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MAMMALS OF NORTHERN COLOMBIA

PRELIMINARY REPORT NO. 6: RABBITS (LEPORIDAE), WITH
NOTES ON THE CLASSIFICATION AND DISTRIBUTION OF THE
SOUTH AMERICAN FORMS

By PHILIP HERSHKOVITZ

RABBITS collected by the author in northern Colombia during his tenure of the Walter Rathbone Bacon Traveling Scholarship include 18 tapitis representing *Sylvilagus brasiliensis* and 73 cottontails representing *Sylvilagus floridanus*. The following review shows the above named to be the only recognizably valid species of leporids indigenous to South America.

All North and South American rabbits in the collection of the United States National Museum and the Chicago Natural History Museum were compared in preparing this report. Examples of Neotropical rabbits from other institutions, given below, were also examined. Available material included 34 of the 36 preserved types of South American rabbits.

In the lists of specimens examined, the following abbreviations are used:

- A.M.N.H. American Museum of Natural History.
- B.M. British Museum (Natural History).
- C.M. Carnegie Museum.
- C.N.H.M. Chicago Natural History Museum.
- M.N.H.N. Muséum National d'Histoire Naturelle, Paris.
- U.M.M.Z. University of Michigan Museum of Zoology.
- U.S.N.M. United States National Museum.
- Z.M.T. Zoological Museum, Tring.

The author expresses his appreciation to the authorities of European museums listed above for permission to study specimens in their charge. Loan of material from American institutions is gratefully acknowledged. Permission to describe a new subspecies of tapiti from specimens in collections of the Chicago Natural History Museum was kindly granted by authorities of that institution.

Capitalized color terms in descriptions are shown in Robert Ridgway's "Color Standards and Color Nomenclature." All measurements are in millimeters.

VERNACULAR NAMES OF SOUTH AMERICAN RABBITS

Spanish-speaking natives of Latin America distinguish between the true rabbit and the introduced hare by the terms *conejo* and *liebre*, respectively. In Brazil, equivalent Portuguese words, *coelho* and *lebre*, are used. In some localities *conejo* is applied also to other animals, such as the agouti (*Dasyprocta*), having a real or fancied resemblance to the rabbit. In Argentina, south of the extreme southern range of indigenous leporids, wild-living members of the introduced species *Lepus europaeus* and *Oryctolagus cuniculus* are called *liebre* and *conejo*, respectively. The cottontail, *Sylvilagus floridanus*, is restricted to habitats in northwestern South America where tapitis do not occur. Hence, the term *conejo* applied to rabbits in general offers no confusion locally. The Guajiros of northern Colombia have named the cottontail *átpana*; the Indians of the Venezuelan coast, *carpa*. The tapiti, *Sylvilagus brasiliensis*, is most commonly known in Brazil by the Portuguese *coelho*, and in Andean countries by the Spanish *conejo*. In Ecuadorian Quechua the tapiti is called *cunu*.

The name tapiti, or tapeti, universally adopted in literature for *Sylvilagus brasiliensis*, is derived from *tapiti* or *tapeti* of the Paraguayan Guaraní and Brazilian Tupí languages. English pronunciation of tapiti is "tuh-pee-tee."

DISTRIBUTION AND HABITAT IN SOUTH AMERICA

South American representatives of *Sylvilagus floridanus* inhabit arid and semiarid tropical regions of Colombia, Venezuela, and some adjacent islands. The altitudinal range is from sea level to approximately 1,000 meters above. Cottontails prefer to hide in dense and thorny thickets bordering open fields or savannas and under scattered hedges and shrubs of scrub country. They do not make burrows. The species is never found in virgin or fully reestablished forests. Cottontails could have been introduced into South America by man or have entered the continent from Central America by following the interconnecting maze of natural and artificially created savannas in

Panama and northwestern Colombia. These savannas may have been more numerous and more extensive than is indicated at present time.

Primary forests are natural barriers to the spread of cottontails in South America. Thus, the northern Colombian cottontail (*S. floridanus superciliaris*) is abundant along the base and cleared foothills of the Sierra Nevada de Santa Marta but is absent from savannas in the Sierra Nevada at 1,000 meters and more above sea level. These montane savannas, apparently affording ideal habitats for cottontails, are separated from lowland savannas by a continuous belt of forest. On the other hand, the same cottontail has penetrated clearings on the opposing slope of the Sierra de Perijá, to as high as 1,000 meters above sea level where these clearings are continuous with those of the lowlands.

Cottontails have spread over cleared banks of the Río Magdalena and those of many of its tributaries but have not gained access to true highland savannas, or *páramos*, on the crests of the Andes. These *páramos* are isolated from the largely artificially created savannas lower down, by belts of primary forest. Nothing impedes a continuous distribution of cottontails from the Río Cesar Valley, Colombia, into the arid Guajira Peninsula, thence eastward into arid and semiarid savannas and scrub countries of northern Venezuela. The *llanos* of the Orinoco Basin again provide suitable and accessible habitats. The cottontails on a few islands off the Venezuelan coast must have been introduced relatively recently by man.

Cottontails are active only at night unless some disturbing circumstance compels them to emerge from their retreats in daytime. The savanna dog, *Dusicyon thous*, is their most persistent enemy.

Tapitis (*Sylvilagus brasiliensis*) inhabit the remainder of South America exclusive of high altitudes above snow line and the Patagonian region south of the Argentine Chaco. They live in Tropical and Temperate Zone forests and in swamps, savannas, scrublands, and deserts. Their presence is most evident in forest clearings and natural grasslands. Tapitis nest in brush heaps, in hollow trunks of trees, at the base of trees, and amid tangled roots. They sometimes find refuge in burrows made by other animals. In lowlands tapitis are active only at night. In the highland *páramos* they are active from late in the afternoon to early in the morning. Principal enemies of tapitis are members of the cat and dog families.

In northwestern South America habitats of tapitis and cottontails are mutually exclusive. Tapitis cling to dwindling forests and the clearings therein and to natural savannas of the Andean crests, while cottontails are replacing them in artificial savannas cutting through the original forests. No doubt introduction of the larger, more prolific, and more aggressive cottontail, together with the train of predators following it, is the most important factor contributing to the exclusion

of tapitis from the continuously expanding artificial savannas and scrublands of northwestern South America. Elsewhere tapitis live successfully in at least superficially similar habitats.

More precise geographic data regarding ranges of cottontails and tapitis are given under the species and subspecies headings.

LITERATURE

Publications on indigenous leporids of South America include brief descriptions of new forms, a few short reviews of what had been regarded as species and species groups, and generalized comments on the interrelationships of some forms. Broader works on leporids as a whole and on lagomorphs in general have dealt sparingly and cautiously with rabbits of South America.

Lyon (1904) classified families and genera of lagomorphs chiefly on the basis of osteological and dental characters. He included the 11 kinds of South American rabbits known at that time in the genus *Sylvilagus*. He (*op. cit.*, p. 334) regarded the generic name *Tapeti* Gray as "nothing else than a part of *Sylvilagus*."

Nelson (1909) discussed South American tapitis in connection with his revision of North American leporids. He believed that *Tapeti* Gray, with *Limnolagus* Mearns a synonym, was a valid subgenus of *Sylvilagus*. Nelson then arranged the North American species of *Tapeti* into two groups. One group included *gabbi* and *palustris*, the other *insonus* and *aquaticus*. This heterogenous assemblage was based on what Nelson (*op. cit.*, p. 259) regarded as a "striking double parallelism in the curious resemblance in both form and color between the two representatives of this group in Mexico (*S. [gabbi] truei* and *S. insonus*) and the two swamp rabbits of the United States (*S. palustris* and *S. aquaticus*). *S. g. truei* of the humid tropical forests of southern Mexico, in its rich dark colors, short ears, short slender feet, and short tail is remarkably like *S. palustris* of the United States. On the other hand, *S. insonus* of southwestern Mexico bears an equally close superficial resemblance to *S. aquaticus* of the United States. . . . It is difficult to decide whether these remarkable resemblances point to a common origin, or merely represent parallel development." The "superficial" external and cranial characters enumerated by Nelson as indicative of close relationship between members of each of the above groups are mainly family or individually variable characters and do not support his classification. On the other hand, Nelson failed to discuss the relationship of North and South American cottontails.

Thomas (1913) made the first attempt to clarify the interspecific relationships of South American Leporidae. As a point of departure, he restricted the type locality of *Lepus brasiliensis* Linnaeus to Per-

nambuço, Brazil. Range of the species was given (*op. cit.*, p. 211) as "the southern half of Brazil and westwards to Peru. Northwards [it ranges] into Colombia, and will probably be found to intergrade with *S. gabbi*." Thomas recognized another group of rabbits inhabiting the coast and islands of Colombia and Venezuela. This group included *cumanicus* with *margaritae* and *superciliaris* regarded as scarcely distinguishable, and *S. orinoci* "a more isolated form, tending again toward *S. brasiliensis*." Still another group was composed of the Andean rabbits, *S. meridensis*, *andinus*, and *capsalis*. It appeared to Thomas that the dark-naped *S. nigronuchalis* differed most from all others.

Pocock (1925) described some external characters of lagomorphs. American rabbits included in his study were *floridanus*, *superciliaris*, *brasiliensis*, *palustris*, and *aquaticus*. *Tapeti* was used in a generic sense for *brasiliensis*, and the names *Tapeti* and *Limnolagus* were used interchangeably for *palustris* and *aquaticus*. Evidently Pocock was more concerned with characters distinguishing the Leporidae from the Ochotonidae. Nevertheless, minor differences between species and genera were described. Pocock noted the absence of a supertragus in the ears of *floridanus* and *brasiliensis* and its presence, though weakly developed, in *palustris*. The hind feet of *floridanus* and *brasiliensis* were found to be similar in form. Likewise, the hind feet of *aquaticus* and *palustris* were described as resembling each other most while differing notably in certain respects from the other two species mentioned.

Tate (1933) reviewed the taxonomic literature of Neotropical leporids from the pre-Linnaean description of the tapiti by Marggraf in 1648 to the last publication on the subject in 1929. All named forms, with type locality of each, were listed. The type locality of *S. brasiliensis* was discussed and that of Pernambuco, Brazil, as fixed by Thomas in 1911 was accepted. Tate did not pretend to classify the rabbits or to define their characters. It appears from the title of his paper, however, that all South American rabbits, including cottontails, are members of the subgenus *Tapeti*.

Hershkovitz (1938) discussed the status of *Sylvilagus andinus* and its relationship to other tapitis. Material examined was chiefly from Ecuador, the remainder from widely scattered localities in Central and South America. Named forms of tapitis were treated in terms of species groups. Tapitis of the "gabbi group," from Central America and the lowlands west of the Andes, and those of the "brasiliensis group," from Brazil, were found to be very closely related. The "kelloggi group" from the western slopes of the Cordillera Occidental in Ecuador appeared to be nearest *S. daulensis*, the western Ecuadorian representative of the "gabbi group." Characters given by the author for distinguishing *S. andinus* from other groups now appear to

be relative and in most cases intermediate between those of the *gabbi* and *brasiliensis* groups. No attempt was made to compare tapitis with South American cottontails or with the North American species *aquaticus*, *palustris*, and *insonus*.

Krumbiegel (1942) listed the named species of Central and South American rabbits. His material consisted of seven specimens from various sources representing three forms, and eight specimens collected by Krig in the Chaco. The latter were referred to *Sylvilagus brasiliensis paraguensis* Thomas.

Hummelinck (1940) revised the cottontails of northern Venezuela, northern Colombia, and adjacent islands. *S. nigronuchalis* with *continentis*, a subspecies, and *S. cumanicus* with subspecies *superciliaris*, *margaritae*, and *avius* were recognized. Hummelinck's account includes all pertinent bibliographic references, all known locality records, full descriptions, and detailed measurements of most of the 39 specimens examined. Information is given on habits and relative abundance of the forms treated.

CLASSIFICATION OF AMERICAN RABBITS

The four genera of American rabbits recognized by Lyon (1904) are *Sylvilagus* Gray, *Limnolagus* Mearns, *Brachylagus* Miller, and *Romerolagus* Merriam. Lyon divided *Sylvilagus* into subgenus *Sylvilagus* (type, *Lepus sylvaticus* Bachman=*S. floridanus mallurus* Thomas) and subgenus *Microlagus* Trouessart (type, *Lepus cinerascens* Allen). All South American rabbits were assigned to typical *Sylvilagus* with *Tapeti* Gray a synonym. The genus *Limnolagus*, according to Lyon, embraced *aquaticus* Bachman (type), *palustris* Bachman, and *telmalemonus* Elliot.

Nelson (1909) admitted three, instead of four, genera of American rabbits. He recognized *Sylvilagus*, *Brachylagus*, and *Romerolagus*. *Microlagus* was relegated to the synonymy of typical *Sylvilagus*, while *Tapeti* Gray (*Lepus brasiliensis* Linnaeus, type) was revived as a subgenus of *Sylvilagus*. *Limnolagus* was placed in the synonymy of *Tapeti*.

Material and information accumulated to date confirm the inclusion of all South American rabbits within the genus *Sylvilagus*. The South American cottontail (including *nigronuchalis*, *cumanicus*, *margaritae*, *superciliaris*, and others) is specifically identical with the North American *Sylvilagus floridanus*. The tapiti, *S. brasiliensis* (including *tapetillus*, *gabbi*, *andinus*, and others), is distinguished from all cottontails chiefly by smaller size, near obsolescence of tail, and by the normal number of six mammae. These characters, together with others of lesser importance, are barely sufficient to validate *Tapeti* Gray as a subgenus of *Sylvilagus*.

The North American species *aquaticus* and *palustris*, assigned by Nelson to *Tapeti*, are not nearly related to *S. brasiliensis*. *Sylvilagus aquaticus* is here regarded as a true cottontail though larger and more highly specialized for an aquatic habitat than any other species of the subgenus *Sylvilagus*. The name *Limnolagus*, therefore, is transferred from the synonymy of *Tapeti* into that of typical *Sylvilagus*, where it remains available. The swamp rabbit, *Sylvilagus palustris*, is even more highly specialized than *S. aquaticus* for aquatic and palustrine life. Moreover, as is shown under the next heading, the characters of *S. palustris* combine a number of peculiarities that distinguish this species just as certainly from true cottontails (subgenus *Sylvilagus*) as from tapiti (subgenus *Tapeti*) and from all other American rabbits as well. It is proposed, therefore, to establish Bachman's *Lepus palustris* as type of a new subgenus of *Sylvilagus*, to be known as *Paludilagus*. *Brachylagus* and *Romerolagus* are apparently valid genera, while *Microlagus* is currently contained in the synonymy of typical *Sylvilagus*.

COMPARISONS AND RELATIONSHIPS OF SOUTH AMERICAN LEPORIDAE

All named forms of South American cottontails grade into one another and are specifically indistinguishable from North American representatives of *Sylvilagus floridanus*. Recent discoveries of the Central American *S. floridanus hondurensis* Goldman (1932, p. 122) and *S. f. costaricensis* Harris (1933, p. 3) fairly fill the distributional gap between North and South American cottontails. The blackish nuchal patch of South American *continentis* and *nigronuchalis* is a relatively simple character comparable to the blackish upper side of the tail of some Central American cottontails, notably *hondurensis*. In all cases complete gradation from the blackish to the rufous condition characteristic of most cottontails is demonstrable.

South American representatives of *Sylvilagus floridanus* are distinguished from *S. cunicularis* by smaller bulla, shorter palatal bridge, and less developed and defined anterior angle of supraorbital process. They differ from *S. graysoni* in the same respects except for a greater resemblance in shape of angle of supraorbital process. South American cottontails diverge widely from other North American relatives such as *nuttallii*, *audubonii*, and *bachmani* and need no comparison with them.

The tapiti, *Sylvilagus brasiliensis* (including *gabbi* of Central America), is smaller than *S. floridanus*. The rudimentary tail, indistinguishable from the similarly colored rump, and six, not eight, teats are other marked external characters of the tapiti. Structure of the skull of *S. brasiliensis* is highly variable but generally conforms to that of *S. floridanus*. No constant difference between *brasiliensis* and

floridanus is noted in dental design. Number of folds, or crenulations, of the enamel of anterior aspect of first lower premolar varies from one to five in both species. These folds may be deep or appear as slight crenulations. Frequently a different number of enamel folds obtains in each of the two lower premolars of the same animal in either species.

Sylvilagus brasiliensis has no near relatives outside the *S. floridanus* group. Nelson's unwarranted inclusion of species so remotely related *inter se* as *aquaticus*, *palustris*, and *gabbi* (= *brasiliensis*) in the subgenus *Tapeti* presents gratuitous complications to the definition and classification of South American rabbits. Characters of *Tapeti* Gray as given by Nelson (1909, p. 44) exclude, by strict interpretation of certain one or more details, each of the species purportedly described by them. Actually, some alleged superficial resemblances between swamp rabbits and tapitis as noted by Nelson are nonexistent.

