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A REVIEW OF THE WEASELS OF EASTERN NORTH
AMERICA.

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The present paper treats of all the weasels of eastern North America west to and including the Great Plains. There is apparently no portion of this vast region not tenanted by at least one member of this cosmopolitan group. Generally one species occupies a very large area, in the central part of which no others are found, so that when two species occur together it is usually at points where the edges of their ranges overlap. It has been my experience that weasels are nowhere very abundant—never sufficiently so to exhaust their food supply. They are held in check by some natural cause, which may be the parasite that attacks the frontal sinuses of these animals as well as those of their relatives, the skunks, mink, and otter. I have seen skulls in such fearful condition that it would seem as if the animal must soon succumb; still there is no proof that the parasite ever does cause death. *Putorius longicauda* and *P. frenatus* are so free from its attacks that it is rare to find a skull of either badly affected. *P. noveboracensis*, on the other hand, suffers so much that it is hard to get perfect skulls, since many are so distorted that the whole interorbital region is unfit for comparison. As far as I can learn, *P. longicauda* occurs in larger numbers than any of our weasels, while *P. noveboracensis* is apparently not an abundant animal anywhere.

MATERIAL.

Through the kindness of Dr. C. Hart Merriam, Dr. J. A. Allen, Dr. G. Brown Goode, and Mr. William Brewster, I have been enabled to study the eastern weasels belonging to the Department of Agriculture, the American Museum of Natural History, the United States National Museum, and the Museum of Comparative Zoölogy. Dr. C. Hart Merriam, Mr. Gerrit S. Miller, Jr., Mr. Samuel N. Rhoads, and Mr. John H. Sage have also sent me all the skins of weasels in their private collections. These and the large series in the collection of E. A. and O. Bangs comprise a much larger amount of material than was ever before brought together, and enabled me to examine between five and six hundred skins and nearly as many skulls. Of some of the rarer species, as *P. peninsulæ*, *P. rixosus*, and *P. richardsoni*, there are still very few specimens in existence, and these are mostly old, poor, or imperfect. I am much indebted to Mr. Oldfield Thomas, of the British Museum, for comparisons with the supposed types of *P. richardsoni* and *P. longicauda* which are still in that museum, and for sending me specimens of the European species for comparison with ours.

Subgenus GALE Wagner.

Putorius proper, as restricted to the polecats and the ferrets of the old world, is represented in America by *Putorius nigripes* only. All our other weasels belong to the subgenus *Gale*.

The subgenus *Gale* is distinguished from *Putorius* proper by the slender elongate body, terete tail with a decided pencil, and the slightly palmate feet, rather than by any important structural characters. Skulls of the larger American weasels, such as *frenatus* and *longicauda*, are not essentially different from the skull of *Putorius* proper, and there is a regular gradation through *noveboracensis*, where the male skull resembles the *longicauda* group and the female skull the *richardsoni* group, down to the little, light, smooth skull of *rixosus*, which represents the extreme of differentiation of *Gale*.

VARIATION.

Sexual variation.—The great difference in size between the sexes of all the species of *Putorius* is now well known, but in no group is it so marked as in the subgenus *Gale*. The different species vary in this respect: in *P. noveboracensis* the difference is greater

than in any of the others, while in *P. longicauda* the sexes are more nearly alike. In adult examples of *P. noveboracensis* the male averages about eighty millimeters more in total length than the female, while in *longicauda*, which is a larger animal, the difference is about sixty millimeters. This sexual difference in size must always be kept in mind in trying to identify weasels, since it may give rise to a great deal of trouble, especially in skins made up by inexperienced collectors, who are unable to determine the sex of their specimens.

Apart from the difference in size, the sexes of most weasels are alike, *noveboracensis* being the only one to show other sexual characters (in this species there is a well marked sexual difference in the skull apart from size).

Variation with age.—Weasels vary much in size with age, continuing to grow for at least a year, and probably after the age can be told by the skull. Very young weasels in the first summer have the tails rather short, the hair of the tail very short and appressed, and the tail tapering off to a point without any decided pencil. In this condition the tail has a very different look from that of the adult. The color of the under parts is often more yellow or buffy in the young than in the adults, but on the whole the young and old do not differ much in external appearance.

The skull of course varies greatly with age. In young skulls the brain case always looks very large, round, and deep. By actual measurement, however, it is about as in the adult, and as the animal increases in age the rest of the skull grows up to it. The whole rostral portion of the skull is slender and small in the young and gradually becomes broader and heavier as the animal grows older. This change takes place slowly and seems to continue over a long period. Very old examples of any species, but especially of *P. richardsoni* and *P. r. cicognani*, show very broad, heavy rostrums. This is often the surest mark of great age, which a worn and broken condition of the teeth by no means always indicates. All the species of the *longicauda* group and the male of *P. noveboracensis* develop strong sagittal crests with age, while the members of the *richardsoni* group and the female of *P. noveboracensis* keep quite smooth and show only a slight indication of a sagittal crest. The sutures all close very early, and the skull has the appearance of age long before it has attained full size.

Individual variation.—The range of individual variation in color is slight and unimportant. In some forms, noticeably in *P. rich-*

ardsoni cicognani, there is a wide range in size. Just how much of this is due to age and how much to individual variation is hard to tell, as there is in this subspecies a constant increase in size from south north, examples from Minnesota and northern New Brunswick and northward being much larger than those from Massachusetts and Connecticut.

