

PRELIMINARY DESCRIPTION OF A NEW SUBGENUS AND SIX NEW SPECIES AND SUBSPECIES OF HARES, FROM THE MEXICAN BORDER OF THE UNITED STATES.<sup>1</sup>

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THE GENUS *Lepus* stands so much in need of a thorough revision, that, in order to characterize the new species intelligently, it is necessary to define the characters of the remaining species of this region.

The eleven species of the Mexican border, together with their seven additional subspecies, belong to four sections of the genus *Lepus*, at least three of which may with advantage be recognized as subgenera. One of these sections contains the water hare (*Lepus aquaticus*, Bachman) of the lowlands bordering the Gulf of Mexico, another the cottontails (three species), from which the cactus rabbit (*Lepus cinerascens*, Allen) of the Pacific Coast region is sufficiently different to merit separation as a third section, the Mexican jackrabbits (six species) composing the fourth. These groups may be conveniently characterized, anatomically, as follows:

ANALYSIS OF THREE SUBGENERA OF LEPUS.

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- A. Interparietal persistent as a distinct bone in adults; usually developed from a single ossific center. Ear shorter than hind foot (except in *L. cinerascens*).
- a. Skull and teeth massive; rostral portion about as wide as high; postorbital process of frontal bone ankylosed with the cranium for its entire length; frontal and parietals deeply pitted; skull rather straight above, about half as wide as long; pelage harsh; head small; ear, tail, and hind foot short, the latter scantily haired..... *Hydrolagus*, Gray.

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<sup>1</sup>This is the third of a series of papers, in the Proceedings of the United States National Museum, based on the collection of mammals made by the writer in connection with the recent resurvey of the Mexican boundary line, in which it has been deemed advisable to present brief preliminary diagnoses of such mammals as appear to be new to science, in anticipation of the publication of the proposed report on the collections of the International Boundary Commission, United States and Mexico. This course is necessitated by the delay incident to getting out the final report, in which detailed descriptions and illustrations of the new forms may be expected. (See Proc. U. S. Nat. Mus., XVII, pp. 129-130; XVIII, pp. 443-447.)

aa. Skull and teeth lighter; rostral portion wider than high; postorbital processes united with the cranium behind (in old specimens), inclosing a narrow foramen; upper surface of skull much less pitted; skull much arched above, sometimes wider than one-half of its length; pelage softer and longer; feet densely padded; head, ears, tail, and feet relatively larger.

*Sylvilagus*, Gray.<sup>1</sup>

AA. Interparietal distinct only in the fetus, and for a short period after birth; always obliterated in adults; usually developed from two ossific centers; skull low and narrow, its breadth considerably less than half the length, with large, arching postorbital processes, which are united to the cranium by suture posteriorly, inclosing a long and wide foramen; nasal bones long; anterior upper incisors rounded externally, and without a distinct lateral groove. Ear longer than hind foot; tail black above, this color running up on the rump. Pelage never white..... *Macrotolagus*.<sup>2</sup>

The species and subspecies of *Lepus* at present known to inhabit the region of the Mexican border may be determined by reference to the following key:

ANALYTICAL KEY TO THE SPECIES AND SUBSPECIES OF *LEPUS* FOUND ON THE MEXICAN BORDER OF THE UNITED STATES, INCLUDING THE *LEPUS* *CALLOTIS*, WAGLER, OF MEXICO.

A. Interparietal persistent as a distinct bone in adults; usually developed from a single ossific center. Ear shorter than hind foot (except in *L. cinerascens*).

a. Skull and teeth massive; superior outline moderately convex; postorbital process of frontal bone ankylosed with the cranium for its entire length, "leaving neither foramen, notch, nor suture;" frontal and parietals deeply pitted; skull about half as wide as long, with the muzzle about as wide as high; pelage harsh; feet scantily clothed; head small; ears, tail, and hind feet relatively short (= *Hydrolagus*, Gray)..... *aquaticus*.<sup>3</sup>

aa. Skull and teeth lighter; superior outline strongly convex posteriorly; postorbital process united with the cranium behind (in old specimens), inclosing a foramen; upper surface of skull much less pitted, about as wide as long, with the muzzle usually wider than high; pelage softer and longer, especially on the feet, which are heavily padded; head, ears, tail, and feet relatively larger (= *Sylvilagus*, Gray).

b. Ear longer than hind foot; tail short; skull narrow, low, and lightly ossified, with postorbital process usually free, scarcely touching cranium behind..... *cinerascens*.

<sup>1</sup> *Lepus cinerascens*, Allen, an aberrant species, is provisionally referred to a second section of this subgenus. (See key to species.)

<sup>2</sup> *Macrotolagus*, new subgenus. Type *Lepus alleni*, Mearns, from southern Arizona and adjacent parts of Mexico.

<sup>3</sup> This has recently become *Lepus aquaticus allwateri*, Allen, Bull. Am. Mus. Nat. Hist., N. Y., VII, Art. X, November 8, 1895, pp. 327, 328. Type locality: Medina River, 18 miles south of San Antonio, Texas.