Nelson (1909, p. 44) grouped *brasiliensis*, *palustris*, and *aquaticus* together on the basis of their "proportionately small, thinly haired ears; small short-haired hind feet, and small, sometimes almost obsolete, tail." Appearance of length of these structures in the dried skin can be misleading. Ear of *S. brasiliensis* is comparatively thickly haired, especially basally; length of ear when individual measurements are compared is proportionately greater than that of either *palustris* or *aquaticus* and averages slightly longer than that of Neotropical forms of *S. floridanus*. *S. aquaticus* is not only a comparatively long-tailed species, but its tail is of the cottontail type. Tail of *S. palustris* is actually short but intermediate in appearance between the cottontail type and the tapiti or "butontail" type. Contrary to Nelson's belief, there is little difference between the species of *Sylvilagus* in proportional length of hind foot. Hind foot of *aquaticus* is more sturdily and broadly built than that of either *floridanus* or *brasiliensis*. Hind foot of *S. palustris* differs widely in structure from that of any other species of *Sylvilagus*. The well-produced middle digit of its relatively narrow hind foot tends markedly toward perissodactylism, a condition first noted by Pocock (1925, p. 692). The extremely long, dark claws of both fore and hind feet serve further to distinguish *S. palustris* from *brasiliensis*.

Nelson (*loc. cit.*) believed that the "coarse, harsh (and usually rather thin) pelage" was distinctive of species he assigned to *Tapeti*. Pelage of *S. palustris* is rather coarse but sleek superficially, the under fur, notably on underparts, extremely thick and soft; altogether, a pelage suited to the marshy habitat and aquatic proclivities of *S. palustris*. Pelage of Tropical Zone races of *S. brasiliensis* is comparatively thin, dull in appearance, and definitely not of a texture associated with water repulsion. Pelage of Temperate Zone, or *páramo*, races of

brasiliensis is thick, soft, quite lax, and obviously adapted for preservation of body heat. Pelage of *S. aquaticus* more nearly resembles that of *palustris* but is not so highly specialized. The nuchal patch, nearly suppressed in *palustris*, is well defined in *aquaticus* and tropical races of *brasiliensis*. In Temperate Zone tapitis, color of the long, thick nuchal pelage tends to merge with that of surrounding parts. Normally there are eight mammae in *palustris* and *aquaticus*, six in *brasiliensis*.

Important cranial characters, apart from gross differences in size, separate *brasiliensis* from *palustris* and *aquaticus*. Basisphenoid in *S. brasiliensis* is subtriangular in outline, with only anterior third nearly parallel-sided; ventral sphenopalatine plates laterad of basisphenoid slightly or not at all imperforate. In *palustris* basisphenoid is funnellform in outline with one-half or more of anterior portion nearly parallel-sided; sphenopalatine vacuities usually strikingly large and may extend beyond nearly parallel-sided portion of basisphenoid. Bullae of *palustris* are approximately twice the bulk of those of *brasiliensis*. Occipital condyles of *palustris* are widely separated from each other, the distance between ventral posterior edges of each condylar ridge greater than width of sphenoccipital synchondrosis. In *brasiliensis* the condyles are more approximated, the distance between them usually less than width of sphenoccipital synchondrosis. Posterior projecting process of zygomatic bone short and obtuse in *brasiliensis*; longer, more tapering in *palustris*. In *brasiliensis* angular process of mandible is comparatively weak, articular surface of condyloid process relatively short, coronoid process small; in *palustris* angular process relatively longer, stronger and more rounded, articular surface of condyloid relatively longer, coronoid process comparatively well developed. *Sylvilagus aquaticus* agrees with *brasiliensis* in most cranial characters separating the latter from *palustris*. The basisphenoid and sphenopalatine plates of *aquaticus* are as in *brasiliensis*; bullae smaller than those of *palustris*; posterior angle of supraorbital process normally completely fused with frontal in *aquaticus*, is less completely fused in *palustris*, entirely free or partially, seldom completely, fused with frontal in *brasiliensis*. Dental characters show considerable range of variation in the species concerned and offer nothing of diagnostic value.

Sylvilagus insonus Nelson is a large species with a superficial resemblance to *S. aquaticus*. The status of *insonus* cannot be determined definitely on the basis of the type and topotype, the only specimens available. However, *insonus* does not appear to be a tapiti, nor does it show any of the peculiarities of *S. palustris*. It is best treated as a distinct species of the typical section of the genus.

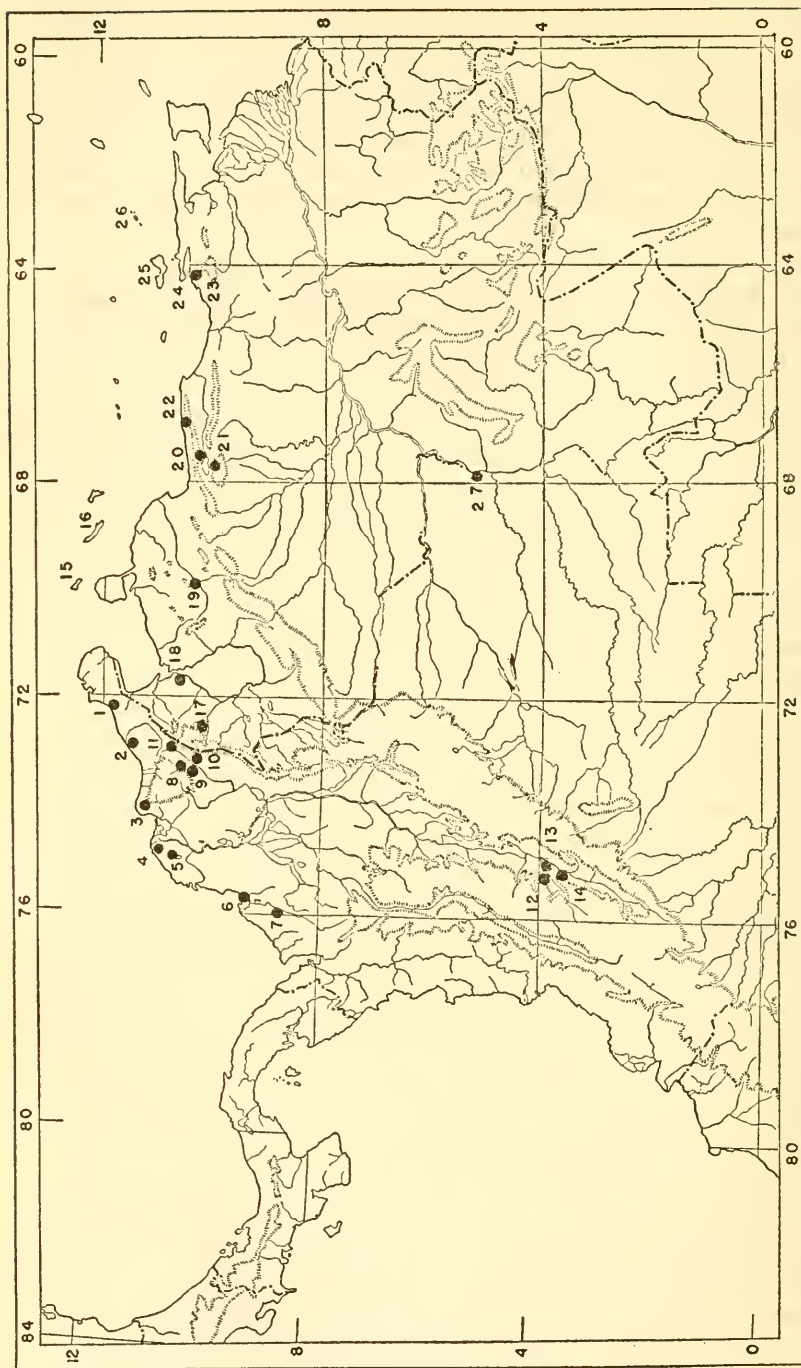


FIGURE 42.—Collecting localities of South American cottontails: *Sybilagus floridanus superciliaris* (1-11); *S. f. purgatus* (12-14); *S. f. nigronuchalis* (15-16); *S. f. contineris* (17-19); *S. f. valenciae* (20-21); *S. f. cumanicus* (22-24); *S. f. margaritae* (25); *S. f. avius* (26); *S. f. ornoci* (27). See opposite page for key to localities.

EXPLANATION OF MAP (FIGURE 42)

(Type localities in **boldface** type)*Sylvilagus floridanus superciliaris* (Allen):

COLOMBIA

1. Cardón (El Cardón; Cordón de los Remedios), Guajira (sea level).
2. Río Haeha, Magdalena (sea level).
3. **Bonda**, Magdalena (50 meters).
4. La Playa, Atlántico (approx. 50 meters).
5. Ciénaga de Guájaro, Atlántico (15 meters).
6. Puerto Zapote, Bolívar (sea level).
7. Jaraquiel, Bolívar (20 meters).
8. El Salado, Magdalena (430 meters).
9. Guaimaral, Magdalena (140 meters).
10. Río Cesar, Magdalena (158 meters).
11. Villanueva, Magdalena (274 meters).
11. Sierra Negra, Sierra de Perijá, west and above Villanueva (1,000 meters).

Sylvilagus floridanus purgatus Thomas:

COLOMBIA

12. Ortega, Tolima (446 meters).
13. **Purificación**, Tolima (292 meters).
14. Nataigama, Tolima (316 meters).

Sylvilagus floridanus nigronuchalis (Hartert):

DUTCH WEST INDIES

15. **Aruba**.
16. **Curaçao**.

Sylvilagus floridanus continentis Osgood:

VENEZUELA

17. Río Cogollo, Zulia (100 meters).
18. **Maracaibo**, Zulia (sea level).
19. Río Tocuyo, Lara (500 meters).

Sylvilagus floridanus valenciae Thomas:

VENEZUELA

20. Maracay, Aragua (445 meters).
21. **El Trompillo**, Carabobo (400 meters).

Sylvilagus floridanus cumanicus (Thomas):

VENEZUELA

22. San Julián, Caracas (near sea level).
23. **Cumaná**, Sucre (sea level).
24. Península de Araya, Sucre.

Sylvilagus floridanus margaritae (Miller):

VENEZUELA

25. **Isla de Margarita**.

Sylvilagus floridanus avius Osgood:

VENEZUELA

26. Los Testigos.
Testigo Grande (Tamarindo)
Isla de los Conejos.

Sylvilagus floridanus orinoci Thomas:

COLOMBIA

27. **Maipures**, Vichada (115 meters).

THE SOUTH AMERICAN COTTONTAIL

SYLVILAGUS FLORIDANUS (Allen)

(Synonymies given under subspecies headings)

Distribution (map, fig. 42).—Islands of Aruba, Curaçao, Margarita, Los Testigos, and arid and semiarid savannas and scrublands of Caribbean coastal plains and highlands of Colombia and Venezuela. Some cottontails have penetrated southward into valleys of the upper Río Orinoco, Venezuela, and the upper Río Magdalena, Colombia; altitudinal range to approximately 1,000 meters above sea level.

Characters.—Larger than *S. brasiliensis* but ear averaging proportionately shorter; base of ear on outer side thinly haired, the median anterior portion well defined from crown; gray inner side of ear sharply defined from brownish outer surface by a fine white edging. Tail comparatively long, grayish to brownish above, cottony white to grayish brown beneath, and always distinguishable from rump. Dominantly white upper surface of hind foot often marked with spots or patches of ochraceous to tawny. A well-defined white to buff circumorbital band nearly always present. Nuchal patch ochraceous to black. Rump like back or paler, grayer. Mammae, eight: one pair pectoral, two pairs abdominal, one pair inguinal. Skull comparatively large and relatively narrow, the rostrum broad; nasals long, between 82 and 107 percent of zygomatic breadth. Supraorbital process comparatively heavy, posterior wing thick and broad with posterior edge of inner border nearly always fused with frontal, sometimes entire inner border fused. Least length of palatal bridge usually less than one-third greatest distance across outer border of maxillary plates of molar rows. Bulla comparatively large.

Remarks.—Most cranial differences between Neotropical *floridanus* and *brasiliensis* are largely dependent upon over-all differences in size. There is some overlapping in actual cranial measurements between smaller races of *floridanus* and larger ones of *brasiliensis*. In these extremes there is usually a narrower average difference in some cranial proportions. As a rule, however, the relatively longer nasal and larger bulla distinguish the skull of any one individual of Neotropical *floridanus* from an otherwise similar skull of *brasiliensis*. In addition, the posterior angle of supraorbital process in *floridanus* is never so delicate and widely separated from frontal as in many individuals and even entire populations of *brasiliensis*.

Variation.—South American cottontails vary individually, locally, sexually, and to a certain extent seasonally, as described by Nelson (1909, pp. 26–37) for their North American relatives. A slightly larger average size noted among females may be attributable to the greater number of old females than old males in collections. Seasonal change in pelage among Neotropical cottontails follows the same cycle as that of Boreal forms but shows less strongly contrasted differences

between old and new pelages. Molt occurs through the months of August, September, and October. New pelage is prime in December and January. From February through July the pelage becomes progressively shorter, thinner, and paler as result of wear on the dark tips of the hairs. However, as compared with winter and summer pelages of cottontails of middle latitudes of North America, the pelage of Neotropical forms is of uniform length and thickness the year round.

Subspecies.—The comparatively small area of northwestern South America inhabited by cottontails varies little ecologically from place to place. This condition tends to restrict subspeciation almost entirely to macrogeographic isolation. Cottontails west of the Sierra de Perijá, the western bifurcation of the Cordillera Oriental, in Colombia, are all rufous-naped. They segregate into two weakly defined races, the northern Colombian *superciliaris* and the paler, smaller *purgatus* of the upper Río Magdalena Valley. Cottontails east of the eastern bifurcation of the Cordillera Oriental, the Sierra de Mérida, in Venezuela, are likewise rufous-naped but differ appreciably in cranial characters from their Colombian relatives. Eastern Venezuelan subspecies recognized are the nominal mainland forms, *cumanicus*, *valenciae*, and *orinoci*, and the insular *margaritae* and *avius*. The Lake Maracaibo Basin, between the eastern and western bifurcations of the Cordillera Oriental, is inhabited by a dark-naped form, *S. floridanus continentis*. Cranially, *continentis* bridges the gap between the eastern and western rufous-naped rabbits. Available material does not show complete intergradation between *continentis* and the Colombian *superciliaris* in one character, color of nape. On the other hand, a series from Río Tocuyo, in the highlands between the Sierra de Mérida and the low plains of the coast and Lake Maracaibo, represents a completely intergrading population between *continentis* and rufous-naped cottontails of eastern Venezuela. The name *nigronuchalis* is based on a dark-naped rabbit from Aruba, an island about 20 km. off the Península de Paraguaná. Absence of important differences between the Aruba form and its nearest mainland relative, the equally dark-naped *continentis*, indicates its comparatively recent separation from the mainland stock. No doubt dark-naped forms arose from a rufous-naped cottontail somewhere within the present range of *continentis*. The probable dominance of a blackish nape over the reddish one has permitted *continentis* to maintain and even to extend its range.

SYLVILAGUS FLORIDANUS SUPERCILIARIS (Allen)

Lepus (Sylvilagus) superciliaris ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 12, p. 196, 1899.

Sylvilagus superciliaris, ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 20, p. 445, 1904 (Bonda; field notes by H. H. Smith).—Pocock, Proc. Zool. Soc. London, 1914, p. 905, fig. 10d (facial vibrissae).

[*Sylvilagus*] *superciliaris*, THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 211, 1913 (synonym of *cumanicus*).

Sylvilagus] *cumanicus superciliaris*, HUMMELINCK, Studies on the fauna of Curaçao, Aruba, Bonaire and the Venezuelan Islands, vol. 1 (Utrecht), p. 66, 1940 (La Guajira); vol. 2 (The Hague), p. 103, 1940 (Cardón and Río Hacha, Guajira).

Sylvilagus boylei ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 35, p. 84, 1916 (type locality, La Playa, northwest of Barranquilla, Colombia).

Holotype.—Adult male, skin and skull, A.M.N.H. No. 15428; collected July 4, 1899, by Herbert H. Smith.

Type locality.—Bonda, near Santa Marta, Magdalena, Colombia.

Distribution.—Northern Colombia, from the Comisaría de la Guajira south into the departments of Magdalena, Atlántico, Bolívar, and the Santanders. (See also the general account of distribution, p. 328.)

Characters.—Nuchal patch Ochraceous-Orange to Tawny; rostral patch, from tip of nose to crown, Ochraceous-Buff to Ochraceous-Tawny; back of crown between anterior bases of ears dominantly buffy; cheek buffy to ochraceous; ventral surface of tail sharply defined cottony white, sometimes with a buffy wash. Basisphenoid narrow, distance across ventral posterior edges of occipital condylar ridges greater than width of sphenoccipital synchondrosis; nasal and palatal bridge shorter, ear slightly longer than in Venezuelan rufous-naped cottontails.

