

**Article VI.** — ON THE MAMMALS OF ARANSAS COUNTY, TEXAS, WITH DESCRIPTIONS OF NEW FORMS OF LEPUS AND ORYZOMYS.

By J. A. ALLEN.

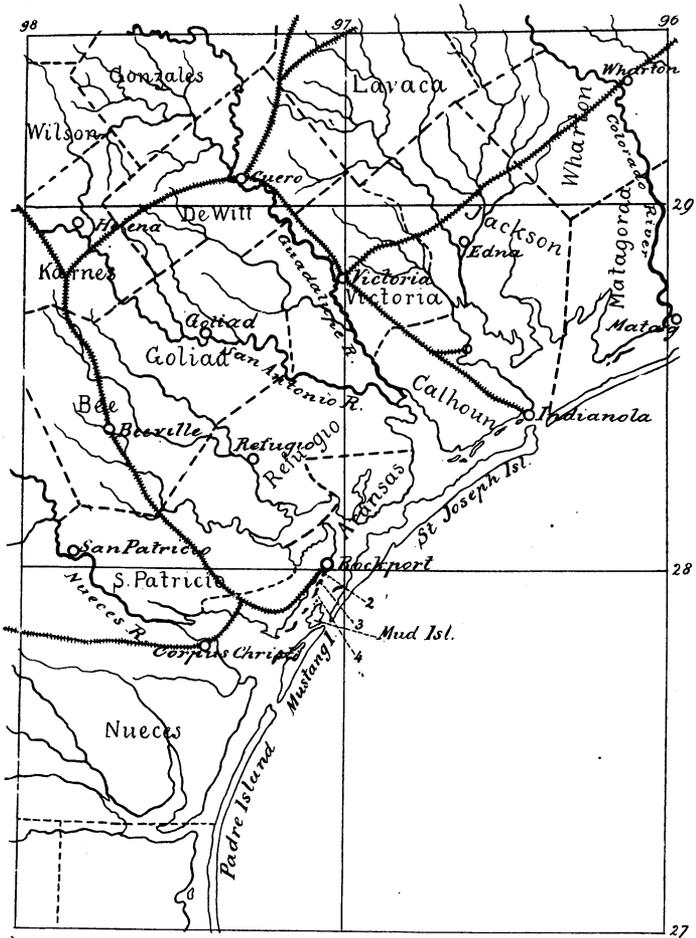
The following paper on the mammals of Aransas County, Texas, is based on a collection made by Mr. H. P. Attwater during the years 1892 and 1893. The collection numbers about 300 specimens, representing 24 species, in most instances by good series of both young and old. About three-fourths of the specimens have been purchased by the Museum, the rest being reserved by Mr. Attwater for his private collection. They have all been kindly forwarded to the Museum for study, and I am further indebted to Mr. Attwater for the valuable field notes presented in the following pages.

The present collection is especially interesting from having been gathered from a very limited area, for the most part within a radius of ten miles of the town of Rockport. As shown on the accompanying map, Aransas County consists of a number of small islands and of several irregularly shaped peninsulas formed by the extension inland of various bays. The specimens were collected partly on the mainland, on marshy ground in the immediate vicinity of Rockport, and partly on the adjoining small islands numbered 2, 3 and 4 on the accompanying map. They doubtless fairly represent the mammalian fauna of this very limited area, but probably a number of additional species occur in other parts of the county. These would probably include a number of additional species of Bats, perhaps one or two Shrews, and a Harvest Mouse (*Reithrodontomys*). No species of Kangaroo Rat was met with, and Mr. Attwater is very confident that none occurs within the area covered by his explorations.

As marked changes have already occurred in the mammalian fauna of Aransas County since its settlement, it has seemed desirable to include in the list a few species that have already become nearly or quite extirpated. The total number of species

is thus increased to 36, about ten being given solely on the basis of Mr. Attwater's notes.

The notes kindly furnished by Mr. Attwater are here given in substance, and generally in his own words. Although sometimes condensed and somewhat changed in form, it has been thought best to present them as though they were direct quotations from



MAP OF ARANSAS AND ADJOINING COUNTIES.—The collection was made chiefly on the small islands numbered 2, 3 and 4, and on a low, marshy point close to the island marked 1, sometimes referred to in Mr. Attwater's notes as the 'Point' or 'Pocket.'

his notes and letters, and to further distinguish them by his initials. They include also the following paragraphs respecting the general character of the area in question.

“Aransas County, with Rockport as the county seat, lies on the Gulf coast of Texas, between the Guadalupe and Nueces Rivers, and about half way between Galveston and the mouth of the Rio Grande. It comprises an area of 437 square miles, and includes Live Oak, St. Charles and Lamar Peninsulas, and St. Joseph Island, which latter extends along the Gulf for 28 miles ; the remainder of the county is made up of Aransas, Copano, Puerto, and St. Charles Bays, in which are situated a number of shell reefs and small islands.

“The prevailing tree growth on the peninsulas consists of dwarfed live oaks, ‘sweet bay’ (*Persea carolinensis*), and ‘huckleberry’ (*Vaccinium arboreum*), with scattered groups of anaqua (*Eluetia elliptica*), hackberry, mezquit, and prickly ash. The shell ridges along the shores and on St. Joseph and the smaller islands are covered with a tangled growth of ‘chaparral,’ consisting chiefly of dwarfed persimmons, huisache and ‘cat-claw,’ with patches of dewberry vines and occasional bunches of prickly pear (*Opuntia*). On St. Charles Peninsula is a considerable area of black-jack oaks.

“Along the shores is a belt of comparatively open country, of an average breadth of half a mile, covered with a dense growth of weedy plants, the most common being ‘wild sage’ (*Croton texensis*), *Eupatorium*, *Cassia*, *Baptisia*, *Helenium*, and *Amphichyris*. On the salt flats *Statice* and *Lycium* grow in abundance. The most common grasses on the uplands are Bermuda and burgrass (*Cenchrus tribuloides*).

“Back in the interior the vast mezquit lands of the West meet the black ‘hog wallow’ prairies, which extend along through the coast counties from Louisiana into southeastern Texas.

““The narrow belt of the Tropical Realm, which extends northward along the Texas coast from the Lower Rio Grande,’ begins to disappear in Aransas County, and probably dies out in Calhoun County, adjoining Aransas on the east, the northern limit being near the mouth of the Guadalupe River. About here

I think will be found the extreme limit in southern Texas of the range of such southern birds as the Vermillion Flycatcher, Chaparral Cock, Cactus Wren, Paraque, White-tailed Hawk, and some others."

**1. *Didelphis marsupialis californica* (Bennett).** TEXAS OPOSSUM.—Represented by three adult specimens, taken Jan. 10, Feb. 5 and Feb. 10. Two of these agree with three others from Corpus Christi and another from Brownsville in the surface of the pelage being black; the other specimen differs in having a very full covering of long pure white bristly hairs, which largely conceal the blackness of the finer pelage below.

In the absence of specimens from the supposed type locality of Bennett's *Didelphis californica* (P. Z. S., 1833, p. 40), said to be "from that part of California which adjoins Mexico," I follow Professor Baird in referring to this form the Texas series of Opossums. The Texan animal, as represented in the coast region of Texas, differs from the northern *D. m. virginiana* not only in the generally much darker color, but in the presence of a well-defined blackish eye-stripe and wholly black feet. In a series of 24 specimens from the vicinity of New York City the whole head is much lighter (nearly white), the eye being merely surrounded with a dusky border, most developed in front of the eye; there is also no eye-stripe nor median frontal stripe as in the Texas specimens. The apical portion of the toes of both fore and hind feet is white, as a rule, the white, however, varying in extent, being sometimes limited to the terminal phalanx, and sometimes involving the greater part of the foot. In Texan specimens the black also extends much further on the tail, involving the basal third or half, or even more, instead of being confined to the extreme base, as in northern examples; and the tail is also very much longer.

"Opossums are very common all over the peninsulas of Aransas County, and I think also on St. Joseph Island. They frequently come into town at night after chickens, and during summer, when the doors and windows are open, enter houses and explore the premises. One was caught lapping milk that had been left on a table in a kitchen. Several were sent to me that

had been killed in and near a house on the outskirts of town. They vary considerably in color, but none are very light."—H. P. A.

**2. *Tatusia novemcinctus* (Linn.).** NINE-BANDED ARMADILLO.—One specimen, St. Charles Peninsula, 20 miles northeast of Rockport, Oct. 1, 1893.