- bb.* Ear shorter than hind foot; tail longer than in the preceding section; skull stouter, higher, and heavier, with postorbital process united with the cranium behind.
- c.* Ear shorter than head.
- d.* Skull high, size small; tail very short; hind foot short and scantily clothed; ear small. Length, 370 mm.; tail vertebrae, 50; ear above crown, 70; hind foot, 82.
- dd.* Skull not so high; size larger; tail, ears, and hind feet larger, the latter heavily coated with long hair.
- e.* Skull lightly ossified, with audital bullae much inflated, mandible small, dentition weak, and rostral portion of skull abbreviated; nasals falling considerably short of the premaxillaries; ears heavily coated with long hair; color dark. Length, 425 mm.; tail vertebrae, 58; ear above crown, 64; hind foot, 105..... *bachmani*.
- ee.* Skull and dentition heavier; audital bullae small, mandible large; nasals and rostral portion of skull elongated, the former exceeding the premaxillaries; ears less heavily clothed with short hair; coloration light. Length, 415 mm.; tail vertebrae, 67; ear above crown, 80; hind foot, 100.
- cc.* Ear longer than head.
- f.* Skull low and narrow, with rostral portion elongated; audital bullae moderately inflated, shorter antero-posteriorly than the upper molar series; size large; ears broadly tipped with black; color of upper surface tawny olive, mixed with gray and black. Length, 400 mm.; tail vertebrae, 67; ear above crown, 90; hind foot, 92..... *pinetis*.
- ff.* Skull higher and broader, with rostral portion reduced; audital bullae much inflated, longer antero-posteriorly than the upper tooth-row; size small; ears narrowly tipped with black; color of upper surface pale yellowish brown, mixed with gray and black.
- g.* Size large; coloration dark. Length, 380 mm.; tail vertebrae, 55; ear from crown, 85; hind foot, 92.
- gg.* Size small; coloration light.
- h.* Larger; ears and tail relatively long. Length, 360 mm.; tail vertebrae, 60; ear above crown, 85; hind foot, 82..... *holzneri* (p. 554).
- hh.* Smaller; ears and tail relatively short; skull with rostral portion, mandible, and audital bullae relatively more developed. Length, 330 mm.; tail vertebrae, 50; ear above crown, 80; hind foot, 80..... *auduboni*.
- AA.* Interparietal only present in the fetus, and for a very short period after birth; always fused with the parietals in adults, and usually developed from two ossific centers. Ear longer than hind foot.
- i.* Convex surface of ear white at the apex; black patch on middle of rump tending to become obsolete.
- major* (p. 557).
- minor* (p. 557).

- j. Nape and base of ear black..... *callotis*.
- jj. Nape and base of ears sooty grayish or yellowish.
- k. Sides white; size small; head stout; ears moderate.  
*gaillardi* (p. 560).
- kk. Sides gray; size large; head slender; ears enormous. *alteni*.
- ii. Convex surface of ear black at the apex; rump with a distinct black median stripe, in continuation of the black upper surface of the tail.
- l. Nape and base of ears black ..... *merriami* (p. 558).
- ll. Nape and base of ears never black, usually paler than or concolor with the body.
- m. Haunches and sides of rump distinctly whitish or pale grayish, in sharp contrast with the dark coloring of the back.
- n. Size medium; ears small (under 150 mm. from crown) with ochraceous fringes anteriorly; upper surface of body vinaceous cinnamon.. *melanotis*.
- nn. Size small; ears larger (over 150 mm. from crown) with brownish white fringes anteriorly; upper surface of body brownish gray.  
*griseus* (p. 562).
- mm. Haunches and sides of rump not distinctly whitish, but suffused with the dark coloring of the back.
- o. Head stout; black of upper surface aggregated so as to form blotches; under surface mostly white.
- p. Size large (total length, 620 mm.; ear from crown, 170; hind foot, 145); colors, grayish above, white below..... *texianus*.
- pp. Size small (total length, 580 mm.; ear from crown, 160; hind foot, 130); colors, more brownish on sides, sometimes stained with yellowish below..... *eremicus*.
- oo. Head slender; black of upper surface evenly distributed, not forming dusky blotches; under surface stained with yellowish or cinnamon.
- q. Colors pale; upper surface grayish or clay color, but slightly mixed with black; ears pale drab, large (averaging 165 mm. from crown); under parts lightly tinged with ochraceous buff (sometimes whitish).  
*deserticola* (p. 564).
- qq. Colors dark; upper surface drab, mixed with gray and considerable black; ears dark drab, small (averaging 155 mm. from crown); under parts strongly tinged with cinnamon.  
*californicus*.

LEPUS SYLVATICUS HOLZNERI, new subspecies.

HOLZNER'S COTTONTAIL.

