

ARTICLE XVI.—*Description of a New Subspecies of the Eastern Chipmunk, from the Upper Mississippi Region, West of the Great Lakes.* By EDGAR A. MEARNs, Assistant Surgeon, U. S. A.

Some months ago, when examining several specimens of the form of *Tamias striatus* here described, from Fort Snelling, Minnesota, certain peculiarities were noted in them, which led to their comparison with all of the specimens of this species available, including the series from the Museum of Comparative Zoölogy at Cambridge, as well as those in the American Museum. In order to ascertain whether the differences observed were constant, rather than accidental, an especial effort was made to procure additional specimens, which has resulted in a collection of thirty-five specimens, all obtained by the writer. Of these, thirty-two were taken at Fort Snelling, Minnesota, the point where the Mississippi is joined by the Minnesota River; and the remaining three came from the Lemonweir River, in Juneau County, Wisconsin, a stream which reaches the Mississippi through the Wisconsin River. The season during which these specimens were taken extends from April 2 to October 20, all of the intervening months but June being represented.

Through the kindness of Dr. J. A. Allen, of the American Museum, I have received the specimens of the *Tamias striatus* group, in the collection of that institution, for comparison with my own. This material comprises typical specimens of the northeastern race, *Tamias striatus lysteri*,* from Lake Umbagog, Maine, Rutland and Castleton, Vermont, the Catskill Mountains and Lewis County, New York, and Toronto and Lorne Park, Ontario, Canada, the last (three specimens collected by Mr. Ernest E. Thompson) of special interest as representing the type locality. All of the specimens from the lower Hudson—from West Point to New York—all from New Jersey, and all from Long Island, except a single specimen from Rockaway, are *striatus*, but do not exhibit its strongest characters, as expressed in examples from the

* Originally described by Richardson, from Penetanguishene, on the northeast arm of Lake Huron, but never recognized as subspecifically distinct from *Tamias striatus*, until so described by Dr. C. Hart Merriam (American Naturalist, XX, 1886, p. 236), who restored Richardson's name, as specimens from the region of the type locality were known to belong to the northeastern race (*lysteri*).

type locality—Virginia and the Carolinas. Massachusetts is an interesting neutral ground, furnishing specimens of both subspecies, more or less intermediate; those from Sheffield and Rehoboth, though clearly referable to *lysteri*, verge towards *striatus*, while those from Newton are intermediate between *lysteri* and *striatus*. Examples from Providence, Rhode Island, are *striatus*, but show an approach, both in measurements and color, to *lysteri*. A specimen from Erie, Pennsylvania, collected by Mr. Frank M. Chapman, is *lysteri*, but not reflecting its highest state of development; and six specimens from Ravenna, in northeastern Ohio, also near Lake Erie, are likewise to be referred to *lysteri*, but are more heavily colored than the last, and are much suffused with ferruginous yellow. Michigan specimens are likewise *lysteri*, and present slight local peculiarities of coloration, but in the main agree with those from Ohio.

Upon separating the above enumerated specimens of the two recognized subspecies, *striatus* and *lysteri*, and comparing the Fort Snelling series with them, a strong disagreement is found in each case. As coming from so high a latitude, and being of large size, they are naturally to be compared with *lysteri*, but their dark coloring, strong markings, stout 'build' and scant hairiness below, combine to form a striking contrast with that race, and it is found that it will bear a much closer comparison with *striatus*, especially as regards coloration. Like the latter, the body is stout and heavy, and the hands and feet broad in proportion to their length. It is probably the largest and heaviest of all the Chipmunks of this group. Though the feet are disproportionately broad, they measure in length fully as much as the largest examples of *lysteri*, two of the eleven adults measured reaching 38 mm., a size probably never exceeded by *lysteri*. Its general coloring closely resembles that of northern specimens of *striatus*, such as are before me from northern New Jersey and the lower Hudson Valley; but it is readily distinguished from them by the absence of the strong fulvous tinge of the sides, and of the castaneous of the rump, by the clearer iron-gray above, the greater posterior extension of all the dorsal stripes, and coincidentally of the gray bands bordering the median line at either side of the central black stripe; the white stripes are

broader, longer, and clearer white, and the central black stripe often reaches the root of the tail. The under side of the tail is pale buffy fulvous instead of deep hazel. In spring specimens the admixture of gray on the rump is a conspicuous point, in connection with the absence of the chestnut from that part. It may also be recognized by the coarseness and scantiness of the hair, and by the greater size of the feet, as well as of the body generally.

