NOTES ON THE MAMMALS OF THE CATSKILL MOUNTAINS, NEW YORK, WITH GENERAL REMARKS ON THE FAUNA AND FLORA OF THE REGION.

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These notes are based on observations covering the period between August 4 and September 14, 1896, supplemented by such information as could be obtained from the residents of the region. During this time I lived at Evelyne Villa, near Kaaterskill Junction, on the Stony Clove and Catskill Mountain Railroad. This house occupies a hillslope at the base of East Kill Mountain, on the right (north) bank of Schoharie Creek, at an elevation of nearly 1,800 feet above the sea, and commands a superb view of Plateau and Hunter mountains and of the Stony Clove between them. The place is surrounded by orchards and farming lands, broken by small bits of forest and larger wooded strips along the streams, which latter are numerous, though of small size, and tributary to Schoharie Creek. This large brook, the main water course of the locality, rises about 8 miles above Evelyne Villa and 10 miles above the town of Hunter, reaching the sea through the Mohawk and Hudson rivers.

The work was of the nature of a reconnoissance rather than a systematic examination of this interesting region; and more was not attempted. The first fortnight was spent in examining the country in the vicinity of Evelyne Villa and Schoharie Creek. After that, the summits of East Kill Mountain (altitude about 3,200 feet), Plateau Mountain (altitude about 3,900 feet), and Hunter Mountain (altitude 4,025 feet) were climbed. On these expeditions I sometimes burdened myself with a shotgun, for the entertainment of my boy and the benefit of an ornithological friend, to whom we are looking for an account of the birds of the Catskill region.[1] We set out long lines of traps of various kinds

[1] Some of the most beautiful pen pictures of the bird life of the Catskills are contained in the earlier writings of John Burroughs. Mr. T. M. Trippe (American Naturalist, January, 1872, VI, pp. 47, 48,) has also furnished interesting notes on a few species, and Mr. Eugene Pintard Bicknell, in the Transactions of the Linnæan Society of New York, has given an extended review of the summer birds of a part of the Catskill Mountains in the vicinity of Slide Mountain, the highest of the range (altitude 4,205 feet).

for mammals, dropping them in crevices of the rocks, beside logs, brush heaps, stone heaps, in trees and hollow stumps, and beside the water; some in runways, others in open spots, in thickets, and a few at random, until the whole neighborhood was so beset with traps that not even the house cat escaped them. Trapping was gradually extended upward from the lower levels to the slopes of the East Kill and Plateau mountains, and finally to the top of Hunter Mountain, the highest of the neighboring peaks and second only to Slide Mountain, which exceeds it in height by some 200 feet, though it is much less massive. We also trapped one night around Kaaterskill Lake.

The interior region of the Catskills surrounding Kaaterskill Junction belongs, as a whole, to the Canadian, the lowest of the Boreal faunæ, though slightly mixed with the Alleghenian in the farming lands on the banks of Schoharie Creek. There is some evidence, however, that certain mammals of the Transition and Upper Austral Zones, as the New England cottontail (*Lepus sylvaticust ransitionalis*), deer mouse (*Peromyscus leucopus*), and gray fox (*Urocyon cinereoargenteus*), have but lately extended their ranges to this locality by following up the clearings.

Though again well wooded, the barest tags and remnants alone remain of the splendid primeval forests that once covered this area. All is second-growth except in the rockiest gulches, whence the lumber could not have been extricated, and about the rocky summits of a few mountains of the East Jewett ranges, including East Kill Mountain. The hills must have been early stripped of their timber, to judge from the indications of a few remaining stumps and rotten logs, nearly all of which were coniferæ. The woods are now very thoroughly mixed, deciduous trees of numerous species mingling, almost everywhere, with the evergreen coniferæ. On the mountain sides, at the present time, nothing is seen of the regular succession of altitudinal forest zones which may have existed in times past, before the timber was cut. The black spruce, balsam, hemlock, yew, and white pine are the only coniferæ seen by us in the interior valleys of the Catskills, and all grow on the banks of the Schoharie, near Kaaterskill Junction (altitude 1,700 feet). Of these only the black spruce and balsam occupy the mountain peaks. The hemlock and yew scarcely rise on the mountain slopes above 2,500 feet; the white pine is local on the creek banks, and the spruce and balsam increase in abundance from the lowest to the highest level. Of deciduous trees, which are at least as numerous as the coniferous, and in the number of species much more so, the maple, beech, birch, ash, cherry, aspen, basswood, elm, and willow are the most abundant. The red juniper, pitch pine, chestnut, hickory, butternut, and oak are conspicuously absent, although they are characteristic trees of the Hudson River slopes of these mountains, extending up to the Catskill Mountain House, at which point their ranges end rather abruptly. Among the smaller plants, many species were collected in the vicinity

of the Mountain House and Kaaterskill Lake, which were recognized as common species of the lower Hudson, and which were absent from the interior valleys to the westward, or only occurred there as rare stragglers.[1]

The following is a list of the trees and shrubs collected and placed in the U. S. National Museum:[2]

Pinus rigida Miller.
Pinus strobus Linnæus.
Picea mariana (Miller).
Tsuga canadensis (Linnæus).
Abies balsamea (Linnæus).
Juniperus virginiana Linnæus.
Taxus minor (Michaux).
Juglans cinerea Linnæus.
Populus balsamifera Linnæus.
Populus grandidentata Michaux.
Populus tremuloides Michaux.
Salix amygdaloides Andersson.
Salix cordata Muehlenberg.
Salix bebbiana Sargent.
Carpinus caroliniana Walter.
Betula lutea Michaux.
Betula papyrifera Marshall.
Fagus latifolia (Muenchhausen).
Castanea dentata (Marshall).
Quercus prinus Linnæus.
Quercus rubra Linnæus.
Quercus velutina Lamarck.
Ulmus americana Linnæus.
Ribes cynosbati Linnæus.
Ribes lacustre (Pursh).
Ribes oxycanthoides Linnæus.
Hamamelis virginiana Linnæus.
Spiræa salicifolia Linnæus.
Aronia nigra (Willdenow).
Cratægus coccinea Linnæus.
Rubus americanus (Pursh).
Rubus odoratus Linnæus.
Rubus hispidus Linnæus.
Rubus strigosus Michaux.
Rubus occidentalis Linnæus.
Potentilla tridantata Solander.
Prunus pennsylvanica Linnæus.
Prunus serotina Ehrhart.
Prunus virginiana Linnæus.
Rhus hirta (Linnæus).
Ilex laevigata (Pursh).
Ilex verticillata (Linnæus).
Ilicoides mucronata (Linnæus).
Acer saccharinum Linnæus.
Acer saccharum Marshall.
Acer pennsylvanicum Linnæus.
Acer spicatum Lamarck.
Tilia americana Linnæus.
Cornus canadensis Linnæus.
Cornus stolonifera Michaux.
Azalea lutea Linnæus.
Kalmia angustifolia Linnæus.
Gaylussacia dumosa (Andrew).
Fraxinus nigra Marshall.
Sambucus canadensis Linnæus.
Viburnum alnifolia Marshall.
Viburnum cassinoides Linnæus.
Diervilla diervilla (Linnæus).

