

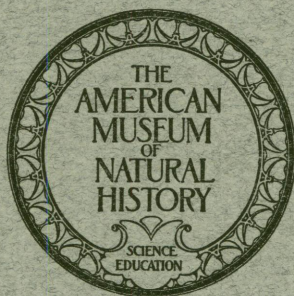
MAMMALS COLLECTED BY
A W. ANTHONY IN GUATEMALA,
1924-1928

By GEORGE G. GOODWIN

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**Article I.—MAMMALS COLLECTED BY A. W. ANTHONY IN
GUATEMALA, 1924–1928**

BY GEORGE G. GOODWIN

PLATES I TO V

This is a report on mammals from Guatemala, collected by A. W. Anthony for The American Museum of Natural History. The expedition was in the field from early in the year 1924 until 1928. Although the primary objective of this trip was to collect birds, approximately 1000 mammals were secured, providing a good representation of the mammalian fauna of central and southern Guatemala.

Eight new species of these mammals have already been described in American Museum Novitates, but a general report on the entire collection, with such field notes as seem to be of interest, is deemed worthy of publication, as this region is faunally an important one, and typical specimens of several species from near some of Salvin's old stations are now made available for the first time in American collections.

The specimens represented are from such diverse regions as the lofty mountain ranges in western Guatemala; low coastal plains of the Pacific; hot, dry, arid regions, and dense tropical forests of central Guatemala.

Mr. Anthony's itinerary, which gives a brief description of the country in the vicinity of each collecting station, and remarks on the altitude, character of environment, etc., as well as detailed maps showing principal elevations and a key to collecting stations, was published in 'Distribution of Bird Life in Guatemala,' by Ludlow Griscom (1932, Bull. Amer. Mus. Nat. Hist., XIV). Although these maps are as correct as is reasonably possible, the location of the following stations should be noted: "Concepcion" is just south of Tucuru; "Sepacuite" is fifty miles east of Coban and belongs south of Cajabon (also written Cahabon) instead of north, as shown on the map.

The use of mammal skulls at native altars appears to be as prevalent in Guatemala as in other parts of the world. I saw skulls of animals used in Siberia in a manner somewhat similar to that described in a letter from Mr. Anthony, who states: "In many parts of Guatemala one finds little shelters, built of sticks and thatched with grass, where the natives build their altar fires to make sure of good crops. These houses of worship are in or near the cornfields, and on the altar, slightly raised above the stone platform, where fires have been built for generations, one finds an excellent index to the larger mammals of the section. Skulls, so black with smoke that they might have been painted, are side by side with those taken but yesterday. It seemed a shame to leave so many good specimens, but it would not have been safe to molest them. From these 'museums' I often got valuable data as to what might be found in the surrounding forests.

"The most common skulls seen on the altars were those of the cats. Often eight or ten were observed, representing jaguar, puma, and the local ocelots. These seemed to be equally common from the coast to the 'altos,' and perhaps to the tops of the volcanoes. I think the big cat—jaguar—is more common along the coastal plain, while the others are usually found where the hunting is good."

I wish to make cordial acknowledgment to Major E. A. Goldman, whose knowledge of Central American mammals has been of great assistance in preparing this report; also to Mr. A. H. Howell and Mr. H. H. T. Jackson, for advice on the harvest mice and shrews in the collection; to the Biological Survey for the loan of comparative material; and to Mr. H. E. Anthony, whose advice and criticism have contributed much to the merit of this paper.

All the photographs and field notes are by Mr. A. W. Anthony.

***Didelphis mesamericana tabascensis* (Allen)**

Tabasco Opossum

Species of the genus *Didelphis* are externally distinguished from the other opossums by their large size and the long guard hairs that extend conspicuously beyond the shorter and softer underfur.

The Tabasco opossum is a long-tailed species differing from other forms of the *mesamericana* group in having very long nasals, which terminate posteriorly in a somewhat sharp angle. Externally it does not differ from typical *D. m. mesamericana*. In normal pelage the long guard hairs are soiled whitish over the middle of back and rump; beneath this is a coat of soft long underfur, white for about two-thirds of its length,

the apical portion black; the cheeks are white, with generally a whitish spot over each eye and a whitish area surrounding the base of the ears. Fore and hind limbs and feet black; beneath, the pelage consists mainly of soft underfur, with tips tinged with dusky; ears entirely black; tail black basally for half or more of its length; the apical portion flesh color. In the black phase the long overhair is black instead of white; in other respects it is as in the gray and normal phase.

This species was primarily based on specimens from Tabasco, to which typical specimens from central and southwestern Guatemala are referable. The character of the long nasals, terminating posteriorly in a V-shaped angle, is strongly marked throughout the Guatemala series.

MEASUREMENTS.—Two adult females from Salache: total length, 843–800 mm.; length of tail vertebrae, 450–440 mm.; length of hind foot, 60–60 mm.; ear, 65–55 mm.

NUMBER OF SPECIMENS.—6: Salache, 2 adults; Finca Cipres, 1 juvenile; Chimoxan, 3 juveniles.

FIELD NOTES.—Opossums of this species were more or less common in all parts of Guatemala visited up to an altitude of 6000 feet or more. Few, if any, were noted in the deep rain forest of the Caribbean side, though they were abundant along the Rio Motagua below Quirigua, in the banana plantations, and along the border of the forests. At Finca Cipres they were so abundant as to be classed as a pest.

At San Lucas a number were taken in my traps, which I loaned to the natives, who complained that the animals were stealing their chickens.

***Marmosa mexicana mexicana* Merriam**

Mexican Opossum

The genus *Marmosa* includes a number of small slender long-tailed species commonly termed “murine” opossums, owing to a superficial resemblance to rats.

The Mexican *Marmosa* is a moderately small reddish-brown form varying in intensity of color according to its habitat; sides of body including outer sides of hind and upper surfaces of fore limbs paler and clearer colored than back; under parts, including inner side of hind, under surface of fore limbs, cheeks and sides of head, yellowish or buffy white, an intensely black oblong patch from back of nose across eyes to ear; fore and hind feet solid whitish or buffy; tail a little longer than head and body, sparsely haired; brownish above, faintly paler below.

The range of the Mexican *Marmosa* is imperfectly known. So far as I know, all the specimens on record from Guatemala have come from

the Departments of Alta Vera Paz or Baja Vera Paz and were taken at elevations of not more than about 3000 feet.

MEASUREMENTS.—Adult male from La Primavera: total length, 300 mm.; length of tail vertebrae, 160 mm.; length of hind foot, 20 mm.; ear, 18 mm.

NUMBER OF SPECIMENS.—1, La Primavera.

FIELD NOTES.—At Finca La Perla, I was shown a tree that was said to be well patronized by these small opossums when the fruit is ripe. The native said that he saw, with a flashlight, one or more at any time of night he passed. This was perhaps the highest elevation that I recorded—4400 feet. The single specimen taken was trapped in a canebrake, at the border of a field of sugar-cane. Natives told me that this species, as well as the pallid opossum, is fond of raw sugar and often is caught in the warehouses where this product is stored.

***Metachirops opossum pallidus* (Allen)**

Pallid Opossum

Opossums of this genus are of medium size and have rather straight, short fur and are without the projecting long guard hairs present in *Didelphis*.

The pale northern form is similar to *M. o. fuscogriseus* from Nicaragua, but the general coloration is much lighter, the white patches over the eyes are larger, and the black on the head is less intense and more restricted in area. The distribution of *M. o. pallidus* is not clearly known. Specimens on hand indicate that it ranges in central and western Guatemala from near sea level to at least above 3000 feet elevation. The Guatemala series varies a little in coloration above. Specimens from western Guatemala on the Pacific slope are probably near typical *pallidus*. Those from Chipoc and Finca Sepacuite, about fifty miles east of Coban, are darker, with longer and softer pelage, but without showing any specific difference.

The color of under parts of the series varies from yellowish white to deep buffy white; adult males have a strong greenish-yellow patch on side of abdomen in front of thighs; in the female this patch is represented by a clearer white than the surrounding parts. An adult male from Finca Cipres differs from the average through the intensity of the buff coloration on the throat and sides of neck, which tint prevails as a strong wash over most of the lower surface. The majority of these specimens are young or subadult, in which the last molar has not yet or has only recently come into use.

MEASUREMENTS.—Adult male from Finca Cipres: total length, 580 mm.; length of tail vertebrae, 282 mm.; length of hind foot, 45 mm.; ear, 32 mm.

NUMBER OF SPECIMENS.—6: Finca Cipres, 2; Carolina, 2; Finca Sepacuite, 1; Chipoc, 1.

FIELD NOTES.—Common on both sides of the Republic up to about 3500 feet.

At Finca Sepacuite I was told that these little opossums are often killed in the sugar house and that they are quite fond of sweets. In the bananas, at Finca Cipres, several times I surprised them at night, feeding on the ripe fruit. In the beams of the carbide hunting lamp, their eyes were extremely bright, gleaming white, like electric lamps, easily seen at one hundred yards or more. At Chipoc, one was taken at the edge of a cornfield and was attracted by bait composed chiefly of peanut butter and rolled oats.

***Cryptotis micrura* (Tomes)**

Tropical Shrew

The tropical shrew is a very small, dark-colored animal with a very short tail.

This species, described by Tomes in 1861, was based on three specimens collected at Coban, Guatemala. A specimen from La Primavera, 3200 feet elevation, and about ten miles southwest of the type locality, agrees closely in detail with the type description both in color and measurements, and represents what is clearly typical *C. micrura*. In color the La Primavera specimen is fuscous on upper parts with a slightly grizzled appearance; under parts are paler, between drab and dark brown. A series from Panajachel in the highlands of southwestern Guatemala is nearly typical, but varies somewhat in density of color which, however, is evidently due to age and seasonal variation.

MEASUREMENTS.—Adult male from La Primavera: total length, 90 mm.; length of tail vertebrae, 25 mm.; hind foot, 12 mm. Average of five adults from Panajachel: total length, 96 mm. (103–90); length of tail vertebrae, 21.8 mm. (25–14); length of hind foot, 12.6 mm. (13–12).

NUMBER OF SPECIMENS.—8: La Primavera, 1; Panajachel, 7; adult and 4 young in alcohol.

FIELD NOTES.—Shrews were several times found along the trails in the altos, where they evidently had been abandoned during the night before by animals that objected to the musky flavor. However, these

were so far gone in decomposition that they were not saved. At Panajachel this species seemed to be common, several being found where the cat had dropped them after deciding they were not up to her standard. Others were taken in a grassy field near the house, the bait being oatmeal and peanut butter.

***Cryptotis goodwini* Jackson**

Goodwin Shrew

This species is a relatively large, dark-colored short-tailed shrew inhabiting the high mountain ranges in western Guatemala. It belongs apparently to the *mexicana* group, and of the Central American and Mexican members of the genus is exceeded in size only by *Cryptotis magna*. In color it is not essentially different from *Cryptotis m. mexicana*, but it is noticeably larger than that form and *C. griseoventris*. From *C. micrura* it is readily distinguished by its larger size, blacker and longer pelage, and much larger fore and hind feet.

General color of upper parts dusky, somewhat darker than clove brown; under parts about as dark as back, almost olive-brown in effect, mixed with grayish.

MEASUREMENTS.—One specimen from Tecpam: total length, 120 mm.; length of tail vertebrae, 30 mm.; hind foot, 15 mm.

NUMBER OF SPECIMENS.—1, Tecpam, altitude 9700 feet.

FIELD NOTES.—The above specimen was found in the trail in the forest above Tecpam, where some animal had killed and dropped it,—a not unusual custom among the small carnivores. I recall one, and perhaps two others, found under similar conditions, near the heavy forest of cypress, at a point a few miles northwest of Tecpam and at about 10,000 feet altitude. It was impossible to save these.

***Rhynchiscus naso priscus* G. M. Allen**

Mexican Long-nosed Bat

The Mexican long-nosed bat is a small butterfly-like species with a long projecting nose, long pointed ears, and indistinct whitish dorsal stripes; tail not reaching more than halfway to posterior border of wide interfemoral membrane; calcar very long. Unlike other closely related genera from this region, it has no antebrachial membrane sac. Distinctive characters which will greatly aid in the identification of this species include a haired tibia and tufts of grayish hair along outside of forearm.

General color above, grizzled brown, the ends of hairs grayish; under parts grayish white.

MEASUREMENTS.—One alcoholic specimen from Ocos: total length, 53 mm.; length of tail vertebrae, 11 mm.; length of hind foot, 6.5 mm.; forearm, 37 mm.; ear, from notch, 10 mm.

NUMBER OF SPECIMENS.—6 alcoholics, Ocos.

FIELD NOTES.—This bat was somewhat common along the river at Ocos where all of the specimens were taken. Unlike other bats, they did not seem to avoid the sunlight, but when disturbed, where they were clinging to the bark of the mangroves overhanging the water, they fluttered along the surface of the water until they found a tree trunk to their liking, whereupon the "flock" of half a dozen plastered itself against the bark. There, with wings half spread and held tight against the tree, they became almost lost to sight. Oftentimes dark openings under the roots of the mangroves offered shelter that would seem to suit the demands of any reasonable bat, but such refuges were always passed by in favor of the more open spaces over the water. Even after being several times driven from their chosen shelters, a company of six or eight refused to become separated and repeatedly lit in a space that might be covered by a Mexican's sombrero.

***Saccopteryx bilineata centralis* Thomas**

Mexican White-lined Bat

The Mexican white-lined bat is a small, brownish-black species with two brownish-white longitudinal stripes near the center of the back; rather long, narrow, pointed ears and conspicuous glandular sacs in antebrachial membranes. General appearance something like *Rhynchiscus*, but color blackish; the tibia and forearm are naked instead of clothed with grayish fur as in *Rhynchiscus*.

MEASUREMENTS.—One alcoholic specimen from Hacienda California: total length, 65 mm.; length of tail vertebrae, 17 mm.; hind foot, 11 mm.; forearm, 46.5 mm.; ear, from notch, 14 mm.

NUMBER OF SPECIMENS.—10 alcoholics, Hacienda California.

FIELD NOTES.—All the specimens of this species taken were found in one of the outbuildings of the estate.

***Balantiopteryx io* Thomas**

Guatemala Sac-winged Bat

Balantiopteryx io is a small, slender diminutive bat with moderately short, rounded ears; slender tragus; nose simple; tail not reaching posterior border of interfemoral membrane; wing sacs in center of membrane and hind feet quite free of membrane; base of interfemoral

membrane hairy as far as exsertion of tail. Color of body above and below dark brown; no white lines on back; a white border along posterior edge of wings. Specimens from Chimoxan, which is not more than forty miles west of the type locality, represent typical *Balantiopteryx io*.

MEASUREMENTS.—One alcoholic specimen from Chimoxan: total length, 54 mm.; length of tail vertebrae, 17 mm.; hind foot, 8 mm.; forearm, 37 mm.; ear, 12 mm.

NUMBER OF SPECIMENS.—16 alcoholics, Chimoxan.

FIELD NOTES.—These specimens were taken in a cave, near the planting of coffee, at Chimoxan. Some long-forgotten generation of Maya Indians had walled up the cave about twenty feet from the entrance and what they had behind the walls is still unknown. The bats, in the semitwilight, were not "bunched" as are some species, but were scattered over the roof of the cave. The shooting, with a .32 auxiliary, did not greatly disturb them and I think none were driven out into the sunlight.

***Micronycteris megalotis mexicana* Miller**

Mexican Big-eared Bat

Micronycteris megalotis mexicana is a small slender bat with large thin interfemoral membrane, big thin delicate ears connected by a concealed band across the forehead; slender tragus; nose leaf long, narrow and pointed; tail short and perforating membrane. The pelage is long and brownish in color.

MEASUREMENTS.—One alcoholic specimen from Hacienda California: total length, 53 mm.; length of tail vertebrae, 12 mm.; hind foot, 10 mm.; forearm, 33.5 mm.; ear from notch, 21 mm.; tragus, longest finger, 68.5 mm.

NUMBER OF SPECIMENS.—2 alcoholics, Hacienda California.

FIELD NOTES.—Taken in company with *Saccopteryx*, in one of the buildings at the cattle ranch. I am not sure that both species were in the same part of the shed, as the difference in species was not noticed until they had been collected.

***Glossophaga soricina leachii* (Gray)**

Leach's Long-tongued Bat

The genus *Glossophaga* typifies the subfamily Glossophinae which includes several other genera, mainly tropical in distribution. Bats of this group are characterized externally by elongate muzzle; long, slender tongue; small nose leaf; short, rounded ears; notched lower lip; tail

short, protruding slightly from the upper side of the moderately developed interfemoral membrane; or external tail absent.

Leach's long-tongued bat has a moderately long, narrow muzzle; long tongue, extensible, attenuate with recurved papillae on sides; erect portion of nose leaf developed; groove on lower lip margined with warts; tail terminating on upper surface of membrane; zygomatic arches complete. The length of forearm is about 35 mm. General color of this bat, upper parts cinnamon mixed with black; color variations tend to group themselves around two extremes, in one the general effect is between bistre and black; in the other snuff-brown or royal brown; under parts usually less dark than back, often with a tinge of drab.

The range of *Glossophaga s. leachii* extends from Panama north to Central America and shows very little geographical variation throughout its wide range. Specimens from some localities in Guatemala are typical. On the other hand, however, individual and local differences are considerable. Three specimens from Hacienda California, on the Pacific coast, while having all the major characters of typical *leachii*, are relatively smaller and darker than the latter, with a more rounded and actually higher brain case, shorter rostrum and less protruding upper incisors. These differences are well marked and, though probably sufficient in themselves to be considered as a recognized form, are more or less discounted by intermediate grades from other localities.

