

ARTICLE XIV.—*Notes on a Collection of Mammals from Costa Rica.* By J. A. ALLEN.

I am indebted to Mr. George K. Cherrie, Taxidermist and Acting Curator of Mammals, Birds, and Reptiles, in the Museo Nacional de Costa Rica, for the opportunity of examining the mammals which form the basis of the present paper. They belong in part to the Museo Nacional, and in part personally to Mr. Cherrie. The American Museum is indebted to the authorities of the Museo Nacional and to Mr. Cherrie for a set of duplicates from the joint collection here under notice.

The collection numbers altogether about 100 specimens, partly skins and skeletons, and partly spirits specimens, representing 38 species. The Carnivores and the larger mammals generally are scantily represented; the Bats also are not numerous, but the collection is rich in *Muridæ*, of which there are nine species, three of them apparently new to science. There is also a new *Blarina*, which, very surprisingly, turns out to belong to the 32-toothed section of the genus, not before reported from south of the United States. Many of the specimens were collected by Don Anastasio Alfaro, Director of the Museo Nacional de Costa Rica, but the greater part by Mr. Cherrie. Most of the alcoholics were obtained on La Carpintera, a mountain situated eight miles east of San José, at an altitude of about 6000 feet, during the months of October, November, and December, 1890.

The officials of the Costa Rica Government, we are gratified to learn, take great interest in collecting and making known the natural history productions of the Republic, and provide liberally for the development of their rapidly growing Museum. Mr. Cherrie informs me that further collections of Costa Rican mammals will probably be forwarded to this Museum for identification.

In addition to the collections already mentioned I have examined in the present connection the entire series of Costa Rican and Mexican *Muridæ* belonging to the United States National Museum, including the types of Dr. Coues's *Hesperomys melanophrys*, kindly loaned me for this purpose by the authorities of the National Museum.

1. *Mycetes palliatus* Gray. — A dozen specimens of this common Howler are included in Mr. Cherrie's collection.

2. *Ateles geoffroyi* Kuhl. — The several specimens of *Ateles* collected by Mr. Cherrie seem referable to this species.

3. *Cebus hypoleucus* (Humb.). — Three specimens.

4. *Felis pardalis* Linn. — Represented by several skins and skulls.

5. *Procyon lotor hernandezii* (Wagler). — Two skeletons and one skin, La Carpintera. The skulls are slightly larger than those of *P. lotor* of corresponding age from the United States, but present no other noteworthy differences.

6. *Cercoleptes caudivolvus* (Pall.). — Skins, skeletons and skulls, including skulls of young still retaining the milk dentition. La Carpintera, Sept.-Nov., 1890, George K. Cherrie.

7. *Conepatus mapurito* (Gm.). — Represented by a single half-grown specimen.

8. *Galictis barbara* Linn. — The collection contains a single specimen of this common Costa Rican mammal.

9. *Atalapha frantzii* Peters. — One specimen, ♂ ad., in spirits. La Carpintera, Nov., 1889, George K. Cherrie.

This specimen is rather larger than the average of *A. noveboracensis* (fore arm 1.60 in., tibia .80), the apical half of the interfemoral membrane is nearly naked (quite so towards the margin), the wing membrane behind the fore arm is entirely bare, and the tipping of the fur of the dorsal surface is bright red.

10. *Vesperus fuscus* Beauv. — One specimen, ♀ ad., in spirits, San José, May, 1888, A. Alfaro.

11. *Glossophaga soricina* (Pall.). — Adult ♀ in spirits, La Carpintera, altitude 6000 feet, Nov., 1890; three skins, ♂, San José, July 31 and Nov. 12, 1889, A. Lizano.

12. *Carollia brevicauda* (Wied). — One specimen, ♀ ad., in spirits, La Carpintera, altitude 6000 feet, Nov., 1890, George K. Cherrie.

The color of this specimen is ashy brown, with no trace of rufous, thus very different in coloration from *C. castanea*, recently described from Costa Rica by Dr. H. Allen.*

13. *Artibeus carpolegus* Gosse (?).—Three skins with skulls (two females and a male, all adult), San José, June 9, 1889, C. F. Underwood. The male is everywhere uniform sooty brown; the females are faintly rufescent on the breast, nuchal region and anterior part of the back. They agree in size and coloration with the pair received from Dr. Buller collected at Tehuantepec. (See *antea*, pp. 170–173, and 181.)