MOLLUSKS.

Owing to the character of the geological formation, there are but few shells in the Catskills. The following list includes all of the species which we found there:

1. *Polygyra albolabris* Say. Found sparingly from Schoharie Creek to the summits of Plateau and Hunter mountains.

2. *Polygyra dentifera* Binney. Specimens were taken on Schoharie Creek and on the summits of Hunter and Plateau mountains.

3. *Polygyra sayi* Binney. Hunter Mountain; scarce.

[1] Among the stragglers are one or two butternut and oak trees in the vicinity of Kaaterskill Junction which may have been artificially planted.

[2] For assistance in determining the plants collected, I am indebted to Mr. Charles Louis Pollard; for assistance with the animals, to Messrs. Charles T. Simpson, Barton A. Bean, Leonhard Stejneger, and Gerrit S. Miller, jr.

4. *Polygyra tridentata* Say. Found from the bed of Schoharie Creek up to 3,300 feet altitude on Hunter Mountain.

5. *Polygyra monodon* Rackett. Specimens were taken on the summit of Plateau Mountain.

6. *Pyramidula* species. Found above 3,000 feet on Hunter Mountain.

7. *Selenites concavus* Say. Ranges from Kaaterskill Junction to the summit of Plateau Mountain.

8. *Zonites ligerus* Say. Found in a burned area at the summit of Plateau Mountain.

9. *Succinea obliqua* Say. Found from Schoharie Creek to the summits of Plateau and Hunter mountains; not abundant.

10. *Sphærium partumeium* Say. Found only in Kaaterskill Lake.

CRUSTACEANS.

The only crustacean found was the common crawfish or brook lobster, *Cambarus bartoni* (Fabricius), which is abundant in all the brooks.

FISHES.

1. *Ameiurus nebulosus* (Le Sueur). Small catfish; Common bullhead. A specimen was taken at Kaaterskill Lake, where this fish is said to be abundant.

2. *Catostomus commersonii* (Lacépède). Common sucker; Brook sucker. Abundant in Schoharie Creek. Many were seen from a footbridge at the village of Hunter, where 'sucker-wire' is a staple in the hardware stores.

3. *Semotilus atromaculatus* (Mitchill). Horned dace; Creek chub. Abundant in Schoharie Creek and tributary brooks.

4. *Notropis cornutus* (Mitchill). Shiner; Red-fin. Abundant in Schoharie Creek.

5. *Rhinichthys atronasus* (Mitchill). Black-nosed dace. Abundant in Schoharie Creek and its petty tributaries.

6. *Exoglossum maxillingua* (Le Sueur). Cut-lips; Nigger chub; Nigger dick. Abundant in Schoharie Creek.

7. *Salvelinus fontinalis* (Mitchill). Brook trout; Speckled trout. Abundant in Schoharie Creek and the numerous spring brooks that join it.

8. *Lucius reticulatus* (Le Sueur). Common eastern pickerel. My son caught two specimens in Kaaterskill Lake, where the pickerel is abundant.

NOTE.—In addition to the pickerel and catfish, several other fishes are in Kaaterskill Lake. I saw a bream, and a small species that may have been *Fundulus;* and eels are said to have been caught there.

BATRACHIANS.

1. *Spelerpes bilineatus* (Green). Striped-backed salamander. Common along streams.

2. *Desmognathus fusca* (Rafinesque). Dusky salamander. The most abundant salamander; found along streams.

3. *Diemyctylus viridescens* Rafinesque. Spotted triton; Newt; Evet; Eft. Very numerous in Kaaterskill Lake; not seen elsewhere in the region.

4. *Bufo americanus* Le Conte. American toad. Abundant along Schoharie Creek; one specimen taken on Hunter Mountain (altitude, 3,800 feet).

5. *Hyla versicolor* Le Conte. Common tree-toad. Common (August 4 to September 14, 1896).

6. *Rana pipiens* Schreber. Common frog; Leopard frog. Eleven specimens were taken at Kaaterskill Lake, September 10, 1896.

7. *Rana sylvatica* Le Conte. Wood-frog. Two specimens from East Kill Mountain (2,000 feet) and one specimen from Hunter Mountain (3,800 feet).

8. *Rana clamitans* (Latreille). Green frog. Schoharie Creek and Kaaterskill Lake, August 12 to September 10, 1896.

REPTILES.

1. *Thamnophis sirtalis* (Linnæus). Garter snake. Abundant from the margin of Schoharie Creek up to the summit of Hunter Mountain.

2. *Storeria occipitomaculata* (Storer). Red-bellied brown snake. Common in the Schoharie valley; most often seen after sundown.

NOTE.—No turtles were seen, but a species answering to the description of *Chrysemys picta* (Hermann) was said to abound in Kaaterskill Lake and other pools of the region.

MAMMALS.

A. SPECIES KNOWN TO OCCUR AT THE PRESENT TIME.

LEPUS SYLVATICUS TRANSITIONALIS Bangs.

NEW ENGLAND COTTONTAIL.

Curiously enough, this small rabbit is generally known to the residents of the upper Schoharie valley by the name of 'jack rabbit.' I was informed by persons who had lived near Kaaterskill Junction for many years that this rabbit had extended its range upward into the cleared lands of the Schoharie valley during recent years. Although it is said to be abundant at the present time in the valley, and on the lowest adjacent hills, I was unable to find it; and two specimens trapped by my son, Louis di Zerga Mearns, beside Schoharie Creek, at the nearest bridge, September 4 and 9, 1896, were the only ones seen. These were males.

No. 83111, U.S.N.M. collection, measured as follows: Length, 385 mm.; tail vertebræ, 65; hind foot, 92; head, 72; ear from crown, 66; ear from notch, 59. No. 83112, U.S.N.M., measured, in total length, 370; tail vertebræ, 58; hind foot, 89; head, 74; ear from crown, 57; ear from notch, 52.