EARLY HISTORY OF THE SPECIES.

The first work that need be taken into consideration in studying our weasels is the *Fauna Boreali-Americana* of Richardson, published in 1829. In this the author described two species and gave them the names of the common European weasels, *vulgaris* and *erminea*. The latter he divided into two varieties, a large long-tailed one from Carlton House, Saskatchewan, and a large short-tailed one from Fort Franklin, Great Bear lake.

Bonaparte, in his *Fauna Italica* (fasciculus xxii), published in 1838, described a new weasel from the United States which he called *Mustela cicognani*. This was the same animal that Richardson had called *M. vulgaris*. The same year, in Charlesworth's Magazine, Bonaparte named Richardson's two varieties of *erminea* as distinct species, calling the long-tailed one from Carlton House *Mustela longicauda*, and the short-tailed one from Great Bear lake *Mustela richardsoni*. The next year (1839) Richardson, in the 'Zoölogy of Beechey's Voyage,' accepted Bonaparte's conclusions as stated above.

De Kay in 1840, in his 'Report on the Zoölogy of New York,' named a new weasel which he called *Putorius noveboracensis*. He gave no description and his name is a *nomen nudum*. Emmons, the same year (1840), in his 'Report on the Quadrupeds of Massachusetts,' described *P. noveboracensis*, attributing it to De Kay. Of course the name must date from Emmons. It is rather unfortunate, as Emmons gives no type locality. As he was treating only of Massachusetts mammals, it seems advisable to consider Massachusetts the type locality.

Audubon and Bachman in 1842, in the 'Journal of the Academy of Natural Sciences of Philadelphia,' described *Mustela fusca*, which is the same as *M. cicognani* of Bonaparte.

De Kay, in his 'Zoölogy of New York' (1842), in addition to *P. noveboracensis* gives *M. fusca* of Audubon and Bachman, and describes another weasel that he calls *Mustela pusilla*. All but the first are synonyms of *cicognani* Bonaparte.

Audubon and Bachman's 'Quadrupeds of North America' appeared in three volumes, from 1851 to 1853. In this work are given five species of weasels, namely, *Putorius ermineus*, *P. agilis*, *P. fuscus*, *P. pusillus*, and *P. frenatus*. Their *ermineus* and *agilis* are *noveboracensis* (the former the male and the latter the female). Their *frenatus* was a combination of *frenatus* and *xanthogenys*.

In 1857 appeared Professor Baird's great work, 'The Mammals of North America.' He gave six species of weasels as inhabiting eastern North America, namely, *P. noveboracensis*, *P. richardsoni*, *P. cicognani*, *P. pusillus*, *P. longicauda*, and *P. frenata*. All his species were correct except *richardsoni*. This animal he had never seen, and not being aware of the great sexual difference in size, he referred the smaller examples of *noveboracensis*, probably females, to it. His *Putorius pusillus* is the *P. rixosus* of the present paper, he wisely thinking that it was not the *M. pusilla* of De Kay. His *frenatus* was the true *frenatus* of Lichtenstein.

After Baird came a period of great confusion, authors giving all the species or nearly all accorded to eastern North America by Baird from any one locality they happened to be writing about.

Samuels, in his list of the 'Mammals of Massachusetts' (1861-1862), gave four species as inhabiting that State, namely, *richardsoni*, *cicognani*, *pusillus*, and *noveboracensis*. Of course these four were the males and females of our two common species, *cicognani* and *noveboracensis*.

Dr. Gilpin, in his 'Mammals of Nova Scotia' (1866), gave *P. richardsoni*, *P. noveboracensis*, and *P. cicognani* as inhabitants of that province. In reality there is but one weasel in Nova Scotia, and that is *P. cicognani*. I have examined nearly all the skins Dr. Gilpin sent to the United States National Museum and find them labeled *richardsoni* and *cicognani*, according to size. The measurements he gave for the specimen he called *noveboracensis* indicate a total length 100 millimeters greater than the largest male *noveboracensis* I ever measured and are probably erroneous.

Gray, in an article in the Proceedings of the Zoölogical Society of London for 1865, with his usual disregard for all previous names, gives two new ones, namely, "*Putorius erminea*, var. *americana*," which includes *P. longicauda* and *P. noveboracensis*; and for *P. cicognani*, "*Mustela (Gale) vulgaris*, var. *americana*." Fortunately neither of these names can stand. He based *P. richardsoni* on Baird; the animal is, as already stated, *P. noveboracensis*. In 1869 Gray arranged the American weasels in the same way in his 'Catalogue of the Carnivora in the British Museum.'

The next paper of importance is Allen's list of the 'Mammals of Massachusetts' (1869). Allen degraded all the species of previous authors and lumped all our weasels under the names *Putorius erminea* and *Putorius vulgaris*, allowing *P. frenatus* to stand as a doubtful form.

In 1877 appeared Coues' Fur-bearing Animals. In this work the author recognized four weasels in the whole of North America, namely, *vulgaris*, *erminea*, *longicauda*, and *brasiliensis frenatus*. This arrangement has been followed by most subsequent authors.

The species of the subgenus *Gale* inhabiting eastern North America may be arranged in three groups as follows:

- 1. Skull large and heavy, much constricted just back of postorbital processes, and developing a strong sagittal crest; postorbital processes well developed; inflated squamosal much reduced *Neogale* Gray.*

Name of species.	Type locality.
<i>Putorius longicauda</i> (Bonaparte).....	Carlton House, Saskatchewan.
<i>longicauda spadix</i> subsp. nov.....	Fort Snelling, Minn.
<i>brasiliensis frenatus</i> (Licht.).....	Valley of Mexico.
<i>peninsulæ</i> Rhoads.....	Hudson's, Pasco Co., Fla.

