

## Article XXXVIII.—NEW SOUTH AMERICAN SCIURIDÆ.

By J. A. ALLEN.

As the publication of my revision of the South American Sciuridæ<sup>1</sup> is likely to be delayed for several months, the following descriptions of new forms are presented in advance of the review of the entire group.

**Notosciurus** gen. nov.

Size small; ears long, narrow, and pointed; naked portion of plantar surface restricted to apical half, the proximal half heavily furred; toe pads large and crowded; heel pad very large and nearly square, occupying the whole breadth of the foot; palmar surface not especially modified, the toe pads and naked portion as in typical tree squirrels.

Premolars  $\frac{1}{1}$ . Skull highly convex, the highest part at the fronto-parietal suture; rostrum broad and short; posterior border of nasals square, terminating on a line with the posterior border of premaxillaries; infraorbital foramen broad, subcircular; malar broad, rather heavy; audital bullæ greatly inflated.

Type. *Notosciurus rhoadsi* sp. nov.

The striking feature of the genus *Notosciurus* is the character of the hind foot, which has the proximal half of the plantar surface heavily furred, and only the distal half (instead of three fourths or more, as in ordinary tree squirrels) naked, and the heel pad close to the toe pads, large, square, transverse to the axis of the foot, instead of long and narrow, and parallel to the edge of the foot. (Figs. 1 and 2.)

**Notosciurus rhoadsi** sp. nov.

Type, No. 12725, Mus. Philadelphia Acad. Nat. Sciences, ♂ juv., Pagma Forest, Chunchi (altitude 6300 feet), Ecuador; coll. Samuel N. Rhoads, for whom the species is named.

Character of the pelage and coloration nearly as in *Guerlinguetus hoffmanni*, but ears relatively long and narrow, and the proximal half of the soles of the hind feet heavily furred.

Upperparts uniformly finely grizzled pale yellow and dusky, the hairs individually blackish basally and narrowly ringed near the tip with pale yellow and black, mixed sparingly with hairs wholly black, resulting in a pale yellowish brown general effect; underparts ochraceous orange, paler on the chin, throat and sides of nose; limbs externally like the upperparts, and internally like the belly, the feet grizzled with pale orange; ears rufous, well haired on both surfaces; tail grizzled on both

<sup>1</sup> See this Bulletin, Vol. XXXIII, p. 145, Feb. 26, 1914.

surfaces like the back, the tips of the hairs pale orange, the hairs individually narrowly ringed alternately with yellowish buff and black, the undersurface of the tail with a submarginal, rather narrow band of black and long ochraceous tips.

Total length (collector's measurements), 330 mm.; tail vertebrae, 152; hind foot 50; ear, 20.

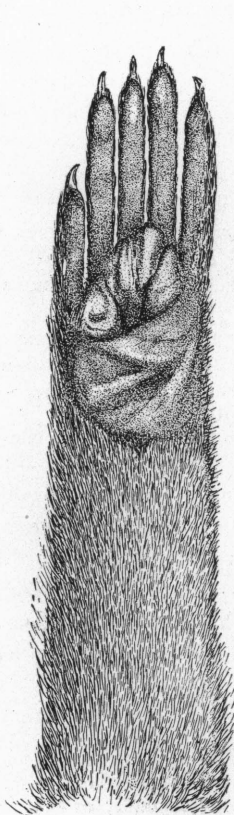


Fig. 1.

Fig. 1. Hind foot of *Notosciurus rhoadsi*.  $\frac{2}{1}$ .

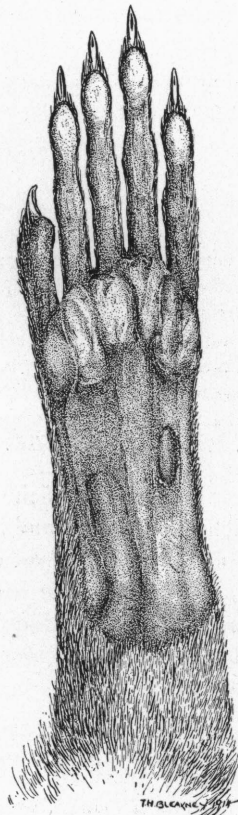


Fig. 2.

Fig. 2. Hind foot of *Guerlinguetus hoffmanni* (Peters), for comparison with Fig. 1.  $\frac{2}{1}$ .

Skull, total length, 47; zygomatic breadth, 27; interorbital breadth, 15; post-orbital breadth, 13; breadth of braincase, 22.5; nasals,  $14 \times 7$ ; diastema, 11; maxillary toothrow, 8. The skull still retains the milk premolars, and therefore the specimen is not fully adult, although it has the appearance of being adult in all other respects.