MEASUREMENTS.—Average of five adults from Progreso: total length, 65 mm. (70–63); length of tail vertebrae, 5 mm. (6–4); length of hind foot, 11 mm. (13–9); ear, 10 mm.

NUMBER OF SPECIMENS.—63: Progreso, 9; Chipoc, 1 alcoholic; Puebla, 1 alcoholic; Finca Cipres, 6, and 22 alcoholics; Hacienda California, 2, and 4 alcoholics; Finca Caroline, 3 alcoholics; Barrillas, 1 alcoholic; San Lucas, 14 alcoholics.

FIELD NOTES.—At Progreso a colony of perhaps 100 was found in a small cave which was not much more than an overhanging rock. The single specimen taken near Puebla was in company with *Carollia subrufa*, in a room in the Maya ruins, said to have been built about 450 A.D.

At Finca Cipres, Carolina, Hacienda California, and San Lucas, large colonies were found in buildings. These were usually hanging in clusters like grapes, as closely bunched as seemed possible.

The single specimen taken at Barrillas was caught in a mousetrap hanging over a pile of raw sugar. Whether the bats were after insects drawn by the sugar, or were there for the sweets, I cannot say, but I lean toward the former idea. The natives insist that bats eat the sugar.

Anoura geoffroyi Gray

Geoffroy's Long-tongued Bat

In external characters *A. geoffroyi* is similar to *G. s. leachii* but differs in having a more elongate muzzle, no external tail, interfemoral membrane reduced to a narrow strip down each leg to ankle, and is thinly furred; calcaneum rudimentary. Dark mummy-brown above and dark grayish-brown below appears to be the usual color of this bat.

The long muzzle and small nose leaf in conjunction with the absence of a tail, abbreviated interfemoral membrane, and vestigial calcaneum will aid in the identification of this bat.

MEASUREMENTS.—One specimen from Barrillos: total length, 78 mm.; length of tail, 0; length of hind foot, 18 mm.; ear, 8 mm.; forearm, 41 mm.

NUMBER OF SPECIMENS.—1, Barrillos.

FIELD NOTES.—The only specimen taken was caught in a mouse-trap, as mentioned in connection with the last.

Choeronycteris mexicana Tschudi

Tres Marias Islands Bat

The exceptionally long muzzle, grayish-brown color, and large size distinguish *Choeronycteris mexicana* from other glossophine bats known to inhabit Guatemala. In addition, the tail is short, about one-third the length of the naked interfemoral membrane; nose leaf nearly triangular, but longer than broad; ears short, rounded, and less than half the length of head; tongue very long. General color of upper parts dark brown; fur pale grayish-brown at base; under parts light brown.

MEASUREMENTS.—One alcoholic specimen from Panajachel: total length, 72 mm.; length of tail vertebrae, 17 mm.; length of hind foot, 11 mm.; ear from notch, 12.5 mm.; forearm, 43.5 mm.

NUMBER OF SPECIMENS.—4: Hacienda California, 3 alcoholic (2 young and 1 adult); Panajachel, 1.

FIELD NOTES.—These were all taken in outbuildings, where they seemed to be disinclined to mingle with other species.

Carollia perspicillata azteca (Saussure)

Short-tailed Bat

Bats of the genus *Carollia* are small or medium-sized species with rather larger nose leaves, short, rather pointed ears, and tail reaching to about middle of the naked interfemoral membrane; forearm furred

along outer side near base; outer upper incisors very small; lower incisors small, their crowns notched.

The short-tailed bat is of medium size, robust, and has relatively large feet. The forearm measures about 42 mm. in length. General color of entire body usually dark brown but varies to rusty.

MEASUREMENTS.—One alcoholic specimen from Chipoc: total length, 66 mm.; length of tail vertebrae, 11 mm.; length of hind foot, 15 mm.; ear, from notch, 19 mm.; forearm, 44 mm.

NUMBER OF SPECIMENS.—21: Chipoc, 20 alcoholics and 1 skin.

FIELD NOTES.—All taken in caves near Chipoc.

***Carollia subrufa* (Hahn)**

Mexican Short-tailed Bat

The Mexican short-tailed bat resembles *C. p. azteca* very closely, but is distinguished by its smaller size, the forearm measuring about 39 millimeters instead of about 42 millimeters, as of the latter species. The difference in size is still more apparent when skulls of the two species are compared.

Carollia subrufa is intermediate in size between *azteca* and *castanea*, though apparently not intergrading with either. From the former it differs in its smaller size and lighter dentition and smaller and differently shaped skull. *Castanea*, on the other hand, is much smaller and has the cranial peculiarities of *subrufa* carried to extremes.

MEASUREMENTS.—One specimen from Puebla: total length, 78 mm.; length of tail vertebrae, 8 mm.; length of hind foot, 15 mm.; ear, 12 mm.

NUMBER OF SPECIMENS.—14, Puebla.

FIELD NOTES.—At the ruins, near Quirigua, we found a small room, the entrance so low that we could gain access only on all fours, the main room so low that we could not stand. Here lived a colony of bats. Some fourteen of this species were taken by netting them as they attempted to pass out by the low entrance. Among these was one *Glossophaga soricina leachii*.

***Artibeus jamaicensis jamaicensis* Leach**

Jamaican Bat

The Jamaican bat is a large, robust species with extensive wings, narrow interfemoral membrane, no external tail, moderately long, pointed ears, relatively small tragus and well-developed nose leaf. In general color it is about mummy brown above and below; membranes and ears a

shade darker except tips of wings, which are whitish; a pair of indistinct whitish facial stripes extend from nose pad to near inner side of ears, and a pair, faintly indicated or absent, reach from near angle of the mouth toward the ears. The forearm measures about 62 mm.

MEASUREMENTS.—One specimen from Panajachel: total length, 85 mm.; length of tail, 0; length of hind foot, 17 mm.; ear, 17 mm.; forearm, 63 mm.

NUMBER OF SPECIMENS.—1, Panajachel.

FIELD NOTES.—Purchased from a native, who caught it in the church tower.

***Artibeus phaeotis* (Miller)**

Yucatan Bat

The Yucatan bat is a small member of the genus *Artibeus* with a thick pointed nose leaf, much longer than broad; rather rounded ears; broad muzzle; no external tail; interfemoral membrane reduced; pelage moderately thick, soft, and extends well down base of forearm and over interfemoral membrane. General color nearly uniform dark grayish-brown; very narrow ears, usually without whitish border in Guatemala specimen; facial stripes moderately developed.

Artibeus phaeotis is almost indistinguishable in external characters from other small *Artibeus* from Mexico and Central America. In cranial characters *phaeotis* is readily distinguished from *A. nanus*. In the latter the rostrum is flattened and slightly bent upward; the profile is therefore very different from the *phaeotis* skull. In a *phaeotis* the proportionate length of the bony palate measured from palation to hinder border of incisive foramina is longer than the distance from palation to basion; in *nanus* the palate is shortened.

The differences between *phaeotis* and *A. toltecus* are not clearly marked. Size apparently is the main factor. *A. phaeotis* is the smaller, with a shorter tooth row; length of forearm about 38 mm. as against 39–43 mm. in *toltecus*. A specimen from San Lucas agrees almost exactly with the type *phaeotis*, though in general characters it is close to *toltecus*.

MEASUREMENTS.—One alcoholic specimen from San Lucas: total length, 50 mm.; length of tail vertebrae, 0; hind foot, 11 mm.; ear, from notch, 14 mm.; tragus, 4 mm.; forearm, 37.5 mm.

NUMBER OF SPECIMENS.—1 alcoholic, San Lucas.

FIELD NOTES.—This specimen was among a lot taken in one of the buildings (church?) at San Lucas. The rest of the congregation seemed to be *Glossophaga*.

Desmodus rotundus murinus (Wagner)

Mexican Vampire Bat

The Mexican vampire bat is of medium size, robust, and subsists upon the blood of animals, probably to the exclusion of other food. In this bat the ears are short, somewhat pointed; nose leaf absent, but nose is bordered by cutaneous folds with a V-shaped notch in the middle above the nostrils. There is no external tail and the interfemoral membrane is reduced to a narrow furred fringe. Thumb is long with two prominent pads on inner side; calcar is short and supports no part of interfemoral membrane; pelage is short and rather coarse, rusty brownish in color and extends the full length of the forearm and well down the hind limbs. The dentition is highly specialized; the median upper incisors are much enlarged, chisel-like teeth that exceed the canines in size and are largely instrumental in making the puncture through which the blood is drawn.

MEASUREMENTS.—One specimen from San Antonio: total length, 80 mm.; length of tail vertebrae, 0; hind foot, 15 mm.; ear, 11 mm.; forearm, 57 mm.

NUMBER OF SPECIMENS.—1, San Antonio.

FIELD NOTES.—Near San Antonio, about four miles from the old capital of Guatemala, Antigua, are two "mines," said to have been dug by the Spanish at the time of the conquest. One I was unable to explore, as it was unsafe. There must have been quite a large number of bats living in the lower workings, as a stone dropped into the darkness was followed by a subdued roar, lasting for several minutes. The second mine proved to be only a short drift in the side of the hill and sheltered some fifty or more bats of this species, all of which escaped save the single unfortunate that blundered into range of a stick.

At Sacanquim and several other stations on the Caribbean side, horses were often seen that had suffered from the attacks of the vampire. The upper parts of the shoulder were more often the parts bitten, the blood, at times, running to the hoofs. Colts were often bitten behind the ears, the muscles cut so that the ears hung down like those of the European rabbit.

In many places I saw cactus hung in the stables above the backs of the horses as a means of protection against vampires. Mousetraps, baited with fresh meat and hung in similar places, failed to catch bats, and I rather doubt the efficiency of the cactus.

Natalus mexicanus Miller

Mexican Straw-colored Bat

The Mexican straw-colored bat is a small, delicately formed species with low funnel-shaped ears, thin, papery flying membranes and long slender limbs. Nose leaf absent. The long thread-like tail crosses the interfemoral membrane, which is large and naked except for a line of fine hairs along posterior border.

Nearly uniform rich golden-yellow or cinnamon buff appears to be the normal color of this species, but individuals vary to dark brown. The flying membranes are dark wood-brown; under parts paler than back.

The color, in conjunction with the thin papery ears and flying membranes, helps in the identification of this bat.

MEASUREMENTS.—Average of five adult specimens from Progreso: total length, 100 mm. (105–100); length of tail vertebrae, 52 mm. (55–48); length of hind foot, 9 mm. (10–8); ear, 10.5 mm. (11–10).

NUMBER OF SPECIMENS.—6, Progreso.

FIELD NOTES.—All were taken with the series of *Glossophaga*, from a shelter formed by an overhanging rock, hardly to be regarded as a cave, and open to full daylight. As I recall, I fired but one shot at the cluster of bats, killing twenty or more; the rest flew out, seeking other shelter, and only a few returned to the “cave.”

Myotis nigricans nigricans (Wied)

Little Black Bat

The little black bat is a small, slender, dark-colored species with a small foot. In general appearance it superficially resembles several related species and genera in the combination of small size, slender form, simple nose, narrow pointed ears, slender tragus, long tail reaching to near posterior border of a wide interfemoral membrane. The little black bat, however, is usually recognizable by its color and size. The color on upper parts is dark Mars brown; upper parts not as dark as back and in the Guatemala specimens with a buffy cast; the length of forearm is about 34 mm.

MEASUREMENTS.—Average of four specimens from Finca Carolina: total length, 82 mm. (83–80); length of tail vertebrae, 35.5 mm. (36–35); hind foot, 7 mm. (9–5); ear, 11 mm. (12–10); forearm, 35 mm. (36–34).

NUMBER OF SPECIMENS.—11: Finca Carolina, 4 skins and 6 alcoholics; Finca Cipres, 1.

FIELD NOTES.—All taken in one of the warehouses, where hundreds were hanging from the roof beams.

Eptesicus fuscus miradorensis* (H. Allen)*Mirador Brown Bat**

The Mirador brown bat is a large, dark brown species with long tail reaching to near posterior border of a wide interfemoral membrane; nose simple; narrow well-pointed ears, tragus long and slender. Externally it is similar to other large species of this genus, but the length of forearm is distinctive, measuring about 50 mm. General color dark brown, paler below; membranes and ears blackish.

MEASUREMENTS.—Two specimens from Chichivac and Tecpam: total length, 118–115 mm.; length of tail vertebrae, 50–51 mm.; length of hind foot, 11 mm.; ear, 14–17 mm.; forearm, 52–52 mm.

NUMBER OF SPECIMENS.—5: Chichivac, 1; Tecpam, 1, and 3 alcoholics.

FIELD NOTES —Chichivac was the Indian name for the station above Tecpam, and all of the bats were taken by the natives, who found them in the cracks in the limestone which they were blasting to burn for lime.

Lasiurus borealis mexicanus* (Saussure)*Mexican Red Bat**

The Mexican red bat is a small species with low, rounded ears and long tail reaching to posterior border of interfemoral membrane. The dense body fur extends over the hind limbs and the entire upper side of the wide interfemoral membrane. There are small tufts of fur at upper base of thumb and sparingly distributed along the basal portion of the fourth finger.

The rich reddish-brown color of the upper parts, including the fur covering the upper side of interfemoral membrane, at once distinguishes this bat from all others of this region.

MEASUREMENTS.—One alcoholic specimen from Barrillos: total length, 89 mm.; length of tail vertebrae, 45 mm.; hind foot, 8 mm.; ear, from notch, 9 mm.; forearm, 38.5 mm.

NUMBER OF SPECIMENS.—1 alcoholic, Barrillos.

FIELD NOTES.—Caught in a mousetrap hanging above a pile of raw sugar in a distillery.

Eumops abrasus* (Temminck)*Shaved Mastiff Bat**

Eumops abrasus belongs to the family Molossidae, which includes bats from small to large size with short thick leathery ears, broader than long, and projecting forward over the eyes. The muzzle is not provided

with a nose leaf and the tail projects beyond the posterior border of inter-femoral membrane; wings very narrow. Pelage is short, close, and velvety.

Members of the genus *Eumops* are easily recognized externally by their large size and the connection of the ears across the forehead.

Eumops abrasus may be distinguished from its Central American congeners by the combination of dark reddish-brown color, large size, and the absence of a distinct border of fur along the posterior margin of the forearm.

MEASUREMENTS.—One alcoholic specimen from Finca Cipres: total length, 118 mm.; length of tail vertebrae, 45 mm.; hind foot, 13.5 mm.; forearm, 59 mm.; ear, from notch to most anterior point, 19 mm.

NUMBER OF SPECIMENS.—1 alcoholic, Finca Cipres.

FIELD NOTES.—The only specimen noted was given me by an Indian woodcutter, who found it under a loose slab of bark.

***Procyon lotor shufeldti* Nelson and Goldman**

Campeche Raccoon

Raccoons are readily recognized by their robust form, short ears and rather short, somewhat bushy, ringed tail. The Campeche raccoon is a relatively large, rather pale, short-haired form of the *lotor* group. In general color it is light buffy gray, with thinly distributed overlying black hairs; sides lighter; top of head grayer mixed with black and lacking buffy tone suffusing back; black mask across face extending downward along median line of muzzle to nose and upward to middle of forehead; tail above with eight narrow blackish rings and a black tip, alternating with light ochraceous-buffy rings. *P. l. shufeldti* is similar in general character to *P. l. hernandezii* from southern Mexico, but the pelage is shorter, color duller, top of head grayer and less modified by black-tipped hairs; skull more massive. In size it is about equal to *P. l. crassidens* from Costa Rica but decidedly paler in color; upper parts less overlaid with black than the latter.

MEASUREMENTS.—Adult male from El Espino: total length, 970 mm.; length of tail vertebrae, 320 mm.; length of hind foot, 120 mm.; ear, 55 mm.

NUMBER OF SPECIMENS.—1, El Espino.

FIELD NOTES.—Raccoons were common at all stations visited, but more especially in the more open sections, near the forest. At Finca Cipres they were often hunted with dogs and shot from the trees where they had been driven by the hounds.

Nasua narica bullata Allen

Dark Coati

The coatis are readily distinguished from other members of the general group to which they belong by the length and mobility of the snout, which projects forward well beyond the lower lip. The claws are long, ears short, tail long and tapering. A specimen from Volcan Zunil (6000 feet), Guatemala, is typically referable to the dark-colored Costa Rican species, which is much darker than any of the Mexican forms and has large, greatly inflated bullae and relatively small teeth. The general color of the specimen is brownish black over most of the body. In the middle of the dorsal region the hairs are tipped with yellowish; the head is darker than the body; muzzle whitish with two narrow lines extending backward along face, diverging gradually to eyes; throat and chest soiled whitish; feet black; rest of color dull brownish black.

MEASUREMENTS.—Not recorded.

NUMBER OF SPECIMENS.—1, Volcan Zunil.

FIELD NOTES.—Coatis were more or less common in all of the forested sections visited. In many places skins were seen indicating a much more pallid race than *bullata*. Several times these animals were seen in "cloud forest" along the upper slopes of the volcanoes near Atitlan. They pass easily from tree to tree, and when treed by dogs often escape in that manner. When driven by hounds, they often run for three hours before taking to a tree, and when overtaken on the ground are said to overcome easily two or more common hounds.

Often small companies, perhaps families of six or eight, are seen in the early morning, retreating from the cornfields, where they have been feeding during the night, to the shelter of the forest.

