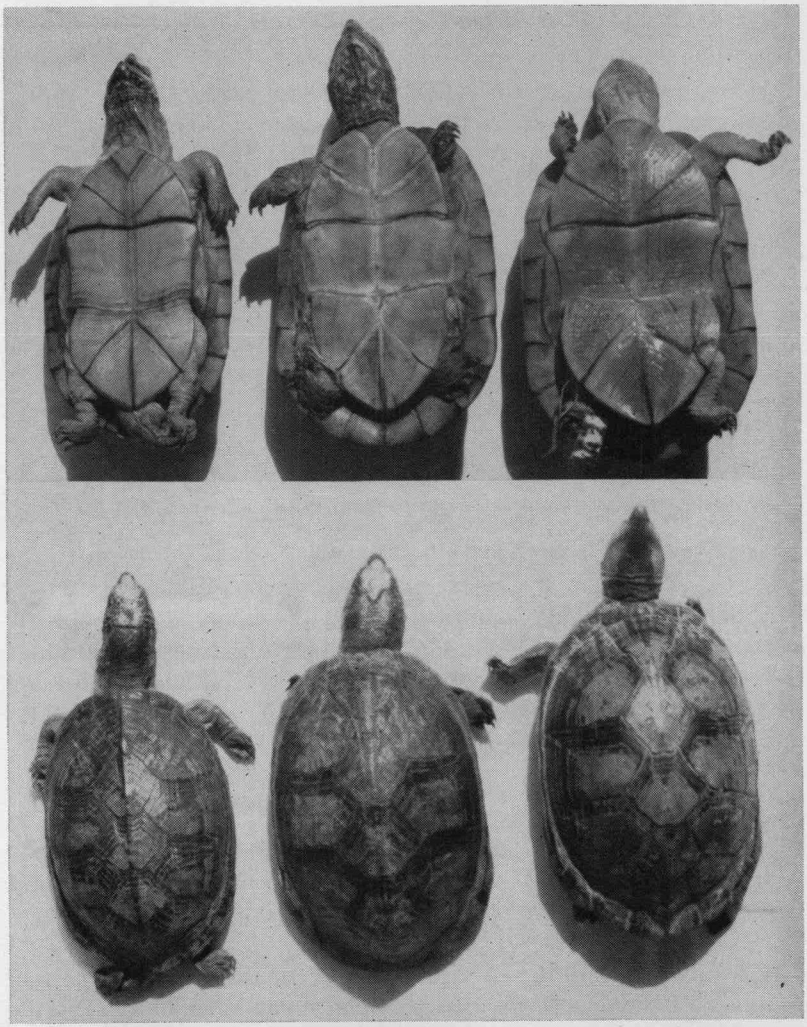

Fig. 6. Upper row, left to right: WTN 2858, *Kinosternon acutum*, showing long midportion of plastron; WTN 2859, *K. leucostomum*, near San Andrés Tuxtla, Veracruz, Mexico, showing small gular, large hands and feet, and axillary-inguinal contact; MCZ 71635, *K. mopanum* new species, type specimen, showing large gular, small hands and feet, and lack of axillary-inguinal contact. Lower row: same specimens in dorsal view, showing head patterns. All to same scale.

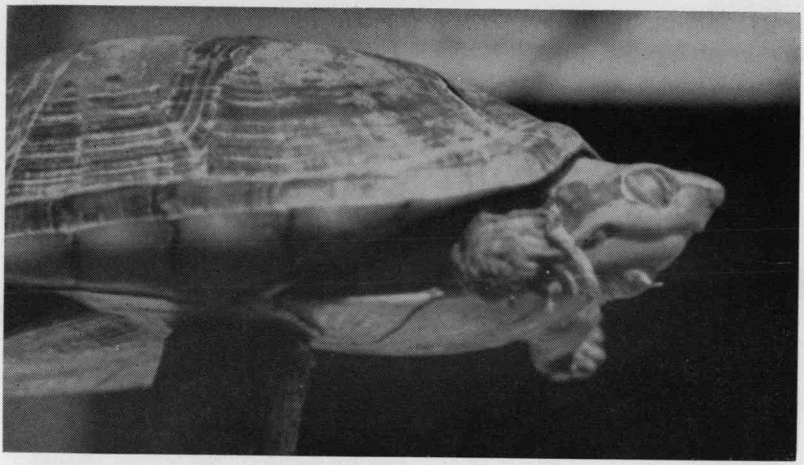

Fig. 7. MCZ 71635, *Kinosternon mopanum* new species, type specimen. Lateral view to show postorbital markings.