"Armadillos are found in several parts of Aransas County. The one sent is from St. Charles Peninsula, where I have heard of a number being seen. This is probably about the limit of their range to the eastward along the Texas coast."—H. P. A.

**3. *Lepus callotis* Wagler.** JACKASS HARE.—Represented by six specimens, including adults in both summer and winter pelage, and also young of various ages, from one apparently only a few days old (collected Oct. 11, 1893) to others half to two-thirds grown.

There appears to be no appreciable difference in coloration with age. There is, however, a marked seasonal variation. Summer specimens have the pelage much shorter, thinner, and somewhat lighter in color (less fulvous and grayer) than winter specimens, with a broad, long (about 75 by 35 mm.) jet black nape patch of fine, short fur, usually divided posteriorly by a narrow stripe of gray, formed by a slight tipping of gray to the black hairs. This stripe varies in extent and distinctness in different specimens. In full winter pelage the black nape patch is wholly wanting, and the general pelage is much fuller, longer, and more strongly fulvous.

Mr. Attwater gives the weight of two adult specimens as follows: ♀, Nov. 8, 6 lbs. 6 oz.; ♂, Sept. 18, 6 lbs. The length of the hind foot in each of these specimens is given on the label as 5.25 in. (= 133 mm.).

Two other specimens collected by Mr. Frank M. Chapman<sup>1</sup> at Corpus Christi, April 16 and 25, and hence in short summer pelage, are evidently referable to the same form.

<sup>1</sup> Mr. Chapman collected at Corpus Christi from March 18 to April 25, 1891. His report on the birds he collected has already been published (this Bulletin, Vol. III, pp. 315-328), as have his notes on two of the mammals (l. c., pp. 284, 285, and 288, 289). Further frequent references will be made to the mammals in the present paper.

These specimens are all provisionally referred to *Lepus callotis*, originally described from some part of Mexico, of which Dr. Mearns's *Lepus melanotis*,<sup>1</sup> from Kansas and Oklahoma Territory, seems to be merely a larger, rather more fulvous northern subspecies.

"Jack Rabbits are common all over the country, and do considerable damage to gardens. Many of the smaller truck farms are surrounded by rabbit-proof fences for protection from their depredations. The State passed an act two years ago (1892) placing a bounty on them, and they have now become much scarcer. They are also sold in the poultry and game shops, being brought to town from a distance by Mexicans and others. I understand that the bounty was removed at the last session of the legislature, some of the southwestern counties of the State not having money enough to pay the bounties on these and other animals included in the act.

"Jack Rabbits are now very common on St. Joseph Island, where I am told they were introduced during the late war.

"These animals are sometimes taken young and kept alive ; but they are always wild and very pugnacious. The species appears to breed at any time, its food being easily obtainable at all seasons. I think they have only one young at a time."—H. P. A.

**4. *Lepus sylvaticus bachmani* (Waterh.).** TEXAN WOOD HARE.—Eleven specimens of this form of the Wood Hare are contained in Mr. Attwater's collection, and eleven in Mr. Chapman's Corpus Christi collection. Among the former are three one-fourth to one-third grown, taken respectively Feb. 26, March 20, and July 24. There seems to be very little seasonal variation in color.

This is a well-marked form of the *sylvaticus* group, distinguished by its very small size and the clearer, whitish gray of the sides and rump. I follow Baird in identifying it with the *L. bachmani* of Waterhouse, assuming, with him, that the original specimen was in all probability a part of the "Texas collections

<sup>1</sup> Bull. Am. Mus. Nat. Hist., II, p. 297, Feb., 1890.

of Douglas"—a probability our present knowledge of the southwestern forms of the group (*arizonæ*, *auduboni*, etc.) greatly strengthens. Although this is a light-colored form, it does not present the kind of pallor shown by the pallid forms of the interior.<sup>1</sup>

"All the specimens are from the mainland, where they are not uncommon. I have not found them on the islands, but I am not sure they do not occur there."—H. P. A.

[*Lepus aquaticus* *Bachman*.—Represented by two specimens taken by Mr. Attwater at San Antonio in April, 1891, and one taken May 8, 1894, but there are none in the Aransas County series. I am, however, indebted to Dr. C. Hart Merriam for specimens kindly loaned for examination from Matagorda and the lower Brazos River, showing that the species extends southward from Louisiana along the Gulf coast nearly to Aransas County. The San Antonio specimens are much lighter colored than Dr. Merriam's coast specimens, which do not appear to differ from Louisiana examples.]

5. *Geomys personatus* *True*.—Represented by a series of about 50 specimens, taken nearly throughout the year, only the months of June, July and August being unrepresented.

<sup>1</sup> An examination in this connection of numerous specimens of the *sylvaticus* group from various parts of North America shows that it stands in need of careful revision. It is an exceedingly plastic group, its representatives varying greatly in size, in color, and particularly in the size of the ears, at different localities. While the material for its satisfactory revision is lacking, I take the present opportunity to characterize a form which attracted my attention many years ago, and was even still earlier referred to by Professor Baird (*Mam. N. Am.*, 1858, p. 599)—namely, a large form from Iowa, Wisconsin and Minnesota, which I propose to call *Lepus sylvaticus mearnsii*, in honor of Dr. E. A. Mearns, U.S.A., on whose large series from Minnesota this subspecies is now primarily based.

*Lepus sylvaticus mearnsii*, subsp. nov.

Distinguished by its large size and rather pale colors, in comparison with true *sylvaticus* of the East, its nearest ally. The dorsal area is not nearly so dark brown, and the sides of the body are much paler.

Ten specimens from Fort Snelling, Minn., measured in the flesh by Dr. Mearns, average as follows: Total length, 475 mm. (18.74 in.); head and body, 418 mm. (16.45 in.); tail vertebrae, 66 mm. (2.60 in.); hind foot, 105 mm. (3.95 in.). This is about two inches longer in total length than the average of specimens from New York and Massachusetts, while the hind foot is about .30 in. longer.

Compared with the Texas series above mentioned the difference is still more striking, both in respect to coloration and size. Nine Corpus Christi specimens, measured in the flesh by Mr. Chapman, average as follows: Total length, 431 mm. (16.97 in.); tail vertebrae, 45 mm. (1.77 in.); hind foot, 79 mm. (3.11 in.).

Type, No. 4188, ♂ ad., Fort Snelling, Minn., March 29, 1891, Dr. E. A. Mearns.

This form is somewhat parallel in its large size and peculiar tints with *Tamias striatus griseus* Mearns, *Tamias quadrivittatus neglectus* Allen, *Sciurus carolinensis hypophæus* Merriam, and other forms from the same region yet to be separated.

“This Gopher is very common in Aransas County, especially in that part of the peninsulas between the bay and the edge of the brush. There is hardly a square foot of this belt of land (half a mile to a mile in width), where the soil is sandy and there are few or no trees or brush, that has not been plowed over many times by these animals. I think they have done much towards fertilizing this particular region, and that the wonderful vegetable growth on the knolls and open places on Live Oak, St. Charles and Lamar Peninsulas, can be attributed to this cause.

“Like the Moles, they do not throw up many mounds in summer—from May to September—and probably for the same reason, namely, the abundant food supply of bulbs, roots, etc., which can readily be found within a few feet of their nests. Later they burrow more extensively in search of food. They are particularly destructive to young fruit trees. A farmer on St. Charles Peninsula told me he killed over 250 of these animals between the 18th of March and the middle of April, 1893. They were eating off his young mulberry and pear trees at the roots. The orchard had been set out in an old sweet potato field, and sweet potatoes came up all over it from potatoes left in the ground the previous year. These no doubt attracted the Gophers, as they are particularly fond of sweet potatoes, and are thus a great nuisance to farmers and gardeners.

“Gophers, Pocket Mice and Moles frequent the same localities. I found none of either on any of the islands. They do not take to water, as do the Cotton Rats, Rice-field Mice (*Oryzomys*), Raccoons, etc.”—H. P. A.

#### 6. *Perognathus paradoxus* Merriam. TEXAS POCKET MOUSE.

*Perognathus fasciatus* BAIRD, Mam. N. Am. 1857, 420 (at least in part; not *P. fasciatus* WIED); THOMAS, P. Z. S. 1888, p. 449 (Duval Co., Texas).

*Perognathus paradoxus* MERRIAM, N. Am. Fauna, No. 1, Oct. 1889, p. 24 (Trego Co., Kansas).