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14. *Blarina costaricensis*, sp. nov.

One specimen, in spirits, from La Carpintera, collected Oct., 1890, by George K. Cherrie.

Much larger than the largest specimen of a large series of *Blarina talpoides* from various New York State localities, but not distinguishable in coloration from average adult examples of this species. Above entirely sooty blackish-brown, a little paler and grayer below, with a faint brownish suffusion over the pectoral region.

Length of head, 28 mm. (1.10 in.); head and body, 89 (3.50); tail, 28 (1.10); fore foot, 10.7 (.42); hind foot, 15.2 (.60). Skull, total length, 24.4 (.96); basal length, the same; greatest width, 13.5 (.53); lower jaw (point of incisors to condyle), 15.7 (.62); upper tooth-row, 10.9 (.43); lower tooth-row, 12.2 (.38).

This species is in all respects a typical *Blarina*, the number of upper unicuspid being 5, and the total number of teeth 32 ($=\frac{20}{12}$). Their relative size is the same as in *B. talpoides*, but the dentition is heavier, and the skull much larger. The specimen is a fully adult animal, with the teeth well worn. It also presents an imperfection in the teeth of the right side above, through the absence of the fourth unicuspid, which has fallen out, leaving a well-marked diastema on that side between the third and fifth unicuspid, about equal to the size of the fourth unicuspid of the opposite side.

Although this species is about twice the size of *Blarina* (*Soriciscus*) *micrura*, it was presumed to be referable to the subgenus *Soriciscus* till on removal of the skull it proved to belong to the 32-toothed section of the genus, and thus a true *Blarina*, with

* Proc. Am. Phil. Soc., XXVII, 1890, p. —.

which its size also accords. The discovery of a true *Blarina* in Costa Rica extends the distribution of the subgenus *Blarina* hundreds of miles to the southward of its previous known range, it not having been previously reported from south of the southern portion of the United States. So surprising was this discovery that I wrote to Mr. Cherrie asking him if by any possibility there could be a mistake as to the locality. He replied emphatically in the negative, the specimen having been taken by himself in Costa Rica at the locality above stated.

15. *Sciurus hypopyrrhus* Wagler.—In the series of eight specimens representing this species the lower parts are either uniform deep rufous, or deep rufous blotched irregularly with pure white, varying from a few small spots of white on the middle of the breast and axillæ to large areas of white, distributed over the lower abdomen as well as on the pectoral region, in some cases covering nearly half of the lower surface. The upper surface varies in different specimens from black or dark brown, with the hairs broadly ringed subterminally with pale rufous, to specimens with broad lateral bands of creamy white, and the middle of the dorsal area dark brown, varied with buff. There are various intermediate stages. The two specimens differing most widely are females, taken in the month of July. Mr. Cherrie informs me that in a series of sixty specimens examined by him no two were alike in coloration. The present series shows that the variation is not wholly seasonal, and is not due to differences of age or sex. They are all referable to the "*rigidus* type" of Alston.

16. *Sciurus æstuans hoffmanni* Peters.

Sciurus æstuans var. *hoffmanni* PETERS, Monatsb. K.-P. Ak. Wiss., Berlin, 1863 (1864), p. 654.—THOMAS, P. Z. S., 1880, p. 401 (in text).

Sciurus æstuans var. *rufoniger* ALLEN, N. Am. Roden., 1877, p. 757.

Macroxus griseogenæ GRAY, Ann. & Mag. Nat. Hist., 3d Ser., XX, 1867, p. 429.

Sciurus griseogenys ALSTON, P. Z. S., 1878, p. 667.

Sciurus æstuans THOMAS, P. Z. S., 1880, p. 400.—ALSTON, Biol. Cent.-Am., Mam., June, 1880, p. 132.

Sciurus hoffmanni ALLEN, Bull. U. S. Geol. Surv., IV, 1878, p. 885.

Four specimens, taken as follows: ♂, Santa Clara, Dec. 18, 1885, A. Alfaro; ♂, March 29, ♀, March 27, 1890, Talamanca,

G. K. Cherrie; ♂ ad., Bebedero, Jan., 1890, C. F. Underwood. The December specimen is in fuller softer pelage than the others, and is much lighter and more yellowish above. The March specimen is much darker and the pelage is shorter, probably representing the summer coat.