- 2. Skull of male developing sagittal crest; that of female smooth. Inflated squamosal much more reduced in the male than in the female; postorbital processes well developed in both sexes.

noveboracensis Emmons..... Massachusetts.

- 3. Skull light and smooth, not sharply constricted back of postorbital processes; developing only very slight sagittal crest; postorbital processes not well developed; inflated squamosal large and much inflated *Gale* Wagner.

richardsoni (Bp.)..... Fort Franklin, Great Bear lake.
richardsoni cicognani (Bp.)..... Eastern United States.
rixosus sp. nov..... Osler, Saskatchewan.

KEY TO THE WEASELS OF EASTERN NORTH AMERICA (IN SUMMER PELAGE).

Pelage coarse and harsh.

Tail less than half as long as head and body; a tuft of white hairs in front of ear and sometimes an indistinct white patch on forehead..... *peninsulæ*.

**Neogale* was proposed by Gray for the bridled weasels on account of the peculiar black and white facial markings. *P. longicauda* also belongs to this group, which is almost worthy of subgeneric rank.

Tail more than half as long as head and body ; head with distinct black and white markings or wholly unmarked.

Head with distinct black and white markings.....*frenatus*.

Head without black and white markings.

Upper parts light brown or clay color.....*longicauda*.

Upper parts dark rich brown*spadix*.

Pelage fine and soft.

Tail not tipped with black ; size smallest.....*rixosus*.

Tail tipped with black ; size medium or large.

Tail almost half as long as head and body ; feet usually without white markings.....*noveboracensis*.

Tail about one-third as long as head and body ; feet usually with white markings.

Under side of tail concolor with back ; tail vertebræ in adult male about 80 millimeters.....*cicognani*.

Under side of tail concolor with belly ; tail vertebræ in adult male about 100 millimeters.....*richardsoni*.

Putorius longicauda (Bonaparte). Long-tailed Weasel.

Pl. I, figs. 1, 1a ; II, figs. 1, 1a ; III, figs. 1, 1a.

Mustela (Putorius) erminea Rich., Fauna Boreali-Americana, 46-47, 1829 (in part: the long-tailed variety from Carlton House).

Mustela longicauda Bonap., Charlesw. Mag. Nat. Hist., II, p. 38, Jan., 1838. No description, but based on Richardson's long-tailed variety of *erminea* from Carlton House, Sask. (Rich., Fauna Boreali-Am., 1, p. 47, 1829).

Putorius longicauda Rich., Zoöl. Beechey's Voyage, p. 10,* 1839.

Baird, Mamm. N. Am., p. 169, 1857.

Coues' Fur-bearing Animals, p. 136, 1877 ; and of most subsequent authors.

Type locality.—Carlton House, Saskatchewan. The supposed type, a specimen in winter pelage, is in the British Museum.

Geographic distribution.—Northern plains from Saskatchewan and Alberta, south at least to Nebraska and Kansas, west to the Rocky mountains, and east only to the western edge of the eastern forest belt in Minnesota. Apparently abundant throughout its entire range. Inhabits parts of the Canadian, Transition, and Upper Sonoran Zones.

General characters.—Size very large ; tail very long, more than one-third of total length, with the black tip short, often scarcely more than the pencil ; claws long, sharp, and curved ; coat in summer pelage coarse and harsh.

Color.—Summer pelage: Upper parts pale yellowish brown, varying individually from strong tawny to clay color, rather darker on top of head and sides of nose ; under parts yellow (varying from buff yellow and maize yellow to pale ochraceous and saffron yellow) ; line of demarkation between colors of upper and under parts distinct and straight along the sides, color of under parts extending down inside of legs and covering the whole fore feet and toes and inside half of upper surface of hind feet ; chin

and upper lips white; tail same color as upper parts, sometimes a little paler below than above, becoming suddenly black at tip, and ending in a long pencil of black hairs; under fur a shade or two lighter than the long hairs. Winter pelage: Pure white all over, with no yellowish tinge; end of tail jet black. The change to a white winter coat apparently takes place over the entire range of the species.

Size.—Average of five adult males from Alberta and Saskatchewan: total length, 445.5; tail vertebræ, 161; hind foot, 51.5. Average of five adult females from Alberta, Saskatchewan, and North Dakota: total length, 385; tail vertebræ, 139; hind foot, 43.5.

Skull.—Short, broad, and massive, developing with age a strong sagittal crest; general shape of brain case, viewed from above, triangular, owing to great width across mastoids and sharp constriction behind postorbital processes; postorbital processes well developed and conspicuous; audital bullæ broad, deep, and short; inflated squamosal much reduced and not nearly flush with under surface of audital bullæ; distance from audital bullæ to postglenoid process very short; mandible large and heavy.

The skull of *P. longicauda* resembles the skull of *Putorius* proper more than that of the smaller members of the subgenus *Gale*.

The dentition is normal, but rather heavy.

Remarks.—*Putorius longicauda* is easily told from all other North American weasels. Its highly developed desert coloration, large size, and long, graceful tail make it one of our finest species. Specimens from Devil's lake, North Dakota, while referable to this species, are rather darker than true *longicauda* and are approaching its eastern subspecies *spadix*.