The general appearance of *Notosciurus rhoadsi* is that of a pale *hoffmanni* in miniature, in bulk *N. rhoadsi* being less than half the size of *hoffmanni*. This renders further comparisons needless.

I am indebted to Dr. Witmer Stone, curator of mammals and birds at the Philadelphia Academy of Natural Sciences, for the opportunity to make known this remarkable little squirrel.

***Guerlinguetus pucheranii salentensis* subsp. nov.**

Type, No. 32840, ♀ ad., near Salento (altitude 9000 ft.), Central Andes, Colombia, Nov. 8, 1911; Leo E. Miller.

Pelage very soft and thick. Upperparts with a broad median dusky band, sparingly punctated with ochraceous, the rest of the upperparts with the hairs broadly tipped with bright ochraceous; underparts nearly uniform pale yellow; tail as usual in the group, blackish above washed with white, below grizzled ochraceous and black edged with white.

Total length (type, collector's measurements), 310 mm.; head and body, 150; tail vertebrae, 150; hind foot, 40. Six adult specimens, Salento and a little above Salento (7000-9000 feet). Total length, 300.5 (288-310); head and body, 153 (148-163); tail vertebrae, 159.5 (135-150); hind foot, 41.7 (40-45).

Represented by 14 specimens: Salento and vicinity, 7; El Roble, 2; Laguneta, 2; Miraflores, 2; Palmira, 1 (all from localities in the Central Andes).

In three specimens the dorsal band is black, broad, and sharply defined; in two it is obsolete; in all the others it is merely a darkening of the median line, the black basal portion of the hairs being lightly tipped with ochraceous. The two specimens from Miraflores (alt. 6200 ft.) and the single specimen from Palmira very closely resemble those from La Guneta (alt. 10,300 ft.), El Roble, and part of the Salento specimens; one, however, from above Salento (alt. 9000 ft.) and one from Salento differ from the others in being nearly white below with only a faint yellowish wash — doubtless merely individual variants.

***Guerlinguetus hoffmanni quindianus* subsp. nov.**

Type, No. 32835, ♂ ad., Rio Frio (central Rio Cauca Valley, altitude 3500 feet), western slope of Central (or Quindio) Andes, Nov. 27, 1911; Leo E. Miller.

Upperparts with the mid-dorsal region black, extending (in different specimens) from the nape or shoulders to the base of the tail; rest of the upperparts finely grizzled yellowish and black varying (in different specimens) to ochraceous and black; outer surface of limbs and feet like the flanks; underparts ochraceous orange varying (in different specimens) to orange red; inside of limbs like the ventral surface; tail above black at the extreme base (for about 30 to 50 mm.), then orange (pale orange to orange red in different specimens) and tipped with black (usually for the terminal 40 to 50 mm.); under surface of tail grizzled fulvous and black, with black base and tip, and broadly edged with orange, the hairs individually black at base, then broadly banded with orange, followed by a broad band of black, and a very broad terminal band of orange; ears medium, clothed with very short hairs similar in color to the adjoining pelage.

Total length (collector's measurements), 397 mm.; head and body, 215; tail vertebræ, 182; hind foot, 55. Six topotypes, total length, 400 (375–440); head and body, 221 (202–230, 1 at 242); tail vertebræ, 179 (146–198); hind foot, 56 (53–58). Eleven specimens from Salento (altitude 9000 feet), total length, 395 (390–418); head and body, 218 (205–226); tail vertebræ, 176 (162–203); hind foot, 56 (54–58).

Skull (type), total length, 56; zygomatic breadth, 31.5; interorbital breadth, 16; breadth of braincase, 24; length of nasals, 16.4; maxillary tooththrow, 8.6. Four topotypes, total length, 54.4 (53–55); zygomatic breadth, 31.3 (30–32); interorbital breadth, 16.1 (15.5–17); breadth of braincase, 23.4 (22.8–23.8); length of nasals 16 (15.5–16.5); maxillary tooththrow, 8.2 (8–8.5). Salento and Laguneta skulls have practically the same measurements, the skulls from these four localities exceeding in size those of true *hoffmanni* from any of the numerous localities in Central and South America from which series of specimens have been received.

The following specimens are referred to *Guerlinguetus hoffmanni quindianus*: Rio Frio (alt. 8500 ft.), 6; Salencio (Nóvita trail, alt. 5500 ft.), 1; Salento (alt. 9000 ft.), 2; Laguneta (alt. 10,300 ft., near the top of the Central Andes), 5; Passada Tores (alt. 3000 ft.), 2; Cauca Valley,<sup>1</sup> 1. All are from the west slope of the Central Range except the single specimen from Salencio, which is in the Valley of the Rio Cauca, west of the river at the base of the Western Andes, yet it is indistinguishable from average specimens from Rio Frio and Salento.