Coloration.—Subterminal bands of cover hairs Ochraceous-Buff to white, tips dark brown or black; rump predominantly grayish, contrasting with back; sides of body buffy to ochraceous with a light mixture or mottling of brown or black and contrasting with the more coarsely darkened back; ventral surface, except collar, white usually with a lateral band of buff or ochraceous. Nuchal patch Ochraceous-Orange to Tawny; rostrum Ochraceous-Buff to Ochraceous-Tawny, the posterior portion darker and more coarsely mixed with black. White circumorbital band defined by black line above, black patch behind, and beneath by black streaks or lines with, frequently, a well-defined patch anteriorly. Side of muzzle buff; cheek below orbit buffy to Tawny streaked or lined with black. Upper surface of forefoot white washed or mottled with ochraceous to entirely ochraceous; hind foot white above with or without a wash or mottling of ochraceous; outer side of limb Ochraceous-Buff to Ochraceous-Orange becoming warmer, to Tawny, on inner side. Upper side of tail coarsely mixed gray, buff and Tawny. Under side cottony white, sometimes lightly washed with buffy.

Measurements.—Means and extremes of six topotypes: Ears, dry from notch, 55.3 (52–57); condylobasal length, 67.7 (65.1–70.4); zygomatic breadth, 34.4 (33.2–35.8); length of nasals, 31.3 (30.6–31.8); greatest combined width of nasals at premaxillary sutures, 15.4 (14.9–

15.5); least length of palatal bridge, 6.6 (5.1–7.5); greatest distance between outer sides of maxillary plates of tooth rows, 21.8 (21.3–22.6); alveolar length of molar row, 14.4 (14.0–14.9). Means and extremes of 23 specimens from Villanueva: Total length, 431 (392–463); tail, 42 (31–57); hind foot, 89 (85–94); ear, dry from notch, 55.5 (52–60); condylobasal length, 69.9 (68.2–73.3); zygomatic breadth, 36.1 (34.2–38.5); length of nasals, 35.3 (33.2–37.4); greatest combined width of nasals across premaxillary sutures, 16.6 (14.3–18.2); least length of palatal bridge, 6.5 (5.7–8.1); greatest distance between outer sides of maxillary plates of tooth rows, 23.0 (21.9–24.7); alveolar length of molar row, 14.5 (14.1–15.0).

Remarks.—Available topotypes, part of the original series collected by Smith, show practically the full range of variation within the subspecies. A female from El Salado, on the eastern slope of the Sierra Nevada de Santa Marta, is indistinguishable from the typical series. The large number of specimens collected in the Río Cesar Valley, including Villanueva, affords opportunities for study of individual and local variation but reveals nothing exceptional. The series from the Ciénaga de Guájaro, west of Barranquilla, is nearly topotypical of *boylei* and averages slightly warmer in coloration than the Bonda series. A subadult from the Sierra Negra, in the Sierra de Perijá above Villanueva, taken at an altitude of approximately 1,000 meters above sea level, the highest recorded for the species in South America, is thickly furred, with more black on back and soles of hind feet than in the Villanueva rabbits. It is also smaller in size than comparable individuals from elsewhere.

With exceptions noted below, all cottontails collected by the writer in northern Colombia were taken at night with the aid of an electric lantern. Specimens from Sierra Nevada and Sierra de Perijá were flushed near roads in deforested sections that opened into savannas and scrublands of the valley below. Cottontails from the Río Cesar-Río Guaimaral region were seen only in pastures, *palmales* (mixed savanna and palm), *tunales* (mixed savanna and thorny shrubs), and *rastrojo* (thickly overgrown land formerly tilled). These sites were reached from the writer's camps on the banks of the Guaimaral and the Cesar by passing through several kilometers of primary and reestablished forest. Significantly, of leporids only tapitis (*S. brasiliensis*) were encountered in the forest traversed and only cottontails were found in deforested sites beyond. These locales bordering the belt of forest on the right bank of the Cesar are designated on labels of the specimens collected as "Palmarito," "Aguas Blancas," "Aguas Verdes," and "El Tunal." Three lactating cottontails, the only ones seen in daylight, were taken in the last locality. No doubt an overflow from the rising Río Cesar flushed these females from cover. Cottontails labeled as being from "Guacamayo" are from pastures

and *rastrojo* on the left bank of the Cesar opposite the station "El Orinoco."

Specimens examined.—Ninety-two. Bonda, 13 (A.M.N.H., the type; U.S.N.M., 3; C.N.H.M., 5; C.M., 4); La Playa, Atlántico, 1 (A.M.N.H., type of *boylei*); Ciénaga de Guájaro, 5 (U.S.N.M.); Puerto Zapote, Bolívar, 3 (C.M.); Jaraquiel, 1 (C.M.); El Cauca, Santander, 1 (C.M.); El Salado, Sierra Nevada de Santa Marta, 1 (U.S.N.M.); Río Guaimaral (including Aguas Verdes, Aguas Blancas, Palmarito), 19 (U.S.N.M.); Río Cesar (including El Orinoco, Guacamayo, El Tunal), 16 (U.S.N.M.); Villanueva, 31 (U.S.N.M.); Sierra Negra above Villanueva, Sierra de Perijá, 1 (U.S.N.M.).

SYLVILAGUS FLORIDANUS PURGATUS Thomas

Sylvilagus purgatus THOMAS, Ann. Mag. Nat. Hist., ser. 9, vol. 5, p. 32, 1920; vol. 20, p. 80, 1927 (vicinity of Bogotá).

Holotype.—Adult female, skin and skull, B.M. No. 19.10.15.3; received in exchange from Frère Apollinaris Maria.

Type locality.—Purificación, Río Magdalena, Tolima, Colombia; altitude, 292 meters.

Distribution.—Savannas and arid scrublands of the upper Río Magdalena Valley, departments of Cundinamarca and Tolima, Colombia; altitudinal range approximately between 200 and 500 meters above sea level.

Characters.—Smaller and paler throughout than *superciliaris*, ear shorter, pelage shorter and thinner. Cranial characters as in *superciliaris* but proportionately smaller.

Measurements.—Means and extremes of six adults (five from Nataigama and one from Ortega, both localities in the typical region): Ear, dry from notch, 47.5 (41–53); condylobasal length, 66.3 (64.6–69.0); zygomatic breadth, 33.9 (33.4–34.6); length of nasals, 32.9 (30.6–35.4); greatest combined width of nasals across premaxillary sutures, 14.4 (12.3–15.7); least length of palatal bridge, 6.0 (5.5–6.7); greatest distance between outer sides of maxillary plates of tooth rows, 21.6 (20.7–22.2); alveolar length of molar row, 13.7 (13.4–14.2).

Remarks.—Skulls of the small *purgatus* resemble those of larger forms of *S. brasiliensis*, notably the Colombian lowland tapiti and *S. b. apollinaris* of the Andes near Bogotá. However, cottontails are always distinguished from tapitis by proportionately larger bullae and longer nasals.

Specimens examined.—Nine. The type (B.M.); Nataigama, Río Magdalena, Tolima, 7 (U.S.N.M.); Ortega, Río Magdalena Valley, west of Purificación, Tolima, 1 (U.S.N.M.).

SYLVILAGUS FLORIDANUS NIGRONUCHALIS (Hartert)

Lepus nigronuchalis HARTERT, Nov. Zool., vol. 1, p. 40, 1894.

Sylvilagus (Sylvilagus) nigronuchalis, LYON, Smithsonian Misc. Coll., vol. 45, p. 336, 1904.

Sylvilagus nigronuchalis, OSGOOD, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 28, pl. 11, 1910 (Aruba, Curaçao).—VAN DER HORST, Bijdr. Fauna Curaçao, Bijdr. Dierk., vol. 23, p. 5, 1924.

Sylvilagus nigronuchalis nigronuchalis, HUMMELINCK, Studies on the fauna of Curaçao, Aruba, Bonaire and the Venezuelan Islands, vol. 1 (Utrecht), p. 67, 1940 (Curaçao, Aruba); vol. 2 (The Hague), p. 95, 1940 (Curaçao, Aruba).

Holotype.—Subadult male, skin (mounted) and skull, Zoological Museum, Tring; collected by Ernst Hartert.

Type locality.—Aruba, Dutch West Indies, off the coast of Venezuela opposite the Península de Paraguaná.

Distribution.—The islands of Aruba and Curaçao, Dutch West Indies; according to Hummelinck (*supra cit.*) "very probably not occurring in Bonaire."

Characters.—A pale, insular dark-naped cottontail: Size comparatively small, nuchal patch, at least medially, Prout's Brown to black; rostral patch, from tip of nose to crown, dominantly grayish or buffy, back of crown between anterior bases of ears, grayish; side of face buffy to ochraceous lightly mixed with dark brown, cheek Light Buff; under side of tail sharply defined white; skull smaller, cranial proportions intermediate between Colombian and Venezuelan rufous-naped subspecies.

Measurements.—Those of a young adult male topotype followed by those of a subadult female from Curaçao: Total length, 388, 360; tail, 28, 30; hind foot, 78, 85; ear, dry from notch, 52, 53; condylobasal length, 61.7, 58.7; length of nasals, —, 30.9; greatest combined width of nasals across premaxillary sutures, 16.2, 14.4; least length of palatal bridge, 6.5, 6.4; alveolar length of maxillary tooth row, 14.1, 12.7. The following measurements given by Hummelinck (*supra cit.*) are the extremes of 19 specimens from Aruba and Curaçao: Hind foot, 78–85; ear, from notch, 52.5–56; condylobasal length, 61–64.5; zygomatic breadth, 33.5–34.5; length of nasals, 30.5–31.5.

Remarks.—Two of three topotypes at hand are juvenals less than a month old, the third a young adult. The last, taken April 28, 1908, during the dry season, is in old gray pelage; its nuchal patch Prout's Brown. Hartert described the nape of the type as brownish black; Hummelinck, who examined 19 specimens from Aruba and Curaçao, most of which were collected during the rainy season from October through December, characterized the nuchal patch as "deep black." A subadult from Curaçao, in unworn pelage, taken March 30, is darker on nape and more warmly colored on back than the available adult topotype; in both, rostral patch is Warm Buff lightly mixed with dark brown, cheek Cartridge Buff to Cream-Buff.

According to Hartert, Dutch residents of Aruba and Curaçao call the dark-naped cottontail "a rabbit," but, he adds, "it does not burrow like rabbits. It lives in the scrub and among the rocks, resting during the daytime in its form, like the European hare."

Specimens examined.—Five. Aruba, the type (Z.M.T.); 3 (C.N.H.M.); Curaçao, 1 (C.N.H.M.).

SYLVILAGUS FLORIDANUS CONTINENTIS Osgood

Sylvilagus nigronuchalis continentis OSGOOD, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 57, 1912.—HUMMELINCK, Studies on the fauna of Curaçao, Aruba, Bonaire and the Venezuelan Islands, vol. 1 (Utrecht), p. 66, 1940; vol. 2 (The Hague), p. 100, 1940.—SANBORN, Fieldiana: Zoology, vol. 32, p. 230, 1947.

Sylvilagus cumanicus, ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 30, p. 249, 1911 (Tocuyo).

Holotype.—Subadult, sex unknown, skin and skull, C.N.H.M. No. 18695; collected January 13, 1911, by W. H. Osgood and S. G. Jewett; original number 4112.

Type locality.—Near Maracaibo, Lake Maracaibo, northern Zulia, Venezuela.

Distribution.—Western Venezuela; savannas, swamps, and scrublands of the Lake Maracaibo Basin and adjacent coastal plains and highlands of Zulia, Falcón, and Lara.

Characters.—The continental dark-naped cottontail: More warmly colored throughout than *nigronuchalis*. Nuchal patch Tawny to black; back Ochraceous-Buff mixed or marbled with dark brown; rostral patch Ochraceous-Buff to Ochraceous-Orange; back of crown buffy gray to ochraceous; side of face buffy to ochraceous with a mixture, or with lines, of dark brown, cheek Light Ochraceous-Buff to Warm Buff.

Measurements.—Those of the type followed by those of four subadult topotypes, respectively: Total length, 407, 420, 407, 389, 390; tail, 43, 40, 40, 45, 35; hind foot, 80, 85, 80, 80, 77; ear, dry from notch, 53, 52, 52, 53, 50; condylobasal length, 66.0, 62.5, 61.1, 60.6, 59.5; zygomatic breadth, 33.6, 33.3, 32.7, 34.0, 32.2; length of nasals, 30.6, 30.0, 28.5, —, 28.0; greatest combined width of nasals across premaxillary sutures, 16.7, 13.4, 14.3, 15.4, 13.8; least length of palatal bridge, 6.0, 6.2, 6.1, 5.6, 6.3; greatest width between outer sides of maxillary plates of tooth rows, 20.8, 21.1, 20.2, 21.4, 20.0; alveolar length of maxillary tooth row, 14.0, 13.4, 12.7, 12.9, 12.9. Of one adult male and two adult females from Río Tocuyo, respectively: Ear, dry from notch, 58, 61, 56; condylobasal length, 65.2, 67.1, 64.9; zygomatic breadth, 34.8, 34.6, 34.4; length of nasals, 34.1, 34.3, 32.1; greatest combined width of nasals across premaxillary sutures, 16.1, 16.6, 16.6; least length of palatal bridge, 6.3, 5.8, 6.6; distance between outer sides of maxillary plates of tooth rows, 22.2, 22.3, 22.2.

Remarks.—Only in the holotype is the nuchal patch nearly wholly black. Characters, especially of the more warmly colored head, distinguishing topotypes of *continentis* from insular *nigronuchalis*, are slight but consistent. The Maracaibo specimens were taken from

December through January, February, and March. Two subadults from foothills of the Sierra de Perijá, taken in February, agree with the topotypes. A series of three adult specimens and one immature individual from Río Tocuyo, Lara, is more somberly colored throughout than either *nigronuchalis* and *continentis* but with head, as in the latter race, more warmly colored than in the former. The Tocuyo series shows gradation between the two dark-naped races on one hand and between the dark-naped and rufous-naped cottontails of eastern Venezuela on the other. One Río Tocuyo specimen with nuchal patch Tawny is practically indistinguishable from some individuals of *margaritae* from Margarita Island. Another with nuchal patch Prout's Brown is intermediate, except for a slightly warmer rostral patch, between the pale topotype of *nigronuchalis* at hand, and the darker Curaçao specimen. The Río Tocuyo specimens were collected by G. H. H. Tate as a member of the Phelps Venezuela Expedition. Allen (*supra cit.*) recorded other specimens collected by Carriker in the same locality.

Osgood (*supra cit.*) observed that *continentis* is "excessively abundant in the vicinity of Maracaibo and in the similarly arid region on the east side of the lake, extending in this direction at least to the Empalado Savannas where it is rather rare. It is sold daily in the market of Maracaibo, and it was there our specimens were obtained. The Venezuelans hunt it at night with a torch made from a tightly wrapped bundle of dry sticks, one man carrying the torch and another the gun, usually a single-barreled muzzle-loader of the cheapest possible construction. At other times small ground fires are kindled at intervals throughout several acres and the hunter goes stealthily from one to the other shooting at such rabbits as have been attracted by the lights. The rabbits seem to be exclusively nocturnal, not stirring even in the short twilight of morning and evening. At day-break or nightfall I repeatedly traversed localities much frequented by them but had no glimpse of one."

Specimens examined.—Twelve. Maracaibo, 6 including the type (C.N.H.M.); Río Cogollo, Zulia, 2 (C.N.H.M.); Río Tocuyo, Lara 4 (A.M.N.H.).

SYLVILAGUS FLORIDANUS CUMANICUS (Thomas)

Lepus sp. ROBINSON and LYON, Proc. U. S. Nat. Mus., vol. 24, p. 161, 1902 (said to be "found, but are scarce" in San Julián, near La Guaira).

Lepus cumanicus THOMAS, Ann. Mag. Nat. Hist., ser. 6, vol. 20, p. 552, 1897.

Sylvilagus cumanicus, THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 211, 1913 (*margaritae* and *superciliaris* synonyms of *cumanicus*).

Sylvilagus cumanicus cumanicus, HUMMELINCK, Studies on the fauna of Curaçao, Aruba, Bonaire and the Venezuelan Islands, vol. 2 (The Hague), p. 100, 1940 (part, not *valenciae*; Manglillo and Chacopata, Península de Araya).

Holotype.—Adult female, skin and skull, B.M. No. 94.9.25.18; collected January 1894, by A. Mocquerys.

Type locality.—Cumaná, Sucre, coast of Venezuela.

Distribution.—Northern coastal plain of Venezuela in the state of Sucre and, according to Hummelinck (*supra cit.*, p. 101), "in Carabobo, Falcón and ? Aragua."

Characters.—A pale, rufous-naped cottontail, essentially as in *margaritae*, paler than *valenciae*.

Remarks.—No typical specimens of *cumanicus* are at hand. According to Thomas, there is little if any difference between *cumanicus* and its nearest geographic ally, *margaritae*, described a year later.

Specimen examined.—One. The type (B.M.).

SYLVILAGUS FLORIDANUS VALENCIAE Thomas

Sylvilagus cumanicus, OSGOOD (*nec* Thomas, 1897), Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 28, 1910 (Maracay).

Sylvilagus valenciae THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 14, p. 413, 1914.

Sylvilagus cumanicus cumanicus, HUMMELINCK, Studies on the fauna of Curaçao, Aruba, Bonaire and the Venezuelan Islands, vol. 2 (The Hague), p. 100, 1940 (part; *Sylvilagus valenciae* in synonymy).