***Tamias striatus griseus*, subsp. nov.**

Habitat.—Upper Mississippi Valley, west of the Great Lakes.

General Characters.—A large, stout, grayish, interior race, in which the fulvous and ferruginous tints are much subdued, and the black markings rather pronounced.

Spring Pelage (based on two adult females—Nos. 2196 and 2197, Am. Mus. Coll.—taken April 2 and 13, which contained, respectively, five and four fœtuses, and a female—No. 3601, Am. Mus. Coll.—taken May 5, which is closely similar to the April specimens, it having recently undergone parturition). Pattern of markings as in *Tamias striatus*. Above mixed gray and black, giving an iron-gray tone, which is tolerably clear from the occiput to the middle of the back, whence posteriorly it is somewhat obscured by an admixture of light chestnut-rufous hairs, as is also the case on the forehead. The black stripes are sharply defined, but fade to a light chestnut posteriorly, except the central one, which commences as a black line at the occiput and extends, though indistinctly behind, to the root of the tail. The white stripes begin opposite the fore part of the shoulder, and are traceable to the root of the tail, though stained with ferruginous posteriorly. There is an inconspicuous admixture of light yellow tips to the hairs above, which extends over the sides as a distinct wash overlying the otherwise pale gray of the sides of the head and body and outer surface of the limbs, this light yellowish gray deepening to pale rusty on the hinder extremities. These parts are but slightly mixed with black hairs; but the grayish color of the sides is somewhat heightened by the gray underfur, which darkens to plumbeous on the back. The ears are quite pointed, densely clothed with rufous hairs on their inner surface, this color passing around the anterior border and forming a narrow band on the outer surface, which has a tricolored pattern, the front border being rufous, the posterior border pure white, and the triangular interspace dusky plumbeous. The dark spot at the base of the nose and behind the eye, and the stripes on the sides of the head, are rather well defined. The whiskers are long and black. The color of the sides fades insensibly into the clear white of the underparts, upon which the hair is coarse, and so scanty as to permit the skin to be seen through it; but the soles of the feet are well clothed as far as the tubercles. The upper surface of the manus is white, faintly washed with yellow, the pes being yellowish above, fading to whitish on the toes, and

with a dusky stripe below. The upper surface of the tail is dark ferruginous at the base, more or less grizzled and mixed with black, thence black, mixed with pale buff centrally, and hoary externally, the lateral hairs being buff or fulvous at base, narrowly ringed with black, with hoary tips, those of the upper surface being black, banded with buff in the middle, with slight hoary tips. The under surface varies from pale buff to fulvous, usually becoming darker towards the extremity.

Summer Pelage.—A nursing female, in very shaggy, worn coat (No. 3602, Am. Mus. Coll.), taken at Camp Douglas, Wisconsin, July 16, is molting, the change of coat having begun at the nose and progressed backward nearly as far as the ears. The new hairs are so broadly tipped with yellow as to conceal the darker, castaneous tone seen in spring specimens, the color being slightly olivaceous. Otherwise, aside from a general fading, it is like spring examples. A male (No. 3603, Am. Mus. Coll.), taken at the same place on August 24, has completed its molt throughout. Its markings, instead of appearing clear and bright, as might be expected after acquiring a new coat, are everywhere obscured by the yellow tips, as observed on the head of the July specimen; but in this specimen the color, which is more olivaceous still, is strongest on the posterior portion, where the fresh coat was latest acquired, while upon the forehead the usual color is being restored by the wearing away of the olive-yellow tips to the hairs. The general coloration differs but little from that of spring specimens.