*Perognathus paradoxus spilotus* MERRIAM, N. Am. Fauna, No. 1, Oct. 1889, p. 25 (Gainesville, Cook Co., Texas); ALLEN, Bull. Am. Mus. Nat. Hist. III, p. 225, April, 1891 (Padre Island and Bee Co., Texas).

This species is represented by 22 specimens, including both sexes and various ages. One was taken in January, 2 in March, 2 in May, 5 in October, 6 in November, and 6 in December.

The adult specimens vary little in color, although some are of a rather stronger shade of reddish yellow than others. Immature examples are darker, with a finer, much softer pelage. They appear to agree perfectly with specimens of corresponding age from Brownsville, Texas.

A large series of adults from Brownsville, taken mostly in August and September, are not comparable as to season, being in thin summer pelage. They are much darker and much less hispid than the Rockport series. An October specimen (No. 4195, ♂ ad.) from Brownsville, however, in nearly full winter coat, is scarcely distinguishable from Rockport examples of corresponding date. Another October Brownsville specimen (4196, ♀ ad.) is less advanced, but plainly indicates a winter pelage like that of the Rockport series.

If separable from the Kansas type (true *paradoxus*), these specimens would all be referable to the *P. paradoxus spilotus* form. The distinctness of the dusky spot on the anterior border of the ear externally is variable, and the whole fore leg is often white instead of tan-colored to the wrist.

“This species is very common in open places, and sometimes where there are bushes. Although found near the shores, I have never met with it on any of the islands. It may, however, occur on St. Joseph Island.<sup>1</sup> Its favorite haunts are the higher knolls in the low flats around the bays. Its chief food in fall and winter is the seeds of the sage weed (*Croton texensis*), which grows in great abundance all over the open country, and affords food for many of the seed-eating mammals and birds. In the spring, when the sage seed becomes scarce, the Pocket Mice take to the seeds of the bur-grass (*Cenchrus tribuloides*), which grows all over this region. On March 29 I caught a half-grown Pocket Mouse with its cheek-pouches filled with these burs. In digging out one of their burrows, probably an old Gopher burrow, I found the bottom of the burrow, for a distance of thirty-five yards, covered with grass burs.

“There are several holes or entrances to each of their homes or nests. The earth removed in excavating them is piled in a

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<sup>1</sup> There are two specimens in the Museum Collection from Padre Island.

single mound several feet away. After going into a hole they fill the dirt in behind them, thereby stopping up the entrance, doubtless for the purpose of keeping out snakes. I have never found any nest; perhaps they do not make any, but merely lie in the sand. While they do not appear to lay up large stores, they probably gather food during the night to eat in their holes, laying up a larger quantity for 'northers' or cold spells. They occasionally drag in rubbish with which to close their holes. I once found the wing of a plover dragged into a *Perognathus* hole.

"An old female taken March 31 contained nine very small embryos, but I have never met with any newly-born young. As they eat grass roots, etc., as well as seeds, food is abundant, and they breed early, and probably several times a year.<sup>1</sup> They can be caught in traps baited with oatmeal, and also by placing traps over their holes, so that they are caught in going in or out."—H. P. A.

**7. *Mus decumanus* Linn.** BROWN RAT; WHARF RAT.—"Captain Bailey, Captain Phillips, and several other old settlers say that 'Barn Rats' or 'Wharf Rats' were abundant fifteen to twenty years ago, but that they gradually disappeared after the great beef packing establishments closed up, and the marine shipping ceased upon the advent of the railway into this region. I do not believe there is at present a Brown Rat in Aransas County. I failed to find one during my two years' residence there, in 1892 and 1893."—H. P. A.

Mr. Chapman secured a very large specimen of this species in the vicinity of Corpus Christi.

**8. *Mus alexandrinus* Geoffr.** WHITE-BELLIED RAT; ROOF RAT.—One specimen, ♂ ad., Feb. 20, 1893.

"The specimen sent was caught on a boat which made trips between St. Charles Peninsula and Rockport. Lucas Dubois, the captain, said it had been on the boat about a year before he caught it. I have heard of rats being killed on other boats here, but they may have been of other species."—H. P. A.

<sup>1</sup> There are half-grown young in the collection taken August 14 (at Brownsville), and as late as Oct. 20 and Nov. 15 (the last two at Rockport).

9. **Mus musculus** *Linn.* HOUSE MOUSE.— Eleven specimens, part caught in the house and part in the fields. They vary much in color, particularly on the ventral surface, as house mice are apt to do at other localities. Two are dingy reddish gray below ; one is nearly pure white ; others are grayish white tinged with buff, and one is strong reddish buff. Age and season doubtless have much to do with this variation, but it is doubtless largely purely individual.

11. **Neotoma micropus** *Baird.* TEXAS WOOD RAT.— Eleven specimens of this species include specimens taken in January, March, June, September, October and December. Three belonging to one litter and less than one-fourth grown, were taken March 30. These are clear ashy gray above washed with black, the prevailing color of the middle of the dorsal area being deep black.

There is little to add to the account of this species already given.<sup>1</sup> The Museum has now large series from Brownsville, Corpus Christi, and Rockport. Several of the Rockport (June and September) specimens have the pelage of the posterior parts of the body very much abraded.

“ Common on the main land wherever bunches of *Opuntia* are growing, but I have not found them on any of the islands. They may, however, occur on St. Joseph Island. I caught one under a wharf, near the water's edge, in the main part of the town of Rockport, in a trap baited with sweet potato. Capt. N. C. Phillips, an old settler, says these rats are excellent eating, in his estimation far superior to squirrel meat.

“ I found a nest once in a club house on Copano Bay, used in the hunting season by duck hunters. A pile of all kinds of material had been carried in, and a nice round nest, open on the top, made in the middle of it.”—H. P. A.

12. **Sigmodon hispidus texianus** (*Aud. & Bachm.*). TEXAS COTTON RAT.— This species is represented by a series of 42 specimens, taken between Sept. 30 and March 30, the other

<sup>1</sup> This Bulletin, Vol. III, pp. 282-285, June, 1891.

months of the year being unrepresented. They fall into two quite sharply differentiated phases—a blackish-gray phase, slightly varied with pale yellowish brown, and a yellowish-brown series, slightly varied with blackish. If they came from widely separated localities they might easily be taken for well-marked geographical forms. Mr. Chapman's Corpus Christi series of 10 specimens is separable in the same way, as he has already noted (this Bulletin, V, p. 45). In this case Mr. Chapman states that the dark specimens came from the marshes, where their runways "led beneath the dense mat of marsh grass," and the light specimens from the dry, scrubby chaparral, where they were more exposed to the bleaching effect of the sunlight. In view of Mr. Chapman's experience I wrote to Mr. Attwater for definite information as to the kind of ground in which the specimens were taken. In reply he states that *all* the specimens came from the islands, where the highest ground—an old railway bed—is "only five feet above the water-line of the bays, and the highest natural level only three feet, the average being about two feet. At high tides much of the land is flooded. The entire location was cut up with channels and bayous, and on the whole would be properly described as a *damp* situation. The rats made their homes on the higher spots in half-flooded situations, generally along the sides of the railway 'dump,' but no part of their haunts could be compared with the 'dry scrubby chaparral.'" In this case therefore it would seem that the two phases above mentioned simply represent individual variation assorted in accordance with the tints of the pelage into two series! Yet there are comparatively few well-marked 'intergrades.'

Ten adults, as measured by the collector, give the following : Total length, 258 to 308 mm., averaging 282 ; head and body, 137 to 174, averaging 156 ; tail vertebræ, 110 to 133, averaging 126<sup>1</sup>; hind foot, 31 to 33, averaging 32.

Six adults from Corpus Christi, measured in the flesh by Mr. Chapman, give the following : Total length, 264 to 290, averaging 277 ; head and body, 145 to 180, averaging 170 ; tail vertebræ, 97 to 121, averaging 109<sup>1</sup>; hind foot, 30 to 33, averaging 31.5.

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<sup>1</sup> The discrepancy in the relative length of the tail in these two sets of measurements is doubtless due to different methods of measuring, as regards the starting point for taking the length of the tail.

As regards seasonal variation, November and December specimens average darker than those taken in other months, while the March specimens are much the lightest of the series. As previously stated, the months of April to August, inclusive, are unrepresented.