P. longicauda and its allies seem to be less subject to the attacks of the parasite that lives in the frontal sinuses of all the weasels than the other members of the subgenus *Gale*. The sexual difference in size is not so great in *P. longicauda* as in most of the other species.

***Putorius longicauda spadix* subsp. nov.**

Type from Fort Snelling, Minn., No. $\frac{3265}{1786}$, male, yg. ad., American Museum Nat. Hist., New York, col. by Dr. E. A. Mearns, U. S. A., June 25, 1889. Original number, 812.

Geographic distribution.—The western edge of the eastern forest belt in Minnesota (Fort Snelling and Elk river). The subspecies probably ranges north and south of this region. Further west, where the open, treeless plains are reached, it passes into true *longicauda*.

General characters.—Similar to true *longicauda*, from which it differs in color only.

Color.—Summer pelage: Upper parts Prout's brown, not very different from the color of *P. noveboracensis*, but perhaps a little brighter—very different from the yellowish and clay color of true *longicauda*. Under parts in the type white, with a faint greenish yellow tinge. In two topotypes

(Nos. $1\frac{2}{7}\frac{6}{8}\frac{3}{5}$ and 3264, American Museum Nat. Hist.) the belly is buff yellow, and in a skin from Elk river, Minn. (No. 31891, Dept. of Agric. coll.), it is strong buff yellow. All but the type, however, are immature, and the under parts of all are much lighter than in true *longicauda* of the same age. The line of demarkation, owing to the much darker upper and lighter under parts, is very much more distinct than in *longicauda*; it runs in an even line straight along the side. The color of the under parts covers the inside of the legs, under surface of the arms, and the whole of the hands and toes; upper lips and chin, white; tail, same color as back, with a short, black end, and also a long pencil of black hairs; under fur, same color as the long hairs. Winter pelage: Pure white, with no yellowish tinge; end of tail jet black.

The change to a winter white coat takes place over the entire range of the subspecies.

Size.—Type, male, yg. ad.: Total length, 445; tail vertebræ, 160; hind foot, 55. Average of five adult males from Fort Snelling and Elk river, Minn.: Total length, 467; tail vertebræ, 171; hind foot, 54. An adult female topotype measures: total length, 375; tail vertebræ, 123; hind foot, 42.5.

Skull.—Same as in true *longicauda*.

Remarks.—*Putorius spadix* is the dark-colored eastern race of *longicauda*. It seems to inhabit only a small area along the western edge of the eastern forest belt. In color it very closely resembles *P. noveboracensis*, from which it can easily be told by the white feet, longer tail with shorter black tip, and the harsh pelage; and with as great certainty by the skull, which is the same in all its characters as that of true *longicauda*.

***Putorius brasiliensis frenatus* (Licht.). Bridled Weasel.**

Mustela frenata Lichtenstein, Darstell. neuer o. wenig bekannt Saugth., pl. XLII and corresponding text, 1832.

Putorius frenata Aud. and Bach., Quad. N. Am., II, p. 71, 1851 (in part; not plate LX).

Putorius frenatus Baird, Mamm. N. Am., p. 173, 1857. Mex. Boundary Sury., part II, Rept. on Mammals, p. 19, 1859.

Putorius (*Gale*) *brasiliensis frenatus* Coues, Fur-bearing Animals, p. 142, 1877 (part).

Type from vicinity of the city of Mexico.

Geographic distribution.—Table-land of Mexico from city of Mexico northward to southeastern Texas (north at least to San Antonio and probably east along the coast to Louisiana).

General characters.—Size, largest of all our weasels, tail forming nearly half of the total length and with a short, black tip; hair rather short and coarse; conspicuous black and white markings on the head.

Color.—Upper parts light brown, varying from russet to raw umber, gradually darkening just back of the ears to black; a large spot between

the eyes and two larger bands extending from the throat up between the ear and the eye, white. These markings are very variable. Sometimes the bands are very broad and meet the white spot between the eyes, making a continuous white band around the head; sometimes they are reduced to a few white scattering hairs between the eyes and narrow and broken bands of white in front of the ears. The rest of the head, the ears, nose, and whiskers are black; under parts uniform, strong orange buff, sometimes tinged with ocher yellow; line of demarkation between colors of upper and under parts a little irregular and rather high up; hands, toes, and inside of feet a shade or two lighter than the under parts, but not white; chin and a very narrow border to upper lips white; tail same color as upper parts, its black tip short; under fur same color as long hairs; no seasonal change in color.

Size.—Average measurements of five adult males from Brownsville, Texas: total length, 499; tail vertebræ, 224; hind foot, 46. Average of three adult females from Brownsville, Texas: total length, 412.5; tail vertebræ, 172; hind foot, 36.5.

Skull.—Large and massive, but not differing in any essential characters from that of *P. longicauda*; it is larger and even more constricted back of the postorbital processes, and has a tendency to become more roughened in old age by muscular impressions.

This weasel, like all the *longicauda* group, is very free from the parasite that preys on the frontal bones; dentition normal, but heavy.

Remarks.—The geographic distribution of this weasel is still imperfectly known. In all probability the form has a much wider range than is actually shown by existing specimens. Probably, like many Mexican mammals, it extends east along the Gulf coast to the shores of Louisiana. Its western limit is not known.

***Putorius peninsulæ* Rhoads. Florida Weasel.**

Pl. I, fig. 5; II, fig. 5; III, fig. 5.