17. *Sigmodon hispidus toltecus* (*De Saussure*).

Sigmodon hispidus berlandieri ALLEN, Bull. Am. Mus. Nat. Hist., III, No. 1, Dec., 1890, p. 186 (in part, the Tehuantepec specimen only).

Two specimens, Talamanca, March 21, 1890. One is labeled "♀, 7 fœtuses. L. 6.75, t. 5.00."

These agree with Tehuantepec specimens in the U. S. National Museum, collected by Prof. Sumichrast, and differ from specimens from the Lower Rio Grande (Brownsville, Texas) and Northern Mexico in their much deeper, more rufous coloration, in this respect much more closely resembling North Carolina and Florida specimens than those from the Rio Grande region.

The series of over 100 specimens of *Sigmodon* before me fall (exclusive of the peculiar *S. fulviventer*, based on a single specimen from Zacatecas, Mex.) into four easily distinguishable groups: (1) *S. hispidus*, from the Carolinas, Georgia, and Florida; (2) *S. h. littoralis*, of the sea-coast of southeastern Florida; (3) *S. h. berlandieri*, of the Rio Grande region and southward over much of Mexico (at least to Colima and San Luis Potosi); (4) *S. h. arizonæ*, the very large pale form of the desert regions of the southwestern United States; (5) *S. h. toltecus*, of the *tierra caliente* of Southern Mexico and southward to Costa Rica. The two forms most resembling each other in coloration are, strange to say, the Central American *toltecus* and true *hispidus* from the Carolinas, characterized by their rich brown tints, in comparison with the gray-black *littoralis* and the bleached *berlandieri* and *arizonæ* types. The *toltecus* form, however, averages the deeper and richer in its tints, some specimens being rich rusty brown, in strong contrast with the pale bleached gray form (*berlandieri*) of the dryer regions to the northward.

As De Saussure's type of *toltecus* was from Vera Cruz, and proves on comparison to agree with Tehuantepec specimens rather than with the Rio Grande form, the dark southern race

may be recognized under this name. It seems to average smaller than either *hispidus* or *berlandieri*, with larger ears and a much longer tail, while the coloration is more rufous than in true *hispidus*, though some of the specimens of the *toltecus* and *hispidus* series are, as already said, very similar in coloration.

The following table, based on measurements made from the fresh specimens by the collectors, gives (in millimeters) the average length of the head and body, and the length of the tail in the several forms here recognized.

	No. of specimens.	Head and body.	Tail.
<i>Sigmodon hispidus</i>	10	161.9	100.9
“ “ <i>littoralis</i>	8	171.1	104.6
“ “ <i>berlandieri</i>	8	152.5	91.5
“ “ <i>toltecus</i>	4	145.2	119.3
“ “ <i>arizonæ</i>	3	182.3	130.3

18. *Hesperomys (Habothrix) teguina* Alston.

Hesperomys teguina ALSTON, P. Z. S., 1876, p. 755; Biol. Centr.-Am., Mam., Aug., 1880, pp. 142, 144, pl. xiv, fig. 1.

Two specimens, ♀ ad., and ♀ young, in spirits, from La Carpintera, Oct.-Dec., 1890, George K. Cherrie.

These specimens appear to agree satisfactorily with Alston's description of his *H. teguina* (l. c.), described from a single mounted specimen in the British Museum, from Coban, Guatemala. As he says, it is a "very peculiar small dark short-tailed mouse," which he refers provisionally to the subgenus "*Vesperomys*" (= *Vesperimus* Coues). "In the comparative shortness of its tail and its nearly uniform rich coloration it is strikingly different from all the Nearctic Mice, and also from all the Neotropical forms with which I am acquainted." He gives the "approximate measurements of the mounted type specimen" as follows:

	Inches.
Length of head and body.....	3.25
“ tail (tip imperfect).....	1.90
“ ear.....	0.40
“ hind foot.....	0.65

In coloration the present specimens agree essentially with Alston's description; the measurements do not conform so well; but Alston's measurements could be only approximate, from the

nature of the specimen, the tail being imperfect, and the body possibly over-stuffed. The specimens here described are both females; while one, as shown by the skull, is fully adult, the other is evidently not fully grown. With these allowances it seems safer to refer the present specimens to *H. teguina* than to treat them as representing an undescribed species. It seems, however, desirable to indicate their characters.