Holotype.—Adult male, skin and skull, B.M. No. 14.9.1.84; collected May 15, 1914, by Samuel M. Klages; original number, 80.

Type locality.—El Trompillo, southeast of Lake Valencia, Carabobo, northern Venezuela; altitude, 1,300 feet.

Distribution.—Known only from vicinity of Lake Valencia.

Characters.—More warmly colored throughout than any other Neotropical rufous-naped cottontail; rump and sides less contrasted with back, crown with more black, side of face buffier and lined with black; under side of tail not sharply contrasted with upper. Size and cranial characters as in *margaritae* and presumably as in *cumanicus*.

Measurements.—Of a male from Maracay, northeast side of Lake Valencia: Total length, 455; hind foot, 89; ear, dry from notch, 57; condylobasal length, 73.3; zygomatic breadth, 37.1; length of nasals, 37.2; greatest combined width of nasals at premaxillary sutures, 16.7; least length of palatal bridge, 7.8; greatest distance between outer sides of maxillary plates of tooth rows, 22.7; alveolar length of molar row, 15.2.

Remarks.—The specimen at hand is readily distinguished from *margaritae* and rufous-naped representatives of *continentis*. Its distinction from the earlier described *orinoci* is less clear though possibly valid. Hummelinck (*supra cit.*, p. 101) inferred from the original description that "*valenciae* might be considered identical with *S. cumanicus*, possibly even with the typical subspecies."

Specimens examined.—Two. The type (B.M.); Maracay, 1 (C.N.H.M.).

SYLVILAGUS FLORIDANUS ORINOCI Thomas

Sylvilagus orinoci THOMAS, Ann. Mag. Nat. Hist., ser. 7, vol. 5, p. 356, 1900.—TATE, Bull. Amer. Mus. Nat. Hist., vol. 76, p. 174, 1939 (Maipures, Río Orinoco).

Holotype.—Female, skin and skull, B. M. No. 99.9.11.49; collected January 22, 1899, by George K. and Stella M. Cherrie.

Type locality.—Maipures, upper Río Orinoco, Vichada, Colombia.

Distribution.—Known only from type locality.

Characters.—Paler than *valenciae*, but with side of face extremely dark; darker than *margaritae*, under side of tail less contrasted with upper.

Measurements.—Of a subadult topotype; Total length, 390; tail, 30; hind foot, 90; ear, dry from notch, 51; condylobasal length, 67.4; zygomatic breadth, 36.1; length of nasals, 33.3; greatest combined width of nasals across premaxillary sutures, 14.0; least length of palatal bridge, 6.5; greatest distance between outer sides of maxillary plates of tooth rows, 22.2; alveolar length of molar row, 14.8.

Remarks.—The subadult topotype at hand is in old pelage, as contrasted with the prime pelage of the available adult representative of *valenciae*, the only form with which comparisons need be made.

Specimens examined.—Two. The type (B.M.); Maipures, 1 (A.M.N.H.).

SYLVILAGUS FLORIDANUS MARGARITAE (Miller)

Lepus brasiliensis, ROBINSON (*nec* Linnaeus), Proc. U. S. Nat. Mus., vol. 18, p. 651, 1896 (Margarita Island).

Lepus margaritae MILLER, Proc. Biol. Soc. Washington, vol. 12, p. 97, 1898.—ROBINSON and LYON, Proc. U. S. Nat. Mus., vol. 24, p. 162, 1902.

Sylvilagus (Sylvilagus) margaritae, LYON, Smithsonian Misc. Coll., vol. 45, p. 336, pls. 86, 87, fig. 5 (type skull), 1904.

Sylvilagus margaritae, OSGOOD, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 29, 1910 (Margarita: Puerto Viejo; Porlamar; Macanao).

S[y]vilagus] margaritae, THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 211, 1913 (synonym of *cumanicus*); ser. 9, vol. 5, pp. 32–33, 1920 (comparison with *purgatus*).

Sylvilagus cumanicus margaritae, HUMMELINCK, Studies on the fauna of Curaçao, Aruba, Bonaire and the Venezuelan Islands, vol. 1 (Utrecht), p. 68, 1940 (Margarita: Los Robles; San Antonio; Laguna Dulce, Macanao; Porlamar); vol. 2 (The Hague), p. 104, 1940.

Holotype.—Adult male, skin and skull, U.S.N.M. No. 63217; collected July 1, 1895, by Wirt Robinson; original number 369.

Type locality.—Isla de Margarita, Venezuela.

Distribution.—Common throughout Margarita Island.

Characters.—A large pale rufous-naped cottontail. Superficially as in *superciliaris* but head paler, ear slightly shorter; side of face as in *continentis*, rostral patch warmer; cottony-white under surface of tail more frequently washed with buffy than in *superciliaris*. Skull

larger than in *superciliaris*, palatal bridge longer, nasal wider, basi-sphenoid wider, the distance between ventral posterior edges of occipital condylar ridges equal to or less than distance across sphenoccipital synchondrosis.

Coloration.—Subterminal bands of cover hairs of back Warm Buff to nearly white, tips and terminal halves of guard hairs dark brown to black, sometimes Tawny forming irregular patches; rump buffy or grayish, weakly contrasted with back; side of body grayish or buffy contrasting with back or with a heavy mixture of black or dark brown. Rostral patch posteriorly ochraceous ticked with dark brown, anteriorly buffy; side of head grayish or buffy ticked with a mixture of black beneath orbits, black suborbital patch present or absent. Under side of tail white or gray mixed with buffy.

Measurements.—Of the type and two females and one male topotypes, respectively: Total length, —, 427, 437, 442; hind foot, —, 83, 85, 85; ear, dry from notch, —, 57, 56, 52; condylobasal length, 70.3, 69.9, 70.6, 72.9; zygomatic breadth, 36.2, 25.5, 37.8, —; greatest length of nasals, 36.8, 36.7, 37.4, 38.9; greatest combined width of nasals across premaxillary sutures, 18.0, 18.0, 17.7, 18.5; least length of palatal bridge, 7.6, 7.7, 7.7, 7.6; greatest distance between outer sides of maxillary plates of tooth rows, 24.9, 24.5, 26.1, 24.1; alveolar length of molar row, 15.2, 15.4, 15.5, 15.5.

Specimens examined.—Twelve. The type (U.S.N.M.); Margarita Island, 11 (C.N.H.M.).

Remarks.—In 1895, Robinson (*in* Robinson and Lyon, 1902) reported cottontails were so plentiful on the Island of Margarita that they were “split and dried like codfish and brought by the boat load to La Guaira [Venezuela] for sale.”

SYLVILAGUS FLORIDANUS AVIUS Osgood

Sylvilagus avius OSGOOD, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 29, 1910.—SANBORN, Fieldiana: Zoology, vol. 32, p. 230, 1947.

Sylvilagus cumanicus avius, HUMMELINCK, Studies on the fauna of Curaçao, Aruba, Bonaire and the Venezuelan Islands, vol. 1 (Utrecht), p. 68, 1940 (Testigos: Isla de Conejo); vol. 2 (The Hague), p. 105, 1940.

Holotype.—Adult female, skin and skull, C.N.H.M. No. 16593; collected February 14, 1909, by John F. Ferry; original number, 304.

Type locality.—Testigo Grande, Islas de los Testigos, Venezuela.

Distribution.—According to Hummelinck (1940, vol. 2, p. 106), “common on the small, uninhabited Isla de Conejo de Los Testigos. Not found on Tamarindo (Testigo Grande), the type locality of this insular form; according to local inquiries no ‘rabbits’ occur on this island.”

Characters.—As in *margaritae* but more warmly colored throughout especially on rump, sides of body and hind limbs, and cheeks.

Measurements.—Those of the type, an old female, followed by those of a young adult male topotype: Total length, 420, 422; hind foot, 85, 82; ear, dry from notch, 54, 54; condylobasal length 68.0, 64.9; zygomatic breadth, 36.2, 35.1; greatest length of nasals, 35.6, 33.5; greatest combined width of nasals across premaxillary sutures, 14.8, 14.4; least length of palatal bridge, 7.0, 6.6; greatest distance between outer sides of maxillary plates of tooth rows, 23.5, 23.6; alveolar length of molar row, 15.1, 14.6.

Specimens examined.—Four. The type and three topotypes (C.N. H.M.).

THE TAPITI

SYLVILAGUS BRASILIENSIS (Linnaeus)

(Synonymies given under subspecies headings)

Distribution (map, fig. 43).—From Rio Grande do Sul, Brazil, and the Argentine, Bolivian and Paraguayan Chaco, north through South and Central America into Veracruz, Mexico; not recorded from the Guianas but undoubtedly occurs there; limits of distribution in south-eastern Peru and the Bolivian highlands unknown; absent from Chile. Altitudinal range, sea level to approximately 4,500 meters above.

Characters.—Smaller than *Sylvilagus floridanus*; tail rudimentary. Brownish-gray inner surface of ear not sharply defined from brown of outer surface, whitish edging restricted to lower anterior border of pinna; base of ear comparatively well haired, lower anterior portion thickly haired and nearly indistinguishable from crown. Tail minute, uniformly brownish, or slightly paler beneath than above, more or less button-shaped and, in the living animal, hardly distinguishable from rump. Dominantly ochraceous to Tawny upper surface of hind foot frequently marked with spots and patches of white, rarely entirely white. Orbital region variable, never with complete circumorbital ring. Supraorbital patch usually pale, suborbital region with or without dark band. Nuchal patch Tawny. Rump usually more warmly colored than back. Mammae, six: one pair pectoral, one pair abdominal, posteriormost pair either abdominal or inguinal. Skull comparatively small, the rostrum narrow; nasal short, between 70 and 92 percent of zygomatic breadth. Supraorbital process less heavily built than in *floridanus*, the posterior wing more delicate and either entirely free or with only inner posterior edge, rarely entire inner border, fused with frontal. Bulla comparatively small.

Remarks.—Small size, delicate form, nearly obsolete tail, warmly colored rump and six mammae distinguish *S. brasiliensis* from all other Neotropical rabbits with which comparisons need be made. The tapiti differs widely from the much smaller, nearly tailless *Romerolagus* of Mexico. Comparisons of *brasiliensis* with other species have already been made in preceding sections.

Subspecies.—Previous arrangements of tapitis appear to have been

no more than groupings of named forms along geographic lines with each regional assemblage regarded as a "species group." The "species" of the so-called *brasiliensis* and *gabbi* groups are no more than lowland races of *Syrrhaptes brasiliensis*, some ranging in Brazil and bordering countries, others in Mexico through Central America, and coastal Colombia and Ecuador. The "*deflippi* group," consisting of the one and only tapiti described by that name, is the eastern Ecuadorian form of *S. brasiliensis*. The "*kelloggi* group," with *kelloggi* and *chillae*, represents tapitis of the forested slopes of the Cordillera Occidental in southern Ecuador. The "*andinus* group" included *meridensis* of the *páramos* of the Sierra de Mérida, Venezuela, *andinus* with several subspecies named thereof, of the Ecuadorian highlands, and *capsalis* of western Peru. All names of these high Andean forms represent scattered populations of geographic races of *S. brasiliensis*. Former taxonomic separation of the "species groups" followed the convenient pattern of bestowing on the same animal a different specific name for each of its representatives on each of the American continents and on each side and slope of each mountain chain. None of the geographical features mentioned have impeded the distribution of *S. brasiliensis*. The only apparent limiting factors to the horizontal and vertical spread of tapitis are absence or extreme scarcity of food, and areas invaded or otherwise occupied by cottontails or, in Argentina, by European leporids and the harelike histricomorph rodents *Dolichotis* and *Pediolagus*.

Of above-mentioned tapitis, only those of the *páramos* of Ecuador (*andinus*) and Venezuela (*meridensis*) are sufficiently differentiated from other forms of *S. brasiliensis* to merit special discussion. These highland tapitis are remarkably similar in their long, thick fur, dusky color, pale limbs, gray cheeks, and in all cranial characters. Their habitats, situated in the highest altitudinal zone of the Andes capable of sustaining mammalian life, are ecologically similar. Neither *andinus* nor *meridensis* could have originated directly from the other. Their respective ranges are completely isolated by the length and ecological diversity of the Colombian portion of the Andean system. It is imperative, therefore, to regard *andinus* and *meridensis* as collateral offshoots from a common stock of tapitis with an unbroken distribution at lower altitudinal levels. This is, in effect, demonstrably true. *S. b. andinus* grades into the more warmly colored *kelloggi* of the Temperate Zone scrub forests of the Ecuadorian Andes. The latter is almost indistinguishable from *chillae* of the subtropical forests of Ecuador. *S. b. chillae*, in turn, grades into *daulensis* of the coastal plain of Ecuador. The lowland or coastal tapitis, whether called *daulensis*, *brasiliensis*, or *gabbi* are the common stock whence diverged localized forms. Tapitis of the Colombian Andes, *apollinaris*, *nicefori*, *fulvescens*, and *salentus*, exhibit characters that, on the

basis of previous classifications, would make optional their assignment to either the "*andinus* group" or the "*gabbi* group." Of Colombian forms, *apollinaris* is nearest *meridensis* and shows very nearly the same relationship to it as *kelloggi* shows to *andinus*.

Distinguishing characters of recognized races are but slight modifications of a common pattern as exemplified by the Central American *gabbi*, to mention the better-known form. Some races, *paraguensis*, *gibsoni*, *capsalis*, *chotanus*, *daulensis*, and *consobrinus*, are paler than *gabbi*; others, *messorius*, *surdaster*, and *defilippi*, are darker. In general, tapitis of humid, primary forest are darker than those of drier deciduous forests or of open country whether this be savanna, swamp, or desert.

Thirty-nine races of *Sylvilagus brasiliensis* are formally listed below. Two of these are described as new. The six North American forms are not critically reviewed. Judgment on the status and validity of each named form of South American tapitis has been exercised here to the extent permitted by the nature of available material. Museum collections contain a fair representation of tapitis from Panama, Ecuador, and Paraguay. Specimens from Brazil and Andean countries, other than Ecuador, are few and from widely scattered localities. The Guianas, the Orinoco region, and, except for a few of its extreme western reaches, the whole Amazonian region are not yet represented by tapitis in collections.

SYLVILAGUS BRASILIENSIS TRUEI (Allen)

Lepus truei ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 3, p. 192, 1890.

Sylvilagus gabbi truei, NELSON, North American Fauna No. 29, p. 262, 1909.

Holotype.—Adult, skin and skull, U.S.N.M. No. $\frac{6357 \text{ (skin)}}{34878 \text{ (skull)}}$ (skull originally misnumbered 25953); collected by C. Sartorius; original mark, "e."

Type locality.—Mirador, Veracruz, Mexico.

Distribution.—Humid tropical forest regions of southern México from Veracruz south into Guatemala.

Remarks.—The unmade skin of the type is in very poor condition, with large portions of the epidermis rotten. The skull, formerly mounted in the skin, is badly damaged. The name *truei* should be restricted to the skull if the skin proves to have been mismatched.

SYLVILAGUS BRASILIENSIS GABBI (Allen)

Lepus brasiliensis var. *gabbi* ALLEN, Monographs of North America Rodentia, Leporidae, p. 349, 1877.

Lepus gabbi, ALSTON, Biologia Centrali-Americana, Mammalia, vol. 1, p. 178, 1882 (part; Costa Rica and Panamá only, not Colombia and plate 19).

Sylvilagus tumacus ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 24, p. 649, 1908 (Tuma, Nicaragua, type locality).

Sylvilagus gabbi, NELSON, North American Fauna No. 29, p. 259, 1909.

Lectotype.—Adult male, skin and skull, U.S.N.M. No. ¹¹³⁷¹/₃₇₇₉₄; collected in Talamanca late in 1872 or early in 1873, by J. C. Zeledón and received from W. M. Gabb; original number, 18; one of three cotypes designated by Nelson (*loc. cit.*) as type.

Type locality.—Costa Rica and Chiriquí; restricted by Nelson (*loc. cit.*), by designation of the type specimen, to Talamanca (=Sipurió, Río Sixaola, near the Caribbean coast), Costa Rica.

Distribution.—Eastern Honduras, Nicaragua, Costa Rica, and western Panama.

Remarks.—Originally described as a "variety" of *brasiliensis*, *gabbi* was subsequently accorded specific rank by Alston because of alleged differences in length of ear and tail between Central American and Brazilian tapitis. Nelson (*supra cit.*) recognized the very close relationship of these tapitis but was misled by Thomas' misidentification of an unusually small tapiti from Rio de Janeiro as typical *brasiliensis* (*cf. infra*, p. 368). Nelson's basis for comparison was specimens of *Sylvilagus minensis* (= *S. brasiliensis minensis*) regarded at the time as specifically distinct from the unrepresentative "typical" *brasiliensis*.

SYLVILAGUS BRASILIENSIS DICEI Harris

Sylvilagus dicei HARRIS, Occ. Papers Univ. Michigan Mus. Zool. No. 248, p. 1, 1932.

Holotype.—Adult female, skin and skull, U.M.M.Z. No. 64043; collected May 24, 1931, by Austin Smith.

