

Article XX.— PANAMA MAMMALS COLLECTED IN 1914–1915.

BY H. E. ANTHONY.

With Map.

During 1914 and 1915 several collections of mammals and birds were made in Panama by the American Museum of Natural History. Although very little of the mammal material proved new to science, a list of the species, with such notes as seem to be of interest, is deemed worthy of record, as the region is faunally an important one, connecting in some respects the fauna of Central America with that of South America.

Mr. E. A. Goldman, of the United States Biological Survey, detailed to work for the Smithsonian Institution in Panama, made extensive collections there in 1911 and 1912, and the material collected by the American Museum is in part a duplication of Mr. Goldman's work. Since he has described many new forms from Panama, and has ready for the press a complete report on all the mammals of Panama, this list is made as brief as possible. Through the kindness of Mr. E. W. Nelson, Acting Chief of the Biological Survey, and of Mr. E. A. Goldman, I have had the opportunity of comparing the American Museum series with those of Goldman's at Washington. I also wish to acknowledge indebtedness to Mr. Goldman in this connection for his help and advice in making these comparisons. Most of the identifications of species were made by direct comparison with Goldman's specimens. As he had previously worked up his collection in detail, his names are used provisionally without verification. Any credit due the Darien Expedition of the American Museum must be shared with Mr. Wm. B. Richardson of Matagalpa, Nicaragua, and Mr. D. S. Ball of this museum because of their hearty assistance in the field, without which the material results of the expedition would have been greatly reduced. Finally the author wishes to express his deep appreciation of the advice and help given him by Dr. J. A. Allen, Curator of the Department of Mammals and Birds.

In February and March, 1914, through the generosity of Mr. George Shiras 3rd, I was enabled to collect mammals in the Canal Zone of Panama for the American Museum. In consequence of the limited time spent in the field the collection was not very large and was made mainly at points in the Zone most readily accessible.

In October, 1914, the Museum sent Mr. Wm. B. Richardson into eastern Panama where he collected mammals and birds in the lowlands until February, 1915, when the author, accompanied by Mr. David S. Ball of the

department of birds in the American Museum, joined Mr. Richardson at Panama City. Here the party outfitted and, February 8, took a launch to El Real on the Tuyra River. The outfit was then transferred to canoes and the river ascended to the limit of canoe navigation at Tapalisa. Here Mr. Richardson remained for several weeks while Mr. Ball and I took packers and proceeded up into the cordillera to the old Indian village of Tacarcuna where collecting was carried on at an elevation of about 2600 feet. Late in March a still higher camp, about 5200 feet above sea level and approximately the highest continuous country attained, was made on the slopes of Mt. Tacarcuna. Returning to the lowlands the middle of April to establish new collecting sites we were caught by the rainy season and forced to abandon work at the higher elevations. Mr. Ball and the author returned to New York with the material then on hand while Mr. Richardson spent the latter part of April and the month of May collecting at Cituro and Boca de Cupe, in the lowlands.

Topography.

Eastern Panama has a varied topography. On the Pacific side the land is very low and heavily forested with dense tropical jungle. This whole general region is drained by the Tuyra River, a drowned river up which the tide ascends about 70 miles to Pinogana, just above El Real. At its mouth the river has a width of about five miles, and although allowance must be made for the volume of the river being increased by the tide-waters of the Pacific, the amount of fresh water discharged is very considerable. Above the head of tide-water the river ascends by gradual stages until the rapids and shoals are encountered, just below Boca de Cupe. From here up to Tapalisa, on the Rio Pucro, the river has more fall and is difficult to ascend with a large canoe. The character of the country remains the same from San Miguel Bay to Tapalisa, mainly flat, with low, rolling, forested hills.

At Tapalisa an elevation of 1000 feet is reached and here the first line of foothills of the cordillera are met. The trail from Tapalisa to Tacarcuna begins to rise after an hour out, and from then on the country is very steep and mountainous. The ridges run in long parallel series and are terraced off by the intervening ravines in rises of about 1000 to 2000 feet. Everywhere the same heavy forest and undergrowth flourishes, and is so thick that only occasionally may one see any distance from the crest of a high ridge. The mean elevation of the main ridges is about 3500 feet, and their direction is roughly north and south.