Female, ad.—Pelage short, thick and close. Above dark brown, the tips of the hairs dull rufescent; sides paler and more ashy, passing gradually into the dark ashy fawn color of the lower surface, the fawn color strongest over the pectoral region. Edges of the lips lighter (whitish in alcohol). Ears moderate, blackish, nearly naked externally, sparsely clothed with short rufescent hairs on the inner surface. Tail uniform blackish, thickly covered with short brownish-black hairs, forming a slight pencil at the tip. Both fore and hind feet brownish black, like the tail and ears. Soles, posterior to the prominent black tubercles, thickly covered with very short dusky brown hairs. Incisors pale yellowish white. Mammæ, $\frac{8}{8}-\frac{2}{2}=4$.

Female, immature.—Similar to the adult, but rather less strongly tinged with fawn below.

Measurements.—♀ ad. Head and body, 71 mm. (2.80 in.); tail vertebræ, 57 (2.25); hind foot, 17.8 (.70); ear, 10.7 (.42).

♀ immature. Head and body, 66 (2.60); tail vertebræ, 54 (2.12); hind foot, 17 (.67); ear, 10.2 (.40).

Cranial Characters.—The skull, compared with that of a specimen of *H. leucopus* of corresponding age, from Suffolk County, Long Island, N. Y., is much shorter and broader, the rostral portion being especially shortened and broadened. Although the skull is fully a third smaller, the tooth row is longer and broader, the dentition being heavier (absolutely as well as relatively). The molars, instead of becoming narrower posteriorly, are of nearly equal size throughout the series, and present a very different crown-pattern. The lower jaw is entirely different in outline, the condylar portion being much less inclined backward; the coronoid process is much heavier and more vertical, and its apex just reaches the plane of the condyle; the angle is broader, more produced, and much more strongly inflected at the lower border.

The crowns of the teeth are well worn. The lateral infoldings of enamel are very slight; on the external border of the first and second upper molars the hollow between the cusps is exceedingly slight, and only a little more pronounced on the inner border; it is more strongly marked in the lower molars.

Basilar length of the skull, 18.5 mm. (.73 in.); total length, 22.8 (.90); greatest breadth, 12.7 (.50); length of nasals, 8.1 (.32); of upper molar series, 4.6 (.18); of lower molar series, 5.1 (.20).

19. *Hesperomys (Habrothrix) caliginosus* Tomes?

? *Hesperomys caliginosus* TOMES, P. Z. S., 1860, p. 265 (Ecuador).

? *Hesperomys (Habrothrix) caliginosus* THOMAS, P. Z. S., 1882, p. 110 (Huamabo, Peru); *ibid.*, 1884, p. 456 (Central Peru).

Two specimens, skins (♀ and ♀ juv.), San Carlos, Dec., 1888, A. Alfaro. Also, 5 specimens, skins, Pacuare, May, 1876, J. C. Zélédon (Coll. U. S. Nat. Mus.).

These specimens agree well in size, proportions and coloration with Tomes's description of his *Hesperomys caliginosus*, from Ecuador, and apparently with the Peruvian specimens referred to this species by Mr. Thomas. The latter, however, has thrown doubt (P. Z. S., 1884, p. 457) as to what Tomes's *H. caliginosus* may really be, there being in the British Museum collection "a species, represented by three specimens, agreeing *externally* quite as well as these with Mr. Tomes's description, but whose skull is wholly different, and proves it to belong to the subgenus *Oryzomys*. To which of these two species therefore the name *caliginosus* is really referable is a question which can only be settled by an examination of Mr. Tomes's type." As, however, Mr. Tomes describes the head and face as short, "much as in the *Arvicolidæ*," the tail short, etc., it would seem more probable that his species was an *Habrothrix* rather than an *Oryzomys*.

20. *Hesperomys (Tylomys) nudicaudus* Peters.

Hesperomys (Tylomys) nudicaudus PETERS, Monatsb. Ak. Berlin, 1866, p. 404, figs. 1-4, skull.