Type locality.—El Copey de Dota, Cordillera de Talamanca, 25 miles south of Cartago, Costa Rica; altitude, 6,000 feet.

Distribution.—Known only from type locality.

Remarks.—Doubtfully distinct from typical *gabbi*.

SYLVILAGUS BRASILIENSIS INCITATUS (Bangs)

Lepus (Tapeti) incitatus BANGS, Amer. Nat., vol. 35, p. 633, fig. A, 1901.

Sylvilagus gabbi incitatus, NELSON, North American Fauna, No. 29, p. 261, 1909.

Holotype.—Adult female, skin and skull, M.C.Z. (Bangs Collection) No. 8441; collected April 30, 1900, by W. W. Brown, Jr.

Type locality.—Island of San Miguel, Archipiélago de las Perlas, Golfo de Panamá.

Distribution.—Known only from type locality.

SYLVILAGUS BRASILIENSIS MESSORIUS Goldman

Sylvilagus gabbi messorius GOLDMAN, Smithsonian Misc. Coll., vol. 60, p. 13, 1912.

Holotype.—Adult male, skin and skull, U.S.N.M. (Biol. Surv. Collection) No. 179569; collected May 23, 1912, by E. A. Goldman; original number, 21736.

Type locality.—Cana, southeastern Panama; altitude 1,800 feet.

Distribution.—Río Tuyra drainage basin, humid tropical region of eastern Panama.

Remarks.—A dark form, most nearly resembling *surdaster* of north-western Ecuador.

SYLVILAGUS BRASILIENSIS CONSOBRINUS Anthony

Sylvilagus gabbi consobrinus ANTHONY, Bull. Amer. Mus. Nat. Hist., vol. 37, p. 335, 1917.

Holotype.—Adult female, skin and skull, A.M.N.H. No. 36793; collected February 21, 1914, by H. E. Anthony.

Type locality.—Old Panama (near City of Panama), Panama.

Distribution.—Known only from type locality.

Remarks.—Described as an extremely pale form.

SYLVILAGUS BRASILIENSIS SANCTAEMARTAE, new subspecies

Holotype.—Adult female, skin and skull, U.S.N.M. No. 279993; collected March 12, 1942, by Philip Hershkovitz; original number, 232.

Type locality.—Colonia Agrícola de Caracolicito, Río Ariguaní, southern slope of the Sierra Nevada de Santa Marta, department of Magdalena, Colombia; altitude, 335 meters.

Distribution.—Department of Magdalena, northern Colombia; lower southern slopes of the Sierra Nevada de Santa Marta southeastward, through remaining stands of woodland, into forests bordering the middle Río Cesar.

Characters.—A pale race, almost ashy in appearance as contrasted with the nearest geographic ally, *messorius* of Panama; less markedly paler than Panamanian (Gatún) representatives of *gabbi*; pelage shorter, thinner, with that of rostrum hispid, cheek and upper surface of hind foot paler than in *nicefori* and *apollinaris* of the Colombian Andes. Dorsal surface Cinnamon-Buff thinly lined with black or dark brown; rostrum Ochraceous-Orange very lightly ticked with black; circumorbital region, except for buffy supraorbital patch, dark brown; upper surface of hind foot with approximately equal amounts of white and ochraceous.

Coloration of holotype.—Tip of nose brownish, outer border of nares white, rostrum Ochraceous-Orange lightly mixed with black; cheek Warm Buff mixed with black; supraorbital patch Light Buff, a dark band beneath and behind orbit; outer surface of ear between Russet and Mars Brown terminally; nuchal patch Tawny. Back Cinnamon-Buff overlaid with black; cover hairs Pale Drab Gray basally, Cinnamon-Buff subterminally, black terminally; wool hairs entirely Pale Drab Gray on anterior half, gradually becoming darker on posterior half of back; guard hairs entirely black terminally, like others basally. Rump and inner side of thigh and leg mixed with Tawny; wool hairs Tawny terminally, cover hairs like back but sparse, guard hairs absent. Side of body paler than back, with less black, the subterminal bands of cover hairs Light Buff; side of neck warmer. Side of forearm

Ochraceous-Orange, interspersed with white guard hairs, inner side more white; upper surface of forefoot more Tawny; upper surface of hind foot mixed Ochraceous-Orange and white. Hairs of tail Tawny terminally, dark gray basally. Chest, belly, inner surface of hind leg, midventral line of forearm, white. White of chin and throat defined by a thin black line. Collar mixed Warm Buff and Cinnamon-Buff. Hairs of pubic region Ochraceous-Buff terminally, dark gray basally.

Coloration of paratypes (5 males, 2 females).—Two males are immature, one, an adult, is represented by skull and skin of head only. Paratypes with nuchal patch Ochraceous-Orange, average a tone paler than holotype. One adult male with tips of hairs of back dark brown instead of black, tips of hairs of sides even paler. Another male, not quite fully adult, extremely pale and buffy-gray in over-all appearance. Back of an old female heavily lined with black, cover hairs of sides Cartridge Buff with black tipping reduced and disappearing toward under side. Remaining female with black more evenly distributed.

The holotype is the only fully adult specimen with both skin and skull in good condition.

Río Guaimaral (3 males, 5 females).—Two males and one female are subadults. More warmly and more uniformly colored than the paratypes. Subterminal bands of cover hairs of back from Ochraceous-Buff to Cinnamon-Buff; hairs of outer anterior edge of ear average darker, upper surface of hind foot more uniformly ochraceous than in type series.

Measurements.—Those of the holotype, followed by those of a female and male paratype, respectively: Total length, 385, 383, 349; tail, 33, 29,—; hind foot, 76, 75, 68; ear, dry from notch, 53, 55, 50; condylobasal length, 68.9, 62.0, 62.5; zygomatic breadth, 34.4, 32.4, 32.7; length of nasals, 29.4, 28.0, 25.9; greatest combined width of nasals across premaxillary sutures, 13.0, 13.0, 11.3; least length of palatal bridge, 8.0, 7.2, 7.2; greatest width between outer sides of maxillary plates of tooth rows, 23.1, 21.5, 20.6; alveolar length of maxillary tooth row, 15.3, 13.7, 13.5. Of one male and three females from Río Guaimaral, respectively: Total length 308, 369, 358, 341; tail, 25, 35, 32, 25; hind foot, 70, 81, 85, 69; ear, dry from notch, 52, 50, 50, 50; condylobasal length, 54.2, 62.0, 61.0, 57.0; zygomatic breadth, 30.6, 33.0, 31.9, 31.9; length of nasals, 23.9, 26.9, 26.0, 24.7; greatest combined width of nasals across premaxillary sutures, 10.7, 13.4, 12.3, 11.6; least length of palatal bridge, 6.6, 7.6, 7.3, 6.9; greatest width between outer sides of maxillary plates of tooth rows, 19.4, 22.2, 20.6, 20.6; alveolar length of maxillary tooth row, 11.9, 13.4, 13.0, 12.5.

Remarks.—These, the first tapitis to be recorded from northern Colombia, include the only specimens known from the lowlands of this country. They fill the erstwhile distributional gap between South

and Central American populations. Specimens from the Sierra Nevada were flashed at night in overgrown clearings, along edges of pastures, and on banks of streams. No tapitis were encountered in surrounding forests. On the other hand, most tapitis taken in the Cesar-Guaimaral region were captured within the very forest. Occasionally an individual was observed or taken on a trail or in a newly made clearing within the forest. Once the night hunter emerges from forests bordering the Cesar he steps abruptly into savannas, palm groves, or scrub country. Here tapitis are no longer seen, and only the eye of the cottontail reflects back the light of the lantern.

Because of rapid deforestation, principally through burning, tapitis of the Sierra Nevada are in process of becoming completely isolated from their relatives in the plains forests. Tapitis of the Cesar undoubtedly have a wider, more continuous distribution with others in the lowlands of northern Colombia. Presumably they grade into *messorius* and *gabbi* of Panama and into *nicefori* of the forested slopes of the Colombian Andes.

Specimens examined. Sixteen. Colonia Agrícola de Caracolcito, 8 (U.S.N.M.); Río Guaimaral, Río Cesar, 8 (U.S.N.M.).

SYLVILAGUS BRASILIENSIS FULVESCENS Allen

Sylvilagus (Tapeti) fulvescens ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 31, p. 75, 1912; vol. 32, p. 477, 1913 (comparisons).

Sylvilagus fuscescens [sic], ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 35, p. 204, 1916 (*lapsus calami* for *fulvescens*; Belén).

Holotype.—Adult female, skin and skull, A.M.N.H. No. 32360; collected July 28, 1911, by Leo E. Miller.

Type locality.—Belén, a collecting station in the Cordillera Occidental, west of Popayán, Cauca, Colombia. Allen gave the altitude as 6,000 feet, but judged by the collector's itinerary Belén is near or on the summit of the range (10,340 feet) just north of Cerro Munchique.

Distribution.—Known only from type locality.

Characters.—Generally as in high Andean races with pelage long, thick, and soft, posterior angle of supraorbital process delicately formed and divergent from frontal; more uniformly buffy than *andinus* and *salentus*.

Specimen examined.—One. The type (A.M.N.H.).

SYLVILAGUS BRASILIENSIS SALENTUS Allen

Sylvilagus (Tapeti) salentus ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 22, p. 476, 1913; vol. 25, p. 204, 1916 (Salento).—THOMAS, Ann. Mag. Nat. Hist., ser. 9, vol. 5, p. 32, 1920 (comparison with *apollinaris*).

S[*sylvilagus*] *salentus*, THOMAS, Ann. Mag. Nat. Hist., ser. 9, vol. 8, p. 443, 1921 (comparison with *nicefori*).

Holotype.—Adult male, skin and skull, A.M.N.H. No. 33050; collected October 2, 1911, by Leo E. Miller.

Type locality.—Salento, at head of Río Quindio west of Mount Tolima, West Quindio Andes, Caldas, Colombia; altitude, 1,895 meters.

Distribution.—Known only from type locality.

Characters.—Essentially as in *fulvescens* but less uniformly colored, sides of body paler.

Remarks.—Allen found *salentus* "nearly related to *S. gabbi* of Costa Rica." Overlooking his own *fulvescens*, nearest geographically, Allen distinguished *salentus* from *surdaster* of western Ecuador by the long soft pelage, pale ears, and wholly buffy tail.

Specimen examined.—One. The type (A.M.N.H.).

SYLVILAGUS BRASILIENSIS NICEFORI Thomas

Sylvilagus nicefori THOMAS, Ann. Mag. Nat. Hist., ser. 9, vol. 8, p. 442, 1921.

Lepus gabbi, ALSTON (*nec* Allen), Biologia Centrali-Americana, Mammalia, vol. 1, p. 178, 1882 (part, Concordia, Medellín, and possibly pl. 19).

Holotype.—Adult male, skin and skull, B.M. No. 21.7.1.26; collected December 1919 and received in exchange from Hermano Nicéforo María.

Type locality.—San Pedro, Cordillera Central, 24 km. north of Medellín, Antioquia, Colombia; altitude, 2,435 meters.

Distribution.—In addition to the type, Thomas (*op. cit.*) recorded a specimen from Concordia, a locality on the western slope of the Cauca Valley, approximately 45 km. southwest of Medellín, altitude 2,030 meters.

Characters.—Probably not distinguishable from *salentus*; compared with *apollinaris*, underparts less white, the hairs tipped with buff, the dark basal portions showing through.

Remarks.—Tapiti of the Colombian Cordillera Central may eventually prove to be the same, with *salentus* and *nicefori* synonyms of *S. b. fulvescens*. A specimen from Concordia, Colombia, recorded and figured by Alston as *Lepus gabbi* is doubtless the one collected by Salmon and subsequently identified as *Sylvilagus nicefori* by Thomas. In certain details Alston's colored figure fits neither the description of *nicefori* nor of *salentus*. It is possible that the artist was obliged to take some liberties in coloring areas not clearly visible to him in the dried skin. The broad white circumorbital band and the sharply defined white edging of the ears shown in the figure are characteristic of Neotropical cottontails. Otherwise the figure is identifiable with a tapiti.

Specimen examined.—One. The type (B.M.).

SYLVILAGUS BRASILIENSIS APOLLINARIS Thomas

Sylvilagus apollinaris THOMAS, Ann. Mag. Nat. Hist., ser. 9, vol. 5, p. 31, 1920.

Holotype.—Adult, sex unknown, skin and skull, B.M. No. 19.10.15.2; received in exchange from Frère Apollinaris María.

Type locality.—Choachi, Cordillera Oriental, about 20 km. south-east of Bogotá, Cundinamarca, Colombia; altitude of Choachi, 1,966 meters.

Distribution.—Known only from the Bogotá region.

Characters.—Pelage intermediate in thickness, length, and texture between high Andean (*meridensis*, *andinus*, etc.) and lowland tapitis; back Warm Buff to Ochraceous-Buff lined with black, sides distinctly paler, underparts, except collar, sharply defined white, bases of hairs dark gray; rostrum and cheek heavily lined with black; supraorbital patch buffy, suborbital region darker; crown at anterior base of ears mixed Tawny and buffy; upper surface of fore and hind foot ochraceous; ear extremely short; posterior wing of supraorbital process longer and thicker than in high Andean races.

Remarks.—The above description is based on an adult topotype received from Hermano Apolinar María. Ear of type, 42 mm. from notch in dry skin, is equally short in the topotype. *S. b. apollinaris* differs less from tapitis of the Colombian lowlands than it does from *meridensis* and *andinus* of the páramos. A juvenal from the páramo above Choachi is very thickly furred, its cheeks pale. It may represent another páramo race such as *andinus* but may be referred provisionally to *apollinaris*.

Specimens examined.—Three. Choachi (type, B. M.; 1, U. S. N. M.); Páramo de Choachi, 1 (U. S. N. M.).

SYLVILAGUS BRASILIENSIS MERIDENSIS Thomas

Lepus andinus, THOMAS, Ann. Mag. Nat. Hist., ser. 6, vol. 20, p. 553, 1897 (Sierra de Mérida).

Sylvilagus meridensis THOMAS, Ann. Mag. Nat. Hist., ser. 7, vol. 14, p. 36, 1904.—OSGOOD, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 58, 1912 (Páramo de Tamá, observed).

S[y]vilagus meridensis, CABRERA, Trab. Mus. Nac. Cienc. Nat., Madrid, ser. zool., No. 9, pp. 6-8, 1913 (comparisons; distribution).

Holotype.—Adult, skin only, B. M. No. 4.5.14.1; collected by Salamón Briceño Gabaldón e hijos.

Type locality.—Sierra de Mérida, Mérida, Venezuela; probably at 4,000 meters above sea level.

Distribution.—Páramos of the Sierra de Mérida, Venezuela, possibly ranging into páramos of the Cordillera Oriental, department of Santander, Colombia; altitudinal range between 2,800 and 4,200 meters above sea level.

Characters.—More uniformly warmly colored throughout than *S. b. andinus*, pelage longer, nuchal patch less contrasted, circumorbital band dark brown with or without a buffy supraorbital or postorbital patch, underparts with more buff, less sharply defined from sides; upper surface of fore and hind foot ochraceous.

Measurements.—Of four adult male topotypes, respectively: Ear, dry from notch, —, 50, 55, 51; condylobasal length, 62.2, 62.2, 64.3, 65.0; zygomatic breadth, 33.8, 33.3, 34.4, 33.6; length of nasals, 26.6, —, 27.3, 29.6; greatest combined width of nasals at premaxillary sutures, 13.2, 12.1, 14.0, 11.6; postorbital constriction, 11.5, 12.2, 11.4, 11.5; incisive foramina, 17.8, 18.3, 18.0; least length of palatal bridge, 5.6, 6.5, 6.5, 6.1; distance between outer sides of maxillary plates of tooth rows, 21.4, 20.1, 21.8, 21.2; alveolar length of molar row, 13.8, 13.6, 13.5, 13.9.

Remarks.—The tapiti of the Páramo de Tamá recorded by Osgood was seen but not taken. A skull only of a tapiti from the Páramo de Guerrero, Santander differs widely from skulls of topotypes of *meridensis*. Pedicel of its supraoccipital process is extremely narrow anteroposteriorly, the posterior angle extremely delicate and widely separated from frontal; palatal bridge unusually long as result of ossification of posterior borders of incisive foramina.

Specimens examined.—Ten. Sierra de Mérida, Venezuela, the type (B.M.); La Culata and Sierra Nevada, 8 (6, U.S.N.M.; 2, C.N.H.M.), Páramo de Guerrero, Santander, Colombia, 1 (C.M.).

SYLVILAGUS BRASILIENSIS CHOTANUS Hershkovitz

Sylvilagus andinus chotanus HERSHKOVITZ, Occ. Papers Univ. Michigan Mus. Zool., No. 393, p. 8, 1938.

Holotype.—Adult female, skin and skull, U.M.M. Z. No. 77061; collected July 18, 1934, by Philip Hershkovitz; original number, M268.

Type locality.—Río Chota Valley, below Pimanpiro, Imbabura Province, Ecuador; altitude, approximately 1,500 meters.

