Article XIV.—REMARKS ON CERTAIN LAND MAM-MALS FROM FLORIDA, WITH A LIST OF THE SPECIES KNOWN TO OCCUR IN THE STATE.

By FRANK M. CHAPMAN.

During the past five years the Museum has received several collections of small mammals from Florida, containing in all about 400 specimens. They were collected for the most part at Gainesville and on the East Peninsula, opposite Micco, by the writer; at and near Micco by the late Jenness Richardson; at Tarpon Springs by W. E. D. Scott, and at Enterprise and Flamingo, near Cape Sable, by C. L. Brownell. The last-named collection has recently been received. It contains material worthy of special note, and in working this up for publication several facts of interest in connection with species represented in the other collections have been developed. These refer to so large a proportion of the land mammals of Florida that it has been decided to include all the species known from the State. The list as a whole is based on the collections above mentioned, information furnished me by friends and associates, and the following previously published lists of Florida mammals: (1) 'On the Mammals and Winter Birds of East Florida,' etc., by Dr. J. A. Allen (Bull. Mus. Comp. Zoöl., II, 1871, pp. 168–185), an annotated list of 34 species. (2) 'Catalogue of the Mammals of Florida, with Notes on their Habits, Distribution, etc., by C. J. Maynard (Bull. Essex Inst., IV, 1872, pp. 135-148), an annotated list of 36 species. (3) 'The Mammals of Florida,' by C. J. Maynard (Quart. Journ. Boston Zoöl. Society, II, 1883, pp. 1-8, 17-24, 38-43, 49, 50), an annotated list of 36 species, containing much the same matter as the paper just cited. (4) 'Contributions to the Mammalogy of Florida,' by Samuel N. Rhoads (Proc. Acad. Nat. Sci., Phila., 1894, pp. 152-160), containing remarks on 22 species.

- I. Didelphis marsupialis virginiana (Kerr). Common Opossum.—Abundant throughout the State.
- 2. Cariacus virginianus (Bodd.). VIRGINIA DEER.—Abundant in the less-settled portions of the State, and occurring in small numbers in the vicinity of the larger towns and cities. Proper material will doubtless show that Florida deer constitute a well-marked subspecies, distinguished chiefly by their small size.
- 3. Sciurus carolinensis *Gmel*. Southern Gray Squir-Rel.—A common and, in places, an exceedingly abundant animal throughout the 'hummocks' of the State. A perfectly black specimen, collected by W. E. D. Scott, at Tarpon Springs, is the only melanistic individual I have seen.
- 4. Sciurus niger Linn. Southern Fox Squirrel.—Of general distribution throughout the pineries, but is common only locally. In one of eight specimens the black of the head extends half-way down the back.
- 5. Sciuropterus volucella (*Gmel.*). Flying Squirrel.—Common in some parts of the State, living in the live-oaks of the hummocks,' and in turkey-oaks in the pineries.
- 6. Castor canadensis Kuhl. BEAVER.—During a two-days' stay at Marianna in western Florida, in March, 1889, Mr. William Brewster secured reliable information concerning the occurrence of the Beaver in some numbers on Chipola River. Mr. Brewster did not see specimens or signs of the animal during his brief visit, but the character of the testimony he received was such as to place its presence beyond question. I have information also of the occurrence of the Beaver in southern Alabama.
- 7. Arvicola (Neofiber) alleni (True). FLORIDA ROUND-TAILED MUSKRAT.—Doubtless a common animal in favorable localities throughout the State. It is abundant on the savannas of the East Peninsula of Indian River (cf. this Bulletin, II, 1889, p. 119); it is not uncommon near Gainesville, and Mr. Brownell's collection contains a specimen taken at Enterprise.

In a paper by Mr. F. W. True on the relationships of this species (Report of the Smithsonian Institution for 1884, Part II, pp. 325-330, pl. ii), it is, I think, clearly shown that the characters upon which the genus *Neofiber* was based are of not more than subgeneric value.

The Muskrat (Fiber zibethicus) is abundant along the coasts of southern Mississippi and Alabama, and doubtless occurs in western Florida.