LEPUS AMERICANUS VIRGINIANUS (Harlan).

SOUTHERN VARYING HARE.

Two immature specimens (Nos. 83109, 83110, U.S.N.M.) were taken on Hunter Mountain, in spruce and balsam swamps, at altitudes, respectively, of 3,700 and 3,800 feet, on August 31 and September 4, 1896. This hare is abundant on the summits of East Kill, Plateau, and Hunter mountains, descending, at times, along belts of coniferous trees nearly to Schoharie Creek. In the lowest country, it is said to be almost wholly replaced by the cottontail.

ERETHIZON DORSATUS (Linnæus).

CANADA PORCUPINE.

This remarkable beast was formerly abundant throughout this region. During recent years it has become comparatively scarce, except on the mountains. The skeleton of a porcupine was found under the fallen ruins of an observatory on the summit of Hunter Mountain; two other specimens were subsequently trapped there (altitude, 4,025 feet); three were taken at a spring under a shelving rock, at the altitude of 3,800 feet, and a seventh was overtaken and killed in the slide rock on the side of Hunter Mountain, at about 3,000 feet altitude.

Porcupines visit the creamery, on the trail at the base of Hunter Mountain, and leave the marks of their sharp teeth upon the woodwork of the buildings and furniture. They are attracted to this place by their fondness for salt, which makes the best bait for trapping them, though they eat apples, turnips, and in fact almost any fruit or vegetable.

Near the Hunter Mountain trail I set a number of deadfalls, baited with apple, hoping to take specimens of the varying hare; but the porcupines almost invariably sprung the traps, and usually escaped, though one was held fast long enough for it to excavate a large hollow beneath the trap stone, and a very young one was captured. When caught in steel traps set in their well-worn trails, they make continuous efforts to escape, and are so powerful that they sometimes succeed by twisting and breaking the chain holding the trap. When seen on the ground, they are easily overtaken, and only attempt to defend themselves by striking vigorously with their powerful and spiny tails, without attempting to bite or scratch. When attacked by inexperienced dogs, they erect their quills, which afford them such ample protection that their canine enemies seldom continue the attack or forget their

first painful lesson. Those that I caught gave utterance to grunting and sniffing sounds, which were accompanied by nervous facial contortions. At first they lashed out aimless lateral blows with their quilly tails, but declined to bite even when teased. Soon, however, they grew calm, behaving better after a short acquaintance; and it became a painful task to kill such innocent and interesting animals. Although sometimes annoyingly familiar, and prone to gnaw at things about camps and cabins in the woods, porcupines are comparatively harmless and should never be wantonly destroyed. It is to be hoped that such colonies of porcupines as still exist on the peaks of the Catskills can be preserved from extermination by creating a generous public sentiment in their favor.

Of the six skins preserved two were adult females, two immature females, and two, male and female, quite young. Adults differ from the young and immature in having the hair and quills of the back brown instead of black, though mixed, as in the others, with a few long gray hairs. The quills are more yellowish than those of the younger specimens, and the dark longitudinal band on the under side of the tail is much redder. The youngest and only male specimen (No. 83076, U.S.N.M.) is smaller than a cottontail rabbit. It is black, with a sprinkling of long gray hairs all over except on the rump, middle of upper and lower sides of tail, and portions of the head—the gray hairs scattered most thickly across the shoulders, lumbar region, and along the sides. The quills are short, almost concealed by hair, and colored either black or white (never yellowish), and only visible on the crown, cheeks, sides of rump, and tail. The claws are blackish. Another young specimen (No. 83075, U.S.N.M.), twice the bulk of the above, differs in color only in the absence of gray hairs on the middle of the under surface. Two nearly adult females have the quills in part yellowish instead of white; they cover the whole rump and conceal the hair of the part; the under side of the tail is stained centrally with rusty brown, and one specimen is becoming brownish on the back. The color of the hair is black, with a sprinkling of long gray hairs above. The quills cover most of the upper surface and sides of the body. On the back the long hair overtops and conceals the quills, while the reverse is the case on the rump and tail.

Measurements.—Average of two adult females: Length, 678 mm.; tail to end of vertebræ, 190; tail to end of hairs, 230; length of head, 103; hind foot, 90 by 35; fore foot, 71 by 30; ear from anterior base, 29. Weight, 13 pounds. Mammæ, three pairs.

ZAPUS HUDSONIUS (Zimmermann).

MEADOW JUMPING-MOUSE.

Abundant along Schoharie Creek, but not found elsewhere in the region. Nine specimens were trapped along the stream, amid thickets of laurel, witch-hazel, blackberries, and other shrubbery.

Measurements.—Average of five adults: Length, 214 mm.; tail vertebræ, 127 (to end of caudal pencil, 133); length of hind foot and claw, 30.3; ear from crown, 10.6; ear from notch, 13.7; length of head, 25.2. Mammæ, four pairs.

ZAPUS INSIGNIS Miller.

WOODLAND JUMPING-MOUSE.

Abundant on Schoharie Creek, where it was trapped in the same places as the meadow jumping-mouse (*Zapus hudsonius*). In some instances both species were taken, on different nights, in the same trap, set in one spot. One was trapped under a fallen spruce, at the altitude of 3,600 feet, on Hunter Mountain. In all, nine specimens were preserved.

This beautiful mammal is at least partially diurnal. When fishing from some high rocks beside Schoharie Creek I saw several of them beneath some laurel bushes on the bank. Females have four pairs of mammæ, distributed from the inter-humeral to the inter-femoral region. Females are slightly larger and heavier than males.

Measurements.—Average of two adult males: Length, 225 mm.; tail to end of vertebræ, 137.5 (to end of caudal pencil, 145); hind foot, 30.8; ear from crown, 12.5; ear from notch, 16.3; head, 26.8. Average of four adult females: Length, 236.5; tail vertebræ, 146 (to end of hairs, 155); length of hind foot, 31.4; ear from crown, 13.1; ear from notch, 16.4; head, 27.2.

FIBER ZIBETHICUS (Linnæus).

MUSKRAT.

The muskrat is abundant at Kaaterskill Lake. It is also said to occur along Schoharie Creek, but we saw no signs of it there.

SYNAPTOMYS FATUUS Bangs.

HUDSONIAN LEMMING-MOUSE.