At Tacarcuna, an old Indian village (deserted most of the time), the trail

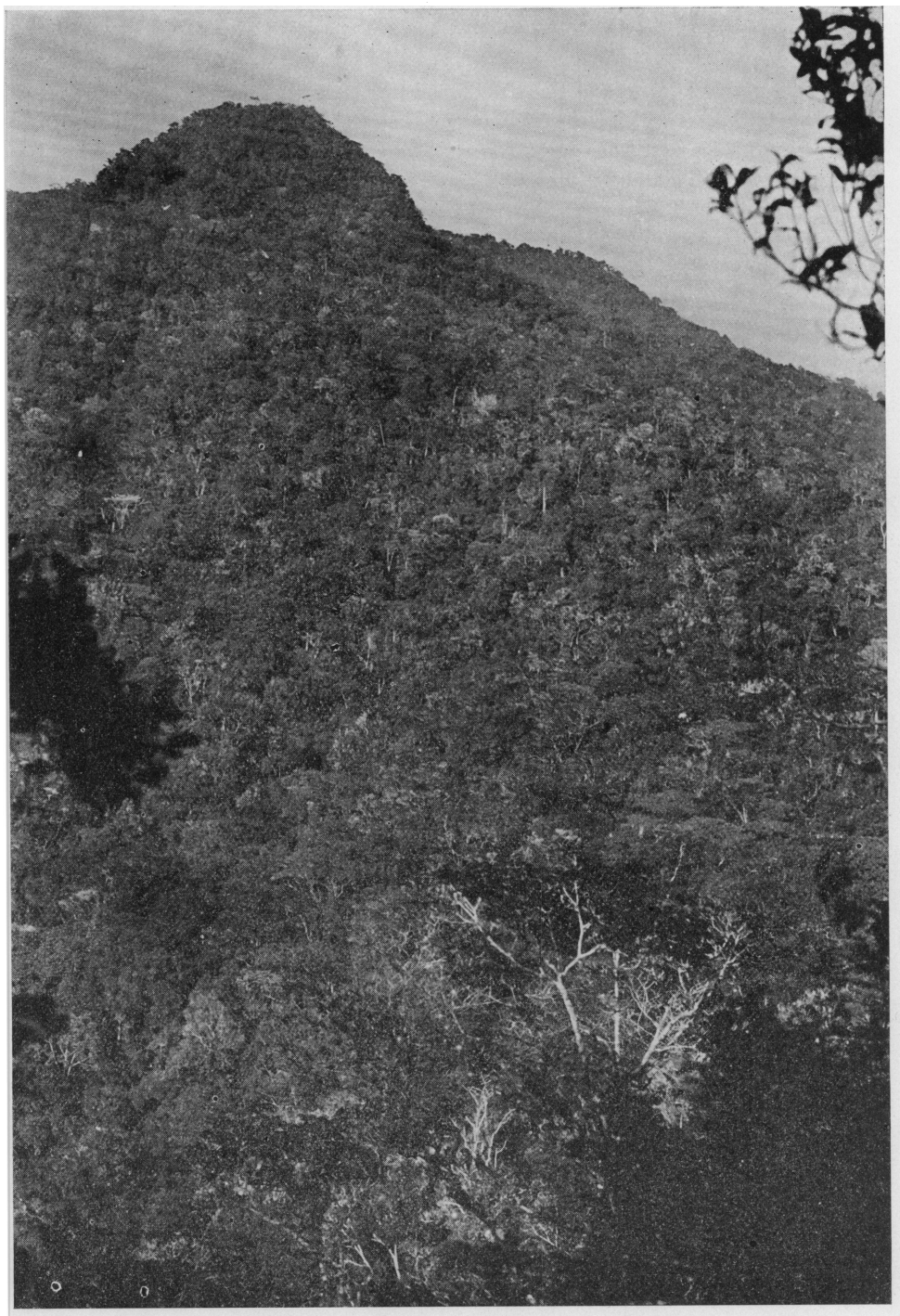


Fig. 1. Summit of Mt. Tacarcuna.

strikes the headwaters of the Rio Tapalisa. Here there are no level areas of any extent; the ridge crests are narrow and the slopes often precipitous to perpendicular. At this point the cordillera has been penetrated but the highest as well as the most eastern range is not met with until about five or six miles from Tacarcuna. Mt. Tacarcuna, with an elevation of 5650 feet by barometer, rises from this last range which has its crest at no point much below 5000 feet. To the eastward the land falls rapidly away and the level



Fig. 2. Rio Tuyra at El Real.

of the sea is reached in apparently but one or two descents. The line of foothills that extend to the westward of the main range has no counterpart on the east. From the last ridge on the east we could see a large body of water with a stream entering it that we judged must be the Gulf of Darien and the Atrato River.

The character of the forest growth remains the same eastward from the mouth of the Tuyra until an elevation of about 4500 feet, on the slopes of Mt. Tacarcuna, is reached. The density of the growth decreases with the



Fig. 3. Rio Pirri at El Real.