- 8. Arvicola pinetorum (*Le Conte*). PINE MOUSE.—Known from Florida only through Audubon and Bachman's record. It is probably restricted to the extreme northern portions of the State.
- 9. Oryzomys palustris natator Chapm. FLORIDA MARSH RAT.—The Museum possesses a fine series of this strongly-marked race from Gainesville, Enterprise, Micco and Flamingo.
- 10. Sitomys aureolus (Wagn.). Golden Mouse.—Two specimens of this species are recorded from Dummitt's by Mr. Maynard, and the Museum has two specimens from Gainesville, presented by Mr. J. Robertson. They agree with examples from North Carolina.
- II. Sitomys americanus gossypinus (Le Conte). DEER Mouse; Hummock Mouse. - Exceedingly abundant. The Museum collection contains a series of some eighty specimens of this well-marked subspecies. Of this number twenty-nine are adults with worn molars. They were taken at Gainesville, Enterprise and Micco, from February to April. Twenty-two examples, representing each of the localities mentioned, are typical gossypinus, with dark, blackish median dorsal area and fulvous sides. Two specimens from Micco exhibit a distinct rufous phase, in which the entire upper parts are almost as uniformly golden rufous as are the same parts in Sitomys aureolus; indeed. at first sight these two specimens would be taken for aureolus rather than gossypinus. Seven specimens, from Gainesville, Enterprise and Micco, are variously intermediate between the rufous and the dark phase of pelage, connecting one with the other by a finely graded series of changes.

Mr. S. N. Rhoads has kindly sent me the type of his recently described Sitomys megacephalus from Alabama, and with it two specimens of Sitomys from Pasco County, Florida, which he has provisionally referred to that species. In my opinion these specimens are examples of S. a. gossypinus. There are specimens in my series of the latter form which practically match them, both in size and color. The average measurements of 14 adult males of S. a. gossypinus are: total length, 179; tail, 73 mm. Six females average: total length, 186; tail, 74 mm. The type of S. megacephalus measures, total length, 184; tail, 81 mm. The two specimens from Pasco County measure, respectively, No. 1660, 9, total length, 203; tail, 76 mm.; No. 1702, &, total length, 175; tail, The cranial measurements in the appended table doubtless show the relative sizes of these specimens with more exactness.

	Sex.	Total length.	Orbital constriction.	Nasals.	Incisors to post-palatal notch.	
S. megacephalus. 3535.2 Alabama S. a. gossypinus.	₽	30	4.5	11.5	11.5	
1702.3 Pasco Co., Fla. 1198.4 Citrus Co., Fla. 691. Gainesville, Fla. 1053. "" 1073. Micco, Fla	₹ \$	28.2 29.5 28.1 28.1 28	4 3 4 5 4 7 4 2 4 3	10.5 11.5 11 11 10	11 11.5 11 11.5 10.2	

The type of S. megacephalus apparently resembles S. a. gossypinus in coloration, and while I believe it to be a distinct form, it is obviously so closely related to gossypinus that a discussion of its characters based on one alcoholic specimen would be premature.

12. Sitomys floridanus (Chapm.). BIG-EARED DEER MOUSE.

Hesperomys floridanus CHAPMAN, Bull. Am. Mus. Nat. Hist. II, 1887, p. 117. Hesperomys macropus MERRIAM, N. A. Fauna, No. 4, 1890, p. 53.

Seven adults from Enterprise, the type of macropus from Lake Worth, loaned me by Dr. Merriam, an immature specimen from

Proc. Acad. Nat. Sci., Phila., 1894, p. 254.
 Coll. Phila. Acad.
 Coll. S. N. Rhoads.
 Coll. Miller and Bangs.

the Indian River, loaned me by Mr. G. S. Miller, Jr., and one adult and one immature specimen from Citronelle, loaned me by Messrs. Miller and Bangs, form a series which clearly shows the relationship of floridanus to macropus. Briefly, the type of macropus is apparently a fully adult example of floridanus. S. floridanus was described from a nursing female, the skull of which had been lost, taken by Mr. James P. H. Bell, at Gainesville. The immature specimens in the collections of Messrs. Miller and Bangs show that this type is in the gray pelage of the almost fully grown young. A tawny or fulvous line on the sides of the type shows it is changing from the immature to adult pelage. Citronelle is about forty miles southwest of Gainesville. The immature specimen from that locality is younger and therefore somewhat grayer than the type of floridanus, and the fulvous line on the sides appears only faintly, and on the anterior parts of the body. The adult specimen from Citronelle agrees essentially with the type of macropus, which the seven adults from Enterprise also The immature specimen from Indian River, however, in Mr. Miller's collection is practically a duplicate of the type of floridanus. It is evident, therefore, that only one species is represented in this series, to which the older name floridanus must be applied.