Fall Pelage.—Seven adults, of both sexes, taken at Fort Snelling, from September 22 to October 4, are all in completed fall pelage, the coat having been worn long enough to take off most of the olive-yellow wash. They vary but little among themselves, and do not differ much from the early spring coat, though somewhat brighter, with a little more rusty or castaneous about the crown and rump. The underparts are white, and but little more densely coated than in the spring specimens.

Young.—In the youngest example before me (No. 780, Mearns Coll.), a female taken July 5, the head and body measured 140 mm. Aside from the usual wooliness of young mammals generally, there is little variation from spring specimens to note, save that it is of a slightly lighter color. A young male of the year (No. 3604, Am. Mus. Coll.) taken at Camp Douglas, Wis., on August 24, was closely similar to the adult male (No. 3603, Am. Mus. Coll.) above described, taken the same day, at the same place. It is strongly washed with yellowish. A dozen specimens, all young of the season, from Fort Snelling, taken from September 21 to October 20, show considerable variation in size, according as they were born early or late in the season. Young of the year, when examined in the flesh, at this season, may be readily distinguished by their narrow, stringy tails, as compared with the more bushy member of adults, though some are scarcely inferior in size. The hair is also shorter and much finer, producing a finer blending of colors; and the under side of the tail is usually paler. The young do not otherwise present any appreciable difference from adults at the same

season. Six fully grown females were taken late in autumn, which were classed as immature, having never borne young, and three males, after an examination of their skulls, were placed in the same category; these are probably young of the preceding year.

Dimensions (average measurements of eleven adults, three of which were males, and eight females, all of the latter having borne young; measured in the flesh by the author).—Length, measured from nose to end of vertebræ of tail, 261; head and body, measured from nose to tuberosity of ischium, 166; tail, from root to end of vertebræ, 103; tail, from root to end of hairs, 124; width of tail outspread, 42; height of ear from crown, 12.6; height of ear from notch, 19.9; width of ear, 14.7; girth of chest, 90; distance between eyes, 20.5; diameter of eye, 6; length of longest whisker, 32; from tip of nose to eye, 18.5; to centre of pupil, 23.1; to auditory meatus, 36.8; to tip of ear, 53; to occiput, 45.3; to end of outstretched hind limb, 244; length of fore limb, measured from coracoid process to end of longest claw, 61; from olecranon to end of claws, 46; length of manus, 23; width of manus, 6.8; longest claw of manus, 4.2; length of hind limb, measured from great trochanter to end of claws, 88; from knee-joint to end of claws, 65; length of pes, 36.3; width of pes, 8.1; longest claw of pes, 4.4 mm.

Type, No. 2196, Am. Mus. Coll., ♀ ad., Fort Snelling, Minnesota, April 2, 1889, Dr. Edgar A. Mearns.

Cranial and Dental Characters.—In this subspecies we have the largest and heaviest skeleton of the *Tamias striatus* group. The skull, measured from the posterior border of the occipital condyle to the end of the nasals, averages 2 mm. longer than the largest specimens of *lysteri* before me. Though the skull of *lysteri* is relatively less in its parietal, interorbital and zygomatic breadth, the molar series of teeth are more widely separated than in *griseus*, and have a greater posterior convergence, the rows being more nearly parallel in *griseus*. The infra-orbital foramen is much larger in *lysteri* than in *griseus*. The heavier ossification of *griseus* is most apparent when the mandibles are compared. They are much larger and rougher for the muscular attachments, with strikingly larger condyles than in *lysteri*, from which it also differs in having the lower outline of the jaw much more concave, owing to the relatively greater development of the angular process, which is produced downwards and backwards. In general, the skull bears a closer resemblance to that of *striatus* than it does to *lysteri*, but differs notably from the former in its considerably larger size.