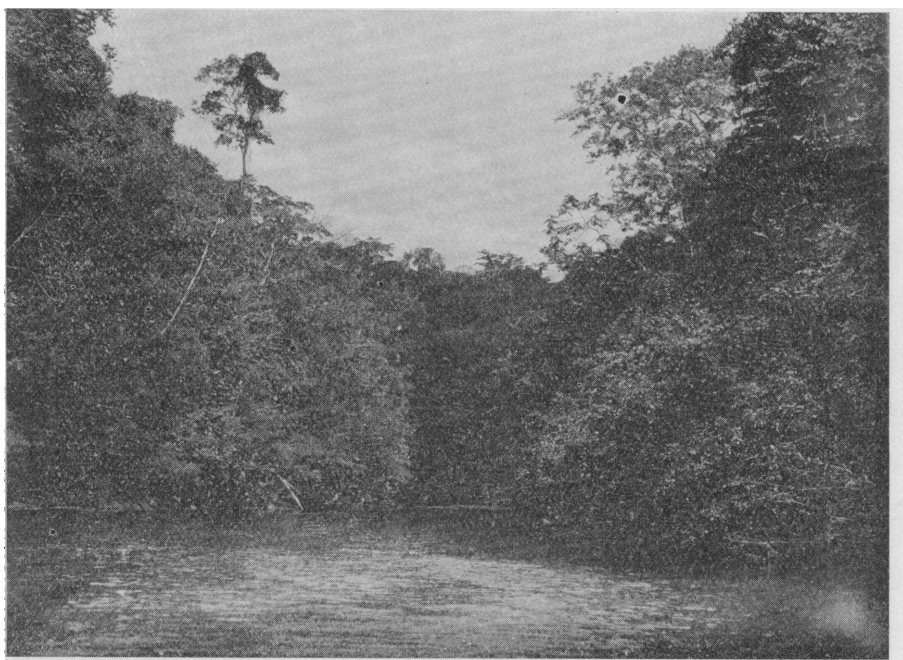


Fig. 4. Rio Pucro below Tapalisa.

rise in elevation but at the mountain a different type of forest is found. The growth is neither so heavy nor the trees so large as in the lowlands and it is evident that a new floral zone has been entered. Here a variety of tree ferns grow, but when an elevation of 5000 to 5500 feet is reached the appearance of the forest is much like that of northern forests of hard woods and birches. The heavy growth of the lowlands penetrates in favorable gulches up into the higher zone to about 5000 feet.

Mt. Tacarcuna itself is a steep conical peak that rises about 800 feet from

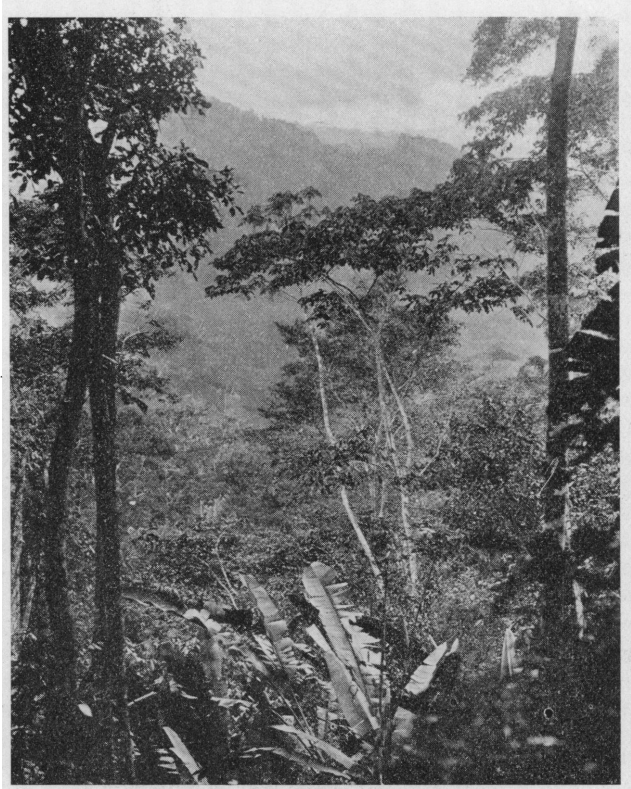


Fig. 5. Cordillera near Tacarcuna.

the main range. Its slopes are strewn with great blocks of stone, of a basaltic nature as nearly as could be ascertained for lichens and other vegetation clothed the rocks so densely that their determination was difficult, and its summit is overgrown with a dense, exceedingly hard-wooded shrub that made progress almost impossible. Mists continually sweep over it and it is

seldom that a complete view of the surrounding country may be obtained from the peak. The ridges as far as the eye can reach, not a very great distance in the Darien, are continuous and extensive, forming a serrated highland of considerable area with a north and south trend. These ridges, at some points, look to be at least as high as Mt. Tacarcuna, if not higher, and probably the maximum height of the Darien Cordillera is not very far from 6000 feet.

The main valleys of this high country are drained by rivers of clear, fairly cool water, which descend over rocky beds with a decided fall. When one leaves these few main streams, although the forests drip with water and the atmosphere is saturated with moisture, springs that come to the surface are almost unknown and the traveller has difficulty in securing enough water to drink. In the height of the rainy season the surplus water is carried off down the steep slopes by little gulches which scar the mountain sides.

High winds pass over the cordillera and numerous uprooted trees are the result. The rainy season usually sets in late in April and then the trails become slippery and impassable to men with packs.

This is a region of noticeable seismic activity, a very vigorous quake that brought down debris from the trees, and was accompanied by a heavy rumbling like distant thunder, was experienced March 29.

Systematic List.