A single specimen of this species was trapped near the summit of Hunter Mountain, the locality being a marshy place strewn with fallen trees, at the altitude of 3,900 feet. *Microtus pennsylvanicus* was caught in the same spot. This specimen (No. 83166, U.S.N.M.), a nearly mature female, measured: Length, 125 mm.; tail vertebræ, 20; caudal pencil, 3.5; ear from crown, 7; ear from notch, 11; head, 28; hind foot, 18.5.

MICROTUS PENNSYLVANICUS (Ord).

COMMON MEADOW-MOUSE.

Specimens were taken from fields bordering Schoharie Creek (altitude, 1,700 feet) and on the ridge of Hunter Mountain at the altitude of 3,900 feet, the same spot in which the only specimen of *Synaptomys* was

trapped. These specimens are much smaller than those from Highland Falls, New York. Skull, No. 83116, U.S.N.M. collection, measures 28 by 16 mm. in its greatest diameters, and No. 83117 (U.S.N.M.) 27 by 15 mm., both being adult males.[1] In the flesh these two specimens gave the following average measurements: Length, 177 mm.; tail vertebræ, 53.5; head, 33.5; hind foot, 22.5; ear from crown, 7.5; ear from notch, 12.5. These dimensions agree quite closely with those of a series of *Microtus pennsylvanicus* from Fort Snelling, Minnesota, but are considerably smaller than specimens from Highland Falls, New York, which latter have the skull higher and less flattened. The coloration of the Catskill specimens is not appreciably different from that of the series from Highland Falls, on the Lower Hudson.

MICROTUS CHROTORRHINUS (Miller).

RUFOUS-NOSED MEADOW-MOUSE.

One adult male was trapped in a pile of moss-covered rocks on a shoulder of Hunter Mountain, at an altitude of about 3,500 feet, August 25, 1896. Many traps were subsequently placed about this spot, but no others were caught. This specimen (No. 83114, U.S.N.M.[2]) gave the following measurements: Length, 171 mm.; tail vertebræ, 50; ear from crown, 8.5; ear from notch, 11; head, 32; hind foot, 20. Though agreeing in cranical characters with the type of *Microtus chrotorrhinus*, it is less yellowish about the nose and face.

EVOTOMYS GAPPERI (Vigors).

RED-BACKED MOUSE.

I refer forty-five red-backed mice collected in the Catskills to *Evotomys gapperi* (Vigors), and not to the subspecies *ochraceus* of Miller.[3] Nevertheless they are slightly more yellowish than those from near the type locality of *Evotomys gapperi*, this trifling variation being in the direction of *Evotomys gapperi ochraceus*.

This mouse was not found on the immediate banks of Schoharie Creek, though such Canadian forms as *Tamias striatus lysteri*, *Peromyscus canadensis*, *Sorex fumeus*, and *Zapus insignis* were there in abundance. It was met with in woods close to Kaaterskill Junction (altitude, 1,700 feet), and on the lower slopes of East Kill Mountain, on the opposite (right) side of Schoharie Creek, at the level of about 2,000 feet. Above these points it increased in abundance until, on the summit of Hunter Mountain (altitude, 4,025 feet), it became so numer-

[1] Skulls of *Microtus pennsylvanicus* from Highland Falls, New York, measure 30.5 by 16.5 mm.

[2] The skinned body, in alcohol, is numbered 82982.

[3] Proc. Bost. Soc. Nat. Hist., 1894, XXVI, p. 193 (from Mount Washington, New Hampshire).

ous that it was difficult to trap any other small mammals there. In the hard-wood forests at low altitudes it was usually taken about moss-covered logs, and in hollow stumps, in dense woods, but on higher ground it was common everywhere.

Specimens were taken on both sides of Schoharie Creek and at altitudes ranging from 1,700 feet up to the actual summit of Hunter Mountain. Seven were trapped around Kaaterskill Lake September 10, 1896. Specimens from these various localities and altitudes exhibited no differences among themselves worth noting.

Farther south, in the Hudson Highlands, only the subspecies *rhoadsi*[1] was found. It occurred in sphagnous swamps overgrown with black spruce and tamarack trees, in the highest part of the mountains, where a single immature specimen was trapped September 30, 1896. This individual, which I have compared with topotypes of *Evotomys gapperi rhoadsi*, in the Department of Agriculture collection, appears to be of this form. The specimen (No. 82832, U.S.N.M.) shows very little of the red dorsal area, the back being brownish gray, as described by Mr. Stone, and quite unlike any of the Catskill specimens.

Measurements.—Average of twenty adult males: Length 142 mm.; tail vertebræ, 41; tail to end of hairs, 49; hind foot, 19.2; ear from crown, 9.1; ear from notch, 13; head 28. Average of sixteen adult females: Length, 144; tail vertebræ, 41; tail to end of hairs, 49; hind foot, 19; ear from crown, 9.1; ear from notch, 13; head, 27.7.

PEROMYSCUS LEUCOPUS (Rafinesque).

EASTERN DEER-MOUSE.

This beautiful mouse was rather abundant along Schoharie Creek, especially about farms and buildings. On the right side of the stream it was found sparingly distributed around the lower third of East Kill Mountain, but was nowhere abundant above the creek bottom. On the left side it was not found above 2,000 feet altitude. Forty-one specimens were collected.

Measurements.—Average of twelve adult males: Length, 174 mm.; tail vertebræ, 79; tail to end of pencil, 84; hind foot, 21.2; ear above crown, 12.7; ear above notch, 16.8; head, 29.5. Average of six adult females: Length, 180; tail vertebræ, 81; to end of hairs, 85; hind foot, 21.5; ear from crown, 13.3; ear from notch, 17.4; head, 30.6.

PEROMYSCUS CANADENSIS (Miller)

CANADIAN DEER-MOUSE.