The Laguneta specimens are from near Quindio Pass, and hence from near the summit of the Central Andes. The Laguneta series is aberrant, approaching typical *hoffmanni*, the mid-dorsal region being only slightly darker than the flanks in two, and decidedly black in the other two, the latter thus agreeing with typical examples of *quindianus*. Specimens from El Eden (alt. 8300 ft.), on the eastern slope of the Central Andes, about 30 miles southeast of Laguneta, are indistinguishable from *hoffmanni* of the Western Andes (Las Lomitas, San Antonio, and thence southward), and from Miraflores in the Central Andes (about 90 miles south of Laguneta).

Specimens from the near vicinity of Bogotá, on the eastern slope of the Eastern Andes, are referable to *G. hoffmanni hyporrhodus* (Gray). These, however, show a tendency to a darkening of the mid-dorsal region, several specimens from Fusugasugá and Panamá being in this respect similar to typical examples of *quindianus*. Both forms agree in the deep orange red of the belly and the upper surface and edges of the tail. The relationships of these two forms, as regards coloration, may be expressed as follows: *quindianus* is normally a black-backed form, with occasional specimens in which

<sup>1</sup> This is one of J. H. Batty's specimens, and the exact position of the locality is not known, but it must be on the middle Rio Cauca, as the collector says on the back of the label "species much darker in higher altitudes," indicating some point near Rio Frio.

the dark dorsal band is poorly developed; *hypporrhodus* is normally without a dark dorsal band, with occasional specimens in which it is more or less shown. Were it not that their ranges are separated by the Magdalena Valley, with an altitude at this point of less than 1000 feet, it would seem reasonable to expect that the two forms will be found to completely intergrade geographically as well as through individual variation. It is already pretty evident that both intergrade with *hoffmanni* to the southward in both the Eastern and Central Andes and probably in the Western Andes.

***Guerlinguetus hoffmanni manavi* subsp. nov.**

Type, No. 34286, ♀ ad., Manavi (Rio de Oro, near sea-level), Ecuador, Jan. 23, 1913; W. B. Richardson.

Similar to *G. hoffmanni hoffmanni* in size and general coloration, but with the proximal half or two thirds of the tail below nearly black, the hairs basally black narrowly ringed with fulvous giving a slightly grizzled effect, followed by a broad zone of black and a slight tipping of reddish orange; apical half or third of the tail below black slightly grizzled with fulvous or orange, the hairs broadly tipped with orange red; whole upper surface of the tail grizzled black and orange red, the surface color of the apical third almost wholly orange red.

Total length (type), 410 mm.; head and body, 230; tail vertebræ, 180; hind foot (c. u. in dry skin), 52. Skull, total length, 52; zygomatic breadth, 31; interorbital breadth, 16; breadth of braincase, 24; length of nasals, 15; diastema, 13; maxillary tooththrow, 8.8.

Represented by 5 specimens from Manavi and 3 from Esmeraldas. As a series the underparts average distinctly redder than in *hoffmanni* from Costa Rica, Chiriqui, or the Western Andes of Colombia. Specimens from Santa Rosa and Loja are intermediate between the coast form and specimens from the interior collected at Zaruma, Guala and Nariño, at altitudes of 6000 to 8000 feet; the Santa Rosa specimens are so much nearer the Manavi and Esmeraldas specimens as to be referable to *manavi*. Guala specimens are indistinguishable from true *hoffmanni*. *G. h. manavi* is a coast form, and ranges from Esmeraldas south to the Peruvian boundary.

***Guerlinguetus griseimembra* sp. nov.**

Type, No. 34611, ad. ♀, Buenavista (altitude 4500 ft.), eastern slope of Eastern Andes, about 50 miles southeast of Bogotá, March 8, 1912; G. M. O'Connell.

Upperparts finely grizzled ochraceous orange and black, not appreciably darker on the median dorsal area; underparts washed with pale ochraceous buff, strongest over the pectoral region, paler on the lower abdomen; lateral edges grayish, forming sometimes an ill-defined gray lateral line; chin and throat dull buffy gray; fore limbs entirely dark gray, the tips of the hairs lighter (whitish or buffy in different specimens); hind limbs externally like the body, internally gray like the fore limbs; ears

colored like the adjoining surface, with a small patch of soft fulvous hairs at the posterior base; tail above washed with pale ochraceous, the general effect grizzled ochraceous and black, with a broad subterminal band of black, but base concolor with the back; under surface of the tail similar to the upper, broadly edged with ochraceous.