1. ***Marmosa isthmica Goldman.***

A large series of murine opossums was taken, and includes localities from both low and mountainous regions. This series is identical with Goldman's type and with specimens taken near Mt. Pirri. There is no appreciable difference between those from sea level and those from 4000 feet elevation. The males are much larger than the females.

Specimens collected, 48.—El Real, 4; Gatun, 7; Maxon Ranch (Rio Trinidad), 2; Tapalisa, 2; Tacarcuna, 2650 feet to 4200 feet, 33.

2. ***Metachirus fuscogriseus fuscogriseus Allen.***

This species was encountered but once, at Gatun, and the specimen agrees in all particulars with the type of *fuscogriseus* from Central America.

Specimens collected, 1, from Gatun.

3. **Metachirus nudicaudatus dentaneus** Goldman.

A small series of this yellow brown opossum, taken in the Canal Zone and in the Darien, conforms well with Goldman's type from Gatun.

Specimens collected, 8.—Gatun, 3; Maxon Ranch (Rio Trinidad), 3; Tacarcuna, 2.

4. **Didelphys marsupialis etensis** Allen.

This large opossum was found to be not uncommon in the Canal Zone but was rather rarer in the Darien district.

Specimens collected, 8.—Boca de Cupe, 1; Cituro, 1; El Real, 1; Gatun, 5.

5. **Bradypus ignavus** Goldman.

The type locality of *ignavus* is Marraganti, and the sloths collected by these expeditions were none of them taken at a distance from Marraganti greater than 30 miles or at an altitude exceeding that of Marraganti by more than a few hundred feet. However my specimens are quite different from Goldman's *ignavus*, being much darker in tone throughout; the browns are stronger, reaching a decided chocolate color, the whites are quite yellow instead of clear white as in the Marraganti specimen. Moreover the series of four adults are uniform in these characters. Under the conditions it seems advisable to call my specimens *ignavus* on the assumption that individual variation or color phase will bridge over these marked differences.

Specimens collected, 5.—Cituro, 1; El Real, 3; Tapalisa, 1.

6. **Bradypus griseus** (Gray).

A sloth, sent to the Museum by Mr. Fred Huber of Gatun, is referable to this species. No others were taken.

Specimens collected, 1, from Gatun.

7. **Tamandua tetradactyla chiriquensis** Allen.

This ant-eater was seemingly rare as but two specimens were secured.

Specimens collected, 2.—Chepigana, 1; Maxon Ranch (Rio Trinidad), 1.

8. **Pecari crusnigrum** (Bangs).

This species was found to be generally distributed throughout the Zone as well as the mountains to the southeast. Animals collected in both regions are referred to *crusnigrum* from Chiriqui.

Specimens collected, 5.—El Real, 2; Gatun, 3.

9. **Tayassu pecari** (subsp. ?).

Natives reported this animal as not uncommon, and a small band supposed to be this species was encountered along the cordillera at about 5000 feet elevation but no specimens were secured.

10. **Mazama sartorii reperticia** *Goldman.*

The brocket deer was taken in southeastern Panama where it seemed to be fairly common. Dr. Allen has identified the specimens as the above subspecies.

This deer was exceedingly wary and hard to shoot. Many were heard when frightened by our passage along the trails but it was very unusual to see one. In addition to those collected, this species was noted at Tacarcuna at elevations from 3000 to 4500 feet.

Specimens collected, 11.—Boca de Cupe, 1; Chepigana, 1; Cituro, 1; El Real, 4; Maxon Ranch (Rio Trinidad), 1; Tapalisa, 3.

11. **Tapirella bairdi** (*Gill*).

Although no specimens of tapir were secured, tracks of this species were noted frequently in the Canal Zone and on the slopes of Mt. Tacarcuna.

12. **Mesosciurus gerrardi morulus** (*Bangs*).

Squirrels taken at Gatun are referable to *morulus* of Bangs, type locality Loma del Leon, Panama. *Morulus* was not taken elsewhere but in a large series of *choco* taken in eastern Panama, a specimen from El Real and another from Tapalisa show marked intermediate characters between *morulus* and *choco*, and if taken singly, with none of the darker individuals, would have to be called *morulus*.

Specimens collected, 3, from Gatun.

13. **Mesosciurus gerrardi choco** (*Goldman*).

This black-backed subspecies was found quite generally distributed throughout southeastern Panama, although nowhere did it seem to be as common as the squirrels of northern woods. The series bears out Goldman's description of the type from Cana. The characters which separate it from *morulus*, while variable, as would be expected, are in most cases readily apparent.

Specimens collected, 35.—Boca de Cupe, 4; Chepigana, 4; Cituro, 6; El Real, 7; Tacarcuna (altitudes from 2650 to 5200 feet), 12; Tapalisa, 2.

14. **Microsciurus alfari venustus** Goldman.

The pygmy squirrels collected in Panama seem to fall into two groups separated from one another by distinct although somewhat variable characters. The series of six specimens can be divided by color characters; they were all collected in the same general locality but *venustus* was taken at slightly higher elevations and on the crest and eastern slope of the cordillera. Three of the specimens agree closely with the type of *venustus* from Gatun.