Hesperomys nudicaudus ALSTON, Biol. Centr.-Am., Mam., 1880, p. 149.

A single skin, without skull, is provisionally referred to this species, described by Dr. Peters as above from a single specimen from Guatemala, apparently the only example known to be extant in museums as late as 1880. In size, proportions, and coloration, and in the nakedness of the soles, tail and ears, it agrees well with Dr. Peters's description.

Except for the very long naked tail, the present specimen has the general external appearance of a *Neotoma*. The specimen may be described as follows:

Pelage very long, soft and full. Above strong yellowish brown, much varied with black, the fur being plumbeous for three-fourths of its length, then broadly

ringed with rather dark yellowish brown, with most of the hairs conspicuously tipped with blackish. This gradually passes into the light color of the ventral surface, which is clear white on the throat, upper breast, and sides of the chest, and buffy white over the rest of the ventral surface (as well as can be judged, owing to the bad state of the skin). Fore arms, sides of the muzzle, cheeks, and front of the head to beyond the eyes, dusky ashy, somewhat darker around the eyes, forming a well-marked dusky brown eye-ring. Inside of fore and hind limbs soiled whitish; upper surface of both fore and hind feet dusky brown, the tips of the toes whitish. Whiskers abundant, very long and black. Ears very thin, blackish, and entirely naked on both surfaces. Palms and soles entirely naked; tail naked, the very minute scattered hairs being scarcely visible. The basal half of the tail is dusky, the apical half whitish, the line of demarkation fairly distinct.

Measurements.—The collector's label attached to the skin reads as follows: Length (total), 18.95; tail, 9.50,—dark part 4.83, light part 4.67; hind foot, 1.50.

21. *Hesperomys (Vesperimus) leucopus sonoriensis* (Baird).—One specimen, ♂ adult, in spirits, from La Carpintera, Oct. or Nov., 1890.

This single specimen is obviously a member of the *sonoriensis* group. It is, however, considerably below the average size of specimens of even the Arizona phase of *sonoriensis*, but presents no other tangible features of difference. Its measurements are as follows: Total length, 142.2 mm. (5.60 in.); head and body, 81.3 (3.20); tail to end of vertebræ, 57.9 (2.28); tail to end of hairs, 61 (2.40); ear from crown, 12.7 (.50); hind foot, 19.8 (.78). The tail is distinctly bicolor, but less dark above than in ordinary *sonoriensis*. The teeth are slightly worn, but neither these nor the skull present any distinctive features. Probably a series of specimens would show that this form is separable from true *sonoriensis*.

22. *Hesperomys (Vesperimus) cherrii*, sp. nov.

Six specimens, as follows: skin (♂? adult), San José, June 9, 1889, C. F. Underwood; five specimens in spirits (2 ♂ ad., 1 ♀ ad., and 2 half-grown young), La Carpintera (altitude about 6000 feet), Oct.–Nov., 1890, George K. Cherrie.

About the size and of much the same general coloration as *H. (Vesperimus) aureolus*, but whiter below, with larger and darker ears, and tail nearly twice as long as in the latter. Also with dusky instead of yellowish feet.

[April, 1891.]

Above dark cinnamon rufous, darker and mixed with blackish on the head and middle of the dorsal region, passing into pure deep rusty cinnamon on the flanks; ventral surface pure white sharply defined against the rich deep golden rufous of the flanks; pelage of the dorsal surface basally deep slaty; of the ventral surface, pale ashy; sides and top of muzzle dusky grayish. Upper surface of both fore and hind limbs, as far as the base of the toes, dusky brownish; toes nearly naked, soiled white. Ears large, dusky, scantily clothed externally and at the base with dusky hairs. Soles naked, 6-tubercled; toes short, third and fourth equal, second barely shorter; fifth slightly shorter than second, about .07 in. shorter than the fourth; first reaching to middle of basal phalanx of the second. Tail very long, naked, uniform dusky brown, the annulations very distinct. Mammæ, $\frac{1}{2}$ - $\frac{3}{8}$ =6.

Length of head and body, adult ♂ (from spirits specimens), 72.4-73.7 mm. (2.85-2.90 in.); tail, 108-114.3 (4.25-4.50); hind foot, 18.3 (.72); ear from crown, 12.7 (.50).