Putorius peninsulæ Rhoads, Proc. Acad. Nat. Sci. Phila., p. 152, 1894.

Chapman, Bull. Am. Mus. Nat. Hist., p. 345, 1894.

Putorius erminea Chapman, Bull. Am. Mus. Nat. Hist., p. 345, 1894.

Type locality.—Hudson's, Pasco Co., Florida.

Geographic distribution.—The whole of peninsular Florida and probably north into Georgia and the lowlands of South Carolina; inhabits the tropical fauna of Florida and perhaps the Austroriparian zone also.

General characters.—Size medium; tail short; very much shorter than in any other member of the *longicauda* group (less than one-third the total length) and tipped with black for about one-third its length; hair on the tail very short, making the tail look slender; feet slender and sparsely haired; the nails very conspicuous; coat everywhere short, coarse, and very lustrous.

Color.—Upper parts, hair brown, with a slight olivaceous tinge in a fine specimen from Tarpon Springs (No. 2379, coll. S. N. Rhoads); burnt

umber in a specimen from Osceola, Florida (No. 7929, coll. Am. Mus. Nat. Hist.), other skins varying between these two extremes; some white hair on the forehead and behind the eyes, varying in amount in different specimens, from large and well defined white markings in the type* to only a few hairs in the Osceola skin; a conspicuous patch of long white hair in front of opening of ear; under parts pale yellow (primrose yellow to pale buff yellow); line of demarkation between colors of upper and under parts high up and rather irregular. The color of the under parts covers under side of arms and whole of hands and extends down inside of legs, covering toes and inside half of upper surface of feet; upper lips and chin and under side of head back as far as the jaw white; tail same color as back, gradually shading to black at the tip, with a short black pencil; no seasonal change in color.

Size.—The size of the male of this weasel is a matter of doubt. An old adult breeding female from Tarpon Springs (No. 2379, coll. of S. N. Rhoads) measures: total length, 374; tail, 127; pencil, 20; hind foot, 44.5 (measured in flesh by W. S. Dickinson).†

Skull.—The skull of *P. peninsulæ* is quite different in many particulars from that of any other weasel I have examined, but clearly places the species in the *longicauda* group. It is large and massive, developing a strong sagittal crest with age; brain case very large and deep (viewed from above triangular with the great construction back of postorbital process and breadth across the mastoids of all the *longicauda* group); postorbital processes well developed; inflated squamosal more reduced than in any of our species, not excepting *longicauda*; audital bullæ extremely large, broad, and deep; mandible short and very heavy.

The dentition is much heavier throughout than in other species of about the same size, with the exception of the last upper molar, which is smaller. For instance, the old adult skull from Tampa bay, although smaller than male skulls of *noveboracensis* or *longicauda* of the same age, shows all the teeth to be actually larger, except the last upper molar, which is smaller than in either of these species.

Remarks.—Mr. Rhoads first described this remarkable weasel from a single unsexed skin, accompanied by the rostral portion of the skull and the whole lower jaw. He considered the specimen an adult female. It probably is a female, as it is about the size of the Tarpon Springs specimen, but is far from adult, as shown by the fact that the sutures are still plainly visible and the teeth unworn. One of the characters he gives is the position of the lower incisors, which are so crowded as to throw the second

* In the type these markings may be exaggerated by albinism, as it has a large, irregular white spot in the middle of the back and a white line on top of the head between the ears, a place where albinism in mammals usually shows itself.

† The measurements of the type taken from the dried skin, and therefore unreliable, are: total length, 375; tail vertebræ, 100; hind foot, 40.

incisor of each mandible behind the other incisors, giving the appearance of a double row of teeth. This condition is merely individual, and is not shown in other skulls of *peninsulæ*. It can be found in many examples of any species.

In the American Museum collection is a skin (No. $\frac{1245}{8616}$), with, unfortunately, only a fragment of the skull left, from Yemassee, in the southeast corner of South Carolina, which I refer with some doubt to *P. peninsulæ*. The specimen is labeled male. The skin is much shrunk and affords no actual measurement, except that of the hind foot, which is 41 millimeters, one millimeter more than in the type of *P. peninsulæ*, also measured from the dry skin. The colors are about as in *peninsulæ*, but the tuft of white hair in front of the ear is not present, and the yellow of the under parts, while covering the whole hand and inside of the arms, does not extend down the legs, but ends about the middle of the thighs, as in *noveboracensis*. The toes, however, are yellow. The fragment of skull has the teeth; they are a trifle heavier than in the average males of *noveboracensis*, while the animal is evidently smaller and has a shorter tail.

All the existing specimens of *peninsulæ* are very nearly of a size. If both sexes are represented, *peninsulæ* is remarkable for the slight difference in size between the male and the female. Male weasels always greatly outnumber the females, and it would be strange if all the seven examples of *peninsulæ* were females. This is a point of great interest, and can only be settled by properly sexed and measured male specimens, which I hope will turn up before long, as I believe that *P. peninsulæ* is far from a rare animal in Florida. I heard of it several times at Micco, where it is apparently not uncommon, but was able to get only the skull referred to below.*

I have been told by a reliable man, who used to live in south central Georgia, that a weasel is common there, and that he frequently caught them when trapping for other animals. Of course, he could not tell the species, but I fancy it is *peninsulæ*.