I was told that at times fifty or more will raid an isolated field of corn and ruin the crop in a few nights. I think the report somewhat exaggerated, but am willing to admit that they inflict more damage than is good for the poor Indian.

Potos flavus campechensis Nelson and Goldman

Campeche Kinkajou

The kinkajous are small arboreal members of the raccoon family with short ears, rounded head, and close soft fur. They bear a remarkable external resemblance to *Bassaricyon*, but are distinguishable by the round, tapering, short-haired prehensile tail.

The Campeche kinkajou is a light-colored member of the *flavus* group, similar in color to its geographical neighbors, but lighter. Its

upper parts are near clay color, purest on face and flanks and outer side of limbs; top of head and back thinly overlaid with brown; under parts, inner sides of limbs, and under side of tail near ochraceous buff.

An immature male, from Finca Salache, with milk teeth still in place is here provisionally referred to *P. f. campechensis* largely on geographical grounds. The specimen itself is too young to show any very definite characters.

MEASUREMENTS.—Not recorded.

NUMBER OF SPECIMENS.—1, immature, Finca Salache.

FIELD NOTES.—The “mico leon” (monkey lion) is more or less common in all parts of Guatemala below 5500 feet. It may extend above that altitude, but I did not find evidence. When hunting with a carbide lamp at night, I frequently saw the eyes of this night prowler, and I was always impressed with their extreme brilliance. The eyes of the *Basariscus* may perhaps equal them in brightness, but no creature of the forest can excel them. Often these little animals were seen about the native huts where they were kept as pets. They were apt to be somewhat sleepy during the hours of daylight, but never to the extent that they were unable to respond to an invitation to accept a banana—their favorite fruit. There is also a species of wild fig, found up to about 6000 feet, that seems to be quite acceptable.

***Jentinkia sumichrasti variabilis* (Peters)**

Guatemala Ring-tailed Cat

The ring-tailed cats are small, short-legged animals with foxlike faces, long tails, ringed in strongly contrasting colors throughout their length. *J. s. variabilis* is grayish in general color, heavily lined on head and back, with black-tipped hairs; cheeks, and a patch behind eye whitish; under parts dull buffy white.

Two specimens from Salache are probably typically referable to *J. s. variabilis* and agree with Peters' description. Thomas described specimens from Volcan de Fuego as typical, agreeing absolutely with the description. These two localities are only about fifty miles apart and apparently in similar surroundings.

MEASUREMENTS.—Adult male and female from Salache: total length, 925–870 mm.; length of tail vertebrae, 500–500 mm.; length of hind foot, 75–75 mm.; ear, 45–45 mm.

NUMBER OF SPECIMENS.—2, Salache (one without skull).

FIELD NOTES.—Ring-tailed cats were quite common on all of the Pacific side of Guatemala, up to at least 6500 feet. A skin, taken by a

native and not complete, was much darker than those seen at Salache and other Pacific coast stations, and it showed hardly any trace of the rings on the tail. This was said to have been taken on the mountains near Joyabaj.

***Mustela frenata goldmani* (Merriam)**

Goldman Bridled Weasel

Weasels are mainly boreal in distribution. Their small size, elongate body and short limbs easily distinguish them from other carnivores. They are represented in Guatemala by a relatively large long-tailed species with conspicuous white markings on the head. *M. f. goldmani* is described by Merriam as: color of upper parts, including whole of fore and hind feet, dull dark chestnut-brown, washed with black on the neck from shoulder forward and becoming pure black on the head; face marked by a whitish patch between the eyes, and a narrow, oblique band between eye and ear, a blackish spot behind angle of snout; color of under parts salmon ochraceous, reaching wrists inferiorly, but not reaching heels; terminal third of tail black.

The Guatemala series are apparently all referable to this species. A young male from Finca Carolina and a similar one from Finca Cipres agree in all respects with *goldmani*. An adult male from Finca Cipres is relatively smaller than other specimens of *goldmani*, but otherwise it agrees with that form. An adult female from Puebla might be expected to show some approach to *M. t. perda* on account of its far eastern origin, but it displays the characters of *goldmani* even better than a female from Volcan San Lucas, which comes from a greater elevation than the Puebla specimens. The Guatemala series, however, displays a variable amount of white on the upper side of the fore feet, which is apparently absent in the type specimen, a character which, due to variability alone in the present series, shows it is unimportant.

MEASUREMENTS.—Adult male from Finca Cipres: total length, 490 mm.; length of tail vertebrae, 185 mm.; length of hind foot, 54 mm.; ear, 15 mm. Subadult female, Volcan San Lucas: total length, 398 mm.; length of tail vertebrae, 150 mm.; length of hind foot, 43 mm.; ear, 14 mm.

NUMBER OF SPECIMENS.—5: Finca Cipres, 2; Volcan San Lucas, 1; Carolina, 1; Puebla, 1.

FIELD NOTES.—Not uncommon in all parts of the Republic visited, but not taken as often as seen. At Finca Cipres I was surprised to find that this little species could, on occasion, climb a tree in a manner that

would reflect credit to a monkey. A hound started a weasel where underbrush, so dear to the members of this family, was not equal to the demand. A moment later the weasel was looking down at us from the fork of a tree, twenty feet from the ground. The smooth bark seemed to offer no difficulties. At San Lucas, I was told by different natives of a much larger and lighter colored weasel, but I have no real evidence that it was not an animal of another family.

Tayra barbara senex (Thomas)

Mexican Tayra

The tayra, as represented in Guatemala, is a large weasel-like animal, uniformly black in color, except head and neck which are grayish white, rather sharply separated from the black of shoulder. The face is darker than crown and neck, the latter more or less yellowish; a large spot on breast pure white or yellowish white. *Tayra b. senex* was described from Jalapa, Vera Cruz, to which are typically referable two specimens from central Guatemala. An adult female taken at Finca El Espino (alt. 150 feet), fifteen miles south of Mazatenango in the virgin forest of the Pacific coast, has a longer and narrower skull than the average, with a relatively shorter palate, flatter bullae and other cranial differences. In the color of the skin, however, it is indistinguishable from typical specimens of *T. b. senex* and the cranial peculiarities of this specimen may be due to individual variation.

MEASUREMENTS.—Adult female from Finca El Espino: total length, 1095 mm.; length of tail vertebrae, 440 mm.; length of hind foot, 110 mm.; ear, 20 mm. Skull: basal length, 107.5 mm.; greatest breadth, 68 mm. Adult male from Finca Concepcion: basal length, 105.5 mm.; greatest breadth, 74 mm.

NUMBER OF SPECIMENS.—3: Finca Concepcion, 1; Finca Chama, 1; Finca El Espino, 1.

FIELD NOTES.—This animal is known to the natives of most of Guatemala as “perito ligero” (little swift dog), and in some parts as “cabeza viejo” (old head); the last, of course, because of the white or gray crown. Its activity is wonderful and the common name, swift, or active, is well earned. One seen on the divide above Tucuru was running directly toward me, leaping in long, high bounds, similar to the gait of its small cousin, the weasel. The advance seemed slow and cumbersome, but in a surprisingly short time the animal was within a few feet of me, without being aware of any possible obstruction to its progress. On sighting the danger, one leap landed the “little bald-headed dog” six

feet up a slender tree, a yard to one side of the trail. The rest of the climb was by leaps incredibly fast. Before I could bring my gun to bear on the animal, it was thirty feet in the air and at the top of the tree, when a charge of buckshot ended the story. The natives state that these weasels often pull down small deer, a statement I think quite true, for the muscular development is surprisingly great.

Often, when hunted with hounds, the tayra will escape after a run of two hours or more by climbing a tree and then leaping from that to the next, traveling several hundred feet before again coming to the ground, thus gaining miles while the dogs are picking up the broken trail. When hard pressed, they are by no means reluctant to take to the water. The specimen taken at Finca El Espino had been running before the hounds for more than two hours, when it took to the river and was shot.

***Urocyon guatemalae* Miller**

Guatemala Gray Fox

Gray foxes are typically foxlike in general appearance, having erect ears, fairly long muzzle, soles of feet hairy and tail bushy, but with a concealed mane of stiff hairs and pupils of eye elliptical.

In color the Guatemala gray fox is not very different from other species of *Urocyon*. Dorsal surface clear gray, formed by a nearly equal mixture of black tips and white subterminal rings of the coarse hairs; base of ears and area behind ears tawny ochraceous, this color extending backward to part of fore leg; muzzle, upper lip, and chin blackish brown; cheek between eye and lips dull white, continuous with white of throat. Under parts ochraceous buff except median area between hind limbs, which is white. Tail gray with black dorsal stripe and a conspicuous black tip.

The Guatemala gray fox is much smaller than the ordinary fox of Mexico. It is most like *U. littoralis* from Santa Barbara Island, California, but averages slightly larger and is darker and richer in color than the latter. The auditory bullae in *U. guatemalae* is slightly more inflated than in other members of the *cinereoargenteus* group.

Two specimens from Finca Cipres are typically referable to *U. guatemalae*. An old male from Volcan San Lucas, while indistinguishable in external characters from typical *U. guatemalae*, has much shorter skull, more crowded tooth row, smaller bullae and large upper molars. These differences, however, are probably abnormal and the specimens, I believe, should be referred to *guatemalae*.

MEASUREMENTS.—Two females from Finca Cipres: total length, 840–810 mm.; length of tail vertebrae, 350–360 mm.; length of hind foot, 119–115 mm.; ear, 70–70 mm.

NUMBER OF SPECIMENS.—3: Volcan San Lucas, 1; Finca Cipres, 2.

FIELD NOTES —Gray foxes were found to be common in all of the dry parts of Guatemala visited and to the tops of the highest volcanoes. They were often seen during the daylight hours, and their discordant barking was not uncommon at night. They are known to the natives as wildcat (*gato monte*), though one Indian confessed to me that he considered them more nearly related to the dog.

***Felis pardalis pardalis* Linnaeus**

Mexican Ocelot

The ocelot is the most abundant of the spotted cats of Central America and is easily distinguished from other species in Guatemala by the presence of about five parallel black stripes on the nape of neck and oblique stripes near shoulders.

Felis pardalis pardalis is intermediate in size between *F. p. griffithii*, the small pale species from northern Mexico, and *Felis mearnsi*, the large dark Costa Rican form. The general ground color of this species is pale grayish-buff, within the black rings dark clay-color. The pattern of the black markings is similar to *F. p. griffithii* but differs in having the chains of black-edged inclosure broken up into shorter patches and the longitudinal black neck stripes more frequently double, enclosing clay-colored stripes. On the fore limbs the black markings are dispersed in irregular rosettes or rounded spots.

Two specimens from western Guatemala are here provisionally referred to *F. p. pardalis*, as they seem to be within the range of individuals in that species. The present status of this species is not very well known. Allen gives the type locality as probably Vera Cruz. The skull of an adult male from Finca El Espino agrees in general measurements with a specimen from Tehuantepec as given by Mearns. This skull compared with *F. mearnsi* from Nicaragua has more swollen and rounded bullae, heavier zygomatic arches, and more abruptly truncated rostrum resulting in a sharp angle in the nasal bones. The skin is finely lined, rings on sides black-dotted and broken into small patches on shoulders and hips, with longitudinal neck stripes divided by clay-colored stripes, quite differently colored from *F. mearnsi* and corresponding rather closely with Mearns's description of *F. pardalis*. This specimen may be related to *Leopardus griseus* of Gray, which is said to have come from Guatemala

but proves to be difficult to identify and has thus far been held in abeyance. A second specimen from Finca Cipres, while having a pale gray ground color equal to that of the Finca El Espino specimens, has heavier markings and less broken lines and spots. These cats, however, are extremely variable in coloration and the difference in marking is probably due to individual variation, especially as these two localities are only a few miles apart.

MEASUREMENTS.—An adult male from Finca El Espino and a young female from Finca Cipres: total length, male 1125–female 1060 mm.; length of tail vertebrae, 334–368 mm.; length of hind foot, 170–? mm.; ear, 55–? mm. Skull: condylobasal length, 129–117 mm.; zygomatic breadth, 94–82 mm.

NUMBER OF SPECIMENS.—2: Finca El Espino, 1; Finca Cipres, 1.

FIELD NOTES.—Skins of the ocelot were among the most common of the trophies seen among the natives in all parts of Guatemala. There was a striking difference in markings and still more difference in size. Some skins, seen in the northern parts of Huehuetenango, were so large that they might have been mistaken for small jaguars were it not for the characteristic markings of the smaller cat. The markings of the ocelots seem to be very unstable. I have seen skins showing quite different markings on the two sides. This is especially true, I think, of the markings on the neck and fore parts.

***Felis (Herpailurus) fossata* Mearns**

Yucatan Yagouaroundi

The yagouaroundi is a small, slender, long-tailed cat, with short limbs, elongate body, and variable but unspotted coloration. It is a dichromatic species presenting gray and red color phases of varying tone. In the red phase it is rather uniformly rusty red color, darker on head and limbs and paler below. In the gray phase the pelage is dark brown or black and buffy gray finely mixed, producing a grizzled effect. Under parts are slightly paler.

One specimen in the red phase, from Finca Cipres, is here provisionally referred to *F. fossata* largely on geographical grounds. Very little is known of these cats and few specimens are available for study. The type of *fossata* is a skull only, with a deep frontal pit which may be abnormal, as it also appears in a specimen of *F. cacomitli* from Brownsville, Texas.

MEASUREMENTS.—Adult male from Finca Cipres: total length, 1210 mm.; length of tail vertebrae, 463 mm.; length of hind foot not taken.

NUMBER OF SPECIMENS.—1, Finca Cipres.

FIELD NOTES.—From the evidence of the skins seen among the native hunters, I think this cat is much more common in the dryer sections of the Pacific side, where it is evidently quite abundant. The dark phase would seem to be far more common than the red. The specimen in the red coat, taken at Finca Cipres, was the first ever seen by the planter, though he had not less than a half dozen dark skins that he had taken on that plantation within a short time. One seen at Chanquejelve was so dark as to appear inky black. Where these cats are at all common they are regarded as a pest, raiding hen roosts nightly until destroyed.

***Sciurus deppei deppei* Peters**

Deppe Squirrel

The Deppe squirrel is readily recognized from other squirrels found in Guatemala by its small size and dark color. It is a wide-ranging species and is found in suitable places throughout Guatemala. It is probably most abundant in dense humid tropical forests at altitudes below 6000 feet, though individuals were taken up to about 9000 feet elevation. The color of typical specimens from Guatemala is: upper parts from crown of head to base of tail, including uppers of fore and hind limbs and feet, nearly uniform grizzled dark rusty brown, varying to dull yellowish brown, with a small dull whitish patch at base of ear; tail above black, thinly washed with white; below median area grizzled ferruginous brown; under parts white or grayish white.

The Guatemala series presents some geographical variation: specimens from Secanquim and localities east of Coban are darker and more rusty than the average, while specimens from the western highlands are more typical, being paler than those of the low country, with grayer fore limbs and feet.

A small series from La Primavera and La Perla in Central Guatemala west of Coban, taken at elevations from 3000 to 4000 feet, agree with the type description of *Macroxus toeniurus* Gray, described from Guatemala. These specimens differ from *S. deppei* in having darker and richer colored upper parts with a dark mid-dorsal area; sides of head and neck, cheeks, outside of hind limbs to hips and hind feet grizzled bright rusty yellow; chest and belly clear buff varying to grizzled bright rusty yellow; under side of tail with broad median area reddish brown. It seems to me that as the range of *S. deppei* covers such a diversified region, these characters are local differences in color which can not properly be recognized as named forms, and *M. toeniurus*, as shown by Nelson, is a synonym of *S. deppei*.

Seasonal changes in pelage in the Guatemala series are not marked, the only noticeable differences being the frequent absence in summer of the white ear patches and of the white tip of the tail.

MEASUREMENTS.—Average of five largest specimens: total length, 382 mm. (405–375); length of tail vertebrae, 162 mm. (170–150); length of hind foot, 54.6 mm. (60–50); ear, 17.6 mm. (22–14).

NUMBER OF SPECIMENS.—29: Volcan San Lucas, 4; San Lucas, 1; Tecpam, 3; Sepacuite, 3; Secanquim, 3; La Montanita, 1; Puebla, 1; Finca Sepur, 1; La Perla, 2; La Primavera, 5; Finca Concepcion, 1; Finca Chama, 2; Finca Carolina, 1; Nebaj, 1.

FIELD NOTES.—Of wide distribution, from near sea level to at least 10,000 feet on Volcan San Lucas. Above Nebaj, at an elevation of 7500 feet, I shot a specimen of *S. griseoflavus* from a pine and a moment later one of the present species from the same limb. Below Quirigua, and along the banks of the Rio Motagua, at practically sea level, I saw several *Sciurus*, the size of *deppei*, but under conditions that rendered collection impossible.

I think this species is somewhat local in distribution. Often I found them more or less common at one station, while another tract of timber, seemingly equally attractive, was either uninhabited or so slightly populated as to be unrecorded.

***Sciurus griseoflavus griseoflavus* (Gray)**

Guatemala Squirrel

The Guatemala squirrel is a large robust species with a broad flat tail. It inhabits the oak and pine forests of the Transition and Boreal Zones of central and northwestern Guatemala and adjacent mountains in southwestern Chiapas, Mexico.

The general color of typical specimens is nearly uniform grizzled yellowish-brown on upper parts; feet slightly grayer than back, an indistinct whitish patch at base of ear; chin and throat pale grayish fulvous; rest of under parts varying from dark dull rufous to dingy grayish, washed with reddish fulvous; tail above black washed with white, below with broad median area grizzled yellowish or rufous brown. Variation in color of the Guatemala series is governed somewhat by elevation. Some specimens from high altitudes have a strong grayish wash over the entire upper parts which is entirely absent in others from relatively low elevations, and especially in specimens from humid tropical forests.