These squirrels were very rare and were very hard to secure although the natives told me they saw them quite frequently. One that was observed displayed much the same habits as those of the northern chickaree, scolding in a harsh, husky fashion and jerking the tail emphatically.

Specimens collected, 3.—Mt. Tacarcuna (5200 feet altitude), 3.

15. **Microsciurus isthmius vivatus** Goldman.

Squirrels collected out from the old village of Tacarcuna are referable to *vivatus*, described from Cana, but they also resemble *isthmius* Nelson to a marked degree.

Specimens collected, 3, all from Tacarcuna, 2650 feet altitude.

16. **Peromyscus (Megadontomys) pirrensis** Goldman.

The commonest rat of southeastern Panama is the big *pirrensis* of Goldman. It was not taken at elevations below 2650 feet but ranges from somewhere about this altitude up to the crests of the cordillera, 5200 feet. A large series was taken at the old village of Tacarcuna and at intermediate points up to Mt. Tacarcuna. It was trapped everywhere throughout the forest of this region.

Specimens collected, 50.—All from the Tacarcuna region from 2650 feet to 5200 feet altitude.

17. **Tylomys fulviventor** sp. nov.

Type No. 38063, ♀ adult, Tacarcuna, District of Darien, Panama. Alt. 4200 ft. March 13, 1915. Collector H. E. Anthony.

Similar to *watsoni* of Thomas but differing markedly from it in color.

Color above argus brown of Ridgway becoming darkest toward the rump, with some admixture of darker, almost black, hairs. Sides lighter in tone than the back; fore and hind limbs above the same color as adjacent parts. Hands and feet dusky above, the toes but very little lighter than the metapodials. Bases of hairs everywhere above slate gray. Head with same general coloration as sides of body and with the dark color of the back extending somewhat in advance of the ears.

Color below unique; a median line from 3 to 8 mm. wide, from pectoral region to base of tail, russet; area between this line and the darker color of the sides ochraceous buffy; throat varying from warm buff to light ochraceous buff; base of tail auburn. Hair of mid-underparts unicolor to base. Under side of limbs with median encroachments of the lighter color of adjacent parts.

Tail for basal half black, somewhat grayer below; terminal half, in flesh, clear white, in dried skin, pale yellowish white.

Skull characters the same as for the genus. Compared with adult *watsoni*, *fulviventer* has the skull with longer incisive foramina, reaching back to plane of first molars. Nasal-premaxillæ suture with frontals convex, the nasals extending posteriorly beyond the premaxillaries.

Measurements.— Total length, 451; tail vertebræ, 233; hind foot, 38; all from animal in the flesh. Skull, total length, 51; zygomatic breadth, 25; nasals, 19; palatal length, 205; maxillary tooththrow, 8; incisive foramina, 10.

Mammæ 4, inguinal.

Specimens examined: 1, the type.

It is rather surprising to find an apparently undescribed *Tylomys* in Panama whence two species, *watsoni* and *panamensis* have already come. However the specimen from Mt. Tacarcuna differs so much in coloration from either of the above species that it seems evident from the material on hand and from the literature on the genus that it is entitled to full specific rank. Scarcity of specimens of this genus and the impossibility of deciding with certainty the status of *panamensis* Gray without examination of the type create rather unsatisfactory conditions. Compared with specimens of *watsoni* from Chiriqui, Panama, the rich warm coloring of *fulviventer* is alone a sufficient distinction, while the character of the nasals is much different in the two forms, the nasals of *fulviventer* being longer than the premaxillaries, those of *watsoni* "decidedly surpassed by the premaxillæ" (Thomas). The feet of *fulviventer* have toes of approximately the same shade as the metapodials but in *watsoni* the "whole of the digits [are] white" (Thomas). *Panamensis* is described as white-bellied, and the only material for comparison available, an immature specimen from Talamanca, Costa Rica, has white underparts and the same general coloration as *watsoni*. Compared with two specimens of *nudicaudus* Peters from La Carpintera, Costa Rica, and from Nicaragua, somewhat the same coloration above is noted but here again, as far as may be determined from the fragmentary specimens and from Peters' original description,¹ the white underparts prove the distinctness of *fulviventer*; and furthermore *nudicaudus* has the digits white, contrasting noticeably with the dark metapodials.

The possibility that the peculiar color of the under parts is due to stain must be taken into consideration but this seems unlikely because the brown

¹ Peters — Monatsb. Akad. Wissens. Berlin, 1866, p. 404.

hairs are in too definite arrangement and are correlated with the strong brown color of the upper parts. A stained specimen of *watsoni*, for example, it seems fair to believe, would not resemble *fulviventer*.

This rat was taken in a banana-baited trap set at the foot of a large tree in the fairly heavy forest that clothes Mt. Tacarcuna. Although the locality was diligently trapped for more, none were taken. A rat thought to be this species was smoked out of a hollow tree, together with a few bats, but it escaped into a hole before it could be secured.