The Canadian deer mouse, though nowhere abundant, was found from the margin of Schoharie Creek up to the summit of Hunter Mountain, and in all sorts of places—sugar camps, deserted houses, deciduous woods, spruce and balsam swamps, under rocks, among the roots

[1] Described by Mr. Witmer Stone in the American Naturalist for January, 1893, p. 55, from Mays Landing, New Jersey.

of old stumps, in brush heaps, and in open, grassy places; in short, it was found everywhere, but nowhere in abundance. It was much less common than *Peromyscus leucopus* along Schoharie Creek, where both species were sometimes taken in the same spot. When trapped, its cheek pouches are as likely to be filled with food as those of the chipmunk. I do not remember ever to have found food in those of *Peromyscus leucopus*. In his description of *Peromyscus canadensis*,[1] Mr. Gerrit S. Miller, jr., observes: "It is worthy of remark, in this connection, that I have found the cheek pouches of *S[itomys] canadensis* [= *Peromyscus canadensis*] much the more frequently and conspicuously distended with food [than those of *Peromyscus leucopus*]." For the history of the discussion concerning the presence or absence of cheek pouches in the mice of the genus *Peromyscus*, and their use when present, consult especially Baird[2] and Allen.[3]

In the flesh, this species is easily distinguished from fresh specimens of *P. leucopus* by its larger ears, different quality and coloration of pelage, and by its longer and tufted tail. These differences are not so striking in cabinet specimens; still it is remarkable that this species should have remained so long unrecognized. The occurrence of *Peromyscus leucopus* and *P. canadensis* together on Schoharie Creek makes it quite certain that they are perfectly distinct species. In the Highlands of the Hudson *P. leucopus* is abundant; but in the highest parts, where the black spruce and tamarack grow, no species of *Peromyscus* could be found. In other words, where *P. canadensis* should have been found the genus was unrepresented. Eighteen specimens were collected in the Catskills.

Measurements.—Averages of seven adult males: Length, 181 mm.; tail vertebræ, 89; tail, measured to end of caudal pencil, 96.5; hind foot, 21.2; height of ear from crown, 13.6; ear from notch, 17.7; length of head, 28.7. Average of three adult females: Length, 190; tail vertebræ, 94; tail to end of hairs, 100; hind foot, 21.5; ear from crown, 15; ear from notch, 17.7; head, 28.2

MUS MUSCULUS Linnæus.

HOUSE MOUSE.

Common in fields and houses. Several were trapped under stacks of fodder corn standing in the fields. None were caught in the woods. Three specimens preserved.

MUS DECUMANUS Pallas.

NORWAY RAT.

Abundant. One was trapped on the base of East Kill Mountain at the altitude of 2,000 feet. No others were seen in the woods.

[1] Proc. Biol. Soc. Wash., June 20, 1893, VIII, p. 62.
[2] North American Mammals, 1857, p. 460.
[3] Bull. Mus. Comp. Zool., 1869, I, p. 229.

ARCTOMYS MONAX (Linnæus).

WOODCHUCK; GROUNDHOG.

This species, the largest of the eastern *Sciuridæ*, is tolerably common in the Schoharie Valley. Its burrows were frequently seen in all of the cultivated lands, though I saw but one woodchuck.

TAMIAS STRIATUS LYSTERI (Richardson).

NORTHERN CHIPMUNK.

The chipmunk of the Schoharie Valley is distinctly of the *lysteri* type. It was common, but shy, occurring from the edge of the creek (altitude 1,700 feet) up to the summit of Hunter Mountain (altitude 4,025 feet). At Palenville, on the Hudson River side of the Catskills, intermediates between the forms *striatus* and *lysteri* occur; in the Hudson Highlands a few individuals from the highest elevations verge toward *lysteri;* lower down the Hudson Valley only true *striatus* is found. No difference was detected between specimens collected in spruce forests and balsam swamps on the mountains and those from the fields and fences along Schoharie Creek. All are *lysteri* and intermediate between the typical form of the subspecies and the pale, yellowish phase found in Maine. The specimens collected had fed most extensively upon mushrooms, wild cherries, and a small bulbous plant, probably a sedge. More than one-half were affected by a subcutaneous parasite (*Cuterebra*) embedded in the cervical, abdominal, or inguinal region. A few individuals of *Peromyscus* were likewise affected by this parasite. Forty-nine specimens of this chipmunk were preserved.

Measurements.—Average of ten adult males: Length, 247 mm.; tail vertebræ, 96; tail to end of hairs, 115; hind foot, 36.3; ear above crown, 11.5; ear above notch, 18.3; head, 45.5. Average of ten adult females: Length, 251; tail vertebræ, 98; tail to end of hairs, 117; hind foot, 36.2; ear above crown, 11.6; ear above notch, 18.5; head, 45.6 Mammæ, four pairs.

SCIURUS HUDSONICUS LOQUAX Bangs.

SOUTHERN CHICKAREE OR RED SQUIRREL.

This lively inhabitant of the forest was found at all altitudes, its range extending from sea level to the highest peaks of the Catskills. It is as apt to be found in deciduous as in coniferous woods. Eight specimens were collected; one killed on August 15 was still partly in winter pelage.

Measurements.—Average of four adult males: Length, 313 mm.; tail vertebræ, 124; tail to end of hairs, 180; hind foot, 48.5; ear from crown, 14.7; ear from notch, 23.5; head, 51.7 Average of two adult females: Length, 319; tail vertebræ, 133; tail to end of hairs, 190; hind foot, 50.5; ear from crown, 14; ear from notch, 23; head, 50.

SCIURUS CAROLINENSIS LEUCOTIS (Gapper).

NORTHERN GRAY SQUIRREL.

The gray squirrel is rare in this region. But one individual was seen during our stay.

SCIUROPTERUS SABRINUS MACROTIS, new subspecies.

CANADIAN FLYING SQUIRREL.

During recent years, *Sciuropterus sabrinus* (Shaw) has been considered a subspecies of *Sciuropterus volans* (Linnæus); but Mr. Outram Bangsh as lately shown[1] these two to be distinct species. Moreover, the form of *Sciuropterus sabrinus* occupying the Canadian life zone, along the northern border of the United States east of the Great Lakes, is so markedly different in size, coloration, and proportions from typical *sabrinus*,[2] that it requires separation as a subspecies.

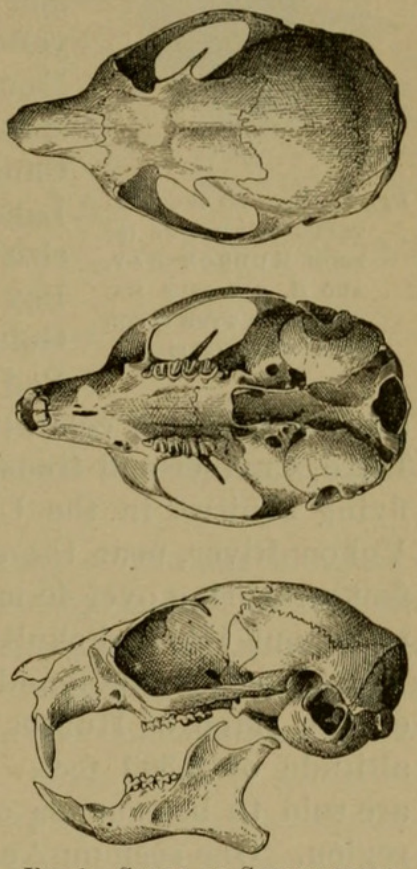


FIG. 1.—SKULL OF SCIUROPTERUS SABRINUS MACROTIS. TYPE. (Natural size.)