Specimens from Antigua, San Antonio, Tecpam, and central Guatemala localities up to 7500 feet elevation are typical *S. griseoflavus*.

Specimens from 9000 feet elevation and from northwestern Guatemala average a shade paler. One specimen from San Mateo (9000 feet) agrees closely with specimens from the high mountains of Guatemala referred by Nelson to *S. griseoflavus*. This specimen, however, is slightly more buffy on the sides of the head than is usual in *griseoflavus*, and in the rich rufescent under parts and other details of color pattern is not very unlike some specimens of *S. socialis*, especially as represented at 2500 feet in the single specimen from Nenton, Guatemala. There is a suggestion that *griseoflavus* might intergrade with *socialis*, but this is not yet clearly proved, and typical specimens of the two are quite widely different.

MEASUREMENTS.—Average of five adult specimens from central Guatemala: total length, 523.5 mm. (553–498); length of tail vertebrae, 254 mm. (255–230); length of hind foot, 68 mm. (72–60); ear, 24 mm. (28–20).

NUMBER OF SPECIMENS.—26: Antigua, 1; San Antonio, 1; La Montanita, 1; Nebaj, 1; Teepam, 6; San Lucas, 1; Volcan San Lucas, 1; La Primavera, 2; Chichicastenango, 3; Momostenango, 3; West Momostenango, 1; Zanjón, 4; San Mateo, 1.

FIELD NOTES.—A common species in the pines and oaks, mixing with the Deppe squirrel, and perhaps meeting the upper limits of the range of *S. goldmani*, but I am not sure as to that. *Goldmani* was seen above the railroad tracks at Patulul and well toward the base of Volcan San Lucas, on the slopes of which the present species was abundant.

***Sciurus yucatanensis phaeopus* Goodwin**

Black-footed Squirrel

The black-footed squirrel is a medium-sized, dusky-colored species with a relatively long tail. Typical specimens are nearly uniform ochraceous buff heavily grizzled with black on upper parts; sides of head blackish with conspicuous black patches at posterior base of ears; tail extensively black lightly washed with white; fore and hind limbs and feet black or blackish; under parts including under side of fore and hind limbs finely grizzled ochraceous buff and black. Individual variation consists mainly in the accentuation of the dark markings. In some specimens the entire under parts are black, others have pure black limbs and feet and a decidedly black facial mask. *S. y. phaeopus* is the darkest form of the *yucatanensis* group, and while similar in general characters to *S. y. baliolus* from Campeche, Mexico, *S. y. phaeopus* is darker in color nearly everywhere, the limbs especially are blacker; in the darker specimens of *baliolus*, the fore limbs and hind feet are black, but not so deep or pure

black as in the Guatemala series; in *phaeopus* the sides of the head are blacker, with conspicuously black patches at the posterior base of the ears which are absent or only slightly indicated in *baliolus*.

It is possible that *S. y. phaeopus* may be near *S. annalium*, which was described from Honduras and was based on a single specimen taken years ago. According to Goldman, northern Honduras seems to be pretty well occupied by squirrels that clearly are not *annalium*, and as the description seems to apply to *baliolus*, *annalium* may have come from British Honduras and the name may be a synonym of *baliolus*.

S. y. phaeopus inhabits the humid tropical forest region in central and southeastern Guatemala at about 1500 feet elevation. It probably grades into *baliolus* in northern Guatemala.

MEASUREMENTS.—Average of five adult specimens from Secanquim: total length, 490.4 mm. (510–482); length of tail vertebrae, 247 mm. (250–240); length of hind foot, 60.2 mm. (63–55); ear, 20.4 mm. (23–17).

NUMBER OF SPECIMENS.—12: Secanquim, 5; Finca Chama, 7.

FIELD NOTES.—I am forced to regard this as quite local in distribution. None were met with until I reached Secanquim, where they were not at all uncommon but quite adept at keeping out of danger. At Chipoc and Chimoxan, closely adjacent and with similar forest, none were seen. I was told that, at times, there was damage done to the green corn, the squirrels retreating to the forest soon after daybreak. I was not able to see any of these squirrels, so I am not sure if there were any.

***Sciurus goldmani* Nelson**

Goldman Squirrel

The Goldman squirrel is a fairly large long-tailed species with relatively coarse stiff pelage. In Guatemala this squirrel inhabits the arid tropical forest region along the western coast at altitudes ranging from sea level to about 3500 feet elevation.

In general color the Goldman squirrel is coarsely grizzled, iron-gray on upper parts, the hairs being glossy black banded with broad, medium rings of yellowish gray or buffy; a conspicuous white patch at base of ears and a thin rusty ferruginous tuft at tip; hind feet whitish, grizzled with iron-gray; tail above black washed with white, below median area iron-gray or rusty; entire under parts white.

The large series examined from Guatemala apparently represents typical *S. goldmani*. The main variations in the series are in the color of the back which ranges from gray with a pale yellowish suffusion to a deep rusty buff and black, and in the color of the hind feet, which may be grizzled buffy gray, or white and slightly grizzled.

MEASUREMENTS.—Average of five adult specimens from Finca Cipres and Finca Carolina: total length, 530.5 mm. (571–500); length of tail vertebrae, 278 mm. (290–270); length of hind foot, 66 mm. (70–65); ear, 27 mm. (30–25).

NUMBER OF SPECIMENS.—23: Finca Cipres (alt. 2000 feet) 16; Finca Carolina (alt. 3500 feet), 4; Salache (alt. 1000 feet), 1; Hacienda California (sea level), 2.

FIELD NOTES.—The most abundant of any of the family met with in all parts of Pacific slope, below 4000 feet. At sea level, near Ocos, they were met with in the forest a mile or so east of the estero and were found equally abundant at Finca Carolina, 3500 feet.

***Orthogeomys grandis grandis* (Thomas)**

Giant Pocket Gopher

Pocket gophers of the genus *Orthogeomys* are the largest members of the gopher family. *Orthogeomys grandis grandis* is one of the largest forms in the genus and is exceeded only slightly by *Orthogeomys grandis nelsoni*. It is a dark-colored species with coarse pelage, the color being nearly uniform mummy-brown except on muzzle, chin, and around the toes, where the hairs are whitish brown.

Two specimens collected at San Lucas, which is not more than twenty-five miles from the type locality Dueñas, and at a similar elevation, are probably typical *Orthogeomys grandis grandis* and agree in detail with Thomas's type description. Two specimens from Volcan San Lucas are from a higher elevation and have somewhat softer and denser pelage than the former but do not seem appreciably different in any other respect from the San Lucas specimens.

It is possible that two specimens from Finca Cipres on the Pacific slope, taken at 2000 feet elevation, may be grading toward a form from the Pacific coast that might be recognized as distinct. I think, however, that for the time being the whole series should be treated as *Orthogeomys grandis grandis*.

MEASUREMENTS.—Adult female from San Lucas: total length, 395 mm.; length of tail vertebrae, 110 mm.; length of hind foot, 50 mm.; ear, 7 mm.

NUMBER OF SPECIMENS.—6: San Lucas, 2; Volcan San Lucas, 2; Finca Cipres, 1; and 1 skull.

FIELD NOTES.—A common species in most of the sections visited along the Pacific side. Considerable damage is done to the coffee trees, and bananas are often so eaten at the roots that plants fall to the ground.

I was told, however, that the red banana was seldom, if ever, molested. On Volcan San Lucas I camped in a native storehouse where a number of large squashes were scattered over the earthen floor. One showed so much activity that I investigated and discovered that a "tatusa" had burrowed up from below and, without showing any signs on the surface, had completely cleaned out the squashes for twenty feet or more. Trapping this species was very difficult until I learned that an open hole did not mean that the occupant might soon be back to close the door with fresh earth. It is true that such a plug is usually used, as is the habit of our North American species of this family, but I discovered that if the opening is even very slightly disturbed the gopher tamps earth into the side tunnel, which is dug only for the dumping of extra earth from the main runway, usually two to four feet from the main run.

These side tunnels are seldom visited after once used, and I found my traps unsprung after ten days or longer. The meat of this giant gopher is considered quite a delicacy by the natives, but after one trial I concluded that by strict self denial I could get along without it.

***Heterogeomys hispidus chiapensis* Nelson and Goldman**

Chiapas Pocket Gopher

The Chiapas pocket gopher is a large, dark-colored form with relatively short soft pelage for *Heterogeomys*. It is similar to *Heterogeomys hispidus hispidus* and *Heterogeomys hispidus torridus* in size and color, but the pelage is shorter and softer and the cranial characters are distinctive. Specimens from Chipoc, Guatemala, 1600 feet elevation, agree with the type series in color, being near seal brown on upper parts, and on outer surfaces of limbs; under parts thinly haired and cinnamon brownish. The pelages of these specimens, however, are somewhat thinner than in typical *H. h. chiapensis*, which come from 7800 feet elevation, but they are about like specimens from various localities in Chiapas taken at somewhat lower elevations that were referred by Goldman to the same form.

MEASUREMENTS.—Average of five adults from Chipoc: total length, 334 mm. (320–348); length of tail vertebrae, 91.7 mm. (90–95); length of hind foot, 48.5 mm. (46–50).

NUMBER OF SPECIMENS.—11, Chipoc.

FIELD NOTES.—I could see no difference between the habits of *Orthogeomys* and *Heterogeomys*. At Chipoc, the only station where this species was taken, they were abundant in the cornfields and doing the usual damage. The burrows were not to be distinguished from those of the *Orthogeomys* except, perhaps, by the somewhat smaller size.

Heteromys desmarestianus desmarestianus Gray

Coban Spiny Pocket Mouse

The Coban spiny pocket mouse is a large dark-colored pocket mouse having a tail about equal or a little longer than the length of head and body, a buffy lateral line usually present, and no white edging on the ears.

The discovery of the Coban spiny pocket mouse at San Lucas and Puebla has extended its known range southward from central Guatemala to near the border of Honduras.

Specimens from Secanquim and Chipoc probably represent typical *H. desmarestianus* which have not hitherto been available from Guatemala in American collections, though specimens from parts of Chiapas in the Biological collections are sufficiently near typical for all practical purposes.

An adult male collected at Secanquim, April 10, 1926, at 1600 feet elevation, is a dark slaty-gray color, being darkest along median dorsal line from nose to base of tail, and heavily grizzled with ochraceous-buffy hairs. A distinct ochraceous-buffy lateral line extends from cheek to hind limbs. This color is continuous down the outside of the forelimbs to ankles. The tail is bicolor, dusky above and white below to tip. Under parts, including lips, cheek pouches, fore and hind feet, are white.

The Guatemala series shows considerable individual color variation. Two specimens from San Lucas are almost as dark as *H. goldmani* and while some have the buffy lateral line well developed, in others it is either indistinct or absent. The relative length of tail is also variable, being longer than head and body in some specimens and actually shorter in others.

MEASUREMENTS.—Average of five adults from Secanquim and Chipoc: total length, 324.6 mm. (345–278); length of tail, 155 mm. (172–130); length of hind foot, 37.6 mm. (40–35); ear, 13 mm. (14–12). Average of five adults from San Lucas: total length of 310 mm. (322–300); length of tail vertebrae, 163 mm. (175–150); length of hind foot, 39 mm. (42–37); ear, 16 mm. (18–15).

NUMBER OF SPECIMENS.—15: Secanquim, 2; Chipoc, 4; Chama, 1; San Lucas, 6; Volcan San Lucas, 1; Puebla, 1.

FIELD NOTES.—This species was usually found along the edges of the heavy forest, or even in the depths of the "cloud forest" as on the Volcan San Lucas.

One taken in the rain forest at Puebla, near Quirigua, was driven from its nest in a palm log. The nest contained four young and was composed

of dry, fine fibers from the palm (?). Near the nest was a storehouse of a large handful of shelled nuts, perhaps also from the palms which formed the chief growth thereabouts.

I discovered that considerable care was necessary in skinning specimens of this species, or one left most of the spines rooted in the back, they being very deeply seated and readily pulled through the skin.

***Heteromys goldmani* Merriam**

Goldman Spiny Pocket Mouse

The Goldman spiny pocket mouse is a large, dark-colored form of this genus, having a tail considerably longer than the length of head and body. The type series came from the heavily forested Pacific slope of the Sierra Madre in extreme southern Chiapas. The discovery of a specimen at Zunil (5000 feet) therefore extends its known range into southwestern Guatemala.

The Zunil specimen varies very little in character from the type series. The general color of this specimen is dark mouse-gray on upper parts, becoming slaty black on back. The slender buffy hairs so pronounced in *H. desmarestianus* are inconspicuous; under parts, feet, lips, and cheek pouches, white; outer side of fore and hind limbs gray, grading above into general color of back; ears dusky, without white edging; tail dusky above, white below.

The Goldman spiny pocket mouse is one of the largest forms of this genus. It apparently belongs to the *H. desmarestianus* group, but is probably not closely allied to its geographical neighbor.

MEASUREMENTS.—Female specimen from Zunil: total length, 300 mm.; length of tail vertebrae, 170 mm.; hind foot, 35 mm.; ear, 15 mm.

NUMBER OF SPECIMENS.—1, Zunil.

FIELD NOTES.—The single specimen of this species was taken in a deep cleft in the side of Volcan Zunil, in typical cloud forest conditions, though but 5000 feet altitude.

***Liomys crispus setosus* Merriam**

Huehuetan Spiny Pocket Mouse

Setosus apparently inhabits the forested coastal plains and lower foothills in southern Chiapas and western Guatemala. Specimens were taken at Hacienda California in the usual tropical flora and so near the Pacific that the surf could be heard. The Guatemala specimens are sufficiently near *L. c. setosus* to be classified as such. They are, however,

somewhat paler and grayer than the topotypes I have examined, which may be due to seasonal variation. Skull characters are essentially the same as typical *setosus*. In color the Guatemala specimens are dark hair-brown, strongly suffused with slender pale buffy-gray hairs; ears dusky without indication of white emargination. Under parts, including fore limbs, under side of hind limbs and feet creamy white; heels dusky; tail dusky above, dull whitish below.

MEASUREMENTS.—Average of three adult males and one female: total length, 214.5 mm. (235–202); length of tail vertebrae, 97.7 mm. (110–90); length of hind foot, 24.5 mm. (30–20); ear, 9.2 mm. (10–8). Skull: greatest length, 31.4 mm. (30–33.8); zygomatic breadth, 14.7 mm. (14–16); interorbital breadth, 6.1 mm. (6–6.6); length of nasals, 12.3 mm. (11.2–12.9); width of brain case, 13.6 mm. (13.2–14); alveolar length of upper molar series, 4.8 mm. (4.6–5.05).

NUMBER OF SPECIMENS.—11, Hacienda California.

FIELD NOTES.—All specimens of this species were taken along the fences bordering the pasture. A few low trees and shrubs are still to be found at the edges of these grasslands, but the virgin forest has long since been removed.

***Liomys heterothrix* Merriam**
Honduras Spiny Pocket Mouse

This species supersedes *L. setosus* of the western coast on the eastern lowlands and Atlantic coastal plains of Guatemala.

It is slightly larger and more tawny than the latter, with tail length about equal to length of head and body, thinly haired and indistinctly bicolor, with ears dusky, faintly edged with white. In cranial characters the Guatemala specimens of *L. heterothrix* is similar in size to *L. setosus*, but the rostrum is relatively longer and flatter, the maxillary root of the zygoma narrower and wedge-shaped, owing to prolongation of frontal along intermaxillary sutures; interparietal is more evenly oval and small posterior emargination barely perceptible. The differences separating *L. heterothrix* and *L. salvini* are not so pronounced. In general size, proportions and color, it is difficult to distinguish them. *L. heterothrix*, however, is uniformly a shade redder with ear paler than in *L. salvini* and also lacks the slaty-gray edging on the forearm. Cranial characters, however, are distinctive and while the rostrum is comparatively flat, as in *L. salvini*, the skull of *L. heterothrix* is relatively narrower with longer and more slender rostrum and nasals.

MEASUREMENTS.—Female from Progreso: total length, 130 mm. (probably should be 230); length of tail vertebrae, 117 mm.; hind foot,

27 mm.; ear, 11 mm. Skull: greatest length, 30.85 mm.; zygomatic breadth, 13.8 mm.; interorbital breadth, 6.2 mm.; length of nasals, 12.5 mm.; width of brain case, 13.1 mm.; alveolar length of upper molar series, 5.2 mm.

NUMBER OF SPECIMENS.—1, Progreso.

FIELD NOTES.—This species is either very local at Progreso or quite rare. The single specimen taken was trapped in a sandy wash, near a cactus hedge, and though traps were set for several nights in that locality, no others were taken.

***Liomys salvini salvini* (Thomas)**

Salvin Spiny Pocket Mouse

The collection of *Liomys* from Guatemala includes what are undoubtedly typical or near typical specimens of *L. salvini*, which is thus made available for the first time in American collections. I have referred eight specimens to this species. Two from Antigua, a young adult male and an immature specimen, are probably typical *L. salvini*. Specimens from San Lucas and La Primavera are somewhat different, but as both these places are near the type locality and in such diversified regions, these variations may be local and cannot be properly recognized as named forms.

Antigua is not over two miles distant from Dueñas and in exactly the same surroundings as when Salvin made his headquarters there. Dueñas, however, has recently been covered with about two feet of volcanic ash.