“*Sigmodons* are common on the group of small islands (marked No. 2, No. 3 and No. 4 on the map I send you), particularly so on Island No. 2, and at the ‘Point’ or ‘Pocket’ where *Oryzomys* was found. I have found none on the mainland. They may occur on St. Joseph Island, as they are good swimmers. Their favorite haunts are the thick growths of cacti (*Opuntia*), and the thick matted grass that grows near the water’s edge. They have been found living with *Oryzomys* and *Onychomys* in the bunches of cactus. Their nests are usually placed on the ground among cactus roots, or under piles of brush, and among the roots of the dwarfed huisache bushes, and are usually composed of anything handy. One nest was made entirely of hog bristles, taken from a dead hog lying near a bunch of cactus. When disturbed they retreat into shallow holes in the ground. They are much preyed upon by rapacious birds and mammals—by the marsh hawk in the day time and by the short-eared owl at night. A great many are also captured by rattlesnakes, and probably also by raccoons and skunks.”—H. P. A.

### 13. *Oryzomys palustris texensis*, subsp. nov.

Above very pale yellowish gray-brown, varied with blackish over the middle of the dorsal region, forming an indistinct blackish dorsal band; sides yellowish gray, very slightly varied with blackish tipped hairs. Below clear grayish white, the fur plumbeous at base.

Total length (of type, No.  $\frac{2}{17}$   $\frac{6}{14}$ , ♂ ad., Rockport, Texas, Nov. 15, 1893, H. P. Attwater), 277 mm.; head and body, 137; tail vertebræ, 140; hind foot, 30.5.

Seven adult males give the following, based on the collector’s measurements taken from the fresh specimens: Total length, 249 to 280, averaging 264; head and body, 122 to 146, averaging 131; tail vertebræ, 122 to 140, averaging 132; hind foot, 28.5 to 30.5, averaging 30.

This is simply a large pallid form of the *O. palustris* group. The Rockport series, when compared with Louisiana and Florida

specimens of *O. palustris natator* Chapm.,<sup>1</sup> is strikingly different in coloration, about as different, and differing much in the same way, as the Brown Rat (*Mus decumanus*) and the Muskrat. The color differences are much less when the Rockport series is compared with North Carolina specimens (true *O. palustris*), but are still very appreciable, while the size is much larger. The following comparative measurements indicate the average size of the three forms (measurements in millimetres) :

	No. of Specimens.	Locality.	Total length.	Tail.	Hind foot.
<i>O. palustris</i> . <sup>2</sup> . . . .	5 ♂	Raleigh, N. C. . . . .	237	120	30
<i>O. p. natator</i> <sup>2</sup> . . . .	5 ♂	Gainesville, Fla. . . . .	286	136	33
<i>O. p. texensis</i> . . . . .	7 ♂	Rockport, Texas. . . . .	264	132	30

This is doubtless the large pale form mentioned by Dr. Coues (Mon. N. Am. Roden., 1877, p. 116) as occurring at Neosho Falls, Kansas. All of the *Oryzomys* thus far examined from Brownsville, Texas, have proved to be *O. aquaticus*—a very different species from any form of the *O. palustris* group. On the other hand, Corpus Christi (Chapman, l. c., p. 45) and Rockport specimens have all proved referable to what is here named *O. p. texensis*.

The Rockport series numbers 29 specimens, and includes young of various ages, middle-aged specimens, and eight or ten that are fully adult. Two were taken in March, one in January, and the rest between Oct. 4 and Dec. 5. One (No. 65, Coll. H. P. Attwater) is exceptionally rufescent; this is the single example mentioned by Mr. Chapman (l. c., p. 45) as apparently referable to his *O. p. natator*.

“The specimens were all taken at one locality, and nearly all from the ‘Point’ or ‘Pocket’ near the mainland [see Map, p. 166]. Some of them were found in holes in the shell ridge formed by the abandoned railway bed, where the *Sitomys mearnsii* were taken. In fact, they made nests in the holes I had formed on former visits in digging out *S. mearnsii*. They were much

<sup>1</sup> Cf. Bull. Am. Mus. Nat. Hist., V, p. 44, March 17, 1893.

<sup>2</sup> Cf. Chapman, l. c., p. 44.

more common in 1893 than in 1892. I think they move about somewhat, as I have found them in places where I had vainly searched for them a short time before. Their favorite resorts are places where the Spanish bayonet (*Yucca*, sp.) grows. They make many nests among the leaves of this plant, placing them close to the stem, beneath the dead leaves, which hang down and afford them shelter. They also nest in holes in the shell ridges. In most cases I have found the male and female in the same nest, but in the yuccas and among the prickly pears, the males and females appeared to occupy separate nests. They also live in the piles of sea weed which accumulate along the beach. Favorite places for them are the 'duck-blinds' made by the hunters for concealment in duck shooting. I once heaped together a small pile of yucca and weed stalks, and used to find one or two of these mice under it whenever I visited the place, during October and November. They eat all kinds of weed seeds, and are very fond of the seeds of the prickly pear."—H. P. A.

**14. *Sitomys mearnsii* (Allen).** MEARN'S WHITE-FOOTED MOUSE.

*Vesperimus mearnsii* ALLEN, Bull. Am. Mus. Nat. Hist. III, p. 300, June, 1891 (Brownsville, Texas).

*Sitomys mearnsii* BRYANT, Zoe, III, Oct. 1892, p. 214.

Represented by a series of 26 specimens, including adults and young of various ages, and also by several nests, collected mainly between Oct. 2 and Jan. 2. As a series they differ very appreciably from a similar series from Brownsville, collected chiefly in August and September. The two phases are evidently too close, however, to require separation. There is practically no difference in size or proportions, judging by the measurements taken by the collectors from the fresh specimens, the slight discrepancy in the relative length of the tail being doubtless due to different methods of measuring. Thus, 14 adult specimens from Brownsville give the following averages and extremes: Total length, 175 to 182 mm., averaging 177; head and body, 89 to 105, averaging 97; tail, 74 to 85, averaging 80; hind foot, 19 to 22, averaging 20. A series of 12 adults from Rockport gives the

following: Total length, 160 to 190, averaging 172; head and body, 76 to 101, averaging 84; hind foot, 19 to 21.5, averaging 20.

In coloration many of the specimens are indistinguishable, but as a series the Rockport specimens are slightly more rufescent, several of the specimens shading much more strongly toward chestnut than any in the Brownsville series. Several Bee County specimens,<sup>1</sup> it is of interest to note, are all as strongly chestnut as the brightest Rockport specimens. One-third of the Brownsville specimens show some trace of a rufescent pectoral spot, while in one-fourth of them it is quite strongly defined, but in the Rockport series not one shows the slightest tendency to such a spot.

“Most of these mice were taken from nests placed in holes in the slopes of an abandoned railway embankment. They are found, however, elsewhere, and even enter houses, where they live with common house-mice, specimens of both having been taken at the same time in the same room.

“The various nests obtained were placed in the sloping railway embankment, at the end of a horizontal burrow, from six inches to two feet in length. Often there is also a vertical exit to the top of the level ground, so that after digging in to the nest one finds that the mouse has escaped up through the other hole. No attempt is made to conceal the entrance. The nests are generally made of anything handy, generally of sea moss, and occasionally of fine grass, or tow, the latter obtained by gnawing up old pieces of rope or twine found on the beach. The breeding season is so arranged that the young are born about the time the seeds of various weeds, on which they feed, begin to ripen. Before the young are born a male and female will be found occupying the same nest, but after this event the male will be found in another hole not far away. Four to six is the usual number of young in a litter. I have several times taken the old female and her young ones home with me to try and raise them, but in a day or two the young ones began to die. On one occasion (Oct. 2) I caught a male and female in separate holes and put them

<sup>1</sup> These were formerly incorrectly referred to “*Vesperimus leucopus texanus*” (= *Sitomys americanus texanus*). Cf. Bull. Am. Mus. Nat. Hist., III, p. 224, April, 1891. The *texanus* phase is quite different.

together in a box alive. During the night young were born, of which three were found in the box the next morning, and the remains of one or two more, in the stomach of the male. At another time a male and female, the latter having newly-born young, were put in a box, and in the morning it was found that the male had killed and eaten two of the five young ones.

"I have never seen any fawn-colored spot on the breast of any *Sitomys* found in this locality."—H. P. A.

**15. *Sitomys (Baiomys) taylori* (Thomas).** TAYLOR'S MOUSE.—One specimen, ♂, Oct. 19. Apparently a rare species near Rockport.

"Brought to me by a boy, who said he found it while digging Wood Rats out of a bunch of prickly pear."—H. P. A.