Type.—No. 83152, U.S.N.M. collection. Adult female collected by Dr. Edgar A. Mearns, on Hunter Mountain (Catskills), Greene County, New York, at an altitude of 3,300 feet, August 31, 1896. Original number, 4036.

Description of type.—Upper surface of body, fawn color; under surface, yellowish white; sides of head, ash gray; sides of body and upper surface of feet, mouse gray, the latter mixed with white; whiskers, and a narrow ring around eye, black; tail, drab gray above, a little darker terminally, and pale écru drab below. Length, 280 mm.; tail vertebræ, 125; head, 41; length of hind foot, 38; ear from crown, 20; ear from notch, 23.5; skull, 37.5 by 22 (fig. 1).

[1] Proc. Biol. Soc. Wash., December 28, 1896, X, pp. 162, 163.

[2] Respecting the type locality of his '*Sciurus sabrinus*,' Shaw, in his General Zoology, 1801, II, Pt. 1, p. 157, states as follows: "It is found in the southern parts of *Hudson's Bay*, in the forests bordering on *Severn* river in *James's Bay*, and seems to have been first described by Dr. Forster in the Philosophical Transactions. I have given this species a new trivial, in order to avoid the repetition of the title *Hudsonius*, which takes place, through oversight, in the Gmelinian edition of Systema Naturæ."

General remarks.—This subspecies is much smaller than typical *sabrinus*, from the west side of Hudson Bay, but has much longer ears (fig. 2), those of *macrotis* measuring 20 mm. against 15 mm. in *sabrinus*. The fur is more reddish. The sides of the head are clear grayish instead of soiled yellowish white. The tail is shorter, much less full and bushy, and does not have the terminal third blackish. The under parts are whiter. The skull is much smaller, measuring 37.5 by 22 mm. in *macrotis* against 40 by 24 in *sabrinus* (fig. 3). Specimens from the northeastern part of North America agree in size with those from New York and Pennsylvania, but in the northeastern localities the ear is shorter and the coloration somewhat paler and more yellowish than in the Middle States (Catskill Mountains and Erie, Pennsylvania). A series of specimens, labeled as from Matamagaminque, Canada (at the head of Moose River, between Lake Huron and James Bay), is intermediate in size and coloration between those from Hudson Bay and the New England and Middle States. Going northwestward from Hudson Bay and the Red River region, we find a decided increase in size and a darker coloration, in specimens from Great Slave Lake, Fort Liard, Cumberland House, and Fort Anderson. The largest American flying squirrel in the U. S. National Museum series came from the Yukon River, near the eastern boundary of Alaska. It has the hind foot measuring over 40 mm. in length; the tail about 175, and skull 41.5 by 25.

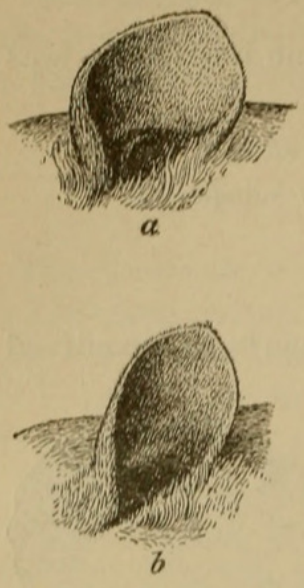


FIG. 2.—EAR OF SCIUROPTERUS SABRINUS (*a*) FROM HUDSON BAY, AND S. SABRINUS MACROTIS (*b*), TYPE SPECIMEN. (Natural size.)

This species was found in spruce woods, on the ridge of Hunter Mountain, at the altitude of 3,300 feet. Flying squirrels are said to be common everywhere in the region. One seen on August 7, 1896, near the base of East Kill Mountain, at 1,800 feet altitude, may have been either the present species or *Sciuropterus volans* (Linnæus).

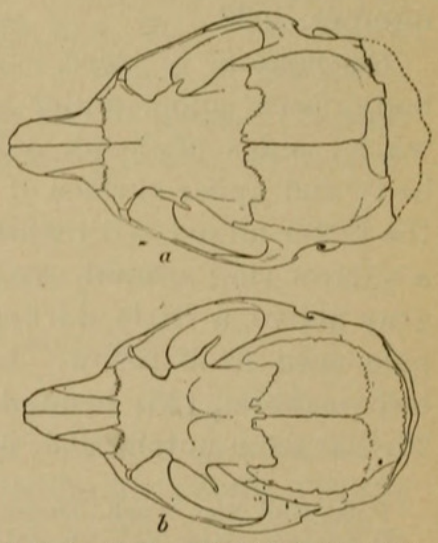


FIG. 3.—SKULL OF SCIUROPTERUS SABRINUS (*a*) FROM GREAT SLAVE LAKE, AND S. SABRINUS MACROTIS (*b*), TYPE SPECIMEN. (Natural size.)

SOREX FUMEUS Miller.

SMOKY SHREW.

Three specimens were taken. One was trapped under a stone wall on the right (north) bank of Schoharie Creek; one in a hollow stump on the south slope of East Jewett Mountain, at about 2,000 feet altitude; and the third under a log, a little farther up the mountain. These specimens,

two males and a female, gave the following average measurements: Length, 121 mm.; tail vertebræ, 46; hind foot, 13.5; head, 23.7.

SOREX PERSONATUS I. Geoffroy Saint Hilaire.

COMMON EASTERN SHREW; MASKED SHREW.

Two specimens were trapped; the first (No. 83165, U.S.N.M.) in a balsam swamp, at 3,700 feet altitude; and the second (No. 82945, U.S.N.M.) on the actual summit of Hunter Mountain. Both are females, and so different in color from all others of this species that I have seen that I hesitate in referring them to typical *Sorex personatus*. Their color is a pale yellowish drab, quite different from summer specimens from the Hudson Highlands, Roan Mountain, or Fort Snelling.

FIG. 4.—FORE FOOT (*a*) AND HIND FOOT (*b*) OF SOREX MACRURUS FROM THE CATSKILL MOUNTAINS. (×1½.)

Measurements.—No. 83165, U.S.N.M., measures: Length, 99 mm.; tail vertebræ, 40; tail to end of hairs, 45.5; hind foot, 12; ear from crown, 3.2; head, 20. No. 82945: Length, 104; tail vertebræ, 42; hind foot, 12.5.