Thomas's original description of the type specimen corresponds very closely with a specimen from Antigua, which is rather dark, grizzled with tawny on the back; outside of forearm fringed with a narrow slaty-gray edging; ears dark dusky with a narrow border of yellowish white. Under parts, including cheek pouches, forelimbs (except slaty-gray edging), inner side of hind limbs and feet, creamy white; outside of hind limbs, heel, and posterior half of underside of hind foot dusky. Tail distinctly bicolor but without sharp line of demarcation; above dusky; below white almost to tip, which is dusky all around.

The San Lucas and La Primavera specimens are somewhat paler, but this may be due to seasonal variation.

The skull of *L. salvini* is rather low with broad flat rostrum and distinctly concave in interorbital region. The ascending branches of the premaxillae are nearly conterminous posteriorly with the nasals in an adult male from San Lucas but reach beyond in the Antigua specimen and in others.

Compared with *L. c. setosus*, *salvini* is larger and darker, with upper parts tawny instead of slaty, and the skull is relatively narrower and flatter.

MEASUREMENTS.—Adult male from San Lucas: total length, 255 mm.; length of tail vertebrae, 127 mm.; hind foot, 32 mm.; ear, 13 mm. Skull: greatest length, 33.1 mm.; zygomatic breadth, 15.4 mm.; interorbital breadth, 7 mm.; length of nasals, 13 mm.; alveolar length of upper molar series, 5 mm. Young adult male from Antigua: total length, 223 mm.; length of tail vertebrae, 112 mm.; hind foot, 30 mm.; ear, 11 mm.

NUMBER OF SPECIMENS.—8: Antigua, 2; San Lucas, 3; Volcan San Lucas, 1; La Primavera, 2.

FIELD NOTES.—The specimen from Antigua was trapped at the edge of a cornfield on a hillside, somewhat above the valley. The species might have been common in that locality, but trapping in that spot was not continued. At San Lucas the species was found in the edge of the forest where large slabs of rocks formed dens inhabited by foxes and small predatory animals that stole traps so fast that I abandoned the location. On the volcano one was taken in the cloud forest above 10,000 feet.

***Liomys anthonyi* Goodwin**

Sacapulas Spiny Pocket Mouse

The Sacapulas spiny pocket mouse is a pale desert form known only from the type locality. It is closely related to *L. salvini* but much paler, especially immature specimens.

The type series shows very little individual variation. Adults are uniform hair-brown on upper parts, grizzled with slender ochraceous-buffy hairs. This color extends down the upper side of hind feet to ankles and heels. The under parts, including the entire fore limbs, hind feet, lips and cheek pouches are creamy white; ears about same color as back and with a narrow border of creamy white. Tail dark brown above, below white. Immature specimens are a shade darker than adults. In cranial characters *L. anthonyi* resembles *L. salvini*, but the skulls is more evenly rounded on the surface, narrower, with relatively longer nasals, and having sides more nearly parallel and less expanded anteriorly.

This species may prove to be an isolated desert form and was taken in a dry area surrounded by rain forest.

MEASUREMENTS.—Average of four adult females and one male from type locality: total length, 250 mm. (260–240); length of tail vertebrae, 126.4 mm. (135–116); hind foot, 30.8 (32–30); ear, 12 mm. (14–10).

Skull measurements, two adult females: greatest length, 34.1–32.4 mm.; length of nasals, 13.8–13.7 mm.; zygomatic breadth, 15.35–15 mm.; interorbital breadth, 7.15–6.65 mm.; alveolar length of upper molar series, 5.1–5 mm.

NUMBER OF SPECIMENS.—21, Sacapulas.

FIELD NOTES.—All the specimens of this species were taken along the high cactus hedges and the dry washes nearby. Several open holes, such as might be inhabited in the United States by ground squirrels, were made, I think, by this species, as traps set near the openings furnished specimens next morning.

***Reithrodontomys fulvescens chiapensis* Howell**

Chiapas Harvest Mouse

Harvest mice are small, slender long-tailed animals and can be distinguished easily by the deep longitudinal grooves near the middle of the upper incisors. The Chiapas harvest mouse is a small dull-colored form with relatively small ears. In color the Guatemala specimens vary from ochraceous buff to pinkish buff on upper parts; white or grayish white below; tail fuscous above, solid white below, some uniform fuscous all around. Specimens from Chanquejelve, 5050 feet elevation, in the highlands of northwestern Guatemala are near typical *R. f. chiapensis*; five from Sacapulas average smaller, color paler and more buffy, which is probably due to local arid conditions; three adults from Hacienda California, on the Pacific coast and near the Chiapas border, referred here to the above species, have smaller ears and closer pelage than the average with tail nearly uniform fuscous. Superficially they resemble *R. pacificus*, especially in the size of the ear and pelage, but cranial and other characters are as in *R. f. chiapensis*.

MEASUREMENTS.—Average of three adults from Chanquejelve: total length, 167 mm.; length of tail vertebrae, 89 mm.; length of hind foot, 19.5 mm.; ear, 15 mm. Average of three adults from Sacapulas: total length, 157 mm.; length of tail vertebrae, 88 mm.; length of hind foot, 19.5 mm.; ear, 14 mm. Average of three adults from Hacienda California: total length, 169 mm.; length of tail vertebrae, 87 mm.; length of hind foot, 20 mm.; ear (dry), 9.5 mm.

NUMBER OF SPECIMENS.—15: Chanquejelve, 5; Sacapulas, 5; Hacienda California, 5.

FIELD NOTES.—At the time I was collecting at Hacienda California they were suffering from an invasion of grasshoppers, the abundance of which would be difficult to exaggerate. The newly hatched grasshoppers,

only able to jump a few inches, were being trapped in trenches dug by Indians for this purpose. All the specimens of this species taken at this station were found in these ditches, from which they were unable to escape, though they were not over a foot in depth. I cannot say if the mice were baited by the insects, but all evidence at hand points to this conclusion.

At Chanquejelve I found these little mice along the edge of an old cornfield, abandoned for some years and well grown to grass. A thicket of underbrush seemed to be their home, for none were taken in traps set a few yards from the wild growth.

At Sacapulas all were found along the cactus hedges, associated with *Baiomys* and *Liomys*.

***Reithrodontomys dorsalis* Merriam**

Black-backed Harvest Mouse

Reithrodontomys dorsalis is a medium-sized harvest mouse with dark dorsal stripe and buffy sides. In fresh pelage the Guatemala specimens are ochraceous buff mixed with black on upper parts; a well-defined dark stripe on back; sides varying from ochraceous buff to pinkish cinnamon; under parts washed with light ochraceous buff; tail bicolor, fuscous above, grayish white below; hind feet grayish white; front feet buffy with a dusky stripe reaching halfway to toes. In worn pelage the general tone is much richer and the dark dorsal stripe is less pronounced.

This species is common and widely distributed throughout the highlands of western Guatemala. Though individual and seasonal variation is considerable, geographical differences in the large series from Guatemala is relatively small.

MEASUREMENTS.—Average of five adults from Barrillos, San Mateo, Panajachel, La Perla, and Zanjón: total length, 178.4 mm. (185–172); length of tail vertebrae, 92.4 mm. (94–89); length of hind foot, 19 mm. (18–20); ear, 14.6 mm. (15–14).

NUMBER OF SPECIMENS.—56: Tecpam, 6; Zanjón, 6; Barrillos, 7; Panajachel, 8; Antigua, 2; San Mateo, 12; La Perla, 4; San Lucas, 4; Huehuetenango, 4; Chanquejelve, 3.

FIELD NOTES.—At Chanquejelve, this species was taken with *R. fulvescens chiapensis* along the edge of an old field near a thicket of brush; those from Huehuetenango, from a garden, in the center of the town. Barrillos harbored them only along a rocky hillside, but with grass furnishing the needed shelter.

Reithrodontomys mexicanus mexicanus (Saussure)

Saussure Harvest Mouse

Reithrodontomys mexicanus mexicanus is a relatively large, tawny, long-tailed harvest mouse. In general color specimens vary from nearly uniform ochraceous tawny to Prout's brown on upper parts, sparingly darkened on back with dusky hairs; an indistinct blackish ring around eye; tail nearly uniform fuscous above and below; upper surface of fore and hind feet hair brown; toes grayish white and under parts white. The Guatemala series of this species exhibits some variation in color. One specimen from San Mateo, 9000 feet elevation, is fairly typical, while a series from Barrillos some twenty-five miles distant and 4000 feet lower elevation are considerably darker and duller, being nearly uniform Prout's brown. A specimen from Chanquejelve, 5050 feet, and two from San Lucas, 4900 feet, are much paler and lighter in color than the San Mateo specimen, being nearly ochraceous tawny, but all agree in general and important characters.

MEASUREMENTS.—Average of five adults from San Mateo, San Lucas, Chanquejelve, and Barrillos: total length, 202.2 mm. (215–180); length of tail vertebrae, 113 mm. (120–104); length of hind foot, 21 mm. (22–20); ear, 16.6 mm. (14–18).

NUMBER OF SPECIMENS.—10: San Mateo, 1; San Lucas, 2; Chanquejelve, 1; Barrillos, 6.

FIELD NOTES.—The single specimen from Chanquejelve was taken in the same field with the last two species, thus furnishing three forms from an area not much larger than a city block. Those from Barrillos also were taken from the same trap line as *dorsalis*, while the San Mateo example came from a thicket near the heavy forest, above the Pueblo, a quite different association. I found, however, that in Guatemala, almost any grassy cover was apt to shelter more or less *Reithrodontomys*. The same cover, too, was prolific of *Sigmodon*.

Reithrodontomys mexicanus howelli Goodwin

Howell Harvest Mouse

The Howell harvest mouse is smaller than *R. m. mexicanus* and has shorter ears; tail shorter with tip white. In color it is nearly uniform cinnamon above mixed with dusky hairs, this color grading on sides to nearly clear pinkish cinnamon; a blackish ring around the eye; tail nearly unicolor, fuscous above, paler below, tip pure white all around; hind feet dusky; fore feet and fore and hind toes white; under parts white. This subspecies is clearly in the *mexicanus* group but in size and super-

ficial characters it is nearest to specimens of *R. pacificus* from Finca Cipres, but differs from the latter in having a longer tail with white tip, longer fur and larger and more swollen brain case.

R. m. howelli is known only from two examples collected at Chichicastenango, 6500 feet, elevation, in the highlands of western Guatemala (marked on some maps Santo Tomas).

MEASUREMENTS.—Two specimens from Chichicastenango: total length, 178–170 mm.; length of tail vertebrae, 104–100 mm.; length of hind foot, 18–18 mm.; ear, 13–15 mm.

NUMBER OF SPECIMENS.—2, Chichicastenango.

FIELD NOTES.—Adjoining the church, in the center of the town of Chichicastenango, was a small patch of corn, surrounded by many blocks of paved streets and closely built houses. In this little planting of corn this species, in company with *Peromyscus b. levipes*, was not uncommon and was not taken elsewhere.

Reithrodontomys pacificus Goodwin

Pacific Harvest Mouse

The Pacific Harvest Mouse is a small member of the *mexicanus* group with small ears, close, short pelage and tail about equal in length to head and body. In general color specimens vary from dull cinnamon-buff to pinkish cinnamon on upper parts; surface of fore and hind feet hair-brown; toes soiled white; tail nearly unicolor clove brown and under parts white. The type series, from Hacienda California, near the Pacific coast, shows the strongest development of this form. Specimens taken at Finca Cipres, 2000 feet elevation, and at the base of the Pacific slope of Volcan Zunil are closely referable to *R. pacificus*, but approach *R. m. howelli* in general color and size, differing from the latter in having shorter tails without white tip, closer pelage and smaller ears.

MEASUREMENTS.—Average of five adults from Hacienda California and Finca Cipres: total length, 174 mm. (180–167); length of tail vertebrae, 91 mm. (101–85); length of hind foot, 17 mm. (18–16); ear, (dry) 10.8 mm. (12–10).

NUMBER OF SPECIMENS.—10: Hacienda California, 2; Finca Cipres, 8.

FIELD NOTES.—At Finca Cipres we found this species hidden among the coffee leaves that had been raked into piles between the rows. They were all secured by Mr. Jos. R. Slevin, herpetologist of the California Academy of Sciences, while he was searching the dry leaves for burrowing reptiles which were also quite abundant in these covers.

The specimens taken at Hacienda California were from the ditches dug to trap the grasshoppers mentioned in connection with *R. f. chiapensis*.

***Reithrodontomys gracilis anthonyi* Goodwin**

Anthony Harvest Mouse

The Anthony harvest mouse is a small pale desert form with relatively large ears and long tail. In general, the color of the small series on hand is nearly uniform pinkish cinnamon above, brighter on sides, and slightly darkened on back with dusky hairs; ears hair brown; tail nearly uniform fuscous, only slightly paler below; fore feet buffy white; hind feet grayish white. *R. g. anthonyi* apparently belongs in the *mexicanus* group. It is most nearly related to *R. g. gracilis*, but differs from the latter in its larger size, bigger ears, longer tail, and paler color. The skull is also much larger. This subspecies is known only from three examples collected by Mr. Anthony in the dry sandy area at Sacapulas, 4500 feet elevation.

MEASUREMENTS.—Average of three specimens from Sacapulas: total length, 181 mm. (189–175); length of tail vertebrae, 104 mm. (112–98); length of hind foot, 20 mm. (20–20); ear, 14 mm. (16–12).

NUMBER OF SPECIMENS.—3, Sacapulas.

FIELD NOTES.—*Reithrodontomys* were not common in the region of Sacapulas, due, I think, to the lack of cover. Cattle keep the scanty grass eaten to the ground, and it was only where the high cactus hedges sheltered the grass that this species found any suitable protection, which was here shared with *Neotoma* and *Baiomys*.

***Baiomys musculus musculus* (Merriam)**

Colima City Mouse

Members of this genus may be recognized by their small size, short tail and small ears. The Colima City mouse is an arid tropical form and relatively large for this genus, the hind foot measuring from 15–17 mm. The discovery of *B. m. musculus* at Chanquejelve and Sacapulas represent the first records of this form in Guatemala and have extended its known range much farther south than has hitherto been recorded. The Chanquejelve specimen is apparently near typical *B. m. musculus*, but specimens from Sacapulas, an isolated hot, dry, sandy area, though referable to this species, are somewhat paler. In color they are nearly uniform cinnamon-buff heavily mixed with dusky on upper parts; feet white or grayish white; tail bicolor, brownish above, grayish white below;

under parts dull cream-buff. The difference in color of these specimens from typical *B. m. musculus*, though uniform throughout the series, is probably due to local conditions and they are not sufficiently different from the type series to be recognized as a named form.

MEASUREMENTS.—Average of five largest specimens from Sacapulas: total length, 126.4 mm. (128–125); length of tail vertebrae, 49.6 mm. (55–45); length of hind foot, 15.6 mm. (17–15); ear, 12 mm. (14–11).

NUMBER OF SPECIMENS.—38: Sacapulas, 37; Chanquejelve, 1.

FIELD NOTES.—The single specimen taken at Chanquejelve was trapped in the grass field where *Reithrodontomys* were the most common forms. In fact, this immediate locality was the only location that produced any of the small rodents, though several seemingly excellent covers were first tried, without result.

***Baiomys musculus nigrescens* (Osgood)**

Sooty Mouse

This small dusky mouse is about the same size as *B. m. musculus* but much darker. Specimens from La Primavera in central Guatemala are typical. In color these specimens are Vandyke brown mixed with sooty on upper parts, the sooty slightly concentrated in middle of back; under parts dull cream to roots of hairs in patches on middle of belly and only on tips at sides; feet dull whitish; tail indistinctly bicolor, dusky above, paler below.

Though *B. m. nigrescens* was taken in the same river valley as *B. m. musculus* and at no very great distance apart, they show no tendency to intergradation and are from a very different type of country. La Primavera, 3200 feet elevation, is some fifteen miles southeast of Coban, in Alta Vera Paz. According to Mr. Anthony's manuscript, the vegetation here is "Forests pine, oak and alder, with rain forest along the ridges where the heavier rains fall."

MEASUREMENTS.—Average of five adult specimens from La Primavera: total length, 121 mm. (129–110); length of tail vertebrae, 45 mm. (50–32); length of hind foot, 16.4 mm. (18–15); ear, 9.8 mm. (12–6).

NUMBER OF SPECIMENS.—5, La Primavera.

FIELD NOTES.—The above specimens were all taken along the edges of a mound, built by the Maya Indians over a thousand years ago, and now in the center of a sugar plantation. The mound was well covered with a recent growth of brush, furnishing ideal shelter.

***Peromyscus boylii levipes* (Merriam)**

Mount Malinche Mouse

This form is a medium-sized mouse with a tail about equal in length to its head and body, having moderately long, soft pelage. In color, specimens vary from rich ochraceous buff to tawny, usually strongly modified by dusky; back with dusky predominating, forming a dark diffuse dorsal stripe.

The Mount Malinche mouse is common and widely distributed throughout the highlands of western and central Guatemala. Of the large series taken, selected specimens from each locality are typical *P. b. levipes*. Individual variation in local series is relatively great, both in size and cranial characters; color variation grades from rich tawny to blackish brown. Immature specimens are grizzled slaty gray. Specimens from San Lucas average rather brighter in color than usual, but they may be matched among specimens from other localities.