**16. *Onychomys longipes* Merriam.<sup>1</sup>** TEXAS GRASSHOPPER MOUSE.—Six specimens, March and December, including adults and young. Identified as this species by Dr. Merriam.

"This species I found least common of any of the small mammals. They are much slower in their movements than *Sigmodon*, *Oryzomys*, and others, and probably for this reason get picked up by hawks, owls, skunks, etc. Two young specimens were caught in traps set over *Perognathus* holes. They probably wander around, looking into holes and crevices for beetles and other insects, and may find many 'square meals' in the *Perognathus* entrances. All were found at the 'Point' close to the mainland, which is surrounded most of the time by mud and water. Two, male and female (probably a pair), were dug out of a shallow hole in the ground among the roots of some dwarfed huisache bushes, and another among the roots of *Opuntia*. At one of these places I found several hundred wings of butterflies [*Danais archippus*], the bodies of which had been eaten by the *Onychomys*.<sup>2</sup> Wings of these butterflies were often found scattered all over this particular locality. These butterflies [identified as above from specimens sent by Mr. Attwater] appear to be migratory, coming here by thousands in the fall."—H. P. A.

<sup>1</sup> N. Am. Fauna, No. 2, Oct., 1889, p. 1. Concho Co., Texas.

<sup>2</sup> This observation is of special interest from the fact that this butterfly is supposed to be 'protected' by a nauseous odor or taste that renders it unpalatable to animals.

**17. *Spermophilus mexicanus* (Licht.).** MEXICAN SPERMOPHILE.—Four specimens, Oct. 3, 1893.

“These specimens were sent to me from some place near Gregory, between Corpus Christi and Rockport. They are not nearly as numerous in Aransas County as they are about Corpus Christi. I hear of a few in the Black Jack Peninsula, and occasionally near Rockport, but they are quite scarce.”—H. P. A.

Mr. Frank M. Chapman collected a series of nine specimens at Corpus Christi, April 8–11, 1891, where he found them locally abundant along the coast, but apparently absent in the interior. Aransas County seems to form their northern limit of distribution in the coast region of Texas.

The type of *Spermophilus mexicanus* came from Toluco, near the City of Mexico. In the absence of material from the type locality the Texas specimens are provisionally identified as above.

Five adult males in Mr. Chapman's series give the following average measurements, taken by the collector before skinning: Total length, 304 mm.; head and body, 188; tail, 116; hind foot, 40. The Corpus Christi specimens do not differ appreciably from a large series from Brownsville.

**18. *Spermophilus spilosoma annectens* Merriam.<sup>1</sup>** PADRE ISLAND SPERMOPHILE.—One specimen, Mustang Island, near Aransas Pass, 12 miles from Rockport, Oct. 26, 1893; 4 specimens, same locality, April 25, 1894. These latter have been submitted to Dr. Merriam for examination, who finds them to agree with his Padre Island series.

“Spermophiles are said to be very common on Mustang Island. I sent over for specimens, and No. 129 [as recorded above] was sent to me. It was killed near the life-saving station [at the north end of the island]. I am told they are found all over Mustang Island, but there are none on St. Joseph Island, nor can I hear of any ever having been found there.”—H. P. A.

Mustang Island is practically a continuation of Padre Island, the type locality of this subspecies, although at present separated

<sup>1</sup> Proc. Biol. Soc. Washington, VIII, p. 132, Dec. 28, 1893.

from it by a narrow inlet only a few miles in width. St. Joseph Island, only slightly separated from Mustang Island, is a further continuation of the remarkable series of 'sand-spits,' or low, narrow, sandy islands, that extends from near the mouth of the Rio Grande north to Matagorda Bay, and is continued still further in the narrow Matagorda Peninsula. Apparently Mustang Island forms the northern limit of distribution of this peculiar form of Spermophile.

**19. *Sciurus niger limitis* (Baird).** TEXAN FOX SQUIRREL.—One specimen, ♂ ad., Rockport, Feb. 27, 1893. Not appreciably different from a specimen from the type locality (San Pedro or Devil's River) of Baird's *Sciurus limitis*, recently received from Dr. E. A. Mearns.

"There are no Fox Squirrels in Aransas County except on St. Charles Peninsula, where there are several square miles of black-jack oaks. This area is separated from the timber on the Guadalupe River by prairie land, so that this colony of Fox Squirrels is practically isolated."—H. P. A.

**20. *Dicotyles angulatus* Cope.<sup>1</sup>** PECCARY.—"Formerly common in Aransas and adjoining counties, but now rarely met with. On Aug. 20, 1892, a large male was killed in front of the Bay View Hotel on the beach in the city of Rockport. It was in the shallow salt water, rooting among the sea grass. It was a season of great drouth, and I fancy the dry weather may have had something to do with its wanderings."—H. P. A.

**21. *Bison americanus* (Gmel.).** AMERICAN BISON.—"I have been told by old residents that the horns and bones of this animal were formerly found on the prairies of Aransas County."—H. P. A.

**22. *Cariacus virginianus* (Bodd.).** VIRGINIA DEER.—There are no specimens in the collection, and the following note is therefore provisionally assigned to this species.

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<sup>1</sup> Am. Nat., XXXIII, p. 147, Feb., 1889.

“Rare on the peninsulas, but quite numerous on St. Joseph Island, where they are protected by Messrs. Wood and Allyn, who own the island and use it as a cattle and sheep ranch. Captain Bailey informs me that about 1857 or 1858 thousands of deer died throughout this region from a disease called the ‘black tongue,’ on account of the tongues in the dead animals being found to be black.”—H. P. A.

**Note on the Camels introduced into Texas.**—As is well known, the United States Government introduced, many years since, two shipments of Camels<sup>1</sup> into Texas, with a view to their acclimatization and use for military purposes. Mr. Attwater made casual reference to the matter in his notes, and on applying to him later for more definite information, he has obtained and kindly transmitted an important letter, written at his solicitation, by Capt. C. F. Bailey, an old settler and prominent citizen of Rockport, from which the following interesting extracts are taken. According to ‘Reports upon the Purchase, Importation and Use of Camels and Dromedaries, to be employed for Military Purposes, according to Act of Congress of March 3, 1855,’ made by Major Henry C. Wayne (published as Senate Ex. Doc. No. 62, 34th Congress, 3d Session, 1857), it appears that the first shipment, consisting of 34 animals, was landed at Indianola, Texas, May 13, 1856, and the second, of 41 animals, at the same port, Feb. 10, 1857. Says Capt. Bailey: “. . . . I personally saw about half-a-dozen of these camels myself during the year 1863 . . . . After landing the camels were loaded only once for the upper country [San Antonio], and then returned to the coast, when the war broke out, and the Confederate authorities not wishing to be bothered with them turned them loose, particularly as the Arabs who had been brought out to manage them had also left. They wandered and scattered without control, let or hindrance all over the country from the Nueces to Indianola, and from San Antonio to the Gulf, with never more than two or three in a bunch. I never heard of but one being killed, and that was on the Aransas River. He was a particularly ugly old male, would pursue and attack every one he saw, whether mounted or

<sup>1</sup> There appear to have been several Dromedaries in the first shipment.

on foot, and was killed by a party on horseback he was pursuing. The last I ever heard of any of them was that a stockman gathered all he could find, either seven or eight, and sold them to the manager of a circus that was traveling through the country, as every body sold every body's else cattle in those days, to be paid for if claim was ever made. It is safe to say that no claim was ever made. This sale was in 1867, I think. Whatever became of the majority of them no one can ever positively tell. I never heard of but one young one being born in this country. An old female with a young one following her was seen near Indianola in 1860 or 1861. I do not think it ever grew to maturity."

**23. *Atalapha noveboracensis* (Erxl.).** RED BAT.—Five specimens, Rockport, August and September, 1893.

As I have elsewhere stated,<sup>1</sup> there is a well-marked sexual difference in color in the present species, the females being darker and duller than the males, with the whitish tipping of the hairs broader, giving a very different general effect to the coloration.

"The only bats I found were the red ones I sent you. I think they stay around trees and roost in them. Captain Phillips informs me that he has noticed also a small brown bat."—H. P. A.

It may be worth while to record in this connection the capture of *Atalapha cinerea* (Beauv.) from Texas, there being in the collection of the American Museum a specimen from Brownsville (Oct. 24, 1891, F. B. Armstrong), and another from probably Bee County (exact locality uncertain), presented by Mr. George B. Sennett.