*Geographic distribution.*—This cottontail was first met with in the red juniper zone of the Carrizalillo Mountains—the first wooded range on the boundary west of the Rio Grande. The Indians, who distinguish it from the cottontail of the plains of that region (*Lepus arizona*

*minor*), said it was the common rabbit of the Boca Grande and other mountain ranges of the surrounding region, and this proved to be the case as we proceeded westward. It was subsequently found in the Hachitas, Dog, San Luis, Animas, Guadalupe, Mule, San José, and Huachuca mountains. It was found from the red junipers and oaks at the lower timber line to the highest summits of these mountains, and was generally abundant. To the northward I have only seen it in the forested area bordering the south side of the Colorado River, in northern Arizona. It is the "wood rabbit" of Arizona and New Mexico; *Lepus arizonæ* being an inhabitant of the plains and deserts.

*Description of type*.—In summer pelage. Well clothed with coarse, rather short overhair, which conceals the underfur. Color of back, hip patches, and upper side of head vinaceous cinnamon, mixed with gray and black, deepening to tawny on the nape, and changing to clear whitish gray on the thighs and rump, which are lined with black; under parts white, faintly stained with yellowish, with the chest patch clay color, and inguinal spots pale vinaceous cinnamon; tail grizzled yellowish brown above, white below. Ears clothed with short hair, without black at tip or on anterior border; convex surface almost bare posteriorly, mixed reddish brown, gray and black anteriorly, fringed with white on basal two-thirds of anterior border, and scantily clothed with whitish hairs on the concave surface. Top and sides of head reddish like the back, pale around the orbit and at base of ears, posteriorly. Anterior face of fore limbs and outer face of hind limbs tawny, their inner surface brownish white.

*Description of winter pelage* (based on No.  $\frac{202336}{355337}$ , United States National Museum).—Adult male, from the Carrizalillo Mountains, near monument No. 31, Mexican boundary line. Collected April 21, 1892, by Mearns and Holzner. (Original number, 1680.<sup>1</sup>) Coat long, coarse, and rigid; feet bushy; ears well clothed. Color above gray, lined with black, faintly washed with clay color on back, hip patches, and along the ventral border; sides, rump, and haunches clear gray, lined with black; under parts with the pectoral area grayish white, tinged with clay color, the small flank patches clay color, and residue of under surface, including the under side of tail, pure white. The ears have their inner (concave) surface clothed with short grayish white hairs, the outer (convex) surface being grayish white posteriorly, gray mixed with black anteriorly, narrowly banded with black on the terminal half, and fringed with white on the edge. The nape is russet, orbital region whitish, and top and side of head gray, very faintly washed with yellowish brown. The feet are clay color on the under side, whitish above, tawny higher up on the shank. The upper side of the tail is grayish brown, with hoary tips to the hairs, the edges white.

<sup>1</sup>This specimen was at one time supposed to represent a form sufficiently different from more western specimens to warrant its separation from *holzneri*, to constitute a subspecies *rigidus*, characterized by smaller size, coarser pelage, and slightly grayer coloration, having for its range the Eastern Desert Tract.

An adult male in recently acquired winter dress (No. 2425, Amer. Mus. Nat. Hist., New York), taken by the writer in the Great Colorado Forest, at Pine Springs, near the Colorado River, in northern Arizona, on November 15, 1884, is practically identical in coloration with the above described specimen. In both, the pelage is gray at base for half its length, then brown, then narrowly ringed with black and drab gray, successively, and tipped with black. It is slightly larger, with a denser, softer coat. This specimen was compared with the types of *Lepus sylvaticus pinctis*, and found to be distinct.

A detailed account of the variations in the pelage of this species which depend on season, molting, age, and locality will be deferred until the publication of the report on the mammalogy of the recent survey of the boundary.

*Dimensions.*—Average measurements of 6 adult males: Total length, 415.2 mm.; tail vertebrae, 64; ear from crown, 77.8; ear from notch, 65; length of hind foot, 99.5; length of head (from nose to occiput), 82. Average of 7 adult females: Total length, 413.3 mm.; tail vertebrae, 69.6; ear from crown, 79.4; ear from notch, 68; hind foot, 97; head, 82.3.

*Cranial and dental characters.*—The nasals and rostral portion of the skull are relatively larger than in any other cottontail, the former usually extending beyond the line of the premaxillaries. The audital bulla is small, and the mandible of medium size. The dental armature is rather heavy.

*Type.*—No. 58937, U.S.N.M. (Coll. International Boundary Commission). Adult female, from the Douglas spruce zone, near the summit of the Huachuca Mountains, southern Arizona. Collected August 29, 1893, by Mr. Frank X. Holzner. (Original number, 989.)