DIAGNOSIS. A mud turtle resembling *Kinosternon leucostomum* in size and general conformation, also in that the carapace bears a single longitudinal keel, and that the moveable anterior lobe of the plastron is decidedly longer than the fixed mid-portion of the plastron. Differing from *K. leucostomum* in that (1) the gular is much larger and longer, its length exceeding one-half the length of the anterior lobe of the plastron; (2) the axillary scute is separated from the inguinal; (3) the head in both juvenile and adult is a clear, light yellowish-brown with a sharply defined black postorbital stripe and a sharply defined sagittate figure on the crown; and (4) the hands and feet are proportionately much smaller.

The new species seems less closely related to *Kinosternon acutum* in which the anterior lobe of the plastron is shorter than the fixed midportion and the head pattern of the adult is reticulate. *K. acutum* also has a more flattened carapace than *K. mopanum*.

Comparison might also be made with *Kinosternon creaseri* Hartweg, supposedly a vicariant of *K. acutum* in Yucatán and Quintana Roo. Unlike *K. creaseri* the new species has a small head and a weakly developed beak, as well as axillary-inguinal separation. The head markings of *K. creaseri* are whitish flecks on a blackish ground.

Kinosternon cruentatum is not closely related to any of the above-mentioned species; its carapace bears three longitudinal keels and it has a blood-red or bright yellow postorbital streak.

DESCRIPTION OF TYPE. Carapace length 102, width 67.4, height

about 39 mm. Carapace but slightly elevated posteriorly, and with a single low median keel. No trace of lateral keels. Laminae of carapace with concentric growth rings. First nine supramarginals thickened. Plastron large, filling the carapace. Plastron length 93 mm. Gular length 17 mm. Length of moveable anterior lobe of plastron 32.3 mm. Length of fixed midportion of plastron 22 mm. Hind lobe of plastron obtusely rounded posteriorly, not notched or emarginate. Axillary scute separated from inguinal scute by 2 mm. on right side, 3 mm. on left. Head length to posterior margin of tympanum 22.7, head width 19 mm. Tail minute, terminating in a needle-like spine.

Carapace black. Plastron, axillary and inguinal scutes, and under side of marginals yellowish-brown, the laminae black-bordered. Exposed portions of limbs black above, whitish below. Head clear yellowish-brown; a black triangle on the crown, the point directed anteriorly, the base extending back onto neck and fading posteriorly. Black speckling on top of snout. A black stripe beginning at the posterior margin of the orbit and extending posteriorly through the tympanum, thence continuing along the sides of the neck as three or four narrow rows of black flecks and dashes. Horny beak clear yellowish-white. A short, black median line on the throat beginning behind the horny beak and extending posteriorly between the chin barbels.

VARIATION. Additional specimens are as follows:

Toledo District: WTN 3961, Machaca Creek Forestry Station, 9 miles northwest of Punta Gorda, 28 October 1959, collected by Wilfred T. Neill, Ross Allen, and Thomas C. Allen, under log by day, in wet, grassy seepage area on hill; WTN 3962, same collecting data as WTN 3961, climbing up clay bank of a small stream, by day.

WTN 3962 is an adult female. It is slightly smaller than the type and does not differ significantly from it. WTN 3961 is a juvenile 36.3 mm. in carapace length. The anterior lobe of the plastron has not attained moveability. The axillary scute is well separated from the inguinal on each side. The carapace bears no trace of lateral keels; a low median keel is present. The head pattern is much as in the adults except that dark stripes on the neck are more numerous and better defined. The shell above and below is colored as in the adults except that there is a small, poorly defined, yellowish-brown spot at the outer edge of the upper surface of each marginal, and that faint brownish spots are sprinkled over the plastron, bridge shields, and the under surface of the marginals.

REMARKS. The head pattern of *Kinosternon mopanum* is present in juveniles of several other species of the genus, and may be a primitive character.

The Machaca Creek area is mostly forested. Waha Leaf Creek arises in a stretch of forest that is continuous with the forest of the Machaca Creek locality. Although Waha Leaf Creek cuts through a coastal savanna belt on its way to Placentia Lagoon, the stream banks are forested.