SOREX MACRURUS Batchelder.

BIG-TAILED SHREW.

Sorex macrurus BATCHELDER, Proc. Biol. Soc. Wash., December 8, 1896, X, pp. 133, 134, text figs. 26–28 (skull and teeth).

On August 24, 1896, I climbed to the summit of Hunter Mountain and distributed about eighty traps along the ridge and on the summit of the mountain. Trapping was continued there until September 4, the traps having been visited nine times and frequently changed from place to place during this period. Among the specimens obtained were eight examples of this recently described shrew. Two of them were preserved in alcohol, two in formalin, and the remaining four as skins with skulls. All appear to be adults. The accompanying text figures of *Sorex macrurus* (figs. 4, 5, 6) were drawn from specimen No. 82940, U.S.N.M. collection, an adult female, taken at the summit of Hunter Mountain, Greene County, New York, August 26, 1896. The enormous size of its tail is shown by comparison with figures of the tails of *Sorex personatus* (adult female, No. 82945, U.S.N.M. collection) and *Sorex fumeus* (adult male, No. 82944, U.S.N.M. collection), from the same region (fig. 6, *a*, *b*, *c*). All were drawn to the same scale by Dr. J. C. McConnell, and are reproduced one and one-half times the natural size.

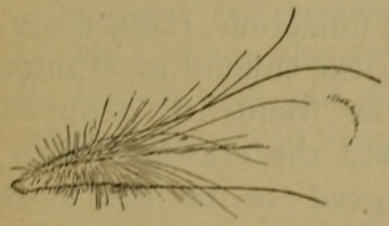
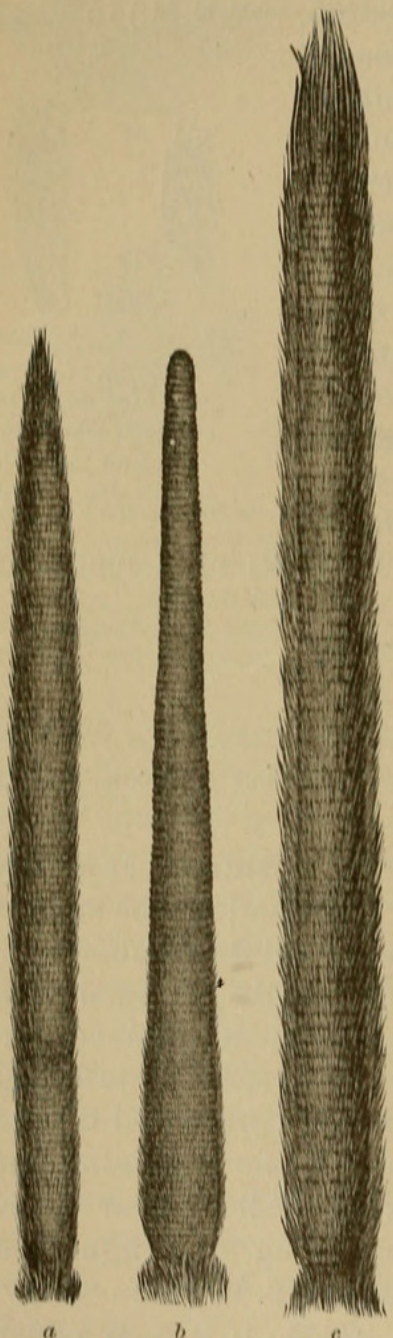


FIG. 5.—HEAD OF SOREX MACRURUS FROM THE CATSKILL MOUNTAINS. (×1½.)

The species was hitherto known only from the two specimens described by Mr. Batchelder, who captured the first on September 9, 1895, at Beedes, Essex County, New York, and the second on August 1, 1896, on the bare, open summit of Mount Marcy, the highest of the Adirondack mountains, about 5,300 feet above sea level.



a b c

FIG. 6.—TAIL OF SOREX PERSONATUS (*a*), S. FUMEUS (*b*), AND S. MACRURUS (*c*). (×2.)

The following measurements were taken from fresh specimens by the author. Average of four adult males: Length, 124 mm.; tail vertebræ, 57; caudal pencil, 7.3; hind foot, 14.7; head, 23.8; ear from crown, 4; ear from notch, 10. Average of four adult females: Length, 123; tail vertebræ, 57; caudal pencil,[1] 7.5; hind foot, 14.8; head, 23.8; ear from crown, 4; ear from notch, 10.

The specimens were trapped in hollows under mossy stones and stumps, usually in wet balsam or spruce woods, or in weedy swamps. The lowest place where it was taken was in a balsam swamp, at about 3,700 feet altitude; others were caught somewhat higher, in a sparsely wooded swamp densely overgrown with asters (*Aster puniceus*), then in bloom; and four were trapped on the top of Hunter Mountain (altitude 4,025 feet).

BLARINA BREVICAUDA (Say).

MOLE SHREW.

Very abundant from Schoharie Creek up to the higher mountain tops, where it appears to be less numerous, though several were taken on the summit of Hunter Mountain. It was frequently trapped during daytime, and the crawfish (*Cambarus bartoni*) proved to be the most seductive bait. Fifty-seven specimens were preserved.

Measurements.—Average of eleven adult males: Length, 125 mm.; tail vertebræ, 28; hind foot, 15.3; head, 28.6. Average of nineteen adult females: Length, 124; tail vertebræ, 28.1; hind foot, 15.2; head, 29.

[1] Besides their unusual length, the caudal hairs are so rigid as to be capable of sustaining the weight of the stuffed skin.

PARASCALOPS BREWERI (Bachman).

HAIRY-TAILED MOLE; BREWER'S MOLE.

One specimen taken (No. 83289, U.S.N.M.). If all the mole workings seen were of this species, it is abundant from Schoharie Creek upward to about 2,500 feet, above which altitude but few moles' tunnels were seen.

MYOTIS LUCIFUGUS (Le Conte).

LITTLE BROWN BAT.

This was the commonest bat in the Catskills, and seen nightly.

An adult male (No. 83000, U.S.N.M.), taken at Kaaterskill Junction, August 21, 1896, presented these dimensions: Length, 93 mm.; tail, 36; alar expanse, 245; longest finger, 61; head, 16; ear from crown, 10; ear from anterior base, 12; tragus, 5. Another male (No. 83001, U.S.N.M.) from the same place, September 12, 1896, measured: Length, 89; tail, 35; alar expanse, 245; longest finger, 57; head, 16; ear from crown, 11; ear from anterior base, 13; tragus, 7.