*General remarks.*—This rabbit is quite different in color from *L. bachmani* or *L. s. nuttalli*, and is much larger than either of them. It is, in fact, the largest cottontail in the Southwest, excepting *Lepus auduboni*, from which it may be instantly distinguished by its much shorter ear, longer hind feet, and wholly different coloration. I have compared Holzner's cottontail very carefully with the *Lepus pinctis* recently described by Dr. J. A. Allen,<sup>1</sup> from the White Mountains, Arizona, and find it to be very different, though, as remarked by Dr. Allen, one of the specimens is immature, and the other in such worn molting pelage as to show but little of the overhair. Though unsatisfactory in character, these specimens indicate a form very different from any previously described. The large, bushy feet and heavily clothed ears are quite similar to those of *Lepus sylvaticus nuttalli*; but, instead of the pallid, hoary, and yellowish coloring of that animal, it is the darkest form of cottontail in the Southwest, the young specimen (No.  $\frac{9041}{7336}$ , Am. Mus. Coll.) being about as dark as the darkest individuals of the cactus rabbit (*Lepus cinerascens*). Fortunately the skulls of the two specimens of *Lepus sylvaticus pinctis* are perfect, and that of the adult (No.  $\frac{9040}{7335}$ , Am. Mus. Coll.) indicates a

<sup>1</sup> Bull. Am. Mus. Nat. Hist., VI, p. 348, December, 1894

form widely different from *L. holzneri*, bearing, in fact, a closer resemblance to the skull of the *Lepus arizonæ*.

LEPUS ARIZONÆ MAJOR, new subspecies.

GREATER DESERT COTTONTAIL.

*Geographic distribution.*—This rabbit occupies the elevated interior region, between the eastern and western deserts, its range extending along the Mexican boundary from Poso de Luis, Sonora, to the basin of the Mimbres, Chihuahua. Northward, it penetrates the Transition Zone on the Colorado Plateau; and southward it assumes a darker phase in the Yaqui Basin.

*Description of type.*—In winter pelage; taken October 23. Similar to *L. arizonæ* (typica) but larger, more reddish, and darker. Pelage long, dense, and rather coarse; ears and feet well coated; above grayish drab, tinged with cinnamon, and thickly lined with black-pointed hairs on the back; sides paler, drab-gray; rump clear iron-gray; nape and outer surface of limbs, dull cinnamon; ears pale grayish on concave surface, drab mixed with gray and black on convex surface, and black at apex; under parts white, except the chest which is light clay-color.

*Type.*—No.  $\frac{18192}{25090}$ , U.S.N.M. Adult male, collected at Calabasas, Arizona, October 23, 1889, by Dr. Leonhard Stejneger. Original number, 3053.

LEPUS ARIZONÆ MINOR, new subspecies.

LESSER DESERT COTTONTAIL.

*Geographic distribution.*—This rabbit ranges from the plains of Colorado southward to the Rio Grande and westward to the elevated central tract, where it intergrades with *L. arizonæ major* in the pass between the southern end of the Rocky Mountains and northern extremity of the Sierra Madre.

*Description (based on the type, in winter pelage).*—Coat long, dense, and silky. On the back it is gray at base for a little more than half its length, then ringed successively with brown, black, and Naples yellow, pointed with black. Ears and feet well clothed. Upper surface of body yellowish brown, of a shade closely resembling Naples yellow, thickly lined with black, changing to yellowish gray on the sides, with a rather distinct line of buff separating the grayish sides from the white underparts; rump grayish white, lined with black; head pale gray, tinged slightly with yellowish brown on the cheeks and more deeply so on the crown; whiskers black; ear with convex surface grayish white posteriorly, gray slightly mixed with yellowish brown and black anteriorly, fringed with white on basal two-thirds of anterior edge, tipped with black, and coated with grayish white on concave surface, where there is an obsolete patch of dusky parallel to the posterior edge; nape light cinnamon; anterior face of fore limbs ochraceous-cinnamon; outer aspect of leg wood brown; hind feet white above, cinna-

mon below; tail white, with a broad dorsal stripe composed of dusky hairs tipped with yellow-brown and gray; chest patch yellowish gray; residue of under parts pure white, with the exception of the two small colored patches usually present in rabbits, at the sides of the abdomen in front of the hind limbs, which patches are pale cinnamon.

*Dimensions.*—Average measurements of 14 adult males: Total length, 345 mm.; tail vertebrae, 50.2; ear from crown, 81.2; ear from notch, 65.8; length of hind foot, 83.4; length of head (nose to occiput), 70.9. Average of 16 adult females: Total length, 360 mm.; tail vertebrae, 52.8; ear from crown, 80; ear from notch, 64.3; hind foot, 83.7; head, 70.5.

*Type.*—No.  $\frac{291}{3} \frac{04}{64}$ , U.S.N.M. (Coll. International Boundary Commission). Adult male, from El Paso, Texas. Collected February 6, 1892, by Mearns and Holzner. (Original number, 1418.)

*General remarks.*—This small, short-eared, pallid race of the *Lepus arizonae* has been hitherto confused with *L. s. bachmani* and *L. s. nuttalli*. Quite recently,<sup>1</sup> however, Dr. J. A. Allen correctly referred a specimen to the species *L. arizonae*. Comparing a series of specimens of this race from the type locality (El Paso, Texas) with a series of *L. arizonae major* taken in central Arizona during the same month (February), the latter are seen to be darker and browner, as well as larger, with relatively larger ears.