There is little to add to Dr. Merriam's description of this species. The pectoral spot mentioned by him as present in the type of *macropus* is shown by the type of *floridanus*, but by no other examples in my series. An apparently constant cranial character is found in the shape of the posterior portion of the palate, which rises at a slight angle from the palatine foramina, and has its thickened margin surmounted by two small, but evident rounded processes.

- 13. Sitomys niveiventris (*Chapm.*). Ground Mouse.—An abundant species on the coast of the East Peninsula, living on the ground beneath the scrub palmettoes near the sea.
- **14.** Sitomys niveiventris subgriseus Chapm. OLD-FIELD MOUSE.—This is a darker form of the preceding, inhabiting the interior. It is abundant in fields, both cultivated and abandoned.

 [December, 1894.]

Some account of its habits and relationships will be found in this Bulletin, Vol. V, 1893, p. 340.

Specimens from Tarpon Springs, in Mr. Rhoad's collection, are intermediate between *niveiventris* and *subgriseus*. (*Cf.* Rhoads, l. c., p. 160).

- 15. Reithrodontomys humilis Aud. & Bach. Harvest Mouse.—Mr. Brownell's collection contains an immature specimen of this species from Enterprise. It was previously known in Florida from only one specimen taken at Tarpon Springs. (Cf. Rhoads, l. c., p. 161.)
- **16.** Sigmodon hispidus Say & Ord. Cotton Rat.—An exceedingly abundant animal, of general distribution in the northern parts of the State. Say and Ord's type came from the St. John's River, doubtless from the vicinity of Jacksonville. A series from this locality in the Museum of Comparative Zoölogy at Cambridge agrees with a series from Gainesville. They differ widely from the more southern *littoralis*, and are obviously to be placed with South Carolina specimens, though, as might be expected, they are to some extent intermediate between these two extremes.
- 17. Sigmodon hispidus littoralis Chapm. South Florida Cotton Rat.—The Museum contains a fine series of this well-marked subspecies from Enterprise, Micco, Pine Island and Flamingo. Thirteen specimens from the last-named locality, as a series, present appreciable differences from other series taken at Enterprise and Micco. They are grayer and have a rufous tinge on the rump. In some respects they suggest Sigmodon h. texianus. These differences are, however, in my opinion, too slight to warrant the separation of a Gulf coast race. A specimen of Sigmodon from Pine Island, mentioned by me in a former paper, is apparently an aged adult in unusually gray pelage.
- **18.** Mus decumanus Pallas. Norway Rat; Brown Rat.—This species is given by all previous writers on Florida mammals. I have never met with it in Florida.
- 19. Mus alexandrinus Geoff. WHITE-BELLIED ROOF RAT.
 —In my experience this is the common House Rat of Florida.

- 20. Mus rattus Linn. BLACK RAT.—This species appears not to have previously been recorded from Florida. Mr. Brownell's collection contains four specimens taken at Enterprise.
- 21. Mus musculus Linn. House Mouse. Abundant in settled parts of the State. New dwellings in unsettled localities are at first tenanted by the native Deer, or Hummock Mouse, but, in time, they are replaced by this omnipresent pest.
- 22. Neotoma floridana Say & Ord. WOOD RAT. Of general distribution in the hummock-grown portions of the State, but, in my experience, it is nowhere a common species.
- 23. Geomys tuza (Ord). FLORIDA GOPHER; SALAMANDER.—An exceedingly abundant animal throughout those portions of the State which are, or were, grown with pines with an undergrowth of turkey-oaks—land of the poorest quality. In some parts of middle Florida I believe one could walk for miles stepping from mound to mound on the earth thrown up by this active miner.

There exists a puzzling confusion in regard to the common name of this species. To naturalists it is known as Gopher, or Pocket Gopher, a name generally applied to its congeners by every one familiar with them. The 'Gopher' in Florida, however, is a large land-tortoise (Xerobates polyphemus), which lives in large burrows in the ground, frequenting the same localities as those in which Geomys is found.