MEASUREMENTS.—Six largest specimens. Momostenango, male: total length, 205 mm.; length of tail vertebrae, 100 mm.; length of hind foot, 24 mm.; length of ear, 18 mm. San Lucas, female: total length, 232 mm.; length of tail vertebrae, 115 mm.; length of hind foot, 24 mm.; ear, 20 mm. Volcan San Lucas, female: total length, 230 mm.; length of tail vertebrae, 117 mm.; length of hind foot, 24 mm.; ear, 16 mm. Chichicastenango, female: total length, 223 mm.; length of tail vertebrae, 110 mm.; length of hind foot, 21 mm.; ear, 16 mm. Huehuetenango, female: total length, 222 mm.; length of tail vertebrae, 107 mm.; length of hind foot, 23 mm.; ear, 20 mm. Tecpam, female: total length, 200 mm.; length of tail vertebrae, 92 mm.; length of hind foot, 23 mm.; ear, 16 mm.

NUMBER OF SPECIMENS.—94: San Lucas, 9; Volcan San Lucas, 24; Huehuetenango, 25; Sacapulas, 4; Momostenango, 6; La Primavera, 2; Tecpam, 5; Chanquejelve, 7; Chichicastenango, 12.

FIELD NOTES.—This mouse was common in the gardens mentioned as furnishing harvest mice at Chichicastenango and Huehuetenango. Both situations were equally infested by cats, which several times took my traps, but in no manner reduced the mouse population, though they had, no doubt, been trying for some three hundred years. On Volcan San Lucas, this and the following species were very abundant about a corncrib, where living conditions were ideal.

***Peromyscus guatemalensis guatemalensis* Merriam**

Guatemala Mouse

The Guatemala mouse is a rather large dark-colored form of the genus, with long lax fur. Adult specimens in unworn pelage are pale cinnamon rufous liberally mixed with dusky, the latter color being concentrated on dorsal area forming an ill-defined broad stripe; under parts buffy white, considerably modified by slaty color of underfur; pectoral and axillary regions usually broadly cinnamon rufous; fore and hind feet white; tail usually bicolor, frequently blotched dusky and yellowish with tip white; below entire tail occasionally dusky. In worn pelage specimens are much darker, the subterminal zone of color being very narrow. Immature specimens are grizzled slaty black.

The Guatemala mouse is apparently abundant in the highlands of western Guatemala. Specimens collected at San Mateo near the Chiapas border and from San Lucas and Volcan San Lucas in southern Guatemala agree in important details with the type series but vary somewhat individually in color and cranial characters.

MEASUREMENTS.—Average of five adults from Volcan San Lucas: total length, 279 mm. (290–270); length of tail vertebrae, 134.4 mm. (141–128); length of hind foot, 31.2 mm. (34–30); ear, 22.4 mm. (25–21). Average of five adults from San Lucas: total length, 277.2 mm. (280–275); length of tail vertebrae, 138 mm. (145–134); length of hind foot, 30.2 mm. (31–30); ear, 23.4 mm. (25–21). Average of three adults from San Mateo: total length, 260 mm. (270–251); length of tail vertebrae, 128 mm. (138–122); length of hind foot, 32 mm. (33–31); ear, 23 mm. (25–20).

NUMBER OF SPECIMENS.—94: Volcan San Lucas, 47; San Lucas, 43; San Mateo, 4.

FIELD NOTES.—An abundant species in the altos, where open forest or fields offered suitable conditions. Those taken at San Lucas were found along the base of the mountain, where the growth of the more or less original forest joined the coffee plantation.

***Peromyscus guatemalensis tropicalis* Goodwin**

Tropical Mouse

The tropical mouse is very similar in color and general characters to typical *P. g. guatemalensis*, but smaller, with somewhat shorter ears and closer pelage, and with smaller molars and shorter tooth rows than the latter. The series on hand are all from the type locality and were apparently taken at 1500 feet elevation in the forest typical of the coast

tropics. The range of *P. g. tropicalis* is probably southeastern Guatemala, southern British Honduras, and at lower altitudes than that of typical *P. g. guatemalensis*.

MEASUREMENTS.—Average of six adults from Chimoxan: total length, 269 mm. (288–261); length of tail vertebrae, 136 mm. (150–127); length of hind foot, 30 mm. (32–28); ear, 19 mm. (20–16).

NUMBER OF SPECIMENS.—23, Chimoxan.

FIELD NOTES.—A common species along the hills about the Finca Chimoxan, chiefly taken at the edges of the brush lands and seldom, if ever, in the forest.

***Peromyscus mexicanus saxatilis* Merriam**

Rock Mouse

The Jacaltenango form of the *mexicanus* group of white-footed mice is very similar to the typical species. In color it is practically identical. The skull, however, has larger auditory bullae and broader and fuller brain case than in the latter species. A series from Chanquejelve, 5000 feet elevation, and about thirty miles from the type locality, are probably typical *P. m. saxatilis*. These specimens in worn pelage are ochraceous buff mixed with dusky on upper parts; the back being much like sides but a shade darker; the tail is irregularly blotched with yellowish white below with under parts creamy white. Specimens from Tecpam, 8650 feet elevation, and sixty miles north of Guatemala City, though not typical *P. m. saxatilis* are apparently referable to that species. In size they average smaller than the Chanquejelve specimens with relatively shorter ears and more hairy tail, which is nearly uniform dusky, being only a shade paler below instead of irregularly blotched; under parts are white. These specimens are in unworn pelage, the general color being cinnamon-rufous mixed with dusky, the middle of back much darker. A small series referable to this species from La Primavera and Finca Concepcion extends the known range of *P. m. saxatilis* from western through central Guatemala to the hills east of Coban.

MEASUREMENTS.—Average of five adult specimens from Chanquejelve: total length, 256.6 mm. (270–248); length of tail vertebrae, 131 mm. (142–120); length of hind foot, 26.8 mm. (26–27); ear, 22.4 mm. (20–24). Average of five adults from Tecpam: total length, 233.6 mm. (255–218); length of tail vertebrae, 107 mm. (121–97); length of hind foot, 25.5 mm. (25–26); ear, 17.4 mm. (20–15).

NUMBER OF SPECIMENS.—23: Chanquejelve, 7; Tecpam, 10; La Primavera, 2; Finca Concepcion, 4.

FIELD NOTES.—At Tecpam (Chichivac), this must have been the dominant species. Under the oaks, large quantities of acorns that had been shelled by this or some other rodent of similar size indicated that mice were abundant, but not a specimen could be found. Either a migration had taken place, or the bait offered—peanut butter with oatmeal—was not to their liking. In a nearby grass field, near the pines, a series of ten were taken in traps set for harvest mice.

***Peromyscus mexicanus gymnotis* (Thomas)**

Naked-eared Mouse

This form is similar to *P. mexicanus saxatilis* but smaller, with tail about equal to or shorter in length than head and body. The type was described from Guatemala but without definite locality. A series from Hacienda California at sea level on the Pacific coast and near the Chiapas border represent what are probably typical *P. m. gymnotis*. They agree closely with Osgood's description of specimens from Huehuetan compared with the type in the British Museum. In color (worn pelage), specimens are nearly uniform cinnamon, lightly mixed with dusky and with only a faint indication of mid-dorsal stripe; unworn pelage is much darker and but little darker on dorsal region than sides; under parts dull buffy white with slaty underfur showing through; pectoral region suffused with fulvous in one specimen only; tail dusky blackish above, irregularly blotched with yellowish white below. One specimen from Finca Cipres, 2500 feet, is somewhat larger and darker than the series from Hacienda California, with tail uniform dusky black. The skull is also larger, with large bullae, relatively broader and fuller brain case, approaching *P. m. saxatilis* in some respects, but somewhat smaller.

The range of *P. m. gymnotis* in Guatemala is probably restricted to the Pacific coastal hills and at slight elevations on the western slope of the Sierra Madre.

MEASUREMENTS.—Average of five adult specimens from Hacienda California: total length, 223.6 mm. (228–220); length of tail vertebrae, 107.4 mm. (113–96); length of hind foot, 24.8 mm. (24–25); ear, 19.8 mm. (20–17). Adult male from Finca Cipres: total length, 240 mm.; length of tail vertebrae, 115 mm.; length of hind foot, 25 mm.; ear, 19 mm.

NUMBER OF SPECIMENS.—13: Hacienda California, 12; Finca Cipres, 1.

FIELD NOTES.—Not uncommon at Hacienda California, where a small series were taken along the edges of the pasture, where the grass

met the underbrush. The single specimen taken at Finca Cipres was found by J. R. Slevin in a pile of leaves, as mentioned in connection with *Reithrodontomys pacificus*.

***Peromyscus grandis* Goodwin**

Guatemala Giant Mouse

Peromyscus grandis is one of the largest forms of this genus and is exceeded only in the subgenus *Megadontomys*. In general characters it is similar to *P. zarhynchus* but is darker and richer in color and has shorter molar tooth rows. The small series on hand, all from the type locality, are rich hazel liberally mixed with black on upper parts; the dorsal area is slightly darker but is not strongly contrasted with color of sides; under parts are dull white overlaid with cinnamon.

These specimens were taken at a coffee ranch 3750 feet elevation, thirty-five miles east of Coban.

MEASUREMENTS.—Average of three specimens from Finca Concepcion: total length, 303 mm. (315–296); length of tail vertebrae, 150.3 mm. (145–156); length of hind foot, 32 mm. (34–30); ear, 24 mm. (26–22).

NUMBER OF SPECIMENS.—3, Concepcion.

FIELD NOTES.—At Concepcion, trapping conditions were not of the best. The clearing of the original growth, for coffee planting, had reduced cover to the vanishing point and no small mammals were found except along a small ridge of rocks, near the hacienda. It was here that the only specimens were taken.

***Oryzomys couesi couesi* (Alston)**

Coues Rice Rat

The Coues rice rat is a widely distributed species, ranging from northern Vera Cruz and Yucatan south through northern and southern Chiapas, Guatemala and Nicaragua to northwestern Costa Rica, at altitudes from sea level to 5000 feet elevation and mainly in the humid lower tropical zone. A series of specimens from La Primavera are of considerable interest, as they represent what is probably typical *O. c. couesi*. The type locality as fixed by Thomas is Coban, less than fifteen miles from La Primavera. These specimens vary slightly in color, between ochraceous buffy and ochraceous tawny on upper parts, being brightest on cheeks and along sides of body; top of head and back darkened by black hairs, under parts varying from buff to dull white; feet white; tail brownish above, dull yellowish below, proximally becoming

brownish toward tip. Specimens taken farther east and those from the west coast of Guatemala compare favorably with typical *O. c. couesi*.

MEASUREMENTS.—Average of four adults from La Primavera and Chimoxan: total length, 277 mm. (250–290); length of tail vertebrae, 142 mm. (132–150); length of hind foot, 32 mm. (31–33); ear, 13.7 mm. (12–15).

NUMBER OF SPECIMENS.—23: La Primavera, 9; Chimoxan, 7; Finca Sepur, 3; La Montanita, 1; Finca Cipres, 1; Hacienda California, 2.

FIELD NOTES.—At all of the stations this species seemed to inhabit about the same situations, grasslands, or the edges of brushy fields with grass not far distant. The single specimen from La Montanita was an exception, being taken in a trap set in the blacksmith shop. At La Primavera specimens were taken along the cane fields.

***Oryzomys alfaroi angusticeps* (Merriam)**

· Santa Maria Rice Rat

The Santa Maria rice rat is a medium-sized, long-furred, dark-colored species which ranges in Guatemala along the heavily forested high mountain slopes in the southwest section. In color the Guatemala series varies from cinnamon brown to ochraceous tawny heavily washed with black on upper parts. The general tone is darkened by the plumbeous basal color; feet dull white, tail nearly uniform blackish, slightly paler below; under parts are white or buffy white, thinly overlying the dark plumbeous basal color. With the exception of the Calcel rice rat no other North American form of the *O. alfaroi* group attains so high an altitude and, like the Calcel rice rat, it has developed a longer pelage than forms ranging at lower elevations. One specimen from San Lucas is nearly typical *O. a. angusticeps*. Others from the same locality have somewhat redder and coarser fur, which is probably due to summer pelage, the type series being collected in January. A small series from Finca Cipres are clearly referable to *O. a. angusticeps* but they are all immature and have relatively close, short pelage.

MEASUREMENTS.—Average of four adults from San Lucas and Volcan San Lucas: total length, 227.5 mm. (250–217); length of tail vertebrae, 122.5 mm. (140–117); length of hind foot, 24.5 mm. (30–37); ear, 17 mm. (18–16).

NUMBER OF SPECIMENS.—12: San Lucas, 4; Volcan San Lucas, 2; Finca Cipres, 6.

FIELD NOTES.—The series from San Lucas were, perhaps, typical in habitat, being all taken along the edge of the clearing, near the cultivated

land. On the volcano, at 9000 feet, they were found along the edges of the cornfields, next to the underbrush, where *Peromyscus* was extremely abundant.

***Oryzomys alfaroi saturator* (Merriam)**

Dusky Rice Rat

The dusky rice rat is a small dark-colored form, similar to *O. a. angusticeps* but smaller and darker. The general color of typical specimens is cinnamon brown, heavily mixed with black on upper parts; top of head and mid-dorsal area blackish; under parts varying from white to ochraceous buff; chin and throat more or less whitish; feet brownish to toes; toes dull yellowish.

The dark colors of *O. a. saturator* appear to be due to environmental conditions. The areas inhabited by this form are heavily forested and excessively humid.

The dusky rice rat, so far as I know, has hitherto been recorded only from the type locality in northern Chiapas. The discovery of this form in central and eastern Guatemala has thus materially extended its known range much farther south. Specimens taken in the tropical forest at Chimoxan and Sepacuite are probably near typical *O. a. saturator*. Specimens from La Primavera and El Soche about fifteen miles south-east of Coban are somewhat brighter colored than the latter but are similar in general characters.

MEASUREMENTS.—Average of five specimens from Chimoxan, El Soche, and La Primavera: total length, 209.4 mm. (218–204); length of tail vertebrae, 103.4 mm. (112–95); length of hind foot, 26 mm. (27–25); ear, 14 mm. (14–14).

NUMBER OF SPECIMENS.—9: Chimoxan, 3; El Soche, 3; Sepacuite, 1; La Primavera, 2.

FIELD NOTES.—Found only in or along the grasslands, near cultivated lands.

***Oryzomys fulvescens fulvescens* (Saussure)**

Vera Cruz Pygmy Rice Rat

The Vera Cruz pygmy rice rat is a very small, long-tailed, widely distributed form, similar in size and general superficial characters to certain species of genus *Reithrodontomys*, but readily recognized from the latter by the absence of grooves on the upper incisor teeth. The Guatemala specimens of *O. f. fulvescens* are ochraceous buff moderately darkened by blackish hairs on upper parts, clearest and brightest on rump, paler on cheeks and sides; under parts varying from white to buffy;

feet whitish, tail brownish above, yellowish below except at tip which is dusky all around.

O. f. fulvescens belongs in the subgenus (*Oligoryzomys*) of very small rice rats. The North American forms of this subgenus are all referable to a single species. They agree closely among themselves in essential characters and by their small size and slender form are readily distinguished from other members of the genus inhabiting the same region.

MEASUREMENTS.—Two adult specimens from La Primavera and Chimoxan: total length, 185–160 mm.; length of tail vertebrae, 97–100 mm.; length of hind foot, 22.22 mm.; ear, 13–8 mm.

NUMBER OF SPECIMENS.—6: La Primavera, 2; Chimoxan, 1; Finca Cipres, 1 adult and 2 juveniles in alcohol.

FIELD NOTES.—Another inhabitant of the piles of dry coffee leaves at Finca Cipres. A nest of dry fibers was uncovered in one of these piles of leaves. It was not notably different from the nests of the many races of *Peromyscus* that I have found in the western United States and contained two young.

***Tylomys nudicaudus nudicaudus* (Peters)**

Guatemala Climbing Rat

The type of the Guatemala climbing rat was described as from Guatemala without locality, and figured by the original describer on a female specimen which was evidently young and preserved in alcohol. A fully adult female from La Primavera is therefore of especial interest, as it represents what is probably a mature example of this species and has not hitherto been available from Guatemala.

La Primavera is in the pines, 3200 feet elevation, and about ten miles southwest of Coban, which is the ultimate market for all skins taken in northeastern Guatemala. La Primavera may be the type locality for *Tylomys n. nudicaudus*. The color of the adult specimen from this locality apparently varies somewhat from the type description. It is dark grayish-brown on upper parts, being darkest on head and along median dorsal line. The face is grayish brown with a broad dusky ring around the eye; under parts light buffy fulvous with a tuft of white fur under forearms and a small white patch in inguinal region; fore and hind feet, including toes, clear dark brown; a little more than basal half of tail blackish; terminal half yellowish white. The color of an immature female from Chimoxan corresponds closely with the type description of *T. n. nudicaudus*, having under parts and toes of fore and hind feet white. The skull of the La Primavera specimen is long and flat, with

relatively slender rostrum, narrow wedge-shaped nasals terminating posteriorly on a plane with the premaxillae.

MEASUREMENTS.—Adult female from La Primavera: total length, 500 mm.; length of tail vertebrae, 240 mm.; length of hind foot, 45 mm.; ear, 29 mm. Skull: greatest length, 51.2 mm.; zygomatic breadth, 26.5 mm.; length of nasals, 18.5 mm.; alveolar length of upper molar series, 9 mm.

NUMBER OF SPECIMENS.—2: La Primavera, 1; Chimoxan, 1.