Total length (collector's measurements), 402 mm.; head and body, 219; tail vertebræ, 183; hind foot, 55. Type and 3 topotypes, total length, 394 (377–411); head and body, 213 (188–225); tail vertebræ, 182 (162–192); hind foot, 56 (55–58).

Skull, total length, 51; zygomatic breadth, 31; interorbital breadth, 16; breadth of braincase, 22.7; length of nasals, 15.5; maxillary tooththrow, 8. Four skulls (type and 3 topotypes, all adult), total length, 51.2 (50.3–53); zygomatic breadth, 30.6 (30–31); interorbital breadth, 16.1 (15–17); breadth of braincase, 22.7 (22–23.2); length of nasals, 15.5 (15–16); maxillary tooththrow, 8.2 (8–8.6).

Represented by 4 specimens from Buenavista (near Bogotá) and 1 from Andalucia (alt. 5000 ft.). All are from the eastern slope of the Eastern Andes, Andalucia being about 150 miles southwest of Buenavista.

The distinctive feature of *G. griseimembra* is the entirely gray fore limbs and the gray inner surface of the hind limbs, in which it differs strikingly from any of the forms of *G. hoffmanni*. In general coloration some specimens closely approach true *hoffmanni*, but the underparts average much paler, and the tail is paler and less heavily washed with ochraceous. It differs still more in coloration from *hyporrhodus*, specimens of which have been received from nearby localities in the Bogotá district to the northward; it is also smaller, the skull especially being smaller and more delicate. It is very much smaller than *quindianus* of the Central Andes (the skull 3 mm. shorter, and all other cranial measurements in proportion), and widely different in coloration.

The four specimens of the type series vary considerably in coloration of the underparts, ranging from a strong wash of ochraceous yellow (in one specimen) to a slighter wash of ochraceous buff. The single specimen from Andalucia is the palest of the five, and the gray of the limbs is the deepest and strongest, probably indicating that the extreme phase of the species may be looked for to the southward of the type locality.

### **Guerlinguetus candelensis sp. nov.**

Type, No. 33670, ♀ ad., La Candela (altitude 6500 ft.), near San Agustín, Huila, Colombia, May 11, 1912; Leo E. Miller.

Upperparts (type) minutely punctated with pale orange yellow and dark brown, the hairs being blackish with minute yellow tips, the mid-dorsal region slightly darker than the flanks; underparts with the tips of the hairs white on the throat and pectoral region and middle of the lower abdomen, and with pale ochraceous over the mid-abdominal region; lower border of the sides of the neck, outer surface of fore limbs, edge of thighs and outer surface of hind limbs washed with ochraceous; inner surface

of fore limbs grayish white like the breast; inner surface of hind limbs with a broad central line of whitish bordered with a wash of ochraceous; tail above heavily washed with red or orange red, black for about 40 mm. at the tip; under surface of tail centrally grizzled pale ochraceous and black, with a submarginal band of black, and a narrow edging of red, the tip of the tail black; ears colored like the surrounding surface, with a bare trace of a post-auricular patch of soft fulvous hairs.

Total length (type, collector's measurements), 380 mm.; head and body, 190; tail vertebræ, 190; hind foot, 53. Eight specimens (type and 7 topotypes), total length, 390 (380–420, only 1 above 400); head and body, 208 (190–230); tail vertebræ, 181 (160–200); hind foot (in dry skin), 52.8 (51–55).

Skull (type), total length, 51.2; zygomatic breadth, 29; interorbital breadth, 16; breadth of braincase, 22.6; length of nasals, 15.5; maxillary toothrow, 8.5. Three adult skulls (type and 2 topotypes), total length, 51.3 (51–52.5); zygomatic breadth, 29.5 (29–30); interorbital breadth, 16 (16–16); breadth of braincase, 23 (22.6–23.3); length of nasals, 15.3 (15–15.5); maxillary toothrow, 8.5 (8.2–8.8).

Represented by 11 specimens: La Candela, 8 (type and topotypes); La Palma (alt. 5500 ft.), a few miles west of La Candela and 1000 ft. lower, 3. In coloration and measurements the La Palma specimens agree perfectly with the type series.

The specimens referred to *G. candelensis* all agree in the coloration of the upperparts and of the tail, but present a wide range of individual variation in the coloration of the underparts, which vary from nearly uniform clear grayish white to orange red on the whole abdominal area, with the upper chest and throat buff. In 5 of the specimens the underparts are almost wholly grayish white, with a tendency to a pale buffy wash over the middle of the belly; in 7 others the underparts are washed with pale orange yellow with the throat and chest mostly white; in one the whole undersurface is rich orange red. The specimen selected as type is of the medium phase of coloration. It may be added that the white on the underparts is plainly not albinistic, as in many normally red-bellied squirrels, the white being limited to the apical portion, the basal fur in all being plumbeous.