The subspecies *minor* also differs from *L. arizonae* (typica) in having the rostral portion of the skull more elongated, the mandible considerably higher and stouter, and the audital bullae larger.

#### LEPUS MERRIAMI, Mearns.

##### RIO GRANDE JACKRABBIT.

*Lepus texianus*, AUDUBON and BACHMAN, N. Am. Quad., III, 1853, p. 156, pl. CXXXIII (Texas).

*Lepus callotis*, BAIRD, U. S. and Mex. Bd. Surv., 1859, pp. 45, 46 (in part; as to Nos. 131, 252, 299, and 300).—BAIRD, Mam. N. Am., 1857, p. 590 (in part; as to Nos. 299, 131, and 252).—ALLEN, N. Am. Rodentia, 1877, p. 350 ("Var. *calotis*:" in part).

*Lepus merriami*, MEARNS, Proc. U. S. Nat. Mus., XVIII, 1896, No. 1103, advance sheet, May 25, 1896, p. 2.

Similar to *Lepus callotis* of Mexico, but with shorter ears, which are tipped with black instead of white; with upper surface of body inclining to grayish fawn color rather than ochraceous buff. I have already briefly described this species, on a page of this volume, but think it desirable, in the present connection, to give a fuller description of it.

*Geographic distribution.*—The range of *Lepus merriami* extends along the lower Gulf coast of Texas to the mouth of the Rio Grande, and up that stream as far as the mouth of the Devil's River, near which point—about Del Rio—the writer found it extremely abundant.

*Description of type.*—Above grayish fawn color, mixed with black; underfur whitish; nape, and base and tip of ears, posteriorly, jet black;

<sup>1</sup> Bull. Am. Mus. Nat. Hist., New York, V, p. 28, 1893.

black nape patch divided by an indistinct stripe composed of brownish gray-tipped hairs; ears with their convex surface, anteriorly, brownish gray mixed with black, white posteriorly, with a cream-colored interspace; inner surfaces of ears scantily coated with short hairs, which are white except on the middle portion of the posterior border, where they are blackish, forming an elongated dusky spot; ear fringes of anterior border clayey white, of tip black, of posterior border white; upper side of tail, and median area of rump, black; outer surface of legs, haunches, and side of rump grayish white, thickly lined with black hairs; gular area clay color; residue of under parts, including inner surfaces of limbs, pure white, except the usually stained patches at sides of abdomen in front of thighs, which in this species are cream buff. This female contained three fetuses, and had molted on the head, neck, and anterior half of the ventral surface before the date of its capture (April 6).

The specimen above described is essentially like numerous others which I have examined in the collections of the United States National and American museums from Indianola, Rockport, Brownsville, and other points in southeastern Texas.

An adult male (No.  $\frac{7279}{5884}$ , American Museum Coll.), taken at Rockport, Texas, September 18, 1893, by Mr. H. P. Attwater, is in summer pelage. The pelage is short and rigid. The upper parts are drab gray, mixed with black; nape black, with a faint longitudinal band of grayish posteriorly. The ears are very short-haired; convex surface white posteriorly, black apically, and finely mixed yellowish brown, gray, and black anteriorly; fringe on anterior edge yellowish brown, on posterior edge white; concave surface sparsely clothed with whitish and yellowish hairs, with a broad blackish area along the posterior border. The gular patch is wood brown mixed with grayish white; under side of tail smoky gray, slightly mixed with long grayish white and reddish brown hairs; residue of under parts white.

*Description of young.*—A small female (No. 2302, Coll. International Boundary Commission), about the size of a *Neotoma*, was taken from a marsh hawk (*Circus hudsonius*), at Fort Clark, Tex., February 25, 1893, by the author. It is coated above with plumbeous, brownish-pointed underfur, a median coat of banded hairs, and a sparse outside coating of extremely long, white-tipped, coarse hairs. The nape is sooty black. The general coloring is grayer than adults, and more mixed with black on the haunches and rump, and with darker underfur. A two-thirds grown male (No.  $\frac{7283}{5888}$ , Amer. Mus. Nat. Hist.), taken at Rockport, Texas, by Mr. H. P. Attwater, November 8, 1893, is in winter dress, except as to the middle of the back, and has a richer, more brownish coloring than any other examined. The ears are quite heavily coated on their concave surface, where they are decidedly ochraceous toward the apex and along the posterior border. The nape and base of ears, posteriorly, are black.

*Dimensions.*—Total length, 570 mm; tail vertebrae, 75; ear from crown, 142; ear from notch, 118; length of hind foot, 123; length of head (nose to occiput), 105.