In a series of twenty-six specimens, six, taken in January, October and December, at Gainesville and Tarpon Springs, appear to represent a rufous phase of pelage. The remaining twenty show little variation in color.

- **24.** Lepus sylvaticus *Bach*. Gray Rabbit; 'Molly Cottontail.'—An exceedingly abundant species, commonly frequenting plantations and 'old-fields.'
- 25. Lepus sylvaticus floridanus Allen. South Florida Rabbit; 'Molly Cottontail.'—A slightly darker form of the preceding species, inhabiting the southern parts of the State.

so far south on the coasts. It is replaced in the southern parts of the State by the closely-related L. p. paludicola.

27. Lepus palustris paludicola (Miller & Bangs), MARSH RABBIT; 'HUMMOCK RABBIT.'—A series of nineteen Marsh Rabbits from Gainesville, Enterprise, Micco, Tarpon Springs and Flamingo furnishes material to more definitely establish the range and relationships of the Rabbit recently described by Messrs. Miller and Bangs' from the Gulf coast of Citrus County as Lepus paludicola. As these authors remark, and as this series proves, palustris and paludicola "show no differences in color that might not readily intergrade." Thus while paludicola averages darker than palustris, a specimen from Flamingo is but little darker than one from Summerville, South Carolina. The characters on which the new race stands, therefore, are rather those of size and proportions than color. The appended tables show a gradual decrease in size from the north southward. A comparison of the extremes shows differences worthy of recognition, but the two forms so obviously intergrade that it is evident that the southern one can claim only subspecific rank.

MEASUREMENTS FROM THE SKIN.

	No.	Sex.	Total length.	Hind foot.	Ear from notch.
North Carolina ²		l	435	96	60
South Carolina ³		l		87	55
Summerville, So. Carolina	1410	₽		85	54
Gainesville, Fla	2793	 •	440	83.5	51
(' (5650	l	430	90	48
"	2794	₽	455	88	53
"	2792	₽	450	90	48
"	2795	8	450	89	50
"	2796	8	450	86	50
Enterprise, "		Ω	l	82.5	50
Micco, "	1893	φ.	400	78	44
"	1892	8	420	78	45
"	1893	ð	400	83	45
Tarpon Springs, Fla	2716			79	45
ñ '''	2718			82	44
Flamingo, "		ै है		79	45

Proc. Biol. Soc. Wash. IX, 1894, p. 105.
 Average of two males by Miller and Bangs.
 Average of two females by Miller and Bangs.

	No.	Sex.	Basilar length.	Length of Nasals.	Width of Nasals.	Length of Incisive Foramen.	Width of Incisive Foramen.
North Carolina ¹			69	33	12.5	19	7
South Carolina ²			67	32.5	13	1 8	7.5
Summerville, So. Car.	1410	₽ .	66	31.5	14.2	18.2	6.5
Gainesville, Fla	1400	۱	67	32	13.7	19	7
" " … "	1411	8	65	33	13.8	18	7.8
" " …	1412	오	68	32	13.3	19	
" " …	1414	ρ	68	33	13	1 8	7 8
"	1415		69	30.5	13.1	19	7.3
Micco, "	1158	2	6ó	27.5	11.5	ıó	7
" "	1157	8	63	28.1	14.1	15.2	6.5
" "	1159	8	62	28	12	16.5	7.2
Tarpon Springs, Fla.	2190	ठ	62	29	13	16	7
** ** **	2193	8	63	30.5	13.2	17	7
" " "	2191		63	28	11.2	16	6.5

MEASUREMENTS FROM THE SKULL.

28. Artibeus carpolegus Gosse. Leaf-nosed Fruit Bat.

Artibeus perspiccillalune [sic] MAYNARD, Bull. Essex Inst. IV, 1872, p. 144; Journ. Bost. Zoöl. Soc. II, 1883, p. 22.

Artibeus perspicillatus H. Allen, Bats of North America, 1893, p. 43 (exclusive of synonyms).