Skull and dentition strictly of the *Vesperimus* type; skull a little smaller than in *H. (V.) aureolus*, the facial region narrower, and the anteorbital portion narrower and longer. Basal length, 20.3 (.80); total length, 24.6 (.97); greatest width, 13.5 (.53); least interorbital width, 4.3 (.17); nasals, 9.4 (.37); upper molar series, 4.1 (.16); lower molar series, 4.6 (.18); length of lower jaw (tip of incisors to condyle), 13.5 (.53); height at condyle, 5.8 (.23).

The four adults appear to vary but little in size or coloration; the half-grown young are darker, and less strongly rufous on the sides.

This species bears a strong resemblance to *Hesperomys fulvescens* of De Saussure (Rev. et Mag. de Zool., 2^o sér., XII, 1860, p. 98, 102), from Mexico, which by some authors has been synonymized (as I think prematurely) with *H. aureolus* of the eastern United States. It is of the same size, with the same relative length of tail, and the same dusky gray ears. In these two latter points they both differ from *H. aureolus*, which has yellowish brown ears, with the tail only about as long as the body without the head, instead of longer than head and body together. *H. (V.) cherrii* differs from *H. fulvescens*, however, in too many points to render it probable that they are identical, the tail in *H. cherrii* being very much longer than in *H. fulvescens*, and the ventral surface is pure white, sharply separated from the deep rusty cinnamon of the flanks, which terminates abruptly at its lower border, whereas in *H. fulvescens* De Saussure says: "Sur le côtés, la teinte devient graduellement plus pâle et plus fauve et finir par passer

à la couleur fauve pâle qui couvre toutes les parties inférieures. Il n'y a pas de ligne de démarcation entre la couleur du ventre et celle des flanc ; ces couleurs se fondent." And again : "Cette espèce sera facile à reconnaître à la couleur fauve de ses parties inférieures." The feet also are "d'un fauve pâle," and not dusky brown, as in *H. cherrii*.

This species is named in honor of Mr. George K. Cherrie, of the Museo Nacional of Costa Rica (formerly of the American Museum of Natural History), to whom I am indebted for the material forming the basis of the present paper.

23. *Hesperomys (Vesperimus?) nudipes*, sp. nov.

One specimen, ♀ ad., in spirits, La Carpintera, Oct., 1890, George K. Cherrie.

Size of a half-grown black rat (*Mus rattus*); skull and dentition as in *Vesperimus*, but tail and feet naked ; ears very large, naked ; feet (as regards relative length of digits, etc.) as in *Vesperimus*.

Pelage full, soft. Color above dark brown, the hairs narrowly tipped with pale rufous, imparting a faint yellowish brown suffusion, which becomes stronger and more rufous on the sides ; beneath grayish white, the hairs dusky for the greater part of their length, narrowly tipped with white ; a broad band of pale chestnut across the breast. A large dusky spot at the base of the abundant very long whiskers, and another in front of the eye, continued beneath the eye as a narrow dusky streak. Top and sides of the nose grayer than the back, thinly haired. Fore and hind feet naked both above and below, the fore feet flesh-colored on both surfaces to above the wrists, the hind feet flesh-colored above, dusky gray on the 6-tubercled soles, with a very few short blackish hairs on the proximal third of the upper surface ; distal fifth of tibiae also nearly naked, being only thinly clothed with short dusky fur. A few short bristly white hairs at the base of the claws on both fore and hind feet. Tail grayish brown, gradually becoming a little lighter at the extreme tip, naked, the annulations very narrow. With a lens the tail and the upper surface of the feet can be seen to be covered with very short whitish hairs, which do not in the least obscure the annulations. Mammæ, $8\frac{2}{3}=4$.

Total length, 230.9 mm. (9.90 in.) ; head, 40.6 (1.60) ; head and body, 137.2 (5.40) ; tail, 139.7 (5.50) ; hind foot, 28.5 (1.12) ; fore foot, 14.5 (.57) ; ear from crown, 20.3 (.80) ; longest whiskers, 50.8 (2.00).