*Cranial and dental characters.*—The skull, though broad and high, is much less massive than those of *Lepus callotis* and *Lepus gaillardi*. The supraorbital processes of the frontal are less elevated and expanded, and the postorbital process incloses a long and narrow, instead of a broadly oval, foramen. The nasal bones are long, longitudinally convex, and very broad. The rostrum and brain case are of average dimensions. The dental armature is much weaker than in *L. callotis*, and quite similar to that of *L. gaillardi*.

*Type.*—No. 2317, Coll. International Boundary Commission. Adult female, from Fort Clark, Kinney County, Texas. Collected April 6, 1893, by Dr. Edgar A. Mearns.

*General remarks.*—This is the common "jackrabbit" of the Rio Grande. It has been described by Audubon and Bachman, Baird, Allen, and other writers, under the preoccupied names of *L. callotis* and *L. texianus*, with which species it has been confounded.

LEPUS GAILLARDI, new species.

GAILLARD'S JACKRABBIT.

Similar to *Lepus callotis*, but smaller, paler, more yellowish, with relatively shorter ears, and lacking the black nape patch.

*Geographic distribution.*—Gaillard's jack rabbit was found only on the east and west forks of the Playas Valley, bordering the San Luis Mountains on the east side.

*Description of type.*—Above pale ochraceous-cinnamon, mixed with black; under side of tail white, its upper surface black, many of the hairs being pointed with whitish; median black line of rump obsolete, but indicated by a (mostly concealed) line of sooty, brownish, white-tipped hairs; sides pure white; rump and thighs white, lined with a few black hairs, the former scarcely divided by a median dusky stripe; limbs white, stained with buff on their outer surfaces; gular patch buff, becoming more ochraceous on front of shoulders and sides of neck; head cream buff, mixed with black, with a whitish area on the side involving the eye; under parts white, with scarcely a trace of the colored patches usually present in front of thighs; ears scantily coated with short hairs; their concave surfaces almost bare, with the usual dusky spot along the posterior border; convex surfaces yellowish brown, mixed with black anteriorly, white posteriorly and at apex; long fringes of anterior edge of ear ochraceous buff, except subapically, where, as in *L. callotis*, there is a tuft of black; fringes of tip and posterior edge white; nape ochraceous buff. This specimen is in mixed coat. Molting has commenced in front and proceeded backward from the nose to the shoulders, and in the median line above to a point behind the middle of the back; there are also scattered patches on

the sides and posterior portion of the back where the winter hair has fallen out en masse and is being replaced. The ventral surface is still covered with dense, long hair. The difference between the coloring of the winter and summer coats is slight.

Another specimen (No.  $\frac{2}{3}\frac{0}{5}\frac{5}{7}\frac{2}{0}\frac{2}{9}$ , U.S.N.M.), an adult female containing three small fetuses, taken at the same locality June 16, 1892, is quite similar to the type in coloring, but has acquired the short summer coating on the whole ventral surface, though the change has not progressed as far on the dorsum, shedding having taken place only on the head and nape, a few scattered patches anteriorly, and over a large area of the posterior border of the blanketed portion of the back, and in the median area of the rump, to the tail.

Another adult female (No.  $\frac{2}{3}\frac{0}{5}\frac{5}{7}\frac{2}{0}\frac{2}{9}$ , U.S.N.M.), taken at the same place June 29, 1892, has only shed the winter hair on the chest and anterior portion of abdomen, on the nose, and a few insignificant spots scattered over the upper surface. It is therefore in nearly complete winter dress. Though faded, the coloring is quite similar to the others. In these three the feet are remarkably shorter-haired, all of the claws being exposed. In comparison with the *terianus* group, the coat is short and coarse.

*Description of young.*—Two young females (Nos.  $\frac{2}{3}\frac{0}{5}\frac{5}{7}\frac{3}{0}\frac{0}{9}$  and  $\frac{2}{3}\frac{0}{5}\frac{5}{7}\frac{3}{0}\frac{1}{5}$ , U.S.N.M.), from the same locality, June 16 and 17, 1892, are still in the soft, woolly coat of early life, except on the front of the head and anterior portion of the middle of the back, where the coarser coating has recently been acquired. This new pelage is vinaceous buff, that of the rest of the upper surface of the body varying from cream buff to cinnamon in different parts. The crown of the head is cinnamon; its sides clayey buff, except the orbital stripe, which is cream buff, and the gular area buff. The upper side of the tail is black, considerably grizzled, and mixed with yellowish white, and the central stripe of the rump is but faintly indicated. These two specimens, and an older one (No. 58914, U.S.N.M.), taken September 15, 1893, exhibit a very interesting character of this species, which I have deferred mentioning until now on account of the unsatisfactory condition of the pelage of the parts in the adults above described, in which the sides have a more or less patchy mixture of the winter and summer coats, tending to obscure the pattern. This character consists of a light stripe of cream buff extending along the anterior two-thirds of the body, above and parallel to the lower edge of the dark area of the back, spreading out anteriorly and involving the shoulder. These stripes are analogous to the shoulder stripes of *Spermophilus beecheyi*; and, their presence having been once determined in the present species, it is possible to discover traces of them in several other hares of this group. The importance of this mark consists in its indication of the common ancestry of the jackrabbits and cottontails.