Distribution.—Arid valley of the Río Chota, upper Río Mira, north of Ibarra, Imbabura Province, Ecuador.

Characters.—Paler throughout than *andinus*, underparts with more white, pelage shorter and thinner.

Remarks.—*S. b. chotanus* intergrades with *andinus* at higher altitudes. The arid habitat of *chotanus* is not far from the humid tropical forest lower down the same valley (Río Mira), where *surdaster* occurs. Nevertheless, *chotanus* differs most from that dark race.

Specimens examined.—Four. The type and three paratopotypes (U.M.M.Z.).

SYLVILAGUS BRASILIENSIS ANDINUS (Thomas)

Lepus andinus THOMAS, Ann. Mag. Nat. Hist., ser. 6, vol. 20, p. 551, 1897.—ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 25, p. 117, 1916 (Quito; Mount Pichincha),

Sylvilagus andinus, THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 212, 1913 (Cayambe; Guallabamba near Riobamba; páramos east of Riobamba; Telagua, Bolívar).—LÖNNBERG, Ark. Zool., vol. 8, p. 33, 1913 (Nono, Pichincha); vol. 14, pp. 3, 53, 1921 (western Ecuador).—STONE, Proc.

Acad. Sci. Philadelphia, 1914, p. 15 (mountains above Chambo).—CABRERA, Trab. Mus. Nac. Cienc. Nat., Madrid, ser. zool., No. 31, p. 56, 1917 (Mount Pichincha),

Sylvilagus andinus, CABRERA, Trab. Mus. Cienc. Nat., Madrid, No. 11, p. 119, 1912 (Mount Pichincha).

Sylvilagus andinus andinus, CABRERA, Trab. Mus. Cienc. Nat. Madrid, ser. zool., No. 9, pp. 4–8, pl., fig. 1, 1913 (Mount Pichincha; distribution; comparisons).

Sylvilagus andinus andinus, HERSHKOVITZ, Occ. Papers Univ. Michigan Mus. Zool., No. 393, p. 9, 1938 (La Compañía; description; comparisons; distribution).

Sylvilagus (Tapeti) ccaudatus TROUESSART, Mamm. de la mission de l'Equateur, p. A23 (author's separate), 1910 (type locality, Quito).

Sylvilagus andinus chimbanus THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 212, 1913 (type locality, Sinche [=Sínchic], Guaranda).—HERSHKOVITZ, Occ. Papers Univ. Michigan Mus. Zool., No. 393, p. 12, 1938 (Río Chimbo, above Chambo; discussion).

Sylvilagus andinus chimbanus, CABRERA, Trab. Mus. Nac. Cienc. Nat., Madrid, ser. zool., No. 9, pp. 6–8, 1913 (comparison, distribution).

Sylvilagus andinus chimbanus, KRUMBIEGEL, Zool. Anz., vol. 137, p. 26, 1942 (Chimborazo).

Sylvilagus andinus carchensis HERSHKOVITZ, Occ. Papers Univ. Michigan Mus. Zool., No. 393, p. 5, 1938 (type locality, near San Gabriel, Carchi).

Holotype.—Adult female, skin and skull, B. M.; collected July 2, 1897, by W. F. H. Rosenberg.

Type locality.—Western slope of Mount Cayambe, Pichincha Province, Cordillera Oriental, Ecuador; altitude, 4,000 meters.

Distribution.—Páramo zones and interandean highland savannas of Ecuador from Colombian border south to the Río Paute Valley, province of Cañar; altitudinal range, approximately between 2,600 and 4,500 meters above sea level.

Characters.—Pelage long, soft, dusky in appearance, with gray wool hairs showing through at surface; sides slightly paler than back; underparts grayish; cheek, side of neck, crown at anterior base of ears dark gray mixed with buffy and black; circumorbital band buffy with or without dark suborbital patch; upper surface of fore and hind foot pale, with more white than ochraceous.

Measurements.—Means and extremes of nine adults (five from La Compañía, Pichincha, and four from near San Gabriel, Carchi): Total length, 349 (338–355); tail, 25.3 (20–31); hind foot, *s. u.*, 66.7 (64–73); ear from notch, 56 (52–61), same dry, 50.8 (48–55); condylo-basal length, 60.5 (58.6–63.1); zygomatic breadth, 32.8 (32.2–33.8); length of nasals, 27.2 (26.2–28.4); greatest combined width of nasals across premaxillary sutures, 13.4 (12.8–14.8); least length of palatal bridge, 6.5 (5.9–7.2); distance between outer sides of maxillary plates of tooth rows, 19.9 (19.3–20.6); alveolar length of molar row, 13.0 (12.3–13.4).

Remarks.—Separation of *chimbanus* from *andinus* was based solely on a difference in respective lengths of their nuchal patches. The re-

duced size of the patch in the type of *chimbanus* is accounted for by a deep artificial fold of skin behind the ears, an artifact of the preparator. This condition appears also in a topotype at hand and had been noted in other specimens from the Río Chimbo recorded by the writer (*supra cit.*). There is no significantly real difference in length of nuchal patch among the various races of tapitis. Apparent differences in this character are almost entirely due to factors involved with preparation of skins. Characters originally noted for distinguishing *carchensis* from *andinus* are not now regarded as of subspecific importance.

Specimens examined.—Twenty-four. The type (B.M.); Quito, 1, the type of *ecaudatus* (M.N.H.N.); La Compañía, near Cangagua, Pichincha, 3,400 meters, 9 (8, U.M.M.Z.; 1, C.N.H.M.); 5 miles southwest of San Gabriel, Carchi, 2,900 meters, 10 including the type of *carchensis* (8, U.M.M.Z.; 1, C.N.H.M.); El Ángel, Carchi, 1 (C.N.H.M.); Síncic, Guaranda, Bolívar, 4,000 meters, 2, including the type of *chimbanus* (B.M.; U.S.N.M.).

SYLVILAGUS BRASILIENSIS NIVICOLA Cabrera

Sylvilagus] sp. CABRERA, Trab. Mus. Cienc. Nat., Madrid, ser. zool., No. 11, p. 119, 1912 (Mount Antisana, Ecuador).

Sylvilagus nivicola CABRERA, Trab. Mus. Cienc. Nat., Madrid, ser. zool., No. 9, p. 4, pl. fig. 2 (colored), 1913; No. 31, p. 56, 1917 (Mount Antisana).—HERSHKOVITZ, Occ. Papers Univ. Michigan Mus. Zool., No. 393, p. 11, 1938 (discussion).

Holotype.—Adult male, skin and skull, Mus. Ciencias Nat. Madrid No. 749; collected January 1865 by Marcos Jiménez de la Espada; original number, 10.

Type locality.—Mount Antisana, Cordillera Oriental, near snow line, probably in the neighborhood of 4,500 meters above sea level, Pichincha Province, Ecuador.

Distribution.—Known only from type locality.

Characters.—Paler throughout than *andinus* with nuchal patch dark gray, not tawny or ochraceous as in other tapitis.

Remarks.—Whether the dark gray nape is a natural and consistent peculiarity of tapitis from Mount Antisana remains to be verified. In many individuals of *andinus* nuchal hairs without reddish tips would also form a dark-gray patch.

Specimens examined.—None.

SYLVILAGUS BRASILIENSIS CANARIUS Thomas

Sylvilagus andinus canarius THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 213 1913.—ANTHONY, Amer. Mus. Nov. No. 55, p. 10, fig. 3A, 1923 (Taraguacocha, El Oro).—HERSHKOVITZ, Occ. Papers Univ. Michigan Mus. Zool., No. 393, p. 13, 1938 (Taraguacocha, El Oro; comparisons).

Sylvilagus a[andinus] canarius, CABRERA, Trab. Mus. Nac. Cienc. Nat., Madrid, ser. zool., No. 9, pp. 6-8, 1913 (distribution).

Holotype.—Adult male, skin and skull, B. M. No. 99.9.9.123; collected April 18, 1899, by Perry O. Simons; original number, 272.

Type locality.—Cañar, southern Ecuador; altitude 2,600 meters.

Distribution.—*Páramo* zones and interandean highland savannas of Ecuador from southern Cañar, through Azuay, northern Loja, and eastern El Oro Provinces.

Characters.—More warmly colored than *andinus*, auditory bulla smaller.

Remarks.—*S. b. canarius* is a weakly differentiated form probably not worthy of subspecific distinction from *andinus*. The collector's notation on the label of the type, "from hole in ground," induced Thomas to opine that "these rabbits are evidently burrowers." Most probably the tapiti discovered by Simons was occupying a hole made by a burrowing owl or some other animal.

Specimens examined.—Two. The type (B. M.); San Martín, Azuay, 2,600 meters, 1, an immature (C. N. H. M.).

SYLVILAGUS BRASILIENSIS KELLOGGI Anthony

Sylvilagus kelloggi ANTHONY, Amer. Mus. Nov. No. 55, p. 9, figs. 3C, E (skull), 1923 (another specimen from El Paso, Azuay).

S[ylvilagus] kelloggi, HERSHKOVITZ, Occ. Papers Univ. Michigan Mus. Zool., No. 393, pp. 4-5 1938 (Guachanamá; comparisons).

Holotype.—Adult male, skin and skull, A.M.N.H. No. 60515; collected October 8, 1920, by H. E. Anthony.

Type locality.—Guachanamá, headwaters of Río Chira, Cordillera Occidental, Loja Province, Ecuador; altitude, 9,050 feet.

Distribution.—Temperate Zone scrub forests of the Cordillera Occidental, Ecuador, in the provinces of Loja and Azuay.

Characters.—More warmly colored, with more ochraceous, than Peruvian *capsalis*; with more ochraceous, less gray, on cheek and crown, underparts whiter than in *andinus*.

Measurements.—Those of a topotype: Total length, 377; tail, 28; hind foot, 82; ear, dry from notch, 50; condylobasal length, 64.5; zygomatic breadth, 34.7; greatest width of nasals at premaxillary sutures, 13.8; least length of palatal bridge, 6.3; distance between outer sides of maxillary plates of tooth rows, 22.4.

Remarks.—This form was first described as the nominal representative of a "species group" intermediate in characters between *páramo* and tropical lowland tapitis. Present material shows *kelloggi* to be the subspecific link connecting the complex of tapitis from the highlands and lowlands of Ecuador and Peru with the common Brazilian species. While a topotype of *kelloggi* at hand is more or less separable from representatives of its nearest geographic allies, *andinus*, *chillae*, and *capsalis*, it cannot be distinguished from a series of topotypes of its

most distant relative, *S. b. paraguensis*. Presumably, similarities between *kelloggi* and *paraguensis* are correlated with environmental similarities in their respective habitats. Climatic conditions at sea level, latitude 25° S., are comparable to those at high altitudes near the Equator.

Specimen examined.—One. Guachanamá, 1 (A.M.N.H.).

SYLVILAGUS BRASILIENSIS CHILLAE Anthony

Sylvilagus chillae ANTHONY, Amer. Mus. Nov. No. 55, p. 12, 1923.

S[ylvilagus] chillae, HERSHKOVITZ, Occ. Papers Univ. Michigan Mus. Zool., No. 393, pp. 4-5 (Porto Velo, El Oro; comparisons).

Holotype.—Adult female, skin and skull, A.M.N.H. No. 60511; collected August 29, 1920, by H. E. Anthony.

Type locality.—Trail from Salvias to Zaraguro, southwestern flank of the Cordillera de Chilla, El Oro, Ecuador; altitude, 6,600 feet.

Distribution.—Tropical and subtropical forests of the western slopes of the Cordillera de Chilla (Cordillera Occidental), El Oro Province, southern Ecuador.

Characters.—Paler than *kelloggi*, more warmly colored than *daulensis*.

Remarks.—An immature specimen at hand from Porto Velo, El Oro, a few kilometers south of Zaruma and in the typical region, is labeled "a tame animal." Another, an immature, from Arenillas, El Oro, in the dry coastal region of southern Ecuador, is considerably paler throughout but, presumably, nearer typical *chillae* than *capsalis* of northwestern Peru. The last is very different from the dark, richly ochraceous *daulensis* of the coast farther north.

Specimens examined.—Three. The type (A.M.N.H.); Porto Velo, 1 (A.M.N.H.); Arenillas, El Oro, 1 (C.N.H.M.).

SYLVILAGUS BRASILIENSIS DAULENSIS Allen

Sylvilagus daulensis ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 33, p. 199, 1914. — ANTHONY, Amer. Mus. Nov. No. 55, pp. 9, 11, fig. 3D (skull of type), 1923 (comparisons).

Lepus [sic] daulensis, ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 35, p. 118, 1916 (Daule).

Holotype.—Adult female, skin and skull, A.M.N.H. No. 34671; collected April 21, 1913, by William B. Richardson.

Type locality.—Daule, on the Río Daule, coastal plain of western Ecuador north of Guayaquil, Guayas Province.

Distribution.—Known only from type locality.

Characters.—A dark tapiti, more warmly colored than *chillae*, slightly paler than *surdaster*.

Remarks.—Doubtfully distinct from *surdaster*.

Specimen examined.—One. The type (A.M.N.H.).

SYLVILAGUS BRASILIENSIS SURDASTER Thomas

Sylvilagus surdaster THOMAS, Ann. Mag. Nat. Hist., ser. 7, vol. 7, p. 543, 1901.—ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 32, p. 477, 1913 (comparisons).

Holotype.—Adult female, skin and skull, B.M.; collected October 14, 1900; original number, 94.

Type locality.—Carondelet, Río Bogotá, province of Esmeraldas, northwestern Ecuador; altitude, 20 meters.

Distribution.—Known only from type locality.

Characters.—Darkest and most warmly colored tapiti of the South American lowlands west of the Andes.

Specimen examined.—One. The type (B.M.).

SYLVILAGUS BRASILIENSIS DEFILIPPI (Cornalia)

Lepus defilippi CORNALIA, Vertebratorum synopsis in musco mediolanense extantium, p. 303, in G. Osculati, Esplorazione delle regioni equatoriale lungo il Napo ed il fiume delle Amazzoni, Milan, 1850 (*nomen nudum*).

Lepus De-Filippi CORNALIA, *ibid.*, p. 309 (description).

Lepus Defilippii [sic], THOMAS, Ann. Mag. Nat. Hist., ser. 6, vol. 20, p. 552, 1897 ("closely allied to, if not identical with, *L. brasiliensis*").—CABRERA, Trab. Mus. Cienc. Nat., Madrid, zool. ser., No. 11, p. 119, 1912 (Quito!); No. 9, p. 9, 1913 ("Quito" corrected to: Road between Quito and Río Napo).

Lepus brasiliensis, TOMES, Proc. Zool. Soc. London, 1860, p. 265 (Ecuador).—ALSTON, Biologia Centrali-Americana, Mammalia, vol. 1, p. 178, 1882 (Río Napo, Ecuador).

[?] *Lepus brasiliensis*, OSCULATI, Esplorazione delle regioni equatoriali, p. 249, 1850 (mouth of Río Negro).

[*Lepus*] *brasiliensis*, TSCHUDI, Untersuchungen über die Fauna Peruana, Therologie, p. 198, 1846 (reference to the "amerikanischen Kaninchen" recorded from Maynas, Peru, by Poeppig, in Reise in Chile, Peru . . ., vol. 2, p. 374, 1836).

Sylvilagus Defilippii [sic], CABRERA, Trab. Mus. Cienc. Nat., Madrid, zool. ser., No. 31, p. 56, 1917 (road between Quito and Baeza).

Holotype.—Skin, Civico Museo di Milano; collected between July 20 and October 26, 1847, by Gaetano Osculati.

Type locality.—"Habitat rarum in sylvis Quixos." The "Cantoni de Quixos" as indicated on the map prepared by Osculati (*supra cit.*) comprises the region embraced by the upper Río Napo and its affluent, the Coca. Anciently, the province of Quixos extended to the Amazon but in modern maps the term Quixos (or Quijos) is restricted to the right branch of the upper Río Coca. Osculati (*op. cit.*, p. 123) first mentioned the tapiti in connection with his three-month sojourn in the area around Puerto Napo. He trapped tapitis there and, incidentally, noted that upon the advent of a jaguar they would seek refuge near huts of natives. With place of capture of the original specimen of *defilippi* known, the type locality may be restated as Puerto Napo, at head of navigation on the Río Napo, eastern Ecuador; altitude 457 meters.

Distribution.—Eastern Ecuador and probably the upper Amazonian regions of Colombia and northwestern Peru.

Characters.—Most saturate of South American races; with more black on head, tip of ear, back, upper surface of tail, base of claws, and sole of hind foot.

Measurements.—Of two adult males: Total length, 370, 370; hind foot, 80, 82; ear, dry from notch, 50, 52; condylobasal length, 63.5, 61.7; zygomatic breadth, 34.9, 36.5; length of nasals, 29.8, 29.4; greatest width of nasals at premaxillary sutures, 15.4, 13.9; least length of palatal bridge, 5.7, 6.3; distance between outer sides of maxillary plates of tooth rows, 22.7, 22.5; alveolar length of molar row, 14.4, 13.9.