18. ***Sigmodon borucæ chiriquensis*** *Allen.*

This rat was taken only at Gatun where it was found in a low grassy meadow near the Chagres.

Specimens collected, 1, from Gatun.

19. ***Zygodontomys cherrei ventriosus*** *Goldman.*

This species was found but rarely. It was taken only at low elevations.

Specimens collected, 6.— El Real, 1; Gatun, 4; Old Panama, 1.

20. ***Oligoryzomys costaricensis*** *Allen.*

Two small mice from the savannas of Old Panama are referred to *costaricensis*, proving to be indistinguishable from a series of this species taken at Boqueron, Panama.

Specimens collected, 2, from Old Panama.

21. ***Oryzomys pirrensis*** *Goldman.*

This large *Oryzomys* was taken only at the upper camp on Mt. Tacarcuna, 5200 feet altitude. It did not appear to be common as but six specimens were secured. Externally this species bears such a strong resemblance to the *Megadontomys* so common throughout the whole region that it required the closest examination of the animals in the flesh to separate them. The more buffy parts of this *Oryzomys*, together with a more naked and more finely annulated tail, and shorter whiskers, serve as the best field characters.

Specimens collected, 6, from Mt. Tacarcuna.

22. ***Oryzomys alfaroi dariensis*** *Goldman.*

A single immature specimen of this species, seeming to agree satisfactorily with Goldman's series from the Pirri region, was trapped on Mt. Tacarcuna.

Specimens collected, 1, from Mt. Tacarcuna.

23. ***Oryzomys frontalis* Goldman.**

One specimen, taken at the old Indian village of Tacarcuna is referred to *frontalis*.

Specimens collected, 1, from Tacarcuna.

24. ***Oryzomys talamancæ* Allen.**

This soft-haired *Oryzomys* was found sparingly throughout the lowlands from the Canal Zone to the Darien. These specimens differ apparently in no material details from the type taken at Talamanca.

Specimens collected, 15.—Cituro, 1; El Real, 1? (quite young); Maxon Ranch (Rio Trinidad), 3; Tacarcuna, 1; Tapalisa, 9.

25. ***Melanomys idoneus* (Goldman).**

The dark *Melanomys* was found to be quite common in the clearing at the old village of Tacarcuna, but seemed rather rare at lower elevations. It was not found at elevations above 4200 feet. Animals from sea level in the Zone are not appreciably different from those taken at Tacarcuna. These specimens are identical with *idoneus* of Goldman but are also very much like *chrysomelas* Allen from Costa Rica.

Specimens collected, 29.—El Real, 2; Gatun, 1; Maxon Ranch (Rio Trinidad), 3; Tacarcuna, 23.

26. ***Nectomys alfari efficax* Goldman.**

This species was found to be fairly common at Tacarcuna but, strangely was not taken elsewhere.

Specimens collected, 15, all from Tacarcuna, 2650 feet elevation.

27. ***Neacomys pictus* Goldman.**

Two of these small spiny mice, taken at Tacarcuna, are identical with the type of Goldman's *pictus*. The genus was not encountered elsewhere. Specimens collected, 2, from Tacarcuna.

28. ***Macrogeomys dariensis* Goldman.**

The large black pocket-gopher was first encountered at Boca de Cupe. It was not found in the Canal Zone nor on the crest of the cordillera, the highest "earths" noted being at about 4200 ft.

Specimens collected, 9.—Boca de Cupa, 3; Tacarcuna, 5; Tapalisa, 1.

29. **Heteromys zonalis** Goldman.

A single specimen taken on the lower Rio Trinidad at the Maxon Ranch proves to be *zonalis* described from a specimen taken near Gatun, about 25 miles distant.

Specimens collected, 1, from Maxon Ranch (Rio Trinidad).

30. **Heteromys crassirostris** Goldman.

A *Heteromys* taken on Mt. Tacarcuna at an elevation of 5200 feet, upon comparison with Goldman's material, is referred to *crassirostris*.

Specimens collected, 1, from Mt. Tacarcuna.

31. **Isothrix darlingi** Goldman.

Two specimens of this rare rat were collected by Richardson near Tapalisa. They were frightened from a hollow tree and he shot them as they were running along the limbs, the animals falling into the river from the overhanging tree when shot.

Specimens collected, 2, near Tapalisa.

32. **Proechimys centralis panamensis** Thomas.

This spiny rat was quite abundant at low elevations, less so at higher points and none were taken on the crest of the mountain range.

Specimens collected, 46.—Boca de Cupe, 3; Cituro, 5; El Real, 8; Gatun, 21; Maxon Ranch (Rio Trinidad), 3; Tacarcuna (2650 feet altitude), 3; Tapalisa, 3.

33. **Hoplomys goethalsi** Goldman.

The *Hoplomys* taken at Gatun is topotypical of *goethalsi*, and those taken at other points differed in no respects from the Gatun individuals.

Specimens collected, 8.—Gatun, 2; Tacarcuna (2650 feet altitude), 6.