The nearest relative of *G. candelensis* is *G. griseimembra*, adjoining it to the northward in the Eastern Andes. Both are similar in size and in cranial characters, but differ radically in coloration. In *candelensis* the legs and feet are not gray but like the adjoining parts of the body; the coloration of the upperparts is many shades darker, the yellow tips to the hairs being much shorter, and the tail is superficially dark red instead of pale ochraceous.

It is interesting to note, in respect to its nearest geographical allies, that the range of *G. griseimembra* nearly joins that of *candelensis* to the north-eastward, while typical *hoffmanni* is abundant 50 miles to the westward at Almaguer and La Sierra, and also northward in the Western Andes, with which, however, *candelensis* has no near relationship.

The type locality is on the western slope of the Eastern Andes, on the Rio Suaza, one of the upper sources of the Rio Magdalena.

***Sciurus gerrardi salaquensis* subsp. nov.**

Type, No. 33078, ♂ ad., Rio Salaqui, northwestern Colombia; Mrs. E. L. Kerr.

Similar to *S. gerrardi choco* in coloration and other external features, but tail without a black tip, and sides of body more ferruginous. Upperparts with a broad median black band extending from the shoulders posteriorly over the proximal third of the tail; sides ochraceous lined with black; outside of fore limbs orange red, inside like the ventral surface; thighs and outside of hind limbs paler than shoulders and fore limbs; underparts deep orange red, with irregular blotches and lines of white (in type a large pectoral area, axillæ, and a narrow median line white); tail above, proximal third black, rest bright red without black at the tip; under surface of tail for proximal third, and median area to end of vertebræ, grizzled ochraceous and black, distal two thirds and the tip broadly fringed with bright red. An adult female and a young female from the type locality are like the type.

Total length (type, from skin), 470 mm.; head and body, 240; tail vertebræ, 230; hind foot, 60. Unfortunately the skull has been lost, but doubtless would, if available, present no tangible differences from the skulls of neighboring forms of the *gerrardi* group.

Represented by 7 specimens, of which 3 are from Rio Salaqui, 1 from Rio Atrato, and 3 from Nercua. The last 4 are in the U. S. National Museum.

A specimen from the Atrato River, collected by A. Schott a half century ago, agrees perfectly with the type series. Three other specimens (in bad condition) also collected by Schott are obviously referable to the same form. Rio Salaqui is a western tributary of the Rio Atrato. All the known localities from which specimens of *salaquensis* have been received are in the Rio Atrato drainage.

*Salaquensis* intergrades with subspecies *choco* of eastern Panama. To the southward along the coast it evidently intergrades with true *gerrardi*, as shown by specimens from Baudo and Bagado, through the greatly increased intensity of the red on the flanks and limbs.

***Sciurus gerrardi cucutæ* subsp. nov.**

*Sciurus versicolor* OSGOOD (not of Thomas), Field Mus. Nat. Hist., Zool., X, No. 5, p. 47, Jan. 10, 1912.

Type No. 18728, ♀ ad., Field Museum, El Guayabal, 10 miles north of San José de Cucuta, Colombia (near Venezuela boundary), March 13, 1911; Osgood and Jewett.

Similar to *S. gerrardi zulixæ* but much paler, the black of the upperparts duller and less glossy, the red of the underparts orange instead of orange red, the black on base of tail above and at tip more restricted and less intense.

Type (collector's measurements), total length, 433 mm.; head and body, 215; tail vertebræ, 218; hind foot, 57. Skull, total length, 54; zygomatic breadth, 31.2; interorbital breadth, 17.4; breadth of braincase, 23.5; length of nasals, 16.5; maxillary toothrow, 9.



Represented by 5 specimens, all females and all from the type locality, El Guaya-bal, on the border line between the humid and arid districts. The deviation of *cucuta* from *zulia* is towards subspecies *choco*, but the two forms do not closely resemble each other, and are geographically widely separated.

A single specimen from Rio San Jorge (alt. 1000 ft.) closely resembles *zulia* in general coloration, including the orange red feet so distinctive of *zulia* and *cucuta* but absent in the other forms of the *gerrardi* group. The proximal fourth of the upper surface of the tail is black, but the black at the tip of the tail is very restricted, consisting of only the terminal hairs. The bright red of the shoulders extends to the mid-dorsal line, as happens sometimes in both true *gerrardi* and *zulia*. It is probable that this specimen represents a geographical form occurring in northern and northwestern Colombia connecting *gerrardi* directly with *zulia*. Further material is necessary to determine the point, no other specimens from this large area being at present available.