FIELD NOTES.—At the time of my first visit to La Primavera, I presented several traps to the young son of my host, Don Ernesto Wyld. The boy made remarkably good use of them, so that by the time I returned, two years later, he was able to give me quite valuable information as to the mammalian fauna. Among other captures, he told me of a large rat that had been common among the huge rocks that marked the brink of the canyon of the Rio Negro. He seemed to think that with luck I might find a few, even though he had not been very successful in that line. I found the spot well forested between the broken limestone slabs, the size of a small house, but the rats, seemingly, were to be mentioned as "were." It was not until I was about to leave for other fields that I was fortunate in securing the single specimen taken here. At Chimoxan a similar location, a ledge of broken limestone, furnished the second example.

***Otodylomys guatemalae* Thomas**

Tucuru Rat

This species was based on specimens collected by G. C. Shortidge at Tucuru, Guatemala, for the British Museum. A series of four specimens from Chimoxan, 1500 feet altitude, a few miles north of the type locality, represent what are typical *O. guatemalae*. These specimens agree closely with Thomas's brief description, being about equal in size to *O. fumeus* and considerably larger than *O. phyllotis*, grayer in color and feet parti-colored. The color of the Chimoxan series, in fresh pelage, September and October specimens, are uniform dusky grizzled brownish gray on upper parts, becoming paler on sides; under parts dull creamy white, owing to plumbeous basal color of fur. Upper surface of fore feet brownish, hind feet white, irregularly clouded with brownish gray; fingers and toes white.

An adult female from Finca Chama on the Rio Negro, about thirty miles northwest of Coban, taken May fifth, in worn pelage, is a shade redder, less grizzled on upper parts and more plumbeous under parts,

but without showing any difference to warrant separation. Three specimens from Concepcion in southern central Guatemala are slightly browner with uniformly whiter under parts than the Chimoxan series. In general appearance they approach *O. fumeus* Allen of Nicaragua, but in cranial characters they are nearer to *guatemalae*.

MEASUREMENTS.—Adult male, Chimoxan: total length, 360 mm.; length of tail vertebrae, 171 mm.; length of hind foot, 30 mm.; ear, 24 mm. Adult female, Chama: total length, 357 mm.; length of tail vertebrae, 170 mm.; length of hind foot, 30 mm.; ear, 20 mm. Adult female, Concepcion: total length, 341 mm.; length of tail vertebrae, 165 mm.; length of hind foot, 28 mm.; ear, 24 mm. Skulls, average of three adults (Chama and Chimoxan): basal length, 33.5 mm. (35–36); nasals, 15.3 mm. (15–16); zygomatic breadth, 21.3 mm. (20–22); mastoid breadth, 15.1 mm. (15–15.2); upper molar series, 7 mm. (6.75–7.25).

NUMBER OF SPECIMENS.—8: Chimoxan, 4; Chama, 1; Concepcion, 3.

FIELD NOTES.—At Concepcion, one looks down on Tucuru, almost directly underfoot, and wonders how long it may be until he fails to watch his step and lands among the red tiles of the Pueblo, some two thousand feet below and three miles distant by the many hairpin turns of the trail. Among the rocks, mentioned in connection with this station as being the only place where my traps were useful, I secured the three specimens. Similar situations at Chama and Chimoxan furnished their quota. It would seem, however, that the open ledges and forest with no rocky retreats were not favored by these rats, but a combination of the two. From insufficient data I conclude that the animals live in the holes in the well-drained soil between the rocks and not, as some of the natives claim, in holes in the trees.

***Nyctomys sumichrasti salvini* (Tomes)**

Guatemala Vesper Rat

The Guatemala vesper rat is a medium-sized arboreal species of rich yellowish color. It is apparently abundant locally in the highlands of southwestern Guatemala. The description of this species was based on a specimen in the British Museum collected at Dueñas. A large series from Panjachel and San Lucas is apparently typical or near typical *N. s. salvini*. These two localities are both within thirty miles of Dueñas and conditions are somewhat similar, the altitude and flora being about the same.

According to Mr. Anthony these vesper rats pass the day in nests in large trees and only occasionally come to the ground. While specimens were very plentiful in the region around Panjachel and San Lucas, they were either rare or absent in other localities visited by Mr. Anthony.

MEASUREMENTS.—Average of five adult specimens from San Lucas and Panjachel: total length, 275.8 mm. (262–286); length of tail vertebrae, 133.4 mm. (127–145); length of hind foot, 24.6 mm. (24–26); ear, 20.6 mm. (18–23).

NUMBER OF SPECIMENS.—43: Panjachel (altitude 4900 feet), 40; San Lucas (altitude 4900 feet), 3.

FIELD NOTES.—At Finca Cipres I was told of a small nocturnal rat which was sometimes seen in the trees. It was described as having a "tail like a chipmunk," Indeed, the native coffee planter tried for some time, one night, to show me one of these little fellows that he had picked up in the rays of his carbide hunting lamp, but without result. When he shot it, at my request, it was immediately divided among a dozen hounds waiting below, who neglected to save any fragments for me to use as evidence. I suppose that it must have been this species and, if so, it places Volcan Zunil as a further extension of its range. All of the specimens from Panajachel were secured for me by the Indian boys who, with their "bean shooters," drove them from their nests in the large avocado trees and killed them as they scampered along the branches.

The nests were not so large as those built by the red squirrels, but were similar in general structure, composed of fine vegetable fiber and not very well hidden in the upper forks of the trees. In this particular section they were all in the avocado trees, the fruit of which they seem to eat, as do most of the small mammals of the forest. The tooth marks seen on the fallen fruit furnish an excellent index to the local fauna.

At San Lucas two specimens were taken, one in a trap set on the top of a nest built by a *Neotoma*, the other set at the foot of a wild fig tree, the fruit of which is quite popular with most of the birds and small mammals of the region. Both traps were baited with the regular lure of peanut butter and oat meal.

Near San Lucas is a dark "barranco," so narrow that the trees all but meet overhead, a location that furnished me several good things in ornithology. While hunting in this chasm one day I discovered that two *Nyctomys* were following me not more than a yard or two behind. Whether or not I had disturbed them from a shelter under a piece of driftwood, a few paces down the trail, I cannot say, but that seemed probable. When I paused to take observations they detoured a few yards to

one side, but in no manner did they show any fear. The gait was quite like that of *Neotoma* and showed no desire to hasten to cover, frequent pauses being made to inspect some small object of interest before passing on. In fact the entire "escape" suggested nothing so much as a small boy going to school in a slow hurry.

***Sigmodon hispidus saturatus* Bailey**

Teapa Cotton Rat

The Teapa cotton rat is a dark, rich colored species, being deep reddish brown on upper parts, dull cinnamon below, with a relatively short dusky tail and yellowish-brown hands and feet. The rich coloration of this species is uniformly well marked in the large series from Chipoc and Chimoxan and only a few individuals are whitish on under parts.

The dark colored Teapa cotton rat apparently replaces the lighter colored and longer tailed *S. zanjensis* of the western mountain ranges in the central tropical region of Guatemala.

MEASUREMENTS.—Average of five adult specimens from Chipoc and Chimoxan: total length, 262 mm. (250–270); length of tail vertebrae, 104 mm. (102–106); hind foot, 31 mm. (30–32); ear, 15 mm. (13–16).

NUMBER OF SPECIMENS.—55: Chimoxan, 30; Chipoc, 25.

FIELD NOTES.—An abundant species in all grassy openings at these two stations. Traps left set during the day were sure to catch as many rats as those baited and set at sundown. In fact, I think they do most of their eating during the hours of the day.

***Sigmodon hispidus furvus* Bangs**

Ceiba Cotton Rat

The eastern coastal representative of the *S. hispidus* group in Guatemala is a dark, rich colored form. It is closely related to *S. h. saturatus* but differs in having a richer color on upper parts and rather brighter and redder rump. This cotton rat was based on an only specimen from Ceiba, Honduras; therefore a specimen from Puebla, Guatemala, apparently the second on record, is of especial interest, as it extends its known range northward into the coastal region of Guatemala. I have not compared the Puebla specimen with the type, but it agrees closely in all the characters described by Bangs, with the exception of the tail measurement, which is somewhat shorter.

MEASUREMENTS.—Adult female from Puebla: total length, 242 mm.; length of tail vertebrae, 90 mm.; hind foot, 31 mm.; ear, 18 mm.

NUMBER OF SPECIMENS.—1, Puebla.

FIELD NOTES.—A common form along the plantings of bananas in this section. Often seen crossing the railroad tracks during the day.

***Sigmodon hispidus zanjonensis* Goodwin**

Zanjon Cotton Rat

The Zanjon cotton rat belongs to the *hispidus* group and is probably related to its neighbor, *S. h. saturatus*, though good intermediate examples are not available. It is similar in color to *S. h. borucae* of Costa Rica which, however, is considerably larger and sufficiently different. In cranial characters it approaches *S. h. saturatus* but differs in having uniformly grayer and somewhat rufescent pelage, white under parts, longer and distinctly bicolor tail.

The basis of the Zanjon cotton rat is a large series collected in the western highlands of Guatemala above 5000 feet, and characters peculiar to this form reach their strongest development at high altitudes in the middle western section.

There is very little geographical variation in the series. A few have under parts tinged with brownish and a large percentage have the hind feet more or less shaded with yellowish brown. An immature specimen from Sacapulas is considerably paler than the general series, with longer and softer fur, but is apparently referable to this species.

Specimens from Tecpam and San Lucas are typical, while those from Chanquejelve and Panajachel average a deeper shade of red.

MEASUREMENTS.—Type specimen from Zanjon: total length, 280 mm.; length of tail vertebrae, 124 mm.; hind foot, 30 mm.; ear, 16 mm. Average of five adults from Tecpam, Huehuetenango, Panajachel: total length, 278 mm.; (290–262); length of tail vertebrae, 120 mm. (127–115); hind foot, 32.4 mm. (35–30); ear, 13 mm. (14–20).

NUMBER OF SPECIMENS.—90: Zanjon, 1; Tecpam, 2; Huehuetenango, 1; Sacapulas, 1; San Antonio, 1; San Lucas, 11; Volcan San Lucas, 1; Chanquejelve, 22; Panajachel, 50.

FIELD NOTES.—In common with all forms of this genus met with in Guatemala, this cotton rat was quite diurnal and often seen crossing the trail along the grassy openings.

***Neotoma ferruginea ferruginea* Tomes**

Guatemala Wood Rat

The original description of the Guatemala wood rat was based on a British Museum specimen collected by Salvin at Dueñas, Guatemala. A

series of specimens from San Lucas includes what are undoubtedly typical *Neotoma ferruginea*. Conditions at San Lucas are very similar to those at Dueñas, altitude and flora being about the same. The volcano overshadowing Salvin's old station is in sight from San Lucas, some fifty miles distant.

The series of wood rats from San Lucas agree in detail with the type description. In color they are orange rufous on upper parts, darkened by black-tipped hairs along median dorsal line from nose to base of tail; under parts white slightly suffused with brownish in most specimens; feet usually whitish but some clouded with dusky. Compared with *N. f. chamula* from Volcan Santa Maria the differences are at once apparent. *N. ferruginea* is much brighter and richer colored, with under parts and feet whiter. Differences in cranial characters between these two forms are not well-marked, which shows their close relationship.

MEASUREMENTS.—Average of five adults near San Lucas: total length, 365.2 mm. (350–373); length of tail vertebrae, 170.8 mm. (155–185); length of hind foot, 35.4 mm. (35–36); ear, 24 mm. (21–25).

NUMBER OF SPECIMENS.—8, San Lucas.

FIELD NOTES.—At San Lucas two nests were found, both perfectly typical of the genus. Both were placed at the base of large rocks, in a thicket, and were composed of the usual sticks and small rubbish of the immediate neighborhood. These nests were not so large as most of those built by our northern species but otherwise were quite like those of California. Several specimens were taken in traps set among the rocks, where no signs of rat nests were to be seen. Nest building would seem to be somewhat unusual in this race, as the Indians did not seem to know of such a habit.

***Neotoma ferruginea solitaria* Goldman**

Nenton Wood Rat

The Nenton wood rat is an arid tropical member of this group. It is smaller and paler than typical *N. ferruginea* with a relatively longer and less massive skull. While it may be included in the *ferruginea* group, it is apparently not very closely allied to any of its near geographical neighbors. Specimens from Sacapulas agree closely with the type series of *N. f. solitaria* from the hot dry canyons near the upper end of the Chiapas valley. In color they are tawny ochraceous on upper parts, becoming brighter on sides; under parts white, the plumbeous basal color barely showing through; fore and hind feet white, but slightly clouded in some individuals; tail bicolor, brownish black above, dull gray below.

The Sacapulas specimens are from a hot, dry area near the upper end of the Rio Negro Valley. They are from a different river valley than the type series, and although these localities are separated by the continental mountain chain, the section in between it is not very high.

MEASUREMENTS.—Average of five adults from Sacapulas: total length, 340 mm. (320–352); length of tail vertebrae, 154 mm. (150–160); length of hind foot, 35 mm. (35–36); ear, 22 mm. (20–25).

NUMBER OF SPECIMENS.—7, Sacapulas.

FIELD NOTES.—All of the specimens of this race were taken within a small area composed of a short section of cactus hedge. Although other similar growths were seemingly as acceptable and traps were set repeatedly in these thickets, no other colonies could be located.

***Dasyprocta punctata chiapensis* Goldman**

Chiapas Agouti

The agoutis are medium-sized terrestrial rodents with three hoof-like claws on hind feet, short ears, coarse pelage and rudimentary tails. The present known range of *D. p. chiapensis* is southern Chiapas and probably adjacent parts of Guatemala. An immature specimen from Finca Concepcion is too young for very definite subspecific identification. It agrees in general color with the description of *chiapensis*, having upper parts tawny ochraceous finely mixed with black; under parts similar to back but paler; chin, armpits, inner sides of hind limbs and middle line of abdomen yellow buff. The skull, however, is too immature to show the broad posterior border of the premaxillae, small bullae, and other cranial differences characteristic of *chiapensis*.

MEASUREMENTS.—Not recorded.

NUMBER OF SPECIMENS —1 juvenile, Finca Concepcion.

FIELD NOTES.—Common in most of the sections visited on the east side of the Republic. In many places I saw pets that had free run of the place, with perfect opportunity to return to the brush and wild companions. Such "captives," however, even after only a few days' association with humans, refused to be driven back to the wilds.

In their wild state, they seem to be quite nocturnal. I think I saw less than half a dozen during the daylight hours, though they were often noted in the twilight.

***Sylvilagus floridanus chiapensis* (Nelson)**

Chiapas Cottontail

The Chiapas cottontail is a large, coarsely pelaged species that inhabits the highlands of Guatemala from about 2000 to over 10,000 feet

elevation. Its range is mainly in the Upper Sonoran and Transition Zones, but it occurs down to the upper border of the Tropical Zone. It is one of the largest of the subspecies of the *floridanus* group, similar in general characters to *S. f. aztecus* and *S. f. yucatanensis*, but it is darker colored, with hind legs duller and underside of neck darker. General color of a Guatemala specimen in fresh winter pelage is: upper parts ochraceous buff, heavily washed with black, becoming nearly clear black toward tip and bordered with a narrow band of white; fore legs russet; hind feet pale whitish-buff; nape deep rusty-rufous; under side of neck nearly wood-brown; rest of under parts white or whitish.

In size of cranial characters it surpasses all other species of the *floridanus* group except *yucatanensis*, with which it agrees closely in size but is a little shorter and narrower.

MEASUREMENTS.—Adult male from Momostenango: total length, 403 mm.; length of tail vertebrae, 50 mm.; length of hind foot, 95 mm.; ear, 75 mm.

NUMBER OF SPECIMENS.—2: Momostenango, 1; Panajachel, 1 juvenile.

FIELD NOTES.—Not uncommon in most of the dry sections, but so persecuted by dogs and men that specimens were very difficult to secure. Several were seen at Finca Cipres, Progreso, and Tecpam. At the last-mentioned place a native showed me a species that he called "Conejo del monte," said to be confined to the forest. The specimen showed no white on any part, the leaf-brown blending with the forest surroundings to perfection. Unfortunately, this specimen had been dug out of the burrow by a dog who took his pay before his master arrived and evidently considered his time of more value than I did. There was nothing left worth saving.

***Odocoileus thomasi* Merriam**

Huehuetan White-tailed Deer

White-tailed deer are readily distinguished from the brockets by their larger size and the possession of well-developed branching antlers. The Huehuetan white-tailed deer is a relatively large species for Middle America. Color of type from Huehuetan, Chiapas, taken February 22: upper parts, including side of belly, middle of breast, and neck all around, fulvous, becoming bright grizzled golden fulvous on back; muzzle grayish dusky; forehead mixed fulvous and black, becoming solid black in front of plane of ears, with a fulvous spot over each eye; chin white, with a black spot on each side of middle of lip, the spots nearly meeting on median line; inguinal region, middle of belly, inner side of

thighs and posterior aspect of forelegs white; upper surface of tail fulvous; below white. The type of *O. thomasi* is in a red coat, very short, and having the appearance of being quite fresh and probably representing what may be regarded as a summer pelage. It comes from a tropical area and the change in pelage may come early in the season. Specimens from Finca Carolina in western Guatemala, apparently also a tropical area, and so short a distance from the type locality of *O. thomasi*, agree so closely in cranial characters that they are probably referable to *thomasi*.

One specimen from Finca Carolina taken in May and in summer pelage approaches the type of *O. thomasi* in having pelage bright golden fuscous on back. Three others from the same locality, but collected in October, have probably acquired the winter coat and are duller, grayer, with a narrow blackish dorsal stripe from crown of head to shoulder, and agree very closely in color with *O. nelsoni* as represented by the type specimen. An immature specimen without skull from Finca Cipres, dark grizzled brownish-gray in color, and entirely lacking the golden fuscous of adult specimens, is here provisionally referred to *O. thomasi* on geographical grounds.