Skull.—Total length, 36.9 (1.44) ; basal length, 31.2 (1.23) ; greatest breadth, 16.5 (.65) ; length of nasals, 14.5 (.57) ; length of lower jaw (from point of

incisors to condyle), 22.4 (.88); height at condyle, 7.9 (.31); length of the upper molar series, 5.1 (.20); lower molar series, 56 (.22).

The rostral portion of the skull is unusually narrow and attenuated, even for a *Vesperimus*, the relative length of the nasals to the entire length of the skull being as 39 to 100. The structure of the skull and teeth is entirely that of a typical *Vesperimus*, with the slightly ridged supraorbital border common to the larger forms of the group. The relative size of the feet, the relative length of the digits, the large ears, and the length of the tail are all as in *Vesperimus*, from typical members of which group it differs in its very large size and in the extreme nakedness of the feet and tail.

24. *Hesperomys (Oryzomys) alfaroi*, sp. nov.

Five specimens, skins (one ♂ ad., 4 ♀ ad.), San Carlos, Dec., 1888, A. Alfaro.

Female Adult.—Pelage moderately full, short, soft. Above pale rusty yellowish brown, varied with black; sides of head and body much more rufous, varying in different specimens from light yellowish rusty to brownish rusty; below ashy white, the line of demarkation between the colors of the ventral and dorsal surfaces well defined. Upper surface of both fore and hind feet nearly naked, especially of the hind feet, being very scantily clothed with very short yellowish ashy hairs. Ears rather large, dusky, nearly naked on the inner surface, scantily covered with short dusky hairs on the external surface. Soles naked, dark brown, distinctly 6-tuberculate. The three middle digits of the pes are subequal and long; the first is very short, the fifth intermediate between the first and fourth. Tail long (about equaling head and body), naked, faintly bicolor, upper surface blackish brown, the lower surface ashy brown. Mammæ, $\frac{1}{2}-\frac{2}{3}=6$.

Length (approximate from skins) of head and body, 95.3 mm. (3.75 in.); tail, 88.9 (3.50); hind foot, 23.4 (.92); ear from crown, 10.2 (.40).

The five skins, although apparently all adult, differ much in color; the palest (sexed ♂ by the collector) is nearly of the color above of a very old house mouse (*Mus musculus*), though darker, less gray, and more mixed with pale rufous, especially on the sides, where this color prevails, while the ventral surface is clear ashy white, in sudden and decided contrast to the upper surface. The darkest specimen borders on cinnamon rufous above, mixed with black over the middle region, passing into clear pale cinnamon on the sides.

On removing the skulls from the skins all were found to be badly mutilated, two of them consisting of little more than the nasal portion and incisors ; the best one lacks only the posterior half of the brain-case. There is a faint indication of a supra-orbital ridge ; the facial portion of the skull is very short ; the suborbital foramen is as in *Oryzomys palustris* ; the molars are very broad and low-crowned. The first upper molar is distinctly 6-tubercled. The condylar portion of the lower jaw rises far above the plane of the molars ; the coronoid process is rather short and broad.

This species needs no comparison with any thus far described from any point north of the Isthmus of Panama ; it may have near relatives in northern South America, but I am unable to identify it with any of the described species.

While the ears are very large and the tail relatively short, it seems on the whole better referable to the subgenus *Oryzomys* than to any other yet characterized.

This species is named in honor of Don Anastasio Alfaro, the well-known Director of the National Museum of Costa Rica, by whom the specimens on which the species is based were collected.

25. *Heteromys longicaudatus* Gray.—Three specimens in spirits, La Carpintera, Oct., 1890, George K. Cherrie.

These specimens appear to be referable to what Alston has recognized as *H. longicaudatus*. They are brownish black above, the pelage yellowish white for the basal two-thirds ; whole lower surface, inside of all the limbs, cheeks, sides of nose, fore feet as far as the carpus and hind feet as far as lower part of the tibia, white ; soles naked, dusky ; tail sharply bicolored, the lower surface white, the upper dusky brown, scantily haired (almost naked), the annulations conspicuously visible, slightly penicillate, however, at the tip. The three specimens, while very uniform in coloration, vary greatly in measurements. One is an adult male, one an adult female (mammæ 6, all inguinal), the other an apparently full-grown female, but the mammæ as yet undeveloped. The last example has lost the apical portion (one-third to one-half) of the tail. These specimens measure as follows, in millimeters :

Sex.	Head.	Head and body.	Tail vert.	Hind foot.	Ear.
♂ ad.	39.4	125	125	33.1	9.7
♀ ad.	38.1	125	160	34.8	10.9
♀ juv.	36.3	103	...	34.0	10.9

The male, while much the largest bodied, has smaller ears and shorter hind feet than either of the two females, while the adult female has a much longer tail than either of the other two specimens. This variation is probably purely individual.