Mr. C. J. Maynard obtained a single specimen of Artibeus at Key West, which was identified by Dr. Harrison Allen, from sketches, as Artibeus perspicillatus. There can be little doubt that this specimen was of the same species as the Artibeus so abundant in Cuba, of which the Museum possesses a series of 50 specimens. Since writing of these Cuban bats and referring them provisionally to A. perspicillatus, I have secured in Trinidad six adult specimens of what I consider true Artibeus perspicillatus. It requires only the most superficial comparison to show that the Cuban bats are unmistakably distinct from the Trinidad species. They are much smaller, as the appended measurements show, and the facial streaks are wanting or nearly obsolete, while the Trinidad species has four conspicuous facial streaks which in life are plainly observable at a distance of forty feet or more. Five females from Trinidad average: forearm, 68; thumb, 12; 3d finger, metacarp., 67, 1st phal., 24, 2d phal., 38; tibia, 26.

Average of two males by Miller and Bangs.
 Average of two females by Miller and Bangs.
 Cf. this Bulletin, IV, 1892, p. 317.

Five females from Cuba average: forearm, 54; thumb, 11; 3d finger, metacarp., 53, 1st phal., 17, 2d phal., 28; tibia, 23.

The Cuban bats agree with specimens from the West Indies identified by Dr. J. A. Allen as *Artibeus carpolegus*, under which name Mr. Maynard's record should apparently stand.

It is doubtful if this species is more than an accidental visitant in Florida. Mr. Maynard speaks of seeing high-flying bats which he supposed were the same as the specimen brought him, but *Artibeus* is a forest-inhabiting, fruit-eating bat, and is rarely observed in the open even in localities where it is abundant.

- 29. Corynorhinus macrotis (*Le Conte*). BIG-EARED BAT.

 —In his 'Bats of North America,' p. 58, Dr. Harrison Allen records a specimen of this species from Micanopy, Florida.
- 30. Vespertilio gryphus F. Cuv. LITTLE BROWN BAT.— This species is included by Mr. Rhoads on the basis of "several specimens" from Tarpon Springs.
 - 31. Adelonycteris fuscus (Beauv.) Brown Bat.—Common.
- 32. Vesperugo carolinensis (*Geoff.*). CAROLINA BAT.—I found this to be an abundant species on the Suwanee River, as it doubtless is in other parts of the State.
- **33. Nycticejus humeralis** *Raf.* Twilight Bat.—Recorded by Dr. Allen and Mr. Rhoads.
- 34. Dasypterus intermedius (*Peters*). Fulvous Bat.—In his 'Bats of North America' (1893, p. 138), Dr. Harrison Allen records a specimen of this species from Davenport, Florida, in the collection of Mr. G. S. Miller, Jr.
- 35. Atalapha borealis (Müll.) [=A. noveboracensis Auct.]. RED BAT.—Ten alcoholic specimens from Gainesville and the Suwanee River are, as has been before remarked of Florida specimens of this species, more "intensely" colored than northern examples. That is they are browner and darker. The Cuban

form, to which, without having seen specimens, Mr. Rhoads refers bats from Tarpon Springs, is, on the contrary, much lighter and brighter in color than true *borealis*.

- 36. Atalapha cinerea (Beauv.). HOARY BAT.—The Museum has received one specimen of this species from Mr. J. H. P. Bell, of Gainesville, taken in the vicinity of that city in February, 1891. It agrees with northern specimens, and is the first record of this species from Florida.
- 37. Nyctinomus brasiliensis Is. Geoff. House Bat.—Abundant.
- 38. Blarina brevicauda carolinensis (Bach.). Southern Mole Shrew.—A single specimen has been recorded by Mr. Maynard from Miami, and I have taken one at Gainesville.
- 39. Blarina cinerea (Bach.). CINEREOUS SHREW MOLE.—
 "A badly-preserved specimen in alcohol from Indian River" is provisionally referred by Prof. Baird to this species.
- **40.** Blarina exilipes Baird. SMALL-FOOTED SHREW MOLE. —One perfect specimen and one skull found in the stomach of a Barn Owl (Strix pratincola) taken at Gainesville, have been identified by Dr. Merriam as the above-named species.
- **41.** Scalops aquaticus australis *Chapm*. FLORIDA MOLE. —Common. Three examples from Enterprise are typical of this race.