***Sciurus saltuensis magdalense* subsp. nov.**

Type, No. 34626, ♂ ad., Banco (altitude 50–100 feet) Rio Magdalena, a few miles above mouth of Rio Caura; G. M. O'Connell.

Pelage short, coarse and rigid, almost without underfur. Upperparts uniform deep red except front and sides of head, which are orange yellow; underparts and proximal portion of inside of limbs pure white; chin orange yellow, passing into orange red on the throat, sharply contrasting with the white of the lower throat and chest; tail wholly intense dark red from base to tip, both above and below; upper arms and thighs deep red like the upperparts; fore and hind feet orange red.

In a second specimen (topotype) the red of the flanks and limbs is still darker, the hairs of the back subapically narrowly ringed with black, thus distinctly darkening the median dorsal area, which is extended over the proximal third of the tail.

Total length (type), 434 mm.; head and body, 245; tail vertebrae, 189; hind foot, 56. Topotype (♂ ad.), 422, 238, 184, 60. The skull has been temporarily mislaid; measurements of it may be given later.

Known only from two specimens, from Banco, Colombia, on the Rio Magdalena just above the mouth of the Rio Caura.

This subspecies is exactly similar in pattern of coloration to *S. saltuensis bondæ*, but the pelage is coarse and hispid instead of long and soft, and the red is much darker and more vivid. The type locality is at the mouth of the Rio Cesar, which has its source in the Sierra de Santa Marta. Doubtless squirrels of the *saltuensis* group will be found at favorable localities throughout the course of the Rio Cesar, the mouth of which is in the humid tropical, while the region about Bonda is arid, the change in the character of the pelage and the intensification of the color in *magdalense* being doubtless due to its more humid environment.

**Sciurus duida** sp. nov.

Type, 36153,<sup>1</sup> ♀ ad., Rio Cunucunumá (altitude 700 feet), base of Mount Duida, Venezuela, March 31, 1913; Leo E. Miller.

Size large, pelage long and soft with abundant underfur; tail very broad. Upperparts (type) blackish washed lightly with pale cream color, the hairs brownish black slightly tipped with cream color, the general surface effect yellowish gray on a brownish black ground color; top of head darker brown, the hairs minutely tipped with pale rufous; sides of head cinnamon brown; lower back and rump scarcely darker than the middle of the back but the hairs are tipped with very pale rufous instead of cream color; underparts dark ferruginous to the base, the upper chest and throat paler; fore limbs and feet intense deep rufous; hind limbs externally chestnut grizzled with black, internally dark ferruginous; upper surface of hind feet reddish orange; tail above black for about the basal fifth, rest of the upper surface washed lightly with orange yellow, the black subbasal portion of the hairs strongly visible at the surface, the base of the hairs annulated with pale buff; tail below almost wholly intense black for the proximal half, the distal half grizzled black and pale orange yellow, black predominating, and narrowly fringed with pale orange yellow. One of the two topotypes is like the type, in the other the hair tips of the upperparts and the fringe of the tail are a little deeper tone of yellow.

Total length (type), 560 mm.; head and body, 270; tail vertebrae, 290; hind foot, 65. The lateral hairs of the tail are fully 75 mm. long, and when the hairs are directed laterally give a breadth of fully 6 inches,—about one third greater than in *S. tricolor* or in any member of the *langsdorffii-igniventris-pyrrhonotus* group.

Skull (type), total length, 66; zygomatic breadth, 38; interorbital breadth, 20; postorbital breadth, 19.3; breadth of braincase, 25; nasals,  $22 \times 8.2$ ; diastema, 19; maxillary toothrow, 10. Rostrum relatively long and narrow.

Represented by 3 specimens collected on the Rio Cunucunumá, at the southern base of Mount Duida, by Leo E. Miller.

In the form of the skull *Sciurus duida* most nearly resembles *S. tricolor*, especially in the narrow, slender, and relatively long rostrum, but it has no resemblance to that species in coloration or texture of pelage, in which it most resembles the *igniventris* group, with which, however, the form of the skull denotes no close relationship. A striking feature of this species is its magnificent tail, which is fully one third broader than that of any other South American squirrel.

**Sciurus igniventris zamoræ** subsp. nov.

Type (and only specimen), No. 36538, ♂ ad., Zamora, (altitude 2,000 feet), Ecuador, Oct. 29, 1913; W. B. Richardson.