Remarks.—*Sylvilagus brasiliensis defilippi* is the only leporid described from the Amazonian basin east of the Andes. Because authors had assumed the type locality of *defilippi* to be somewhere on the eastern slope of the Cordillera Oriental of Ecuador, tapitis from the Peruvian Andes in the Amazonian drainage were referred to the "species" *defilippi*. As a subspecies of *brasiliensis*, however, there is no reason to believe that *defilippi* is any more closely related to tapitis from isolated localities in the Peruvian Andes than it is to the geographically nearest but very different appearing *S. b. andinus*.

In agreement with Cornalia's observation, the writer also noted while he was in the upper Río Napo region, that tapitis were abundant near native huts when a jaguar moved into the vicinity.

Specimens examined.—Three. Montalvo, Río Bobonaza, 1 (C. N.H.M.); Río Pindo Yacu, upper Río Tigre, 2 (C.N.H.M.).

SYLVILAGUS BRASILIENSIS CAPSALIS Thomas

Lepus brasiliensis, THOMAS, Proc. Zool. Soc. London, 1882, p. 101 (Cutervo, Cajamarca).

Sylvilagus capsalis THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 213, 1913; ser. 9, vol. 18, p. 167, 1926 (part; Celendin, Cajamarca).—OSGOOD, Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 170, 1914 (Hacienda Llagueda, east of Otuzco, Libertad).

[*Sylvilagus*] *capsalis*, CABRERA, Trab. Mus. Cienc. Nat., Madrid, ser. zool., No. 9, pp. 6, 7, 8, 1913 (comparisons; distribution).

Holotype.—Adult female, skin and skull, B.M. No. 0.3.15.29; collected November 8, 1899, by Perry O. Simons; original number, 718.

Type locality.—San Pablo, Cajamarca, western slope of Cordillera Occidental, Peru; altitude, 2,000 meters.

Distribution.—Arid or semiarid western slopes of the Cordillera Occidental, department of Cajamarca, northern Peru. Specimens recorded by Thomas (*supra cit.*) from the Peruvian departments of Amazonas and San Martín are provisionally assigned to the race next described.

Characters.—Palest of known forms of Peruvian tapitis; paler than *kelloggi* and *andinus* of Ecuador.

Remarks.—Tapitis from across the divide in the Amazonian drainage area of northern Peru are darker, more warmly colored and referable either to *kelloggi* or to the race described below.

Specimens examined.—Three. The type (B.M.); Hacienda Llagueda, Libertad, 2 immatures (C.N.H.M.).

SYLVILAGUS BRASILIENSIS PERUANUS, new subspecies

Sylvilagus defilippii [sic], OSGOOD (nec Cornalia), Publ. Field Mus. Nat. Hist., zool. ser., vol. 10, p. 171, 1914 (Moyobamba, Amazonas).—THOMAS, Ann. Mag. Nat. Hist., ser. 9, vol. 19, p. 371, 1927 (Yurac Yacu, San Martín); vol. 20, p. 605, 1927 (Tingo María).

Sylvilagus defilippii, ANTHONY (nec Cornalia), Amer. Mus. Nov. No. 55, p. 11, fig. 3B, 1923 (Moyobamba).

[?] *Sylvilagus capsalis*, THOMAS, Ann. Mag. Nat. Hist., ser. 9, vol. 18, p. 167 (part; Tambo Ventilla, San Martín), p. 399 (Corosha, Amazonas; 10 miles northeast of Chachapoyas, Amazonas), 1926.

Holotype.—Adult female, skin only, C.N.H.M. No. 24143; collected October 17, 1922, by Edmund Heller.

Type locality.—Tingo María, Río Huallaga, Huanuco, Peru; altitude, approximately 700 meters.

Distribution.—Upper Río Huallaga drainage basin, Peruvian Andes.

Characters.—A warmly colored Andean race, with more ochraceous and less black throughout, than *inca* and *defilippii*.

Coloration of holotype.—Back Ochraceous-Buff lined with dark brown, rump Ochraceous-Tawny; sides paler than back; rostrum Ochraceous-Orange thinly lined with black; back of crown and outer anterior surface of basal one-third of ear mixed buffy and ochraceous, terminal portion of outer surface of ear dark brown. Supraorbital patch buffy, a dark brown patch behind orbit, a paler one beneath; cheek Warm Buff; upper surface of foreleg Ochraceous-Orange, of thigh Tawny, of hind foot Ochraceous-Buff.

Measurements of holotype (taken from the dry skin).—Total length, 380; tail, 30; hind foot, 70; ear, from notch, 50. Collector's measurements on label, 300, 10, and 80, respectively, are obviously inaccurate.

Remarks.—Comparison with tapitis from eastern Ecuador shows indisputably the untenability of the name *defilippii* for the northern Peruvian form here called *peruanus*. A subadult from Moyobamba, San Martín, provisionally assigned to *peruanus* is much less warmly colored than the type, its back more heavily lined black. It differs even more widely from *defilippii* to which it was provisionally referred by Osgood (*supra cit.*).

Specimens examined.—Eight. The type (C.N.H.M.); Moyobamba, 1 subadult, 6 immatures (C.N.H.M.).

SYLVILAGUS BRASILIENSIS INCA Thomas

Sylvilagus brasiliensis inca THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 210, 1913.

Holotype.—Adult female, skin and skull, B. M. No. 4.12.4.15; collected in 1902, by J. Kalinowski, and received in exchange from the Branicki Museum, Warsaw.

Type locality.—Cadena, an hacienda in Provincia de Quispicanchi, Distrito de Marcapata, Cuzco, Peru; altitude, 890 meters.

Distribution.—Upper Río Madre de Dios drainage system, southeastern Peru.

Remarks.—A saturate form only slightly paler than Ecuadorian representatives of *defilippi*.

Specimens examined.—Two. The type (B.M.); Condamo, Río Tambopata, above Astillero, Puno, Peru, 1 (C.N.H.M.).

SYLVILAGUS BRASILIENSIS BRASILIENSIS (Linnaeus)

Tapeti MARGGRAF, Historiae rerum naturalium, book 6, p. 223, first fig. p. 224, Leiden and Amsterdam, 1648.

Lepus brasiliensis LINNAEUS, Systema naturae, ed. 10, vol. 1, p. 58, 1758 (America meridionali).—LESSON, Nouveau tableau du règne animal, mammifères, p. 99, 1842 (part; not *Lepus nanus*, Schreber).—PELZELN, Verh. zool.-bot. Ges. Wien, vol. 33, p. 80, 1883 (part; Bahia).—THOMAS, Ann. Mag. Nat. Hist., ser. 7, vol. 8, p. 535, 1901 (Rio de Janeiro determined as type locality).

[*Lepus*] *brasiliensis*, THOMAS, Proc. Zool. Soc. London, 1911, p. 146 (genus *Sylvilagus*, type locality redetermined as Pernambuco).—TATE, Amer. Mus. Nov. No. 661, 1933 (Pernambuco, type locality).

Lepus brasiliensis, THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 209, 1913 (Pernambuco, type locality; specimens from Lamarão, Bahia, considered typical).

Lepus braziliensis [sic], WATERHOUSE, A natural history of Mammalia, vol. 2, Rodentia, p. 141, 1848 (part; skull "sent from Para").

Lepus tapeti PALLAS, Novae species quadrupedum e glirium ordine . . ., p. 30, 1778 (based on Marggraf's *tapeti*).—SCHREBER, Die Säugthiere in Abbildungen, vol. 4, p. 902, 1792.—THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 209, footnote, 1913 ("absolute synonym of *S. brasiliensis*").

Lepus nigricaudatus, LESSON (*nec* Sikes), Nouveau tableau du règne animal, mammifères, p. 100, 1842 (part; Brazil).

Tapeti brasiliensis, GRAY, Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 224, 1867 (genus *Tapeti*; Pará specimen only).

[*Sylvilagus*] *brasiliensis*, THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 211, 1913 (distribution, comparisons).

Sylvilagus brasiliensis, MOOJEN, Bol. Museu Nac. Rio de Janeiro, new ser., zool., No. 1, p. 6, 1943 (Poçoão, Pernambuco).

Type specimen.—None, name based primarily on "*Cuniculus brasiliensis Tapeti*. Marcgr. bras. 223."

Type locality.—Pernambuco (=Recife), Brazil (fixed by Thomas, Proc. Zool. Soc. London, 1911, p. 146). In 1901, Thomas (*supra cit.*) treated the *tapeti* of Rio de Janeiro as typical. His subsequent studies of the "Systema Naturae" of Linnaeus, however, caused him

to assign the type locality to Pernambuco, locale of Marggraf's observations.

Distribution.—Recorded only from states of Pernambuco and Bahia, Brazil.

Characters.—Said to be a dark-colored race slightly smaller than *minensis*, darker than *chapadae*, paler than *inca*.

Remarks.—Beyond the account of Marggraf and the wholly inadequate Linnaean diagnosis, "L. cauda nulla," little is known of the special characters of typical *brasiliensis*. Nine specimens of *brasiliensis* from Lamarão, Bahia, recorded by Thomas were not described but were compared with *minensis* and *tapetillus*. The series recorded by Moojen is practically topotypical but is stated to consist of three juveniles and one odd skull.

Specimens examined.—None.

SYLVILAGUS BRASILIENSIS MINENSIS Thomas

Lepus brasiliensis, LUND, Danske Vid. Selsk., nat. og math., vol. 8, pp. 134, 266, 294, pl. 26, figs. 8, 9, 1841 (Rio das Velhas, Minas Geraes); vol. 9, p. 134, 1842 (Rio das Velhas).—WINGE, Jordfundne og nulevende gnave (Rodentia) fra Lagôa Santa, Minas Geraes, Brazilien, p. 10, 1888 (Lagôa Santa).

Lepus aff. brasiliensi, LUND, Danske Vid. Selsk., nat. og. math., vol. 8, pp. 266, 294, 1841 (Rio das Velhas, Pleistocene fossil); vol. 9, p. 134, 1842 (Rio das Velhas).

Lepus brasiliensis [sic], WATERHOUSE, A natural history of Mammalia, vol. 2, Rodentia, p. 141, 1848 (part; Minas Geraes, fossil).

Sylvilagus minensis THOMAS, Ann. Mag. Nat. Hist., ser. 7, vol. 8, p. 534, 1901; Proc. Zool. Soc. London, 1903, vol. 2, p. 241, 1904 (comparison with *chapadae*).

[*Sylvilagus brasiliensis*] *minensis*, THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 209, 1913.

Holotype.—Adult male, skin and skull, B.M. No. 1.11.3.81; collected May 3, 1901, by Alphonse Robert; original number, 652.

Type locality.—Rio Jordão, District of Araguary, southwest Minas Gerais, Brazil; altitude approximately 500 meters.

Distribution.—Known only from type locality and Rio das Velhas, southern Minas Gerais.

Characters.—Distinction from typical *brasiliensis* not clear; said to be darker than *chapadae*.

Remarks.—Original specific distinction of *minensis* was based on comparisons with what was believed to be an unusually small tapiti from Rio de Janeiro (*tapetillus*) then regarded as typical *brasiliensis*. Specimens from Lamarão, Bahia, near the redetermined type locality were found to be only "slightly smaller" than *minensis* and led Thomas to conclude that "*minensis*, *chapadensis* [sic], and *paraguensis* should all be considered as subspecies of *brasiliensis*."

Specimens examined.—Two. The type (B.M.); Rio das Velhas, Minas Gerais, 1 juvenal (C.N.H.M.).

SYLVILAGUS BRASILIENSIS TAPETILLUS Thomas

Lepus brasiliensis, BURMEISTER, Systematische Uebersicht der Thiere Brasiliens . . . pt. 1, Mammalia, p. 252, 1854 (Brazil, probably southeastern).—PELZELN, Verh. zool.-bot. Ges. Wien, vol. 33, p. 80, 1883 (part; Rio de Janeiro; Sapitiba).—HENSEL, Abh. Akad. Wiss. Berlin, 1872, p. 62, 1873 (Rio de Janeiro, sold in market).—IHERING, Os mamíferos do Rio Grande do Sul, Anuario do Estado do Rio Grande do Sul, 1892, p. 112, 1893 (Passo Fundo, Rio Grande do Sul; Rio de Janeiro); Os mamíferos de S. Paulo, Catalogo, Diario Official, São Paulo, p. 22, 1894 (São Paulo); Rev. Mus. Paulista, vol. 2, p. 151, 1897 (Ilha de São Sebastião, São Paulo).

Sylvilagus brasiliensis, THOMAS, Ann. Mag. Nat. Hist., ser. 7, vol. 8, p. 535, 1901 (Porto Real, near Rezende, Rio de Janeiro).

Sylvilagus tapetillus THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 210, 1913.

Holotype.—Adult (?), sex not determined, skin and skull, B.M. No. 92.11.24. 3; collected by L. Hardy de Dréneuf.

Type locality.—Porto Real, Rio Parahyba, near Rezende, Rio de Janeiro, Brazil; altitude, 380 meters.

Distribution.—Southeastern Brazil, states of Rio de Janeiro and Rio Grande do Sul.

Characters.—Probably not markedly different from typical *brasiliensis* and *minensis*; darker, more warmly and uniformly colored, sides less contrasted than in *paraguensis*; base of ear dark brown or mixed dark brown and buffy; side of muzzle less gray, with more black than in *paraguensis*.

Measurements.—Those of an adult male (skull only) from Rio de Janeiro and a young female from Rio Therezopolis, followed by those of an adult female from São Paulo, respectively: Total length, —, 310, 390; tail, —, —, 17; hind foot, —, 71, 82; ear, dry from notch, —, 38, 53; greatest length of skull, 72.9, 58.8, 71.9; condylobasal length, 67.4, 52.3, 64.6; zygomatic breadth, 34.2, 30.4, 36.4; length of nasals, 29.1, 21.5, 31.4; greatest combined width of nasals across premaxillary sutures, 14.2, 12.9, 14.5; least length of palatal bridge, 7.3, 6.0, 6.3; distance between outer sides of maxillary plates of tooth rows, 23.7, 19.0, 23.3; alveolar length of molar row, 15.6, 11.1, 14.3.

Remarks.—External characters given above are those of a young adult from Therezopolis, Rio de Janeiro. The small size of the type and only specimen available to Thomas led him to regard it as specifically distinct. External measurements given were taken "on the badly prepared" skin of what was said to be an "old specimen." Original cranial measurements of *tapetillus* compare with those of the young Therezopolis specimen. They are also comparable, as follows, with those given by Thomas for *gibsoni* described as a subspecies of *brasiliensis*, respectively: Greatest length of skull, 61, 62.5; condylobasal length, 55, 56; zygomatic breath, 32.5, 31.5; alveolar length of molar row, 13, 12.

Specimens examined.—Four. The type (B.M.); Rio de Janeiro,

1 (C.N.H.M.); Rio Therezopolis, 1 (C.N.H.M.); São Paulo, 1 (C.N.H.M.).

SYLVILAGUS BRASILIENSIS PARAGUENSIS Thomas

Tapiti AZARA, Apuntamientos para la historia natural de los cuadrúpedos del Paraguay y Río de La Plata, p. 32, 1802 (description and life history).

Lepus Brasiliensis, RENGGER, Naturgeschichte der Säugethiere von Paraguay, p. 247, 1830 (description and life history).

Lepus brasiliensis, PELZELN, Verh. zool.-bot. Ges. Wien, vol. 33, p. 80, 1883 (part; Caiçara).—ALLEN, Monographs of North American Rodentia, Leporidae, p. 348, 1877 (Bermejo, Paraguay).—COPE, Amer. Nat., vol. 23, p. 39, 1889 (Chapada, Matto Grosso).—MIRANDA RIBEIRO, Comm. Linhas Telegr. Estrateg. Matto-Grosso ao Amazonas, Rio de Janeiro, Anexo, 5, Hist. Nat. Zool., p. 44, 1914 (Matto Grosso).

[?] *Lepus brasiliensis*, GOELDI and HAGMANN, Bol. Mus. Goeldi (Paraense), vol. 4, p. 76, 1906 (Itaituba, upper Rio Tapajóz).

Lepus Braziliensis [sic], WATERHOUSE, A natural history of the Mammalia, vol. 2, Rodentia, pp. 141-143, 1848 (part; Paraguay; Bolivia, description of specimen collected by Bridges).

Sylvilagus paraguensis THOMAS, Ann. Mag. Nat. Hist., ser. 7, vol. 8, p. 539, 1901.—ALLEN, Bull. Amer. Mus. Nat. Hist., vol. 35, p. 567, 1916 (Trinidad and Río Negro, Paraguay).—KRIEG, Zeitschr. für Morphol. Okol. Tiere, vol. 15, pt. 4, pp. 757, 784, 1929 (Paraguayan Chaco).

[*Sylvilagus brasiliensis* *paraguensis*], THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 210, 1913.

Sylvilagus (Tapeti) brasiliensis paraguensis, KRUMBIEGEL, Zool. Anz., vol. 107, p. 27, 1942 (part; Bolivia: San Jose, Chiquitos; Buena Vista, Santa Cruz. Paraguay: Lapango, Pilcomayo; La Creencia, Chaco).