In the type the seams of the carapace were impacted with reddish clay. Evidently the reptile had been burrowing in mud.

The name *"mopanum"* alludes to the Mopan Maya, an Indian group living south of the Maya Mountains uplift in Toledo District.

Staurotypus triporcatus (Wiegmann)

MATERIAL EXAMINED. Belize District: WTN 2860, Belize River near Boom.

The specimen is a male, carapace length 267 mm. In life the jaws were dull greenish-black with vague upright streaks of yellowish, these streaks better defined on the upper jaw. The head was reticulated with greenish-black and yellow. The carapace was dark brown; a few darker streaks and spots could be made out.

Staurotypus triporcatus is generally considered a species of the Caribbean drainage, replaced by *S. salvini* Gray on the Pacific slope. I referred turtles of the Belize River drainage to *S. salvini* (Neill and Allen, 1959a: 28) on the basis of three shells without soft parts or laminae, compared only with the confused literature relating to this genus. Stuart (1963: 49) has recently diagnosed the Caribbean and Pacific species by color characters. WTN 2860 is somewhat intermediate between the two, although closer to *Staurotypus triporcatus*. Pending a revision of the genus, it seems better to use *triporcatus* for all British Honduras material.

CHECKLIST

Although a detailed herpetology of British Honduras is in preparation, it may be useful now to list the amphibians and reptiles so far discovered in that country. Additions to the list will doubtless be made, and several taxonomic changes are to be expected. A few species or subspecies have been reported from British Honduras but not in convincing fashion; the names of these forms are placed in brackets in the following list.

Class AMPHIBIA

Order CAUDATA

Family PLETHODONTIDAE

Bolitoglossa mexicana mexicana Duméril, Bibron, and Duméril
Oedipina elongata Schmidt

Order SALIENTIA

Family RHINOPHRYNIDAE

Rhinophrynus dorsalis Duméril and Bibron

Family BUFONIDAE

Bufo marinus (Linnaeus)
Bufo valliceps valliceps Wiegmann

Family LEPTODACTYLIDAE

Eleutherodactylus laticeps (Duméril)
Eleutherodactylus ranoides (Cope)
Eleutherodactylus rostralis (Werner)
Eleutherodactylus rugulosus rugulosus (Cope)
Eleutherodactylus sandersoni Schmidt
Leptodactylus labialis (Cope)
Leptodactylus melanonotus (Hallowell)
Syrrhophus leprus cholorum new subspecies

Family HYLIDAE

Hyla ebraccata Cope
Hyla loquax Gaige and Stuart
Hyla microcephala martini Smith
Hyla picta (Günther)
Hyla staufferi Cope
Phrynohyas spilomma (Cope)
Phyllomedusa callidryas taylori Funkhouser
Phyllomedusa moreleti (Duméril)
Smilisca baudinii (Duméril and Bibron)

Family MICROHYLIDAE

Hypopachus cuneus nigroreticulatus Taylor

Family RANIDAE

Rana palmipes Spix
Rana pipiens Schreber

Class REPTILIA

Order SQUAMATA

Family GEKKONIDAE

Aristelliger georgeensis georgeensis (Bocourt)
Coleonyx elegans elegans Gray

Sphaerodactylus glaucus glaucus Cope
Sphaerodactylus continentalis Werner
Phyllodactylus insularis Dixon
Phyllodactylus tuberculosus lanei Smith
Thecadactylus rapicauda (Houttuyn)

Family Xantusiidae

Lepidophyma flavimaculatum flavimaculatum Duméril

Family Iguanidae

Anolis allisoni Barbour
Anolis biporcatus (Wiegmann)
Anolis capito Peters
Anolis humilis uniformis Cope
Anolis lemurinus bourgeaei Bocourt
Anolis limifrons rodriguezi Bocourt
Anolis nannodes Cope
Anolis pentaprion beckeri Boulenger
[*Anolis sagrei sagrei* Duméril and Bibron]
Anolis sagrei mayensis Smith and Burger
Anolis sericeus sericeus Hallowell
Anolis tropidonotus tropidonotus Peters
Anolis ustus Cope
Basiliscus vittatus Wiegmann
Corytophanes cristatus (Merrem)
Corytophanes hernandesii (Wiegmann)
Ctenosaura similis similis Gray
Iguana iguana rhinolopha Wiegmann
Laemanctus deborrei Boulenger
Sceloporus chrysostictus Cope
Sceloporus lundelli lundelli Smith
Sceloporus teapensis Günther