There is also in the Museum a series of six specimens of *Dasypterus intermedius* (H. Allen) from Brownsville, Texas (March 17-19, May 28-30, Aug. 29, F. B. Armstrong), where it is apparently not uncommon.

**24. *Scalops texanus* Allen.** TEXAS MOLE.

*Scalops argentatus texanus* ALLEN, Bull. Am. Mus. Nat. Hist. III, p. 221, April, 1891.

*Scalops texanus* ALLEN, *ibid*, V, p. 200, Aug. 1893.

<sup>1</sup> Bull. Mus. Comp. Zool., I, No. 8, Oct., 1869, p. 207.

This species is represented by a series of 26 specimens, collected by Mr. Attwater in the vicinity of Rockport. They vary considerably in coloration, independently of age, sex, or season, mainly in the amount of orange suffusion pervading the pelage. A few specimens show it in comparatively slight degree; in others it is very strong, so that when held from the light the anterior half of the ventral surface is often deep chestnut orange. The head, and sometimes the anterior third of the dorsal surface, is usually much more fulvous than the rest of the upper surface. There is generally a well-defined orange spot on each side of the nose, the two spots sometimes uniting across the base of the forehead.

The collector's measurements of 12 adult males give the following extremes and averages: Total length, 135 to 147 mm., averaging 141; tail, 23 to 27, averaging 25; hind foot, 16.5 to 19, averaging 17.8. Eight females average slightly smaller, as follows: Total length, 132 to 146, averaging 137; tail, 20 to 25.5, averaging 23; hind foot, 15 to 18, averaging 16.5.

"Moles are very numerous all over the peninsula, perhaps the most common of any of the small mammals. They are extremely hard to catch, frequently going around and under the trap. They work chiefly at night, and go sometimes two or three hundred yards to find a good feeding place. They are particularly active after a rain, the rain probably having something to do with the movements of the insects on which they feed.

"Mole runways are very common even in parts of the country where the soil is very poor, apparently nothing but sand, and the vegetation consists of shrubby oaks and sweet bays, and where no other small mammals are found. But they are most numerous where the soil is more or less damp, as in the so-called 'sub-irrigated' lands, where the dampness comes nearly to the surface. During very dry weather the moles descend deeper into the ground, as owing to the dryness of the soil the runways then fill by the crumbling sand when near the surface. They appear also to be more active in the fall, spring and winter months than in summer, when, from the greater abundance of insects, they may be able to procure food with less effort.

"The position selected for the nest is several feet below the surface, and always in a hard place to get at, being generally

under a clump of bushes or a tree. A nest I dug out was made of fine grass. I have never seen any young ones, nor caught any that were very small."—H. P. A.

**25. *Procyon lotor hernandezii* (Wagler).**—One specimen, from Corpus Christi (April 10, 1891, F. M. Chapman). There are no specimens in Mr. Attwater's collection, but he reports it as abundant, writing as follows :

"Raccoons are common on the peninsulas, and very abundant on St. Joseph Island. George Roberts killed 125 on this island during the winter of 1892-93, and W. A. Brundrett sold 175 'coon' skins taken on Matagorda Island, the next island to the east of St. Joseph, and in the next county. They live in the long grass in the marshes on the side nearest the bays, and in the chaparral on the ridges. Their food consists chiefly of crabs, shell-fish, dead fish washed on the shores, wounded ducks and other birds, birds' eggs, berries, etc. I have not had an opportunity to put up a series of specimens, but have seen a number of skins, which appear to me to be lighter in color, and as a rule much more yellowish than those which are found further inland."—H. P. A.

**26. *Bassariscus astutus* Licht.** CIVET CAT.—Not represented in the collection.

"One was killed in Aransas County last year, and I have heard of several others being taken on St. Charles Peninsula. They are very common in the counties to the north and west, and do considerable damage by destroying chickens while roosting in the trees around the ranches.

"Captain Robert Strachan, who has charge of the main wharf at Rockport, has a pet Civet Cat which has been loose in the warehouse for about two years. It often comes and eats out of his hand. It drinks milk, and will eat cheese, meat and fish (cooked and raw). He says there were a few rats in the warehouse when he first got the Civet Cat, but it soon cleared them out. It disappeared once for several months, but returned again. It was caught in Bee County."—H. P. A.

**27. *Conepatus mapurito* (Gm.).**— This species is represented by two skulls. Mr. Attwater refers to a mounted specimen in his collection, and speaks of the species as less common even than the Little Striped Skunk. The specimens sent were taken in the outskirts of the town of Rockport.

**28. *Mephitis mesomelas* Licht. TEXAS SKUNK.**

*Mephitis mesomelas* LICHT. Darst. neuer oder wenig bekannter Säug. 1827-34, Taf. XLV, fig. 2, and accompanying text ("Louisiana"); BAIRD, Mam. N. Am. 1857, p. 199 (based on above).

*Mephitis varians* GRAY, Charlesworth's Mag. Nat. Hist. I, 1837, p. 581 (Texas; from Mr. Drummond's Coll.); List Mam. Brit. Mus. 1843, 69 (same; in part only, of Gray's later papers); BAIRD, Mam. N. Am. 1857, p. 193 (Texas); Zool. Mex. Bound. Surv. Mamm. 1859, p. 19 (Texas and N. E. Mexico).

*Mephitis macroura* AUD. & BACH. Quad. N. Am. III, 1853, p. 11, pl. cii (San Antonio, Texas; not *M. macroura* Licht.).

Two specimens, ♂ and ♀, Rockport, March 23 and Oct. 20, 1893. They agree very closely with a series of 12 adult specimens from the late 'Neutral Strip,' now part of Oklahoma, collected by Messrs. Richardson and Rowley on the Museum Expedition of 1889.

These 14 specimens are very uniform in coloration and size, there being no noteworthy variation in the whole series. Moreover, in style of coloration, in size and relative proportions, they agree closely with the figure and measurements given by Lichtenstein (l. c.) for his *Mephitis mesomelas*. Lichtenstein refers to a single example in the Berlin Museum, on which the species was based, as having been received from a dealer, with the statement that it came from "Louisiana." How long it had been in the Museum when he wrote, and whether it came from the present State of Louisiana, or from the Louisiana of early days, are matters now impossible to determine. The probability that the Skunk of eastern and northern Texas ranges eastward into western Louisiana, as well as northward to Oklahoma, and that the original specimen of Lichtenstein's *M. mesomelas* is quite likely to have come from some part of this area, coupled with the fact that almost any one of the dozen Oklahoma specimens before me might have served as the basis of his description and figure, seems to render desirable the adoption of Lichtenstein's name for the species here under consideration.

The characters of this species may be indicated as follows :

Size large ; tail long, full, broad and bushy, rather squarely truncated at the end, the vertebræ alone about half the length of the head and body. Total length, 725 mm. ; head and body, 408 ; tail vertebræ, 252 ; tail to end of hairs, 317 (average of 8 adults from the 'Neutral Strip' ; measurements from skins). General color black, with the usual white frontal stripe very narrow and not reaching the white patch on the nape ; nuchal patch broad, square in front, narrowing posteriorly to the interscapular region, where it is usually much narrower than at the front border ; slightly behind the shoulders it divides into two broad lateral bands which pass, one on each side of the body, on to the basal portion of the tail ; between these is a median dorsal band of usually about the width of one of the lateral white stripes, and is continued over the basal half or two-thirds of the tail. The tail hairs are all white basally and black apically, except a few that are wholly white. The latter vary in number in different specimens, being few in some but generally numerous enough to form conspicuous tufts along the sides of the tail, and generally also on the dorsal surface, where at the base of the apical third they often form a more or less pronounced whitish spot, or even a well-marked white band. About half the specimens show a pair of small, oval, symmetrically arranged spots of white on the breast. There is no pencil of white in the tip of the tail, which is wholly black, thick, and obtusely truncate at the end.

Lichtenstein's description, as already said, is strictly pertinent to the present animal. His measurements, translated into millimeters, are as follows : Total length, 731 mm. ; head and body, 432 ; tail vertebræ, 229 ; tail to end of hairs, 299. Compared with my average for 8 Oklahoma specimens, the difference is practically nothing—not greater than occurs between different individuals of the Oklahoma series.