Sylvilagus brasiliensis paraguensis, MARINI, Agronomía y Veterinaria (Rev. centro estudiantés, Univ. Buenos Aires), vol. 23, p. 336, 1930 (Apostoles, Misiones; descriptions, distribution, etc., from literature).

Sylvilagus minensis, VIEIRA, Mem. Inst. Oswaldo Cruz, vol. 35, No. 3, p. 567, 1941 (Salobra, near Miranda, Matto Grosso).

Sylvilagus minensis chapadae, THOMAS, Proc. Zool. Soc. London, 1903, vol. 2, p. 241, 1904 (type locality, Santa Ana de Chapada, Matto Grosso, Brazil).

Sylvilagus minensis, NELSON (*nec* Thomas), North American Fauna No. 29, p. 45, pl. 12, figs. 1, 4, 1909 (Chapada).

[*Sylvilagus brasiliensis* *chapadensis* [sic]], THOMAS, Ann. Mag. Nat. Hist., ser. 8, vol. 11, p. 210, 1913.

Tapeti brasiliensis GRAY, Ann. Mag. Nat. Hist., ser. 3, vol. 20, p. 224, 1867 (part; Bolivia).

Holotype.—Adult female, skin and skull, B.M.; collected May 30, 1901, by William Foster; original number, 383.

Type locality.—Sapucay, east of Asunción, Paraguay; altitude, 220 meters.

Distribution.—Paraguay, the Chaco and adjacent highlands of Brazil (Matto Grosso), Bolivia (Santa Cruz), and Argentina (Corrientes and Misiones).

Characters.—Paler than *minensis* and *tapetillus*.

Measurements.—Means and extremes of six adult topotypes: Total length, 353 (338-365); hind foot, s. u., 73 (71-76); ear, in flesh, 55

(52-59), dry, from notch, 52 (49-57); condylobasal length, 61.6 (59.9-63.5); zygomatic breadth, 33.4 (32.7-34.5); length of nasals, 27.1 (25.5-28.1); greatest combined width of nasals across premaxillary sutures, 13.9 (13.7-14.2); least length of palatal bridge, 6.2 (5.7-7.0); greatest distance between outer sides of maxillary plates of tooth row, 21.5 (20.5-22.5); alveolar length of upper molar row, 13.9 (13.2-14.4). Of an adult male from Piraputangas and a female from Urucum, respectively: Total length, 370, 365; hind foot, 80, 79; ear, dry from notch, 58, 54; condylobasal length, 64.9, 60.3; zygomatic breadth, 34.0, 33.3; length of nasals, 28.8, 24.1; greatest combined width of nasals across premaxillary sutures, 15.2, 14.1; least length of palatal bridge, 5.5, 5.5; distance between outer sides of maxillary plates of tooth rows, 22.0, 21.9; alveolar length of upper molar row, 14.6, 13.7. Of a male and female from Santa Ana de Chapada (*chapadae*), respectively: Condylobasal length, 63.5, 66.1; zygomatic breadth, 33.3, 34.7; length of nasals, 30.4, 30.1; greatest combined width of nasals across premaxillary sutures, 16.1, 15.2; least length of palatal bridge, 6.1, 7.0; distance between outer sides of maxillary plates of tooth rows, 21.5, 21.5; alveolar length of upper molar row, 14.5, 14.6.

Remarks.—Available topotypes, part of the original series collected by Foster, represent the gray phase while the type and two available topotypes of *chapadae* are buffy-phase individuals of the same geographic race. Other specimens from the Paraguayan and Brazilian Chaco show the racial unity of tapitis in the area drained by the Río Paraguay. One of three specimens from Urucum de Corumbá, Mato Grosso, Brazil, agrees with typical *chapadae*, another with typical *paraguensis*, the third is intermediate. A skin from Asunción, Paraguay, is practically indistinguishable from topotypes of *chapadae*. Bolivian tapitis here referred to *paraguensis* generally agree with buffy phase individuals already mentioned but indicate gradation into the more warmly colored *inca*.

The skull of a male topotype of *chapadae* (U.S.N.M. No. 113432) with posterior wing of supraorbital process short and nearly entirely coalesced with frontal led Nelson to believe that *S. aquaticus* and *S. palustris* were closely related to *S. brasiliensis*. Nelson evidently overlooked the female topotype of the series with all but tip of posterior wing of supraorbital process widely separated from frontal.

Specimens examined.—Twenty-five. PARAGUAY: Sapucay, 8 (the type, B. M.; 7, U.S.N.M.); Asunción, 1 (C.N.H.M.); Colonia Nueva Italia, Villeta, 1 (C.N.H.M.); Orloff, Chaco, 2 (C.N.H.M.); Puerto Casado, Chaco, 1 (C.N.H.M.). BRAZIL: Santa Ana de Chapada, 3 (type of *chapadae*, B. M.; 2, U.S.N.M.); Urucum de Corumbá, Matto Grosso, 4 (C.N.H.M.); Piraputangas, Matto Grosso, 1 (C.N.H.M.).

BOLIVIA: Buena Vista, Santa Cruz, 3 (C.N.H.M.); San Carlos, Santa Cruz, 1 (C.N.H.M.).

SYLVILAGUS BRASILIENSIS GIBSONI Thomas

Lepus brasiliensis, MATSCHIE, Ges. naturf. Freunde Berlin, 1894, p. 62 (Tucumán; Jujuy).

Sylvilagus brasiliensis, EISENTROUT, Zeitschr. für Säuget., vol. 8, p. 56, 1933 (Villa Montes, Tarija, Bolivia).

Sylvilagus brasiliensis gibsoni THOMAS, Ann. Mag. Nat. Hist., ser. 9, vol. 1, p. 192, 1918; vol. 5, p. 195, 1920 (Villa Carolina, Jujuy); vol. 15, p. 581, 1925 (Carapari, Bolivia); vol. 17, p. 608, 1926 (Cerro del Campo, Burruyacu, Tucumán).—KRUMBIEGEL, Zool. Anz., vol. 137, p. 26, 1942 (Salta).—MARINI, Agronomía y Veterinaria (Rev. centro estudiantes, Univ. Buenos Aires), vol. 23, p. 339, 1930 (descriptions, discussions, etc., from literature).

Sylvilagus brasiliensis paraguensis, YEPES (*nec* Thomas), An. Soc. Argentina Estud. Geogr., vol. 6, p. 55, 1938 (Chaco and Formosa, Argentina).

Sylvilagus (Tapeti) brasiliensis paraguensis, KRUMBIEGEL (*nec* Thomas) Zool. Anz., vol. 107, p. 27, 1942 (part; Villa Montes, Tarija, Bolivia.)

Holotype.—Male, skin and skull, B.M. No. 18.1.1.8; collected July 25, 1917, by E. Budin.

Type locality.—Manuel Elordi, Vermejo, Salta, northern Argentina; altitude, 500 meters.

Distribution.—Northern Argentina from the Río Paraguay-Paraná to the eastern portions of Tucumán, Jujuy, and Salta, north into Tarija, Bolivia.

Characters.—Grayer, with less black mottling dorsally than *paraguensis*; crown at anterior base of ears with large grayish patches.

Remarks.—The dark collar between forelimbs said to be little more than an inch in anteroposterior diameter in the type, is not distinctive. Width of collar varies with the method of preparing the skin. In many skins the collar has been found to be nearly completely suppressed by the preparator. A specimen each from Yacuiba, Bolivia, and from near Riacho Pilaga, Formosa, in the Argentine Chaco, agrees with *gibsoni* in diagnostic characters.

A *tapiti* (not seen) collected by Budin in Carapari, about 35 km. northwest of Yacuiba was assigned by Thomas (*supra cit.*) to *gibsoni*. A subadult at hand collected by A. G. Maddren in the Río Carapari Valley 18 km. south of Carapari agrees with *paraguensis*. This individual, from the typical region of *gibsoni* may be aberrant.

Specimens examined.—FOUR. ARGENTINA: The type (B.M.), 10 miles northwest of Riacho Pilaga, Kilómetro 182, Formosa, Argentina, 1 (U.S.N.M.). BOLIVIA: Yacuiba, Tarija, 1 (C.N.H.M.); Río Carapari, 10 miles south of Carapari, Tarija, 1 (C.N.H.M.).

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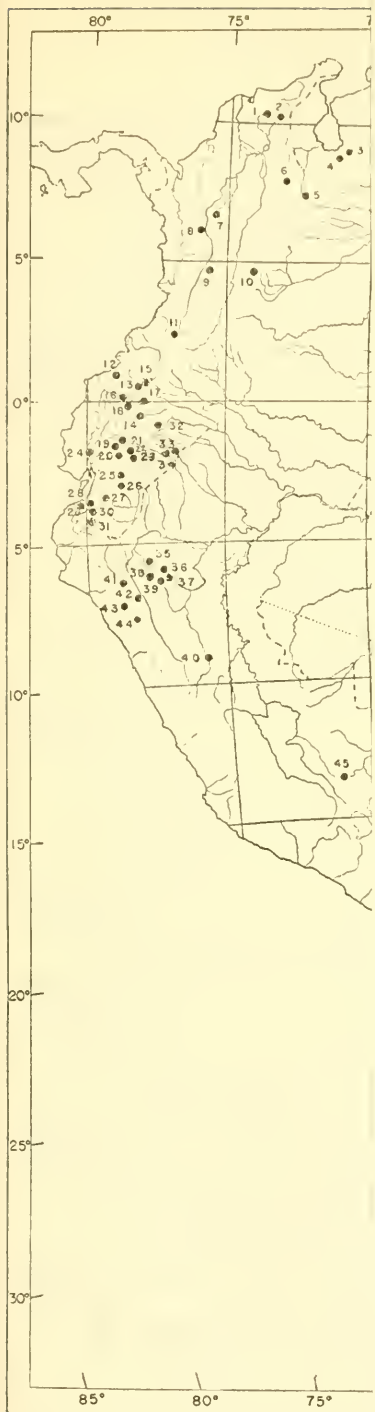


FIGURE 43.—Collecting localities



FIGURE 4. Collection localities of South American tapitis, *Sybilagus trassiensis*. See following pages for keys to subspecies and localities. 553011-40 (Face p. 372)

EXPLANATION OF MAP (FIGURE 43)

(Type localities in boldface type)

Sylvilagus brasiliensis sanctaemartae, new subspecies:

COLOMBIA

1. **Colonia Agrícola de Caracolicito**, Magdalena (335 meters).
2. Río Guaimaral, Magdalena (140 meters).

Sylvilagus brasiliensis meridensis Thomas:

VENEZUELA

3. La Culata, Mérida (approximately 4,000 meters).
4. **Sierra de Mérida** and Sierra Nevada, Mérida (probably at 4,000 meters).
5. Páramo de Tamá, Táchira (probably at 3,000 meters).

COLOMBIA

6. Páramo Guerrero, Santander (about 3,000 meters).

Sylvilagus brasiliensis nicefori Thomas:

COLOMBIA

7. **San Pedro**, Antioquia (2,435 meters).
8. Concordia, Antioquia (2,030 meters).

Sylvilagus brasiliensis salentus Allen:

COLOMBIA

9. **Salento**, Caldas (1,895 meters).

Sylvilagus brasiliensis apollinaris Thomas:

COLOMBIA

10. **Choachi**, Cundinamarca (1,966 meters).

Sylvilagus brasiliensis fulvescens Allen:

COLOMBIA

11. **Belén**, Cauca (exact altitude uncertain, between 2,000 and 3,000 meters).

Sylvilagus brasiliensis surdaster Thomas:

ECUADOR

12. **Carondelet**, Esmeraldas (20 meters).

Sylvilagus brasiliensis chotanus Hershkovitz:

ECUADOR

13. **Río Chota Valley**, Imbabura (1,500 meters).

Sylvilagus brasiliensis nivicola Cabrera:

ECUADOR

14. **Mount Antisana**, Pichincha (at approximately 4,500 meters)

Sylvilagus brasiliensis andinus (Thomas):

ECUADOR

15. San Gabriel, Carchi (2,900 meters).
16. Nono, Pichincha.
17. **Mount Cayambe**, Pichincha (at approximately 4,000 meters).
17. La Compañía, Pichincha (3,400 meters).
18. Quito, Pichincha (2,817 meters).
19. Sinchic (spelled "Sinche" by Thomas), Bolívar (4,000 meters).
20. Telagua, Bolívar.
21. Mount Chimborazo, Chimborazo (probably at 4,000 meters or above).
22. Riobamba, Chimborazo (2,760 meters).
23. Chambo, Chimborazo (at approximately 3,500 meters).

Sylvilagus brasiliensis daulensis Allen:

ECUADOR

24. **Daule**, Guayas (near sea level).

Sylvilagus brasiliensis canarius Thomas:

ECUADOR

25. **Cañar**, Cañar (2,600 meters).
26. San Martín, Azuay (2,600 meters).
27. Taraguacocha, El Oro (9,750 feet).

Sylvilagus brasiliensis chillae Anthony:

ECUADOR

28. Trail from Salvias to Saraguro, El Oro (6,600 feet).
29. Arenillas, El Oro (near sea level).
30. Porto Velo, El Oro (2,000 feet).

Sylvilagus brasiliensis kelloggi Anthony:

ECUADOR

31. Guachanamá, Loja (9,050 feet).

Sylvilagus brasiliensis defilippi (Cornalia):

ECUADOR

32. Puerto Napo, Napo-Pastaza (457 meters).
33. Río Pindo Yacu, upper Río Tigre, Napo-Pastaza (approximately 250 meters).
34. Montalvo, Río Bobonaza, Napo-Pastaza (approximately 250 meters).

Sylvilagus brasiliensis peruanus, new subspecies:

PERU

35. Corosha, Amazonas (8,000 feet).
36. Yurac Yacu, San Martín (2,500 feet).
37. Moyobamba, Amazonas (854 meters).
38. Chachapoyas, Amazonas (2,828 meters).
39. Tambo Ventilla, San Martín (2,503 meters).
40. Tingo María, Huanuco (700 meters).

Sylvilagus brasiliensis capsalis Thomas:

PERU

41. Cutervo, Cajamarca (9,000 feet).
42. Celendín, Cajamarca.
43. San Pablo, Cajamarca (2,000 meters).
44. Hacienda Llagueda, Libertad (6,000 feet).

Sylvilagus brasiliensis inca Thomas:

PERU

45. Cadena, Marcapata, Cuzco (890 meters).
46. Condamo, Río Tambopata, Puno (302 meters).

Sylvilagus brasiliensis brasiliensis (Linnaeus):

BRAZIL

47. Pernambuco (Recife), Pernambuco (sea level).
48. Poçoão, Pernambuco (980 meters).
49. Lamarão, Bahia (490 meters).

Sylvilagus brasiliensis minensis Thomas:

BRAZIL

50. Rio das Velhas, Minas Gerais (approximately 600 meters).
51. Rio Jordão, Minas Gerais (500 meters).

Sylvilagus brasiliensis tapetillus Thomas:

BRAZIL

52. Porto Real, Rio de Janeiro (380 meters).
53. Rio Therezopolis, Rio de Janeiro.
54. Rio de Janeiro, Distrito Federal (sea level).
55. Sapitibi, Bahia de Sepetibi, Rio de Janeiro (sea level).
56. Ilha de São Sebastião, São Paulo (sea level).
57. São Paulo, São Paulo (sea level).
58. Passo Furdo, Rio Grande do Sul (673 meters).

Sylvilagus brasiliensis paraguensis Thomas:

BRAZIL

59. Santa Ana de Chapada, Mato Grosso (855 meters).
60. Caiçara, Matto Grosso (152 meters).
61. Urucum de Corumbá, Matto Grosso (approximately 150 meters).
62. Piraputangas, Matto Grosso (100 meters).
63. Salobra, Matto Grosso (145 meters).

BOLIVIA

64. San Carlos, Santa Cruz (approximately 200 meters).
65. Buena Vista, Santa Cruz (450 meters).
66. San José Chiquitos, Santa Cruz (approximately 300 meters).

PARAGUAY

67. Puerto Casado, Chaco (approximately 150 meters).
68. La Cresentia, Chaco (approximately 150 meters).
69. Río Negro.
70. Lapango.
71. Trinidad.
72. Asunción, Asunción (200 meters).
73. Sapucay, Paraguari (220 meters).
74. Colonia Nueva Italia, Villeta.
75. Bermejo.

ARGENTINA

76. Apostoles, Misiones (150 meters).

Sylvilagus brasiliensis gibsoni Thomas:

BOLIVIA

77. Villa Montes, Tarija (approximately 450 meters).

78. Carapari (approximately 750 meters).

79. Yacuiba, Tarija (639 meters).

ARGENTINA

80. Manuel Elordi, Salta (500 meters).

81. Jujuy (exact collecting locality within state unknown).

82. Cerro de Campo, Tucumán.

83. Tucumán (exact collecting locality within state unknown).

84. Riacho Pilaga, Formosa.

Sylvilagus brasiliensis subsp.:

BRAZIL

85. Mouth of Rio Negro, Amazonas (provisionally included with *deflippí*).

86. Itaituba, Rio Tapajóz, Pará (provisionally included with *paraguensis*).