*Dimensions.*—Measurements of one adult male: Total length, 530 mm.; tail vertebræ, 77; ear from crown, 146; ear from notch, 123; length

of hind foot, 131; length of head (nose to occiput), 104. Average measurements of two adult females: Total length, 567 mm.; tail vertebræ, 86; ear from crown, 148; ear from notch, 127; hind foot, 135; head, 106.5.

*Cranial and dental characters.*—The skull of this species is high and rather wide. The supraorbital process of the frontal bone is elevated and massive. The nasal bones are long and very wide, especially behind. The rostral portion of the skull is of medium length, the brain case of average capacity, and the teeth of the usual size.

*Type.*—No.  $\frac{205}{35} \frac{25}{7} \frac{14}{14}$ , U.S.N.M. (Coll. International Boundary Commission). Adult male, from the west fork of the Playas Valley near monument No. 63, Mexican boundary line. Collected June 17, 1892, by Edgar A. Mearns and Frank X. Holzner.

*General remarks.*—This species scarcely requires comparison with any other. It bears a superficial resemblance to *L. alleni*, from which its diminutive size at once serves to distinguish it.

#### LEPUS TEXIANUS GRISEUS, new subspecies.

##### EASTERN DESERT JACKRABBIT.

*Lepus callotis*, BAIRD, Mam. N. Am., 1857, p. 590 (in part; as to No. 301?); U. S. and Mex. Bound. Survey, II, II, 1859, p. 46 (in part; as to No. 135, Eagle Pass, Tex.).—ALLEN, Mon. N. Am. Rodentia, 1877, p. 355 (in part only).

*Geographic distribution.*—This species inhabits the region of the upper Rio Grande, from Maverick and Kinney Counties, in Texas, to Grant County, New Mexico, ranging southward in Coahuila and Chihuahua, Mexico. Toward the Sierra Madré and other mountain chains to the northward, which form the backbone of the continent, this race gradually merges into the *texianus* type of this species.

*Description of adult in winter coat.*—Size considerably smaller than that of *Lepus texianus* or *L. melanotis*, about equal to *L. californicus*. Length, measured from nose to end of vertebræ of tail, 560 mm.; tail vertebræ 75; height of ear above crown, 138; length of hind foot, 122. Color above brownish gray; pelage thickly lined with long, black-tipped hairs, which are most numerous in the median area of the back; color of rump and haunches changing abruptly to clear grayish, because the brownish staining of the back is wanting. On the back, which has a mottled appearance, the underfur is gray at base for three-fifths of its length, then ringed with light brown, and pointed with black. The coarse, long hairs are white at base, ringed with black in the middle, subterminally ringed with pale drab gray, and pointed with black. Inspection of the parted coat, therefore, shows it to be smoke gray at base, then banded successively with pale brown, black, and drab gray, pointed with black. On the sides of the rump the underfur is pale gray at base and tip, white in the middle. The long coat on this part is composed of two kinds of hair, a dense growth of short hairs which are white to the base, banded and pointed with black, and a sparse growth of very long black hairs, tipped with white. Many of

these long, black, white-tipped hairs are scattered along the sides of the body. Sides gray, slightly lined with black, and barely tinged with yellowish brown. Ears with anterior fringes brownish white, posterior fringes pure white, edges of tip black; their convex surfaces brownish gray anteriorly, white posteriorly, tipped with black for about 30 mm., the black cut off from most of the anterior border by an upward extension of the gray. Nape grayish white, with an indistinct, median, clay-colored band. Chin and area surrounding orbits, whitish; eyelids black. Whiskers black and white, mostly black, tipped with white. Crown, brownish gray, mixed with black. Sides of head and neck faintly stained with yellowish brown. Gular patch grayish clay color; patches in front of thighs faintly tinged with the same; residue of under parts, and inner surface of limbs, pure white. Tail gray, tinged with brownish below, jet black above, the black extending forward on the rump to a point opposite the anterior border of the sacrum, thus dividing the grayish white area of the posterior parts. Outer surface of limbs gray, slightly tinged with clay color; pads broccali brown.

*Description of summer coat based on type specimen.*—Coat shorter, coarser, and somewhat paler than in winter. It retains the mottled appearance above, and the sides, haunches, and rump are still grayish white, this latter feature serving to distinguish it from the races of *Lepus texianus* found west of the Rocky Mountains.

*Dimensions.*—Average measurements of 13 adult males: Total length, 559.2 mm.; tail vertebrae, 91.5; ear from crown, 152.8; ear from notch, 130.2; length of hind foot, 127; length of head (nose to occiput), 105.1. Average of 8 adult females: Total length, 582.5 mm.; tail vertebrae, 97; ear from crown, 158.5; ear from notch, 129; hind foot, 129.9; head, 105.5.