P. peninsulæ is known at present by only a few rather fragmentary and one good sexed and measured specimens, as follows: The type, No. 1515, coll. S. N. Rhoads, from Hudson's, Pasco county, Florida (a rather young, unsexed, and unmeasured skin, with a small part of the skull); No. 61490, U. S. Nat. Mus., from Polk county, Florida, winter 1893-1894, N. R. Wood, collector (good skin, without sex or skull); No. $\frac{3177}{6544}$, coll. Dr. C. Hart Merriam, from Tampa bay, Florida (an old adult, a poor unsexed and unmeasured skin, with a rather more perfect skull than the type, only the occipital part being gone); No. 7927, Amer. Mus. Nat. Hist., from Osceola, Florida (a good but unsexed and unmeasured skin, with no skull); No. 3053, coll. E. A. and O. Bangs, from Micco, Florida (a nearly perfect,

* The great difficulty is in trapping successfully in Florida with any kind of baited trap. Where there are hogs this is practically impossible, and in other places turkey buzzards, opossums and raccoons make the trapper's life a burden.

rather young skull); No. 2379, coll. of S. N. Rhoads (a fine adult breeding female, with the six mammae plainly visible in the skin, taken November 11, 1895, at Tarpon Springs, Florida, by W. L. Dickinson, with a nearly perfect skull), and No. $\frac{1245}{8616}$, Amer. Mus. Nat. Hist., from Yemassee, in the lowlands of South Carolina.

Putorius noveboracensis Emmons. New York Weasel.

Pl. I, figs. 2, 2a; II, figs. 2, 2a; III, figs. 3, 3a.

Putorius noveboracensis DeKay, New York Survey, p. 18, 1840 (*nomen nudum*). Zoölogy of New York, Mammalia, p. 36, 1842.

Emmons, Rept. Quad. Mass., p. 45, 1840.

Baird, Mammals N. Am., p. 166, 1857.

Samuels, Ann. Rept. Agric. Mass., p. 156, 1861-1862.

Putorius erminea Thompson, Nat. Hist. Vermont, p. 31, 1842.

Aud. and Bach., Quad. N. Am., II, p. 56, plate LIX, 1851.

Putorius agilis Aud. and Bach., Quad. N. Am., III, p. 184, plate CXL, 1854 (the female, not *Mustela agilis* of Tschudi).

Putorius richardsoni Baird, Mamm. N. Am., p. 164, 1857 (probably the female).

Samuels, Ann. Rept. Agric. Mass., p. 155, 1861-1862.

Mustela erminea Var. *Americana* Gray, P. Z. S., p. 111, 1865 (part); Cat. Carnivora, British Mus., p. 89, 1869 (part).

Mustela richardsoni Gray, P. Z. S., p. 112, 1865 (based on Baird); Cat. Carnivora, British Mus., p. 90, 1869 (based on Baird).

Putorius ermineus Allen, Bull. Mass. Comp. Zoöl., 1, p. 167, 1869 (part); Proc. Bost. Soc. Nat. Hist., XIII, p. 183, 1869.

Putorius (*Gale*) *erminea* Coues, Fur-Bearing Animals, p. 109, 1877 (part), and of most subsequent authors.

Type locality.—State of Massachusetts.

Geographic distribution.—Eastern United States from southern Maine, southern New Hampshire, and southern Vermont south to North Carolina (Raleigh, N. C.) and probably farther; west at least to Indiana and Illinois (Denver, Ind., and Warsaw, Ill.). Inhabits the Carolinian and Transition zones of the east and just touches the lower part of the Canadian zone. Apparently very rare at the northern and southern extremes of its range and attaining its greatest abundance in lower Transition and upper Carolinian country.

General characters.—Size large; tail long (more than one-third of the total length), with the black end from one-third to one-half the length of the tail; feet slender and small; pelage full and soft.

Color.—Summer pelage: Upper parts rich, deep reddish brown, varying from Prout's brown to Vandyke brown, generally rather darker along the middle of the back; under parts white to pale yellow (usually white in northern examples and yellow in southern); line of demarkation between colors of upper and under parts very irregular and low down, often leaving only a narrow band of white along the middle of the belly. This white band frequently encloses spots of brown. The color of the under parts generally extends half way down the inside of the thighs and to the wrists, the whole of the feet and upper sides of arms and hands being brown. The upper lips are usually but not always brown (in some examples they are broadly edged with white, as in *richardsoni* and *cicognani*).

The tail is the same color as the upper parts for about half its length, then begins gradually to darken, and is tipped with black; under fur the same color as long hairs. Winter pelage: The winter pelage is white or brown, according to latitude; it is white only in the northern part of the animal's range.* In the brown winter pelage the color is usually about the same as in summer, but the coat is, of course, much longer and fuller. I have seen a few winter skins that had not turned white, but were much lighter than the usual summer pelage. One of these (No. 2184, collection S. N. Rhoads, Chester county, Penn., December 16, 1890) has the whole upper parts a beautiful pale drab which fades almost insensibly into the white of the under part. In the white winter pelage the animal is white all over, with generally a yellowish tinge on the posterior half of the upper parts and the whole of the under parts, and with a conspicuous black tip to the tail, usually covering about one-third of its length.

Size.—Average of ten adult males from lower Transition zone: total length, 407; tail vertebræ, 139.5; hind foot, 47. Average of ten adult females from lower Transition zone: total length, 324.5; tail vertebræ, 108; hind foot, 34.5.