Family Scincidae

Eumeces schwartzei Fischer
Eumeces sumichrasti (Cope)
Lygosoma cherriei ixbaac Stuart
Mabuya brachypoda Taylor

Family Teiidae

Ameiva festiva edwardsi Bocourt
Ameiva undulata gaigeae Smith and Laufe
Ameiva undulata hartwegi Smith
Cnemidophorus angusticeps petenensis Beargie and McCoy

Family Anguinidae

Celestus rozellae Smith

Family Boidae

Boa constrictor imperator Daudin

Family COLUBRIDAE

Adelphicos quadrivirgatus visoninus (Cope)
Clelia clelia (Daudin)
Coniophanes bipunctatus bipunctatus (Günther)
Coniophanes fissidens fissidens (Günther)
Coniophanes imperialis clavatus (Peters)
Coniophanes schmidti Bailey
Conophis lineatus concolor Cope
Conophis lineatus dunni Smith
Dipsas brevifacies (Cope)
Dryadophis melanolomus melanolomus (Cope)
Drymarchon corais melanurus (Duméril, Bibron, and Duméril)
Drymobius margaritiferus margaritiferus (Schlegel)
Elaphe flavirufa pardalina Peters
[*Elaphe triaspis triaspis* (Cope)]
Ficimia publia wolffsohni new subspecies
Imantodes cenchoa leucomelas Cope
Lampropeltis doliata polyzona Cope
Leptodeira frenata malleisi Dunn and Stuart
Leptodeira septentrionalis polysticta Günther
Leptophis ahaetulla praestans (Cope)
Leptophis mexicanus mexicanus Duméril, Bibron, and Duméril
[*Leptophis mexicanus yucatanensis* Oliver]
Masticophis mentovarius mentovarius (Duméril, Bibron, and Duméril)
Ninia sebae sebae (Duméril and Bibron)
[*Ninia sebae morleyi* Schmidt and Andrews]
Oxybelis aeneus aeneus (Wagler)
Oxybelis fulgidus (Daudin)
Oxyrhopus petola aequifasciatus Werner
Pliocercus elapoides laticollaris Smith
Pseustes poecilonotus poecilonotus (Günther)
Scaphiodontophis annulatus annulatus (Duméril, Bibron, and Duméril)
Sibon nebulata nebulata (Linnaeus)
Sibon sanniola (Cope)
Spilotes pullatus mexicanus (Laurenti)
Stenorrhina freminvillei Duméril, Bibron, and Duméril
Tantilla canula brevis (Günther)
Tantilla schistosa schistosa (Bocourt)
Thamnophis praeocularis (Bocourt)
Thamnophis proximus rutiloris (Cope)
Tretanorhinus nigroluteus lateralis Bocourt
Tropidodipsas sartorii sartorii Cope
Xenodon rabdocephalus mexicanus Smith

Family ELAPIDAE

Micrurus affinis hippocrepis (Peters)
Micrurus nigrocinctus divaricatus (Hallowell)

Family CROTALIDAE

[*Agkistrodon bilineatus bilineatus* Günther]
Bothrops atrox (Linnaeus)
Bothrops nasutus Bocourt
Bothrops nummifer nummifer (Rüppel)
Bothrops schlegeli (Berthold)
Crotalus durissus tzabcan Klauber

Order CROCODILIA

Family CROCODYLIDAE

Crocodylus acutus Cuvier
Crocodylus moreleti Duméril and Bibron

Order TESTUDINATA

Family DERMATEMYDIDAE

Dermatemys mawei Gray

Family KINOSTERNIDAE

Claudius angustatus Cope
Kinosternon acutum Gray
Kinosternon cruentatum cruentatum Duméril and Bibron
Kinosternon leucostomum Duméril and Bibron
Kinosternon mopanum new species
Staurotypus triporcatus (Wiegmann)

Family EMYDIDAE

Geoemyda areolata (Duméril and Bibron)
Pseudemys scripta ornata (Gray)
[*Terrapene mexicana yucatana* (Boulenger)]

Family CHELONIIDAE

Caretta caretta caretta (Linnaeus)
Chelonia mydas mydas (Linnaeus)
Eretmochelys imbricata imbricata (Linnaeus)

Family DERMOCHELYDIDAE

Dermochelys coriacea coriacea (Linnaeus)

The above British Honduras list includes 2 salamanders, 23 frogs, 39 lizards, 51 snakes, 2 crocodilians, and 14 turtles, a total of 131 species and subspecies, as compared with Schmidt's 1941 total of 98 for this country.