The deer of this region are imperfectly known and available material for comparison is limited.

MEASUREMENTS.—External measurements of the Guatemala series unfortunately were not recorded. One male has antlers 135 mm. long and short prongs on inner sides about midway of the length of the horns.

NUMBER OF SPECIMENS.—5: Finca Carolina, 4; Finca Cipres, 1.

FIELD NOTES.—Quite common in most parts of Guatemala and hunted with hounds at all seasons. Fortunately, the conditions are such that the deer are not apt to be exterminated. To judge by the antlers, the deer of the higher elevations are much the larger. In many places I saw collections of from a dozen to fifty antlers, showing that the specimens of the coastal plains, up to 3000 feet, were short, at times quite heavy, but lacking the "prongs" and length of the animal of the higher mountains.

***Mazama sartorii cerasina* (Hollister)**

Middle American Brocket

Brockets are small forest deer with antlers reduced to simple spikes not exceeding half the length of the head. The body is relatively heavy for so small an animal, but the limbs are very slender.

The middle American brocket is a richly colored form, differing from both *M. s. sartorii* of Mexico and *M. s. reperticia* of the Canal Zone in its darker and more reddish coloration.

In typical specimens of *M. s. cerasina* the entire upper parts, including sides of body, fore limbs to knees and outer sides of hind limbs to hocks, bright reddish chestnut, darkest on back and lighter on sides and limbs. Chin and throat warm buff; under parts of body like sides but lighter colored; tail above like rump, below white.

From nose to withers, including most of outer sides of ears, dark blackish-brown. Sides of muzzle, region around eyes and hairs of crown tuft mixed with reddish; lower limbs dark brown; feet reddish. The middle American brocket is more widely different from the Panama species than it is from the Mexican form. There are apparently no characters separating it from the latter form other than those of color. Specimens from Guatemala are only slightly paler than the type, but clearly resemble *cerasina* more than they do Mexican specimens of *sartorii*.

MEASUREMENTS.—Not recorded.

NUMBER OF SPECIMENS.—2, Barrillos.

FIELD NOTES.—Of rather general distribution, in most of the higher parts of the Republic. I saw evidence of its presence at Sepacuite, many parts of the Alta Vera Paz, and the volcanoes of the Pacific side. It seems to be an inhabitant of the thick undergrowth and to have little of the "staying" qualities of its larger relation. It is said that a common dog will often run one down and kill it. As for the hounds commonly used in hunting in Guatemala, the hunter often finds that his dogs have killed and eaten the quarry before he arrives.

***Dasypus novemcinctus mexicanus* Peters**

Mexican Nine-banded Armadillo

Armadillos of the genus *Dasypus*, which in Central America require comparison only with the genus *Cabassous*, are externally recognized by the four toes on the front feet, the middle pair being subequal in size. The skull is narrow, with a long, slender rostrum.

The dermal armor of the Mexican four-toed armadillo in the fresh specimen is dusky flesh-colored, darkening slightly in the mid-dorsal region. The armor is built of small plates—or scales—and consists of a frontal shield and also a pelvic and scapular shield, with nine transverse movable bands between. The tail has about twelve complete bony rings. From the posterior edge of the body bands project three or four short bristles from each scale.

The species *D. novemcinctus* is divisible into several slightly different geographical races, but externally there are no readily apparent characters

by which they can be recognized. The skulls, however, differ in details that are fairly constant; these details assist in determining the status of the forms.

Bailey fixed the type locality for *D. n. mexicanus* as Colima, as no locality more definite than Mexico was assigned in the original description. A specimen from Finca Cipres, Guatemala, agrees in respect to the small quadrate lachrimal and light dentition with the skull figured by Bailey from Colima and also with the specimen figured in Gray's 'Hand List of the Edentata.'

MEASUREMENTS.—Not recorded.

NUMBER OF SPECIMENS.—1 skull, Finca Cipres.

FIELD NOTES.—I found this animal quite common from sea level to the cloud forest at 9000 feet on the sides of Volcan San Lucas. I do not recall any noted from the east coast, but I saw evidence of it among the natives near Lake Isobel. We often ran the little pests with hounds when we were after better game, only finding the mistake when we ran the beast to its hole. I recall a hunt I had for jaguar down near the Pacific. The owner of the hounds told me that one of the cats had killed one of his pigs not over an hour past, which made it a sure shot that we could put the pups on a hot trail. Sure enough, they took the track with a yell, ran an hour and caught a "shellback." Again they were given the cat's trail and once more we hot-footed it for miles and hived another "armado." Anxious to kill one of these cats, I tried again and again, until we had five armadillos but no fur. It is surprising how long these little chaps can keep ahead of the dogs. At times they will run two or three miles, but more often they are but a short distance from their dens, which are usually in the rocks, if any are to be had along their range. I have eaten the meat of armadillo and found it quite to my ideas. It is in favor with the natives, who hunt it with dogs, usually at night.

FIELD NOTES OF SPECIES NOT INCLUDED IN THE COLLECTION

Alouatta villosa (howler monkey).—The type of *villosa* must have been a trade skin from Coban and been killed almost any place on the east side. I found the species common along the Rio Polochic and the lower Motagua, but was unable to collect any. Twenty years ago yellow fever killed most of the human population along the Polochic and at the same time the monkeys were about exterminated. I was told that they are just becoming as common as formerly. In the altos, west of Coban, and in the cloud forest, there are plenty, but the natives said that they are quite different from those in the lower sections, which might be, if the

wide strip of pine and oak, now separating their habitat, was not populated in times past.

Coendou mexicanum subspecies (tree porcupine).—At Finca Cipres I saw one that was caged for some three years and was quite a pet. It was not much, if any, more than half the size of one that I found by the trail near Finca Primavera, and which was so badly decayed that it could not be saved. A few skulls were seen in the highlands of the central and eastern parts of the country.

Cuniculus paca nelsoni? (spotted cavie or paca).—Known to the natives as “tepeizcuinte,” which is correct Spanish for badger. I found many skulls on the altars in the central parts of Guatemala and near the coasts I often met with natives selling the meat. The hind quarters furnish a surprising quantity of white meat, quite like the breast of young turkey. Along the sides of the volcanoes, near Lake Atitlan, the paca was not uncommon, living in cavelike holes under the rocks. They were quite nocturnal and none were ever seen alive. Hunted with dogs, they took to their holes, and if the holes were not large enough to admit two or more dogs, the pacas often came off victorious.

Pecari angulatus subspecies ? (collared peccary).—Common from the coast to at least 6000 feet. Often seen as pets. The species seemed to be where the feed was to be found, but by no means often seen.

Tayassu pecari subspecies ? (white-lipped peccary).—I often saw parts of the skins and was told that the species was somewhat less common than *Pecari angulatus* along the Pacific side. I was told the animal was found in Alta Vera Paz and have no doubt it is, but I did not see any skins that were surely of this species. In many parts of Guatemala I was told of a third species of “wild hog” that was somewhat smaller than the collared, red in color, and found in larger droves and much more to be avoided. Americans who had lived in the country many years and were quite able to understand the native assured me that they had a distinctive name for this species, and that it surely was to be found in the Peten. I was told also that it was still somewhat common in the Costa Grande, on the west side.

Tapirella dowii (tapir).—Along the Pacific, near the swamps, there are some tapirs, but I cannot place very much confidence in the data given me, which was to the effect that they were very common. I was told, on good authority, that there were a few in the high cloud forest, west of Coban. At this time, they are separated from the habitat of the animals of the Pacific side by many miles of forest not suited to the species, and perhaps never stocked with the species

PLATES 1 to 5

PLATE I

Fig. 1. Zanjón, 9000 feet elevation. The type specimen of *Sigmodon h. zanjónensis* was taken in the tall grass shown in the foreground.

Fig. 2. Forest of cypress above Teepam, 10,000 feet elevation. Shrews (*Cryptotis goodwini*) were found along the trail in this growth.



Fig. 1

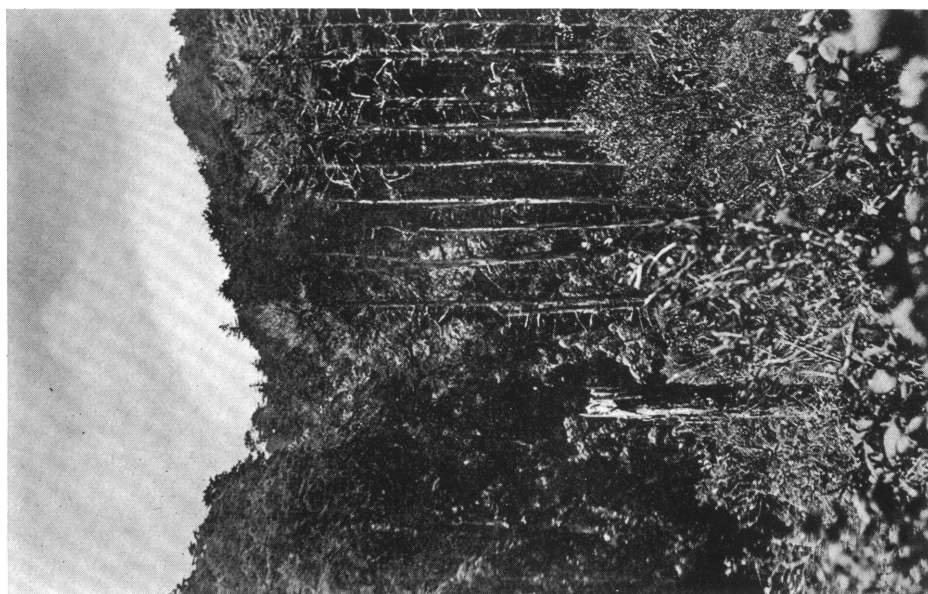


Fig. 2

PLATE II

Secanquim, 1600 feet elevation. Pine and forest. The type specimen of *Sciurus y. phaeopus* was taken in the section shown in right center of this picture. *Heteromys d. desmarestianus* was taken near there.

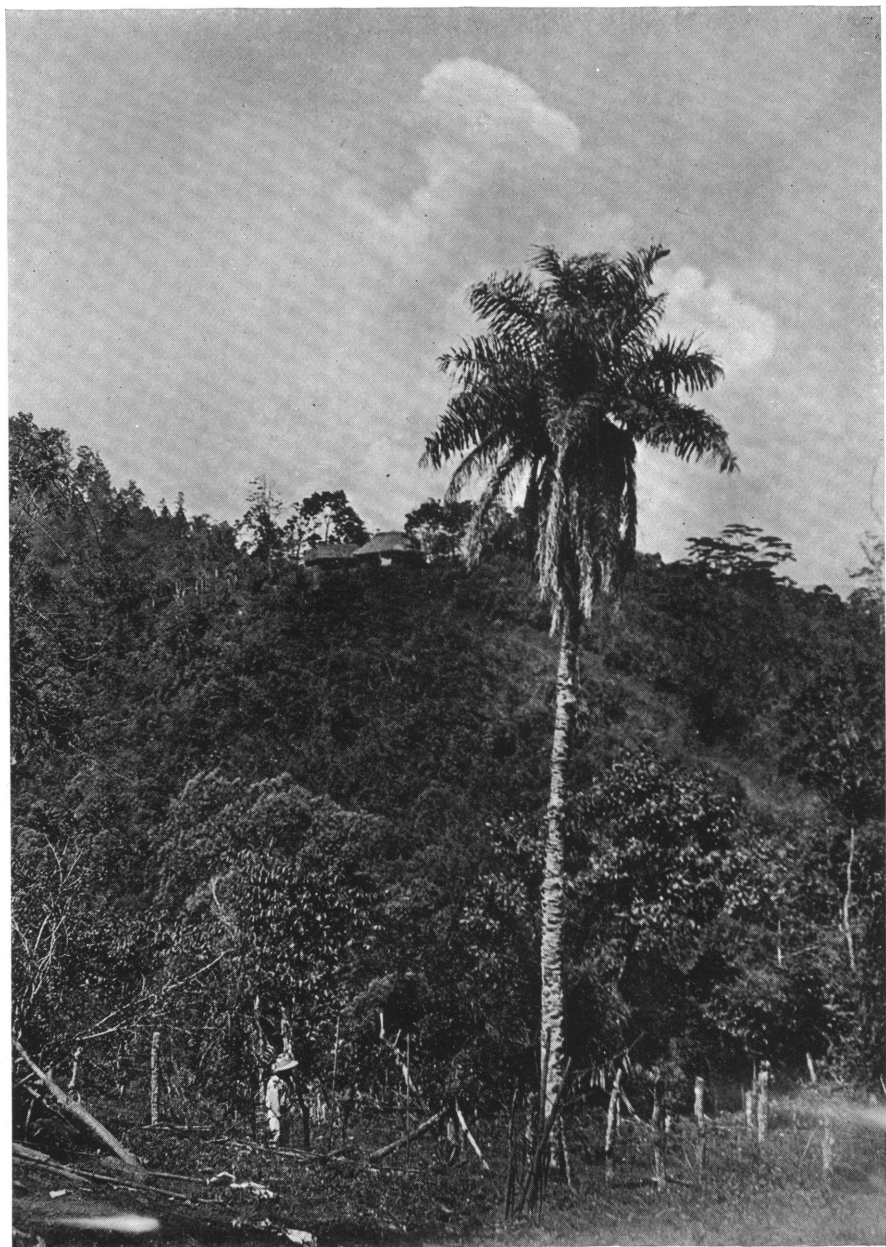


PLATE III

Fig. 1. Lake Atitlan, near Panajachel. Shrews (*Cryptotis micrura*) were taken in the grass shown in the foreground.

Fig. 2. Country near Momostenango, about 6500 feet. Forest, open pines, and oaks with very little undergrowth.



Fig. 1



Fig. 2

PLATE IV

Fig. 1. Finca La Primavera. Squirrels (*Sciurus deppei* and *Sciurus griseo-flavus*) were taken in the forest shown here and specimens of *Baiomys m. nigrescens* in the grass in the foreground.

Fig. 2. Tecpam from near Chichivac. Collections were made from a ranch house about three miles north of the town.



Fig. 1

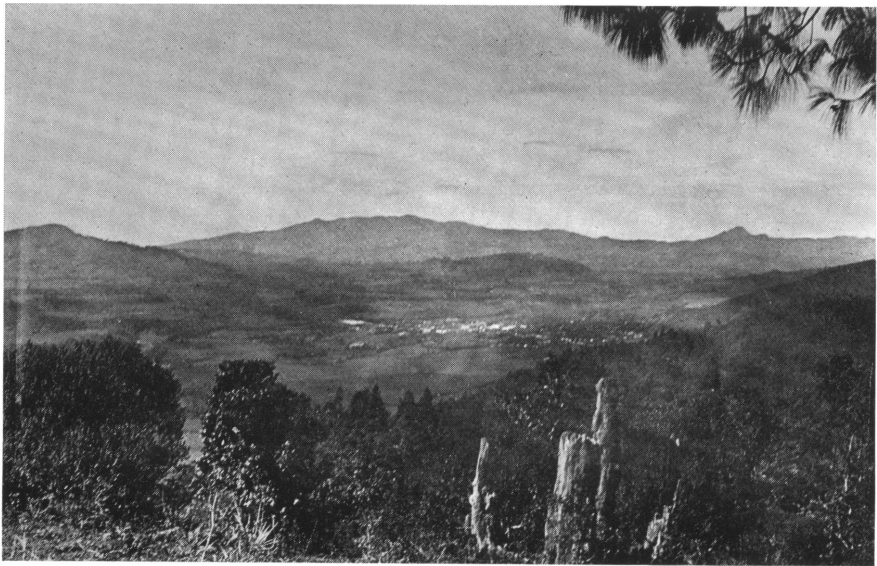


Fig. 2

PLATE V

Fig. 1. Cactus growth at Sacapulas. Habitat of *Neotoma f. solitaria* and *Baiomys m. musculus*, situated in the valley of the Rio Negro, a hot, arid, sandy area, surrounded by mountains.

Fig. 2. Finca "Concepcion," above Tucuru. All the mammals trapped here were from the section shown in about the center of the picture.



Fig. 1

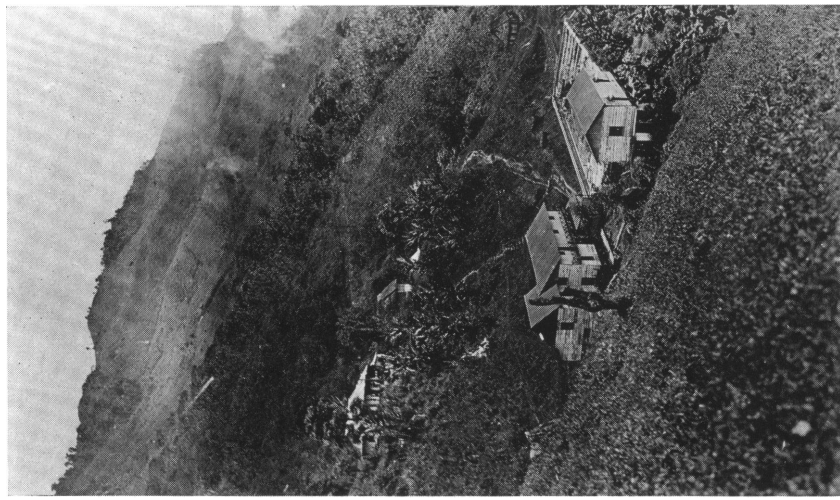


Fig. 2