VESPERTILIO FUSCUS Beauvois.

BROWN BAT.

Common. An adult male (No. 83002, U.S.N.M.), from Kaaterskill Junction, August 12, 1896, measured: Length, 120 mm.; tail, 45; longest finger, 80; head, 21; ear from crown, 13.5; ear from anterior base, 15.

PROCYON LOTOR (Linnæus).

RACCOON.

Tracks of the raccoon were seen in several places on or near Schoharie Creek. It was also said to be common about the Mountain House, but its tracks were not seen on the shores of Kaaterskill Lake, a place where they would naturally be looked for.

URSUS AMERICANUS Pallas.

BLACK BEAR.

I saw recent signs of bears on Plateau Mountain, in August, 1896. Several bears were killed a few miles south of the mountain during the same month. One was seen north of the Jewett ranges during the winter of 1895–96. This species is far from being exterminated in the Catskills, as several individuals are annually killed there.

MEPHITIS MEPHITICA (Shaw).

SKUNK.

Common. Three specimens were trapped on the banks of Schoharie Creek. It was not met with on the mountains.

PUTORIUS VISON (Schreber).

LITTLE BLACK MINK; MOUNTAIN BROOK MINK.

This small mink is common on all the streams of the neighborhood and at Kaaterskill Lake, its prevalence having given rise to such local names as Mink Hollow and Mink Mountain.

A large female mink, heavy with young, was overtaken by the roadside by Mr. Sidney T. Haines, on July 22, 1896, and killed with a whip. It fought viciously. I obtained one specimen (No. 83119, U.S.N.M.) on August 18, 1896.

PUTORIUS NOVEBORACENSIS Emmons.

NEW YORK WEASEL.

One was seen at Evelyne Villa in August, 1896. Weasels, large and small, were said to be common, though I succeeded in trapping but one specimen of the smaller species.

PUTORIUS CICOGNANI (Bonaparte).

BONAPARTE'S WEASEL.

One specimen, a male (No. 83120, U.S.N.M.), was trapped on the left bank of Schoharie Creek, August 23, 1896. Length, 258 mm.; tail vertebræ, 70; black terminal portion of tail, 40; head, 46; hind foot, 34; ear above crown, 8; ear above notch, 19. It uttered a high-pitched cry of rage and attempted to attack me when I came upon it in the trap.

VULPES PENNSYLVANICUS (Boddært).

AMERICAN RED FOX.

This fox is known to be tolerably common throughout the Schoharie valley. Several specimens in local collections were said to have been killed near by. A fox's den was found near Kaaterskill Junction by my son and myself. We carefully set a steel trap in the entrance of the burrow, and fortune at first favored us, as it rained soon after and the fox was caught, but escaped during the night or early morning. From the appearance of the tracks I am of the opinion that it was a gray fox (*Urocyon cinereoargenteus*) and not the present species.

LYNX CANADENSIS Kerr.

CANADA LYNX.

I am informed that there are two mounted specimens in one of the local collections, but I did not see them. Hunters told me that there are still a good many 'lynxes,' as well as 'wildcats,' in the mountains. Very large tracks of a lynx, which I suppose to have been this species and not *Lynx ruffus*, were seen almost daily on the summit of Hunter Mountain during the latter part of August. It often caught varying hares and devoured them in the trail along which my traps were placed.

This is the type locality of Rafinesque's *Lynx montanus*, described[1] as follows:

Lynx montanus. Raf. Ears beardless, black outside, with a white spot, fallow inside; fur grayish and unspotted above, whitish with brown dots underneath, tail grayish.—Obs. On the Highlands of New-York, the Catskill and Peru mountains, the Alleghany, etc. Length from three to four feet, larger than the foregoing [*Lynx canadensis*].

From the above description, this name appears to have been based on the summer pelage of *Lynx canadensis*.

During the winter of 1877–78 a Canada lynx was killed near Rhinebeck, on the Hudson, and brought to Prof. James M. De Garmo, in whose collection I saw it soon after. This is the only record of its occurrence in the immediate vicinity of the Hudson River, during recent years, that has been brought to my attention.

LYNX RUFFUS (Güldenstädt).

WILDCAT; BAY LYNX.

Several stuffed specimens of wildcats said to have been killed in that neighborhood, are preserved in the hotels and stores of the Catskills. It is, in fact, fairly common in these mountains.

B. SPECIES WHOSE OCCURRENCE AT THE PRESENT TIME IS DOUBTFUL.

SCIUROPTERUS VOLANS (Linnæus).

SOUTHERN FLYING SQUIRREL.

The flying squirrels living near Schoharie Creek are quite likely to be of this species.

LASIURUS CINEREUS (Beauvois).

HOARY BAT.

A bat which I saw on August 14, 1896, was supposed to be of this species.

[1] American Monthly Magazine, November, 1817, II, p. 46.

LUTRA HUDSONICA Lacépède.

AMERICAN OTTER.

Otters were said by one or two of the Catskill residents to have been taken occasionally along Schoharie Creek and at Kaaterskill Lake during the past twenty-five years. We saw no signs of them.

MUSTELA AMERICANA Turton.

SABLE; PINE MARTEN.

Some of the residents assert that both the pine marten and the pekan, *M. pennanti* Erxleben, are still sometimes taken in the Catskills; others exclude the pekan, but say that the marten still exists.

CANIS NUBILUS Say.

GRAY TIMBER WOLF.

It is generally believed that the last wolf disappeared from the Catskills, along with the deer, many years ago, though one man expressed the belief that some still remain.

UROCYON CINEREOARGENTEUS (Müller).

EASTERN GRAY FOX.

A few gray foxes were said to have made their appearance in the upper part of Schoharie valley during recent years.

FELIS CONCOLOR Linnæus.

AMERICAN PANTHER.

One man told me that a panther had been killed in the Catskills within the past three years; others that it was extirpated long ago.

DIDELPHIS VIRGINIANA Kerr.

VIRGINIA OPOSSUM.

The opossum seems to be unknown in this portion of the Catskills, though it has been taken near the town of Catskill, at the base of the mountains, on the Hudson River side.

Mearns, Edgar Alexander. 1898. "Notes on the mammals of the Catskill Mountains, New York, with general remarks on the fauna and flora of the region." *Proceedings of the United States National Museum* 21(1147), 341–360. https://doi.org/10.5479/si.00963801.21-1147.341.

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