---

<sup>1</sup> The collector's number on the skull unfortunately was lost, but by exclusion it must have belonged to one of the three skins of this species, and almost beyond doubt to the one here selected as type, the other two being young adults, while this is fully adult, like the type skin.

Similar to *S. igniventris cocalis* but much smaller, with the whole under surface of the tail black except a narrow orange red border on the apical two thirds, and other color differences.

Upperparts blackish, the hairs tipped with chestnut, very minutely over the dorsal region, more broadly on the flanks, and with fine punctations of yellow on the head; postauricular patches orange; underparts nearly uniform pale ochraceous buff, brighter on inside of fore and hind limbs and laterally; tail above dull black for the basal third, the hairs strongly tipped with chestnut, the rest bright orange, the hairs black subbasally for half their length, with long orange tips; lower surface of tail grizzled red and black for the proximal fourth, the red predominating, followed by a broad band of black extending nearly to the tip of the tail and narrowly fringed with orange, black thus prevailing from near the base, to the tip, with an outer border of orange, the terminal hairs black for half their length; fore limbs and feet externally light yellow; hind limbs externally chestnut, the feet pale orange.

Total length (in skin), 490 mm.; head and body, 260; tail vertebræ, 230; hind foot, c. u., 61. (The collector's measurements give the total length as 520, which is obviously erroneous, and the tail as 230).

Skull, total length, 59; zygomatic breadth, 33.5; interorbital breadth, 19; post-orbital breadth, 20.5; breadth of braincase, 25; nasals,  $16.3 \times 9$ ; maxillary tooth-row, 9.2. The type is an old male with much worn teeth.

*Sciurus igniventris zamoræ* differs from *cocalis*, its nearest geographical representative, in much smaller size, the total length being about 60 mm. less than in *cocalis*, the total length and zygomatic breadth of the skull 3.5 mm. less, and other cranial measurements proportionally less. While the general coloration is similar to that of *cocalis* there are many minor differences, aside from the color of the tail, which differs in the presence of a much larger amount of black on the under surface. It thus differs in coloration from true *igniventris* as *tædifer* does, but in the opposite direction, having much more black in the tail instead of less. In addition to this is the marked difference in size, *zamoræ* being much smaller than any other subspecies of the *igniventris* group. The type locality of *zamoræ* is 250 to 300 miles from any known locality of *cocalis* and in a quite different environment. Either *zamoræ* is a small form of *cocalis*, or the type must be construed as a dwarf, and its color differentiation as an individual aberration, although it has the appearance of being in every way a normal adult.

• ***Sciurus langsdorffii urucumus* subsp. nov.**

Type, No. 37068, ♂ ad., Urucum (altitude 400 feet), Rio Paraguay (at mouth of Rio Tacuari), Brazil, Dec. 1, 1913; Leo E. Miller (Roosevelt Expedition).

Similar in general to *S. langsdorffii langsdorffii*, but much smaller and darker colored, with much blacker tail. Upperparts dusky brown, the hairs brownish black minutely tipped with yellowish; nose and front of head pale orange with a narrow median stripe of black on the nose; lower back and rump with tips of the hairs inclining to dark rufous; ears externally blackish edged with rufous; postauricular patch

of soft rufous hairs conspicuous; underparts nearly uniform ochraceous buff; fore limbs and feet externally grizzled buff and black; hind limbs externally light chestnut, feet grizzled dark rufous and black; tail above for the basal fourth intense black, usually a few of the hairs tipped with chestnut; rest of the upper surface of tail pale orange, the hairs black for the greater part of their length, tipped with pale orange, through which the black basal portion of the hairs is more or less visible; tail below for the basal third or more, and medially often nearly to the end, intense black, fringed with orange for the apical two thirds and at the tip.

Total length (type, collector's measurements), 500 mm.; head and body, 260; tail vertebrae, 260; hind foot, s. u., 60, c. u., 63. Six adults (all topotypes), total length, 502 (490-530), head and body, 251 (240-260); tail vertebrae, 250 (230-260); hind foot, c. u., 60.5 (60-63).

Skull (type), total length, 57; zygomatic breadth, 35.2; interorbital breadth, 19; postorbital breadth, 18; breadth of braincase, 23.2; nasals,  $17 \times 7$ ; diastema, 16; maxillary toothrow, 8.5. Seven skulls (type and 6 topotypes), total length, 59 (57-61); zygomatic breadth, 35 (34.6-36); interorbital breadth, 19.6 (19-21); postorbital breadth, 18.3 (18-19); breadth of braincase, 23.4 (22.6-24); nasals,  $18.3 \times 7.4$  ( $17.5-19 \times 7-8$ ); diastema, 17 (16-18); maxillary toothrow, 8.8 (8.3-9.2).