British Honduras measures 174 miles from north to south and not over 70 miles in greatest width. Its herpetofauna is moderately large and notably diverse for so small an area; it includes not only some widespread Mexican and Central American species but also West Indian and Yucatán Peninsular forms, as well as a number of endemics associated with the Maya Mountains uplift.

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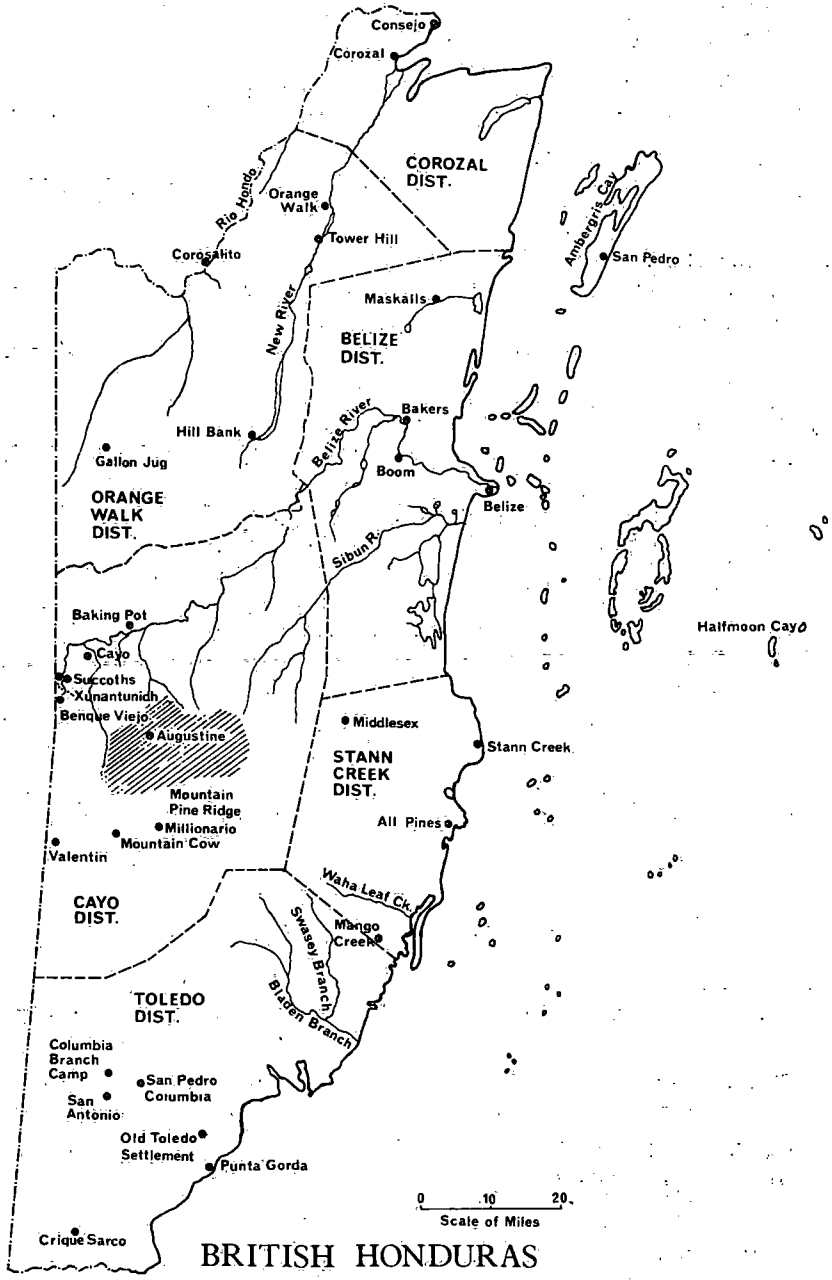

Fig. 8. Map of British Honduras, showing localities mentioned in the text.

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> Conference of Biological Editors, Committee on Form and Style.
> 1960. Style manual for biological journals.
> Amer. Inst. Biol. Sci., Washington. 92 p.

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