*Variations.*—The materials before me indicate that this race reaches its extreme differentiation in southwestern Texas and the adjacent States of Mexico. Further north and east it may be expected to intergrade with *L. melanotis*, as it certainly does with *L. texianus* in the western parts of New Mexico and Chihuahua. As we proceeded westward from the Rio Grande, along the boundary line, the characters of this race were very constant until the hilly country west of the Mimbres Valley was reached. From this point to the San Luis Mountains the ears were gradually lengthened, the whiteness of the rump and haunches became obscured by a backward extension of the brownish color of the back, which also deepened on the shoulders and flanks. In the San Luis Mountains of Chihuahua, north of the Sierra Madre, and the Animas range, which is an extension of the same range, into the United States, a large form of this hare was found which is practically identical with the *Lepus texianus*.

*Cranial and dental characters.*—The cranium is rather wide. Its height varies with the locality—eastern specimens averaging high and western low. The supraorbitals are straight-edged, narrow, and much elevated. Eastern specimens have the nasal bones exceedingly long

and decurved, those of western examples being shorter and straighter; the nasals of eastern specimens are also the widest. The mandible is higher and the whole skull heavier in Texan specimens than in those from the southern border of New Mexico. In dentition this species does not differ materially from the true *L. texianus*.

*Type*.—No.  $\frac{2}{3} \frac{1068}{1088}$ , U.S.N.M. (Coll. International Boundary Commission). Adult female, from Fort Hancock, El Paso County, Texas. Collected by Dr. Mearns, June 22, 1893. (Original number, 2353.)

LEPUS TEXIANUS DESERTICOLA, new subspecies.

WESTERN DESERT JACKRABBIT.

*Lepus californicus*, BAIRD, U. S. and Mex. Bound. Survey, 1859, p. 47 (lower Colorado River of California.—COOPER, Am. Nat., III, 1869, p. 470 (Colorado Valley).—ALLEN, Mon. N. Am. Rodentia, 1877, p. 358 (in part; as to No. 1327, etc.).

*Geographic distribution*.—This is a pallid race, from the desert region between the Sonoyta Valley, of Arizona and Sonora, and the Coast Range Mountains, of California and Lower California. On the Mexican boundary line it occupies the whole of the Tulé, Tinajas, Yuma, and Colorado deserts.

*Description of type*.—About the size of *Lepus californicus*, with larger ears. Above clay color, mixed with gray and black; sides and gular patch a little more ochraceous than in *Lepus californicus*; under parts tinged with ochraceous buff; ears scantily clothed, of the usual pattern, pale drab and white, with black at the apex posteriorly. This specimen is in winter coat, but has molted on the front of the head, where the new coat is seen to be no darker than the old.

*Description of young*.—No. 60912, U.S.N.M. (Coll. International Boundary Commission). A half-grown female, taken with the type, of which it was, perhaps, the progeny. It is still in the woolly coat without much overhair. Color above drab gray; sides and gular patch slightly more yellowish; rest of under parts yellowish white.

*Variations*.—Specimens from the deserts east of the Colorado River are larger, with relatively longer ears, and have the upper surface more mottled. On the Mexican boundary, intergradation with *L. t. eremicus* takes place in the region between the Tulé Mountains and the Sonoyta River. In tracing it westward it is observed to gradually take on some of the characters of *Lepus californicus*. The pelage becomes shorter, coarser, and plainer, losing the variegated or blotched appearance on the back; the size is decreased; and the under parts are suffused with yellowish brown. At the eastern base of the Coast Range Mountains the two species meet, and possibly their ranges slightly overlap; but, though the phase of *Lepus californicus* found in the Coast Range Mountains likewise shows some variations from the phase of the coast which are in the direction of the characters of *L. texianus*, the two species appear to be distinct. This fact warns us against the assumption that

*L. melanotis* and *L. t. griseus* of the Texan region are geographical races of a common species, in the absence of positive proof of their intergradation.

*Dimensions.*—Average measurements of 2 adult males: Total length, 560 mm; tail vertebrae, 110; ear from crown, 158; length of hind foot, 125. Average of 3 adult females: Total length, 571 mm; tail vertebrae, 109; ear from crown, 171; ear from notch, 139; hind foot, 130.

*Cranial and dental characters.*—The skull of this form, especially in specimens from west of the Colorado River, shows a decided approach to the characters of *Lepus californicus*. Like that species, it is weak and fragile, and armed with a light dental apparatus. It is extremely low and narrow, with light supraorbitals, and short and narrow nasals. The brain case is narrow, however, while that of *L. californicus* has greater lateral expansion than usual. East of the Yuma Desert, the skull of this subspecies rapidly acquires the conformation of *L. t. eremicus*.

*Type.*—No.  $\frac{8308}{8612}$ , Am. Mus. Nat. Hist. Adult female, from the western edge of the Colorado Desert, at the base of the Coast Range Mountains, in San Diego County, California. Collected by Mr. Frank X. Holzner, May 7, 1894.