I have also before me five other Costa Rica skins of *Heteromys*, belonging to the U. S. National Museum, collected at Angostura and Pacuare by J. C. Zéledón in 1876. They are in very bad condition, and thus very unsatisfactory for study, two of them being bad alcoholics and the other three unfilled flat-skins with the tails imperfect. Three of them appear to agree fairly well with Mr. Cherrie's specimens; the other two show a strong suffusion of pale chestnut above, which on the sides of the body is very strong. Further reference will be made to them in a later paper in the present volume of this Bulletin.

26. *Syntheres mexicanus* (Kerr).—Several skeletons and skulls, La Carpintera, May, 1890, George K. Cherrie.

27. *Cœlogenys paca* (Linn.).—One skeleton, George K. Cherrie.

28. *Lepus gabbi* (Allen).—Two specimens, ♂ ad. and ♀ juv., San José, Sept., 1890, George K. Cherrie.

These two specimens have been presented to the American Museum, and are a most welcome addition. This is still apparently a rare species in collections. The two types, in the U. S. National Museum, have unfortunately become nearly destroyed by museum pests.

29. *Bradypus griseus* (Gray).—One specimen, ♂ (?), May, 1890. Referred provisionally to Gray's *Arctopithecus griseus*.

30. *Bradypus castaneiceps* (Gray).—One specimen, ♀ adult, Jimenez, Dec. 26, 1890, A. Alfaro. "With foetus."

These two specimens may be referable to the same species, but they are very different in coloration and in cranial characters, especially in the form of the lower jaw, and seem to agree respec-

tively with what Gray has called *Arctopithecus griseus* and *A. castaneiceps*. Much more material is necessary to determine their status, and the relationship of these alleged species to *B. infuscatus* of Brazil.

31. *Choloepus hoffmanni* Peters. — This species is represented by a large series of specimens, of all ages and seasons, and of both sexes. The variation in color between different individuals of the same age, sex, and season is most astonishing.

As Mr. Cherrie will soon give an account of these and other variations, based on an examination of nearly one hundred specimens, including a large series of skeletons, collected by himself, further comment is unnecessary in the present connection.

32. *Cyclothurus didactylus* (Linn.).—A single skin.

33. *Tatusia novemcincta* (Linn.).—One specimen.

34. *Didelphys marsupialis aurita* (Wied.). — Young, San José, May, 1888, A. Alfaro.

Mr. Oldfield Thomas, in his recent "Catalogue of the Marsupialia and Monotremata" (1888, pp. 323-329), unites all of the large opossums under the name *Didelphys marsupialis* Linn., this species, in his opinion, ranging from Southern Brazil to the northern border of the United States, he thus combining under one name some four to six species previously more or less generally recognized. To this wholesale lumping I cannot bring myself to subscribe. While the forms here combined are beyond doubt closely allied, they evidently present several geographical phases which are quite different, and respectively quite constant over large areas. While they doubtless intergrade, and while each presents a considerable range of individual variation, the purposes of science are apparently best subserved by the definite recognition of several of these forms in nomenclature, according them the rank of geographical forms or subspecies. For example, the opossum of Texas and northern Mexico is a very different animal from the opossum of the Eastern United States.

35. *Didelphys (Metachirus) quica* Natterer.—One specimen, skin, without definite locality.

36. *Didelphys (Micoureus) cinerea* Temm.—One specimen, skin and skull, young, San José, Oct. 15, 1890, George K. Cherrie.

37. *Didelphys (Micoureus) murina* Linn.—One specimen in alcohol, La Carpintera, altitude 6000 feet, Dec. 15, 1890, George K. Cherrie. "From the stomach of a rattlesnake."

38. *Didelphys (Philander) lanigera* Desm. — (*Didelphys derbiana* Waterh., and of most recent authors). One specimen, skin.