Represented by 9 specimens, of which 7 are from Urucum and 2 from Tapiropan.

The type locality of *S. l. urucumus* is at the mouth of the Rio Tacuari, on the Rio Paraguay, about 350 miles south of Chapada, Matto Grosso. The external measurements seem to exceed slightly those of *langsдорffii*, and of *steinbachi* from Santa Cruz de la Sierra, Bolivia, but the skulls of *urucumus* are markedly smaller, the total length of the skull being 3 to 4 mm. less, with corresponding differences in all other measurements. The coloration in *urucumus* is much darker than in either *langsдорffii* or *steinbachi*, the light tips to the hairs being shorter and paler, while the black in the tail is more intense and greatly increased in area.

### ***Sciurus langsдорffii steinbachi* subsp. nov.**

Type, No. 1938 (Pittsburgh Museum), ♀ ad., Santa Cruz de la Sierra, Bolivia June 14, 1909; collected by T. Steinbach, for whom this form is named.

Differs from *S. langsдорffii langsдорffii* in much paler coloration throughout, the hairs of upperparts being slightly tipped with pale yellow instead of heavily tipped with orange; the top of the head and nape slightly washed with yellow instead of orange rufous; nose and sides of head dull yellowish instead of deep rufous; thighs rufous instead of chestnut; underparts pale yellow instead of ochraceous yellow, and tail fringed with a lighter shade of yellow.

Total length (type, collector's measurements), 505 mm.; head and body, 250; tail vertebrae, 255; hind foot, 55; ear, 32. Five specimens (including type), total length, 491 (475-505); head and body, 254 (250-260); tail vertebrae, 235 (225-255); hind foot, s. u., 55 (55-55).

Skull (type), total length, 63; zygomatic breadth, 37; interorbital breadth, 23; postorbital breadth, 19; breadth of braincase, 23; nasals,  $20 \times 9$ ; maxillary tooth-

row, 9. Five skulls (including type), total length, 60.6 (60.2–61); zygomatic breadth, 36 (35–37); interorbital breadth, 20.6 (20–21); postorbital breadth, 18.6 (18–19); breadth of braincase, 23.6 (23–24); nasals,  $18.3 \times 7.9$  ( $17.8\text{--}19.8 \times 7.6\text{--}8$ ); maxillary tooththrow, 9 (9–9.2).

Represented by 5 adult specimens (3 males, 2 females) collected by T. Steinbach at Santa Cruz de la Sierra, Bolivia, June 16–July 28, 1909, for the Pittsburgh Museum.

Subspecies *steinbachii* agrees closely in size with true *langsдорffii* (type locality by designation of Wagner, 1843, and Thomas, 1904) Cuyabá, Matto Grosso, and also in general coloration, but readily distinguishable by the absence of the strong rufous color of the head present in both *langsдорffii* and *urucumus*. The type locality is about 300 miles southwest of Cuyubá, and about the same distance west of the type locality of *urucumus*.

I am indebted to the authorities of the Pittsburgh Museum for the use of this and much other squirrel material collected by Steinbach in Bolivia.

### ***Sciurus stramineus zarumæ* subsp. nov.**

Type, No. 36537, ♀ ad., Zaruma (altitude 6000 feet), southwestern Ecuador, Sept. 27, 1913; William B. Richardson.

Like *S. stramineus nebouri* in the presence of a large white nape patch, but widely different in general coloration from either typical *stramineus* or *nebouri*.

Upperparts (except the white nape patch) washed with yellowish rufous, more heavily and more intensely (approaching tawny) on the posterior half of the back and hind limbs, more lightly on the head and anterior half of back, the black basal portion of the pelage wholly concealed by the long rufous tipping of the hairs, which on the lower back is half the length of the pelage; nose and outside of fore limbs grayish; underparts gray, passing into white on the throat, upper breast, inside of fore limbs and inguinal region; upper surface of fore and hind feet intense black, wrists rufous, especially the inner surface, and the rufous on the hind limbs extends slightly beyond ankles; tail rufous all around where it joins the body, the rest black heavily washed with white.

Total length (collector's measurements), 540; head and body, 220, tail vertebræ, 320; hind foot, 60. Skull, total length —; zygomatic breadth, —; interorbital breadth, 19; postorbital breadth, 17; breadth of braincase, 23; nasals, —; diastema, 14; maxillary tooththrow, 10. The nasals and zygomatic arches are unfortunately broken.

Although represented by only a single specimen, the color differences are so profound that, taken with the geographical conditions, it is hard to believe that they do not denote a strongly marked form of the *stramineus* group. The rufous tips of the hairs on the lower back are as long as the dark basal portion.