One of the two specimens in Mr. Attwater's collection is practically identical with several of the Oklahoma specimens ; the other is similar except that the amount of white is much reduced, the frontal stripe being narrowed to a line of scattered white hairs ; the nuchal patch is also narrower and much shorter, dividing in front of the shoulders into two very narrow lateral stripes, which disappear entirely in front of the hips. Also only a very few scattered white hairs reach the surface of the tail. Mr. Attwater states in his notes that in Aransas County this Skunk "varies much in color, some being very white, and I have been told that pure black ones have been killed." He further states that it is the common Skunk of Aransas County, being far more numerous than either of the other two species.

This species differs from the eastern *M. mephitica* in being rather larger, apparently in greater constancy of coloration, and in the posterior extension (ordinarily) of the lateral white stripes on to the basal third of the tail. It also varies in cranial characters, the skull being relatively narrower and longer, with the zygomatic arches less expanded, but especially in the much heavier dentition. Thus the length of the lateral tooth line to the basilar length of the skull is as 37 to 100, while in *M. mephitica* it is as 34.5 to 100. The ratio of breadth across the last molars to basilar length is as 46 to 100, as against 43 to 100 in *M. mephitica*.

Compared with *M. estor* Merriam, from Arizona, *M. mesomelas* is much the larger, the skull averaging 6 mm. longer in basilar length, and 5 mm. wider in zygomatic breadth. Both belong to the western section of the genus, characterized by heavy dental armature, as compared with the Skunks from east of the Great Plains. Several Minnesota specimens agree very well in size and coloration with *M. mesomelas*, but agree with eastern specimens in their weaker dental armature and correlated cranial modifications.

Having spent considerable time in measuring a large series of skulls of the genus *Mephitis*, in the present connection, I append the accompanying tables of results, including averages and ratios of about 34 specimens, believing it may have some interest to other students of this troublesome group.

In explanation of the tables it may be added that the proportion of very old skulls is very small, and all obviously undergrown specimens were excluded; "juv." in the table simply means 'young adult.' Where the sex sign is followed by an interrogation mark, the specimen was received without the sex being indicated by the collector, but in each case the sex as given in the table is almost beyond question correct. The three Minnesota specimens are all very old, which may in part account for their very large size, as compared with any others in the series, although they probably indicate a large form of the *M. mephitica* group.

The second table is an abridged summary of the first, on which it is based, giving most of the elements of real value, and omitting many that are practically worthless. As in the case of Dr.





Merriam's much more detailed table of measurements of skulls of the genus *Spilogale* (N. Am. Fauna, No. 4, Oct., 1890), to quote from his remarks on the subject: "Many of the measurements, and more of the ratios, are worthless; and the table is published as much to show these as those which are really important" (l. c., p. 4). Although my tables give a much larger number of skulls per species than his, they are still too few to give satisfactory results, the addition of a single skull to a series of five or six being often found to modify some of the averages quite materially.

## II.—SUMMARY OF MEASUREMENTS AND RATIOS.

### MALES.

MEASUREMENTS.					
	3 <sup>1</sup>	3 <sup>2</sup>	4 <sup>3</sup>	6 <sup>4</sup>	1 <sup>5</sup>
Number of specimens.....					
Basilar length.....	62.1	69.3	63.5	58.7	66.0
Zygomatic breadth.....	44.6	50.0	46.6	61.8	46.0
Mastoid breadth.....	36.2	44.3	40.8	36.0	40.0
Lateral tooth-row.....	22.6	23.6	22.0	21.5	23.0
Breadth across molars.....	28.7	27.2	27.2	25.9	30.0
RATIOS to <i>Basilar Length.</i>					
Zygomatic breadth.....	71.8	72.2	73.5	71.2	70.0
Mastoid breadth.....	61.5	63.9	64.3	61.3	60.0
Foramen mag. to palatine notch.....	60.0	57.9	56.5	56.9	56.0
Length of palatal floor.....	44.3	42.0	43.5	43.1	43.0
Lateral tooth-row.....	36.4	34.0	34.7	36.8	34.9
Breadth across molars.....	46.2	42.4	42.8	44.2	45.5

### FEMALES.

MEASUREMENTS.				
	6 <sup>1</sup>	4 <sup>3</sup>	6 <sup>4</sup>	1 <sup>5</sup>
Number of specimens.....				
Basilar length.....	59.1	59.2	55.9	61.0
Zygomatic breadth.....	42.8	43.2	40.5	45.0
Mastoid breadth.....	35.9	36.7	34.7	40.3
Lateral tooth-row.....	22.6	21.9	21.3	23.0
Breadth across molars.....	26.9	26.4	25.2	28.0
RATIOS to <i>Basilar Length.</i>				
Zygomatic breadth.....	72.6	72.9	72.4	73.8
Mastoid breadth.....	62.6	61.9	61.0	66.1
Foramen mag. to palatine notch.....	57.7	57.6	57.7	57.4
Length of palatal floor.....	44.5	43.5	45.3	43.1
Lateral tooth-row.....	38.2	37.0	38.1	37.7
Breadth across molars.....	45.5	44.6	44.8	46.0

<sup>1</sup> *Mephitis mesomelas*, Oklahoma.

<sup>2</sup> *Mephitis mephitica*, Ft. Snelling, Minn.

<sup>3</sup> *Mephitis mephitica*, Ohio, Indiana and New York.

<sup>4</sup> *Mephitis estor*, Arizona.

<sup>5</sup> *Mephitis occidentalis*, British Columbia.

In regard to these measurements it may be said that females, as was well enough known before, average slightly smaller than the males ; they also prove to have, as a rule, a shorter mandibular ramus and a lower coronoid process, while the inter- and post-orbital regions of the skull are perhaps relatively slightly broader. In some cases individual variation nearly overlaps the sexual, but generally the differences in size and proportions in skulls from the same locality furnish a trustworthy clue to the sex of the specimens ; but in specimens of unknown origin from widely separated localities, it might be difficult to tell northern males from southern females, when both are specifically the same, there being apparently a marked decrease in size southward in all of the species.

Again, the difference in size and proportions is so slight in the different forms of the genus, and the range of individual variation so great, that perhaps no single character may be taken as invariably diagnostic, although the difference in the relative size of the teeth as compared with the rest of the skull will suffice to distinguish an eastern skunk from a western skunk, and the difference in general size will serve to give some clue to the habitat.

**Note on the variability of coloration in the Skunks of the genus *MEPHITIS*.**—In 1869 I referred to the common Skunk of the northeastern United States as one of the most variable animals, as regards coloration, to be found in North America, and described at length (*Bull. Mus. Comp. Zoöl.*, I, No. 8, p. 179) the great amount of variation to be met with in Massachusetts specimens. This was apropos of Prof. Baird's opinion (*Mam. N. Am.*, 1857, p. 195) that while the "species varies considerably in its markings," "individuals from the same locality are usually quite similar," his opinion being apparently based on a series of five specimens from Middleboro', Mass. It is unnecessary to repeat or even summarize the statements already on record in regard to the variability of Skunks in Massachusetts. It may be of interest, however, to supplement this with a few facts respecting the variability of Skunks at other localities.

As is well known skunk skins are extensively employed by furriers, being sold under various euphemistic names, as 'fitch,'

'American sable,' etc., and used in the manufacture of carriage robes, muffs and trimmings. Their market value depends largely upon their color, those with most white being least valuable, the price declining as the amount of white increases. Dealers usually separate the skins into four grades, the first being worth six or seven times as much as the fourth. The localities to which reference is here made are Vermont, Indiana and eastern New York.

I am indebted to Mr. Walter W. Granger, of this Museum, for important information about Skunks killed within a few miles of Rutland, Vt., which is to the following effect, the prices mentioned being those paid in 1893.

No. 1. Price, \$1.40 per skin. Nearly all black, the only white being a small spot on the nape.

No. 2. Price, 90 cts. Nearly all black, but generally with small shoulder stripes in addition to the white nuchal patch.

No. 3. Price, 55 cts. With about the average amount of white, all of the usual white markings being fairly well developed.

No. 4. Price, 25 cts. Nearly the whole back white, forming a broad white mantle, with generally a narrow median line of black.

From a newspaper account entitled 'The Skunk-skin Harvest,' originally published in the Indianapolis, Ind., 'News,' in September, 1879, I take the following in relation to the skunk-skin trade in "central and southern Indiana," where one dealer is said to have "handled 20,000 skunk skins last year [1878], nearly all of which were caught in Indiana." The skins are classified in four grades, as follows:

"A No. 1, star skunk;" price, \$1.75. All black except "a star-shaped white spot on the top of the head."

No. 2, the "short stripe;" price \$1.25. This has a short white stripe running back from the nuchal patch on to the shoulder.