Skull.—There is great sexual difference, in addition to that of size, in the skulls of *P. noveboracensis*, which seems peculiar to this species. The post-orbital processes are well developed in both sexes. The male skull is large and develops a sagittal crest with age; the general shape of the brain case, viewed from above, is less triangular than in the *longicauda* group, being not so sharply constricted back of the postorbital processes and rather narrower across the mastoids; the audital bullæ are large and deep; the inflated squamosal is much reduced, but usually not quite to the same extent as in the *longicauda* group. The female skull is small and does not develop a sagittal crest; the general shape of the brain case, viewed from above, is nearly oblong, as in the *richardsoni* group; the inflated squamosal is large and much inflated and nearly flush with the lower surface of the audital bullæ; the audital bullæ and inflated squamosal meet in a rounding line (in the *richardsoni* group this line is usually straight). The female skull can be told from that of any of the *richardsoni* group with great certainty by its well developed postorbital processes.

The dentition is much heavier in the male than in the female, the difference being more marked than in other species.

Remarks.—*P. noveboracensis* is very generally distributed over the Atlantic tier of States from North Carolina to New Hampshire. It is the only weasel found in the Carolinian zone, but

* In northern New York and Vermont *P. noveboracensis* always assumes a white winter coat. In northern Massachusetts it sometimes does. I have two specimens, caught in the same trap at Wayland, Mass., one January 11, 1875, in the white pelage and the other January 12, 1875, in the brown pelage. In central Connecticut it never changes, as shown by large series from Liberty Hill, Conn., taken all through the winter, from October to March.

begins to overlap the range of *P. richardsoni cicognani* in Connecticut and New York, and thence northward gradually gets rarer as *cicognani* becomes commoner, until in the Canadian zone we have *cicognani* alone.

There is a slight variation in the color of the under parts, which to a certain extent is geographical, for southern examples as a rule have the belly yellow and northern ones have it white, but the difference is not altogether constant, and does not warrant dividing *noveboracensis* into two races.

It is unfortunate that DeKay cannot have the credit of naming this weasel, and still more so since we know that Emmons and DeKay were fast friends, and that Emmons meant to give him full credit of his discovery. The type locality of *P. noveboracensis* must, I think, be considered to be Massachusetts although Emmons in describing it mentions no locality in that State, nor even the State itself, but says only: "It is common to the middle and northern States." Of course, Emmons was writing only of the mammals of Massachusetts, which fact may be assumed to tie the type locality down to that State.

The male *noveboracensis* is more often seen than the female, and appears to be much commoner. In examining large series of weasels of any species one is always struck by the great preponderance of males, outnumbering the females about 5 to 1. There may be, however, some other cause to account for this, since the males are perhaps easier to trap or more active or courageous and therefore more often seen and killed; hence an examination of skins alone may give a false idea of the relative numbers of the sexes.

The sexual difference in size is very striking in *P. noveboracensis*. The male is a large and powerful weasel and does not hesitate to attack and kill animals the size of the cotton-tail rabbit and the domestic hen, while the female is such a little slender creature that it seems almost incredible that she can nurse and bring up a litter of males each of which soon grows to be much larger than herself. On June 5, 1894, some men at work on our place, at Wareham, Massachusetts, saw three weasels of this species cross a road and go into a stone wall. They immediately ran for a gun, and by imitating the squeaking of a mouse succeeded in attracting one, the adult female, out of the wall and shot her. I saw that she had been nursing, and placed some steel traps along the wall in positions where the other two would

go into them when they came back that way, as they were sure to do. The morning of June 9 I had them both. They were males, and although still retaining their milk teeth, each was very much larger than his mother.

Putorius richardsoni (Bonaparte). The American Ermine.

Pl. I, figs. 3, 3a; II, figs. 3, 3a; III, figs. 6, 6a.

Mustela richardsoni Bonaparte, Charlesw., Mag. Nat. Hist., II, p. 38, Jan. 1838 (based on specimen from Fort Franklin, Great Bear lake, Rich., F. B. A., p. 47, 1829).

Rich., Zoöl. Beechey's Voy., p. 10,* 1839 (not *Putorius richardsoni* Baird).

*Putorius (Gale) erminea** Coues, Fur-bearing Animals, p. 109, 1877 (in part).

Type locality.—Fort Franklin, Great Bear lake. The supposed type, a specimen in winter pelage, is still in the British Museum.

Geographic distribution.—Arctic America east at least to Fort Albany, on the west coast of James bay, and thence northwest to Alaska, where it reaches the Pacific coast. Whether *richardsoni* reaches the Atlantic coast or not is still a matter of doubt, but if it does it must be in the extreme

* The name of the European ermine or stoat has appeared a good deal in our literature, but wholly without warrant. In 1869, in his Catalogue of the Mammals of Massachusetts, Dr. J. A. Allen attempted to prove that all our weasels, excepting the bridled weasel and what he called *P. vulgaris* (probably a mixture of *cicognani* and *rixosus*) belonged to the European species, *P. erminea*. Doctor Allen never mentioned the crania of any of the weasels of which he treated and appears never to have consulted them, but went blindly ahead in an attempt to prove a preconceived theory—that all the carnivora of Europe, Asia, and North America were the same. One land bear, one wolf, one red fox, one mink, one ermine, and one weasel is what he allowed to the whole northern hemisphere. He was substantially followed by Dr. Coues, in his Fur-bearing Animals, in 1877, with the exception that Coues recognized *P. longicauda* as distinct. Since then the name *P. erminea* has been frequently used for American weasels of very different species.