Concerning the status of Scalops parvus Rhoads, Mr. F. W. True, who, while preparing his forthcoming monograph of the Talpidæ, has the types of both S. parvus and S. a. australis in his possession, writes me: "I have no Moles from western Florida except the type of S. parvus. All the characters given by Mr. Rhoads are found with greater or less distinctness in specimens from central and eastern Florida and the Carolinas, except perhaps that relating to the form of the foramen magnum. There

¹ Proc. Acad. Nat. Sci. Phila., 1894, p. 157.

is an approximation to this also. The characters drawn from the teeth are perhaps of little value, as the teeth are very much worn and in a peculiar manner, which gives the impression that the type was an individual kept in confinement for some time. I cannot satisfy myself that this specimen is anything more than a rather small (though adult) australis. It is possible, of course, that with a series at command, this view may prove invalid. In my MS. I have placed the species with a query under your subspecies australis, and so I shall leave it until new evidence is produced."

- **42. Ursus americanus** *Pall.* BLACK BEAR.—Common in the less-settled parts of the State, particularly along the coasts, which it frequents to feed on the eggs of sea-turtles.
 - 43. Procyon lotor (Linn.). RACCOON.—Abundant.
- 44. Lutra canadensis (Schreber). American Otter.—Generally common.
- 45. Mephitis mephitica (Shaw). Common Skunk.—The exact distribution of the two species of Skunks which occur in Florida seems not to be known. This species is common at Gainesville, and, as far as I know, is the only one found there. Dr. Allen gives it as common on the lower St. John's, and Mr. Maynard remarks that it seems to be restricted to the more northern parts of the State.
- 46. Spilogale putorius (Linn.). LITTLE STRIPED SKUNK.—This is a common animal in the coast region of eastern Florida, especially in the 'scrub' of the East Peninsula. Dr. Merriam mentions a specimen from Kissimmee Prairie (N. A. Fauna, No. 4, 1890, p. 7), but I know nothing of its status in other parts of the State.
- 47. Lutreola vison (Schreber). MINK.—This species is included by Dr. Allen, on the authority of Mr. G. A. Boardman, as "not common." Mr. Maynard mentions seeing one at Blue Springs, and says it was "very plenty on the coast near Cedar Keys."

- 48. Putorius erminea (Linn.). Common Weasel.—The Museum has received from Mr. J. H. P. Bell, of Gainesville, one specimen of this species (which has not previously been recorded from Florida) from Osceola. The skull is missing. The skin is more thinly furred than in northern examples; the color of the underparts is more sharply defined from and extends farther up the sides. The fore feet are white, the fore legs white on the under surface. There is a narrow white line along the outer border of the hind legs, and the hind toes are white above and below.
- 49. Putorius peninsulæ Rhoads. FLORIDA WEASEL.—Known only from the type specimen taken in Pasco County (cf. Rhoads, Proc. Acad. Nat. Sci. Phila., 1894, p. 152).
- 50. Urocyon cinereo-argenteus (Müll.). [=U. virginianus Auct.]. Gray Fox.—Common.
- 51. Canis lupus griseo-albus (Linn.). Gray Wolf.— The Wolf in Florida is now on the verge of extinction. The most recent record of its capture, of which I have any knowledge, is based on a skin purchased in Jacksonville three or four years ago by Mr. George A. Boardman. Mr. Boardman writes me: "It was killed down in Lee County, and was black as a bear. I have seen as many as half-a-dozen skins and parts of skins, and most all were black. There were no light ones such as we have north, but one or two were reddish black, lighter on the belly. The hair of all was quite short, and with no fine under-hair as in the northern wolf."
- **52. Felis concolor** *Linn*. Puma.—Confined to the less-settled portions of the State, where it is not uncommon.
- 53. Lynx rufus floridanus (Raf.). FLORIDA WILD CAT.—Common in most parts of the State. In Brevard County (and also other counties) a bounty was offered for scalps of this animal, which resulted not only in bankrupting the county treasury

¹ Cf. Allen, this Bulletin, V, 1893, p. 32.

but in so great an increase of Rabbits as to threaten destruction to the crops of vegetable growers.

From many sources I have received information of the occurrence in Florida of a long-tailed, spotted Wild Cat, which may prove to be the Ocelot (*Felis pardalis*).