34. **Dasyprocta isthmica** Alston.

Agoutis were collected both in the Zone and in the Darien region up to about 800 feet elevation. A specimen taken on the lower Rio Trinidad, about 20 miles from Gatun and about 25 miles from Colon, the type locality of *isthmica*, is assumed to be typical (a topotype), and is indistinguishable from the series taken in the Darien.

Specimens collected, 9.—Boca de Cupe, 3; Chepigana, 2; Cituro, 1; El Real, 2; Maxon Ranch (Rio Trinidad), 1.

35. **Hydrochœrus isthmius** *Goldman.*

The capybaras collected on the Rio Tuyra, the only place where this animal was encountered, are practically topotypical, as Marraganti, the type locality of *isthmius*, is but two miles from El Real.

36. **Sylvilagus gabbi gabbi** *Allen.*

A specimen taken near the ruins of Old Panama differs noticeably from specimens of *gabbi* taken by Goldman in the Canal Zone, in the heavily forested section. The Panama individual came from the savanna region and is lighter in color throughout. The chestnut of the top of the head is weaker in tone and with no intermixed black hairs, and the sides of the head also lack the black hairs of *gabbi* from the forests. It appears somewhat as if the savanna country was inhabited by a race of the forest species, having lighter coloration as the principal character. However the material available is not sufficient to warrant any definite conclusions and until more is acquired the name *gabbi* will be best applicable to this specimen.

Specimens collected, 1, from ruins of Old Panama.

37. **Sylvilagus gabbi messorius** *Goldman.*

Compared with the type series from Cana, the specimens collected by the American Museum match *messorius* very closely, as would be expected on geographical grounds.

Rabbits were not very common, the few that were taken being trapped in runways or brought in by natives.

Specimens collected, 9.—Boca de Cupe, 3; Tapalisa, 4; Tacarcuna, 2.

38. **Panthera onca centralis** (*Mearns*).

One specimen shot near Boca de Cupe by an Indian hunter, seems, upon comparison with the type of *centralis*, a skull from Talamanca, Costa Rica, to be *centralis*. The Talamanca skull is much larger than that of the Panama specimen but the former is an old male while the latter is younger and probably a female. Compared with the type skin of *hernandezii goldmani* from Campeche, Mexico, the Panama cat has larger spots, especially on the head, but is otherwise very similar.

Specimens collected, 1, from Boca de Cupe.

39. **Oncoides pardalis mearnsi** (*Allen*).

The smaller cats were found to be rather rare in the Darien, if judgment may be based upon specimens taken, for but one animal was secured.

Specimens collected, 1, from El Real.

40. **Nasua narica panamensis** *Allen*.

The nasua taken in southeastern Panama is *panamensis*, the type locality being Boqueron, Panama.

Specimens collected, 8.— Boca de Cupe, 1; El Real, 1; Tacarcuna, 2; Tapalisa, 4.

41. **Potos flavus chiriquensis** *Allen*.

The kinkajous collected in southeastern Panama, none being taken in the Canal Zone, comprise a series with considerable range in color variation, from individuals with a lively ochraceous tone on the flanks and underparts, to those with a much flatter tone of yellow buff. The color of the upperparts also varies considerably in much the same manner.

Two were taken from a hollow tree at Tacarcuna, two were shot by moonlight and with the jack light at the upper camp on Tacarcuna, and others were secured from the natives. At the upper camp this species came nightly to feed on what seemed to be a variety of wild fig, a fruit about the size of a man's thumb, with a pink center. Shortly after sundown, a small band of probably eight to a dozen individuals would be heard coming into the fruit tree. They travelled entirely through the trees and did not descend to the ground. Quantities of dead twigs and debris were shaken down by their weight, and their progress could be thus noted when the moving branches could not be seen.

The eyes of the Kinkajou ("Cusumbi" or "Manteja," native names) shine strongly red under the jack light. One was eaten and its flesh proved to be quite palatable. A nasal, grunting, sound was the only call heard.

Specimens collected, 7.— Tacarcuna (2650 feet to 5200 feet altitude), 4; Tapalisa, 3.

42. **Tayra barbara biologiae** (*Thomas*).

No differences of subspecific value were noted to separate the Darien *Tayra* from *biologiae* which was described from Veragua, Panama. However, the range of individual variation in the series collected is very great. Upon the one occasion when this animal was encountered by our party, I found it to be most interesting, it having marked resemblance in behavior to our northern weasels and martens. It was exceedingly curious and unafraid.

Specimens collected, 9.— Tacarcuna, 3; Tapalisa, 6.

43. **Lutra repanda** *Goldman*.

Otter were reported to be quite common in the rivers of Darien, where surely the abundant fish life could support them, but only one was noted

by our party. I shot one near the junction of the Rio Tapalisa and the Rio Tacarcuna but the wounded animal was lost in the rapid stream. Indian hunters brought in two.

Specimens collected, 2, from Tapalisa.

44. **Myotis chiriquensis** *Allen.*

This small bat was found throughout the region visited.