There is really no need for confusing the European ermine and various closely related species or subspecies with any of our weasels. The only North American species that resemble it are *richardsoni* and *cicognani*, but from either of these it can be recognized at once by much larger size and by the greater extent of black on the tail and the immensely long pencil. The skull can be told from any North American member of the subgenus *Gale* at a glance. The brain case is shallow behind, with narrow supra-occipital. The audital bullæ are shallow and flat and the basioccipital broad. The skull can be distinguished by these peculiarities and its much greater size from any of our species with inflated squamosals. These are the only ones it need be compared with.

north.* Apparently abundant over the whole of this vast region and probably shades into *cicognani* in the transcontinental forest belt at the south of its range.

General characters.—Largest of the short-tailed American weasels. Tail short (a little more than one-fourth of the total length), tip black, pencil long and bushy; feet, large and broad; coat, very long, full, and soft.

Color.—Summer pelage: Upper parts pale yellowish brown, ranging from nearly raw sienna to nearly raw umber and intermediate shades, only a little darker than the upper parts of *P. longicauda*, under parts varying from primrose yellow to maize yellow; line of demarkation between colors of upper and under parts high up, straight and unbroken. Color of under parts covers under side of arms and hands, inside of legs and toes; upper lips and chin white; tail above, same color as back; below, same color as belly (usually all the way down to the black tip). This yellow under side of the tail is peculiar to this species, so far as I know, and is shown by every specimen except one that I have examined. This one is an adult breeding female (No. 4349, U. S. Nat. Mus.) from Fort Albany, James bay. It has the under side of the tail not yellow, but yet lighter than the upper side. This specimen is the most southerly and easterly example of *richardsoni* that I have seen and is probably shading toward *cicognani*. The under fur is the same color as the long hairs. Winter pelage: Pure white all over, often tinged with yellow on the tail, hind quarters, and belly; end of tail, for a little more than pencil, jet black; coat extremely long and full; feet very heavily furred. The change to a white winter coat takes place over the entire range of the species.

Size.—The type, evidently a male, although no sex was given, measured: head and body, 11 inches (280 mm.); tail, 4 inches (102 mm.). The only other specimens measured in the flesh are two in the United States National Museum. One of these (No. 5696, from Fort Simpson, December 20, 1860, male, Bernard R. Ross) measured: head and body, 10.30 inches (261.5 mm.); tail, 4.25 inches (107.5 mm.); hind foot, 1.70 (43 mm.). The other (No. 2065, "Barren Grounds," June 28, 1864, male, McFarlane) measured: "extreme length," 13 inches (330 mm.).

Skull.—Skull smooth and light, without pronounced sagittal crest, although in very old examples there is a slight sagittal development; general shape of brain case, viewed from above, oblong, owing to great breadth across interorbital region and relatively short distance across mastoids; postorbital processes short, blunt, and not well developed; audital bullæ long and deep and meeting the inflated squamosal in almost a straight line; inflated squamosal large, much inflated, and almost flush with audital

* On page 149 of Appendix No. IV, vol. II of Ross' Voyage, 8vo, 1819, is a description of a weasel killed at the west side of Baffin's bay. The description is quite minute, and the measurements given are: "From the tip of the nose to the insertion of the tail, eight inches and a half [= 218 mm.]; to the tip of the tail, eleven inches and a half [= 292 mm.]." The breast and belly are said to be yellow. The sex is not given.

bullæ; distance from audital bullæ to post-glenoid process much greater than in the large weasels of the *longicauda* and *noveboracensis* groups.

The skulls of the weasels of this group differ more widely from those of *Putorius* proper than do skulls of the *longicauda* group or of the male *noveboracensis*.

Remarks.—When Professor Baird wrote his 'Mammals of North America' he had never seen a specimen of *richardsoni*, the animal he called *richardsoni* being the small examples of *noveboracensis*, probably females. Since that time the National Museum has accumulated a large series of this interesting weasel, but most of the skins are in poor condition, unmeasured, unsexed, and accompanied only by fragmentary skulls, which are inside the skins. Still there are a few skulls in good condition accompanying the skins taken in Alaska by the indefatigable Nelson; measurements of these are given in the tables. A large proportion of the known skins came from points in Alaska, but there are many from stations that completely surround the type locality from Fort Albany to Franklin bay. The principal localities are Fort Albany, Fort Simpson, Fort Resolution, Fort McPherson, Big Island, Fort Rae, Fort Good Hope, Hudson bay, Fort Anderson, Anderson river, Peel's river, Yukon river, Franklin bay, Plover bay, Fort Yukon, mouth of Porcupine river, Norton sound, St. Michaels, and Point Barrow. They were collected for the most part by E. W. Nelson, B. R. Ross, R. McFarlane, George McTavish, J. Reid, R. Kennicott, L. Clarke, Jr., J. Lockhart, C. L. McKay, and Lieut. P. L. Ray.

Putorius richardsoni cicognani (Bonaparte). The small brown Weasel.

Pl. I, figs. 4, 4a; II, figs. 4, 4a; III, figs. 2, 2a.

Mustela (*Putorius*) *vulgaris* Rich., Fauna Boreali-Am. Quad., p. 45, 1829.

Mustela cicognani Bonaparte, Fauna Italica, fasc. XXII, 1838, Charlesw. Mag., II, p. 37, Jan., 1838.