No. 3, the "narrow stripe;" price, 40 cts. This has a narrow white stripe on each side running back nearly to the tail.

No. 4; price, 20 cts. With a broad band of white on each side, three inches or more wide, and extending the whole length of the body.

I am indebted to Mr. William Wallace, also of this Museum, for the following information respecting 500 Skunks taken last year at Cobleskill, N. Y. (about fifty miles west of Albany), all killed within a radius of five miles :

No. 1, all black, except a white spot on the nape ; price, \$1.40 ; number of skins, 100.

No. 2, nearly all black ; a short white stripe on the shoulders in addition to the white nuchal patch. Price, 80 cts ; number of skins, 100.

No. 3, with the narrow white shoulder stripes extending a little further back. Price, 40 cts ; number of skins, 120.

No. 4. The greater part of the back white, the lateral white stripes very broad and extending back nearly to the tail, separated generally by a narrow median band of black. Price, 20 cts. ; number of skins, 180.

Mr. Wallace also informs me that an enterprising farmer in the Catskills has a successful ' skunk farm ' in operation. For several years he has been raising Skunks for their oil and skins, and in order to improve the skins for the market, he is purchasing all the live Skunks, of either sex, of grade 1, he can obtain, in order to develop, if possible, a breed of black Skunks.

From the foregoing it is evident that the Skunks of at least Massachusetts, Vermont, eastern New York, and central and southern Indiana, are subject to a wide range of color variation, and it is probable that these localities are not exceptional in this respect. While data sufficiently numerous from other parts of the continent are mostly lacking, it may be of interest to mention the few at hand respecting the Skunks of Arizona.

Some years since a valued correspondent wrote to me of his experience with Skunks in Arizona. He says : " By the way, I do not believe in the wide range of individual variation usually accredited to the Skunks. In Arizona I had several unusual opportunities of examining all the young ones of a litter, and in each instance they were almost exactly alike. The Indians here skin (and eat!) a great many, and the variations are very slight

indeed. . . . [Here follows a description of the coloration, illustrated by diagrams, of the species Dr. Merriam had shortly before described as *Mephitis estor*.] In the Arizona skunk the only variable point is the amount of black in the middle line posteriorly, the white side stripes crowding it to a greater or less degree. In only one of several hundred specimens examined was the black entirely crowded out, the whole back and the whole upper side of the tail being white." A series of 8 specimens collected near Fort Verde, Arizona, so far as they go, bear out this statement. They agree perfectly with the original description of *Mephitis estor* Merriam (N. Am. Fauna, No. 3, Sept., 1890, p. 81).

On the other hand, a series of 15 specimens from a single locality in Pinal Co., Arizona, collected Nov. 13, 1886 to Jan. 23, 1887, by Mr. W. E. D. Scott, are as variable as can well be imagined, some being almost entirely without white markings, while in others the whole dorsal surface is nearly uniform white. Thus in No. 1357 the whole animal is black, except for a very narrow white frontal stripe, slight tufts of white hairs behind the ears, a narrow broken line of white on the right side, a few scattered white hairs on the left side, the extreme base of the tail hairs, and a long terminal pencil of white at the tip of the tail. In No. 1352 the whole back and the upper surface of the tail are white, except for a very narrow median line of black on the hinder part of the back. Between these two extremes there is a finely graduated series of intermediate stages. One (No. 1346) almost wholly lacks the frontal stripe, and has no trace of the nuchal patch, but there are narrow lateral white stripes, the one on the right side much heavier than the one on the left; the tail has a terminal white pencil, and the basal third of the hairs is white. Another (No. 1359) has a narrow frontal stripe, a very large nuchal patch, and a short narrow lateral white stripe on the left side, with the tail as in the last, except that the terminal pencil has nearly fallen out. Another (No. 1356) is like the last, except that the nuchal patch extends into a narrow white point to beyond the shoulders, and there is no white on the sides of the body. Another (No. 1350) has a well-developed frontal stripe, but the nuchal patch is nearly wanting; the lateral stripes are fairly well developed, but bifurcate anteriorly into two, one terminating just behind and

below the ear, the other just above it. From this stage there is a gradual transition to those with a wholly, or almost wholly, white back.

Four specimens of the series have the posterior half of the white dorsal area grayish, through the admixture of many black hairs with the white ones. In four out of six of the blackest specimens the tail has a terminal pencil of very long white hairs (five to six inches in length), as in the eastern *M. mephitica*, and there is a trace of it in the other two. These are rather young (one-half to two-thirds grown) specimens. It seems therefore probable that in this species this long terminal pencil is a feature of youth, as it is absent in adult specimens. It is also possible that the Pinal County series is separable from the Fort Verde series, but satisfactory evidence of this is at present lacking. In the accompanying table of measurements, however, the two series were kept separate in computing the averages and ratios. The only difference seems to consist in the slightly smaller size of the Pinal County series, which also averages younger, so that this slight difference may be doubtless safely attributed to the average difference in age between the two series.

### 29. *Spilogale indianola* Merriam.

*Spilogale indianola* MERRIAM, N. Am. Fauna, No. 4, Oct. 1890, p. 10; ALLEN, Bull. Am. Mus. Nat. Hist. III, pp. 219, 308 (Tamaulipas, Mexico, and Corpus Christi, Texas).

This species is represented by five Texas specimens and one from Tamaulipas. Four of the Texas specimens are in Mr. Attwater's collection, and were taken in the immediate vicinity of Rockport. One is a very young example, which differs in color from the adults only in the white markings being pure white instead of more or less creamy white.

The series is very uniform in coloration, and leaves nothing to be added to the descriptions I have already given (l. c.) based on the Corpus Christi and Tamaulipas specimens.

Mr. Attwater refers to them as rare, and says he knows little of their habits. He has met with them only on the peninsulas, and does not know whether they are to be found on the islands.

**30. Putorius brasiliensis frenatus** (*Licht.*). BRIDLED WEASEL.—Unrepresented in the collection, but Mr. Attwater reports it as of occasional occurrence in Aransas County, and says one was recently taken near Rockport.

**31. Canis latrans** *Say*. COYOTE.—No specimens were sent, but Mr. Attwater furnishes the following interesting notes :

“Still common on the prairies inland, and often seen in parts of Aransas County. They are frequently seen from the car windows in passing on the railway in San Patricio County. They are disturbed in the early morning by passing trains from their feast on the dead carcasses of animals killed by being knocked off the track. They do not seem to mind the cars much, as they only slink off for about fifty yards and sit up waiting for the train to pass. In this position they become targets for the trainmen, who shoot at them with revolvers. Several persons have told me that while watching for turkeys they have observed Coyotes catching grasshoppers.”—H. P. A.

**32. Urocyon virginianus** (*Schreber*). GRAY FOX.—Represented by a single imperfect skin, loaned by Mr. Attwater for examination.

“I have the skin of one of these little foxes, which was brought to me in 1892. It was killed on Live Oak Peninsula, about six miles from Rockport. These foxes are common inland. I think they subsist largely on the Texan Bobwhite (*Colinus virginianus texanus*), as do also the wild cats, throughout southwest Texas. I have frequently come across bunches of the feathers of the Bobwhite. These animals easily scent them out during the night. The Bobwhite has become quite scarce in Aransas County, of late years, and I attribute the rare occurrence of foxes and some other animals here to this cause.”—H. P. A.

**33. Lynx rufus maculatus** (*Horsf. & Vig.*). WILD CAT.—Two specimens received from Mr. Attwater are provisionally referred as above. Mr. Attwater states that they are still found occasionally in Aransas County.

34. **Felis onca** *Linn.* JAGUAR.—Now extirpated. “Captain Bailey says he formerly owned a fine skin of a Jaguar killed on the point of Live Oak Peninsula by J. J. Wealder and A. Reeves, in 1858, but has not heard of any in this neighborhood since.”—H. P. A.

35. **Felis concolor** *Linn.* PANTHER.—“Captain Bailey tells me the Panther was common here twenty-five years ago, and remembers riding right on to one, in the long prairie grass on Capano Bay, about 1857. It was in the act of devouring a deer which it had killed.”—H. P. A.

36. **Felis pardalis** *Linn.* OCELOT ; LEOPARD CAT.—“These used to be occasionally found in Aransas County. The last one was killed several years ago by Levi Phillips and William Tally a few miles from Rockport in the brush. I received this information from Capt. N. C. Phillips, a well-known farmer now living in Aransas County.”—H. P. A.