Specimens collected, 11.—Chepigana, 1; Cituro, 1; El Real, 3; Gatun, 1; Tacarcuna, 2; Tapalisa, 3.

45. **Saccopteryx bilineata** *True.*

One of these bats was taken in Cituro by Richardson.

Specimens collected, 1, from Cituro.

46. **Chilonycteris rubiginosa rubiginosa** *Wagner.*

This species was found in the Chilibrillo caves in smaller numbers than either *Hemiderma* or the large *Phyllostomus*. It seemed to segregate itself and was not found mingled with the other species of the caves.

Specimens collected, 10, all from the Rio Chilibrillo.

47. **Phyllostomus hastatus panamensis** *Allen.*

As the type locality of *panamensis* is Boqueron, Panama, the bats collected in southern and eastern Panama, present no differences from this subspecies.

Specimens collected, 25.—Boca de Cupe, 4; Capeti, 4; El Real, 8; Rio Chilibrillo, 9.

48. **Artibeus watsoni** *Thomas.*

A small series of small *Artibeus* from the lowlands of eastern Panama is indistinguishable from *watsoni* taken at Boqueron by Batty. One specimen, No. 37599, is however much lighter colored with the hair everywhere very light at the base.

Specimens collected, 6, from Chepigana.

49. **Uroderma bilobatum** *Peters.*

These specimens present no noteworthy differences distinguishing them from *bilobatum*.

Specimens collected, 11.—Capeti, 7; Chepigana, 1; El Real, 3.

50. **Hemiderma perspicillatum aztecum** (*Saussure*).

This common species was found in great numbers in limestone caves up the Rio Chagres (Rio Chilibrillo) where it was the most abundant bat of the caves.

Specimens collected, 36.— El Real, 1; Rio Chilibrillo, 30; Tacarcuna, 4; Tapalisa, 1.

51. **Leontocebus geoffroyi** (*Pucheran*).

This small monkey was fairly common throughout the whole region where collecting was done, and specimens from the high mountains of the cordillera are specifically the same as those of the Zone. In this series the yellowish underparts, which Elliott¹ made a character of his *salaquiensis*, a species which he withdrew² later upon the basis of additional material, occur frequently and show that this character is a variable one with no diagnostic value.

Specimens collected, 28.— Boca de Cupe, 1; Chepigana, 6; Cituro, 4; Maxon Ranch (Rio Trinidad), 1; Tacarcuna, 12; Tapalisa, 4.

52. **Alouatta palliata inconsonans** *Goldman*.

This monkey was noted the oftenest because of its far reaching call-note. It seemed to be everywhere common from the Zone up to the crests of the cordillera.

Specimens collected, 5.— Cituro, 1; Maxon Ranch (Rio Trinidad), 1; Mt. Tacarcuna (5200 feet), 1; Tapalisa, 1.

53. **Aotus zonalis** *Goldman*.

Although my specimens were taken in southeastern Panama, no material differences between them and the type from Gatun in the Canal Zone are evident. The type is less richly suffused, but this difference is probably not outside the limits of individual variation.

Specimens collected, 8.— Boca de Cupe, 1; Tapalisa, 7.

54. **Cebus capucinus** (*Linnaeus*).

The white-faced monkey of the Darien region is considered by Goldman to be typical. This species was taken both in the lowlands and the mountains but skins from the two extremes seem indistinguishable.

¹ Elliot, Bull. Am. Mus. Nat. Hist., 1912, p. 137.

² Elliot, Bull. Am. Mus. Nat. Hist., 1914, p. 644.

Specimens collected, 9.—Chepigana, 1; El Real, 2; Tacarcuna (3000 feet to 5000 feet altitude), 6.

55. *Ateles dariensis* Goldman.

Spider monkeys were noted but once in the high mountains (5000 feet), and specimens were secured only at Tapalisa.

Specimens collected, 2, from Tapalisa.

Explanation of Map of Darien Region.

Route taken by the expedition.

Localities worked, with dates of arrival and departure.

- (1) Chepigana.— Nov. 28–Dec. 15, 1914.
- (2) El Real.— Dec. 17, 1914–Jan. 23, 1915.
- (3) Boca de Cupe.— April 26–May 4, 1915.
- (4) Cituro.— May 6–May 20, 1915.
- (5) Capeti.— May 23–May 29, 1915.
- (6) Tapalisa.— Feb. 16–March 18, 1915.
- (7) Tacarcuna.— Feb. 20–March 27, 1915.
- (8) Mt. Tacarcuna.— March 28–April 18, 1915.

Goldman's localities of Mt. Pirri and Cana indicated on map by crosses ×
Principal localities in the Canal Zone (not shown on map) with dates of collecting.

Gatun.— Feb. 14–18; Feb. 25–March 4, 1914.

Old Panama.— Feb. 20–23, 1914.

Maxon Ranch, Rio Trinidad.— March 7–17, 1914.

Rio Chilibrillo.— March 1 and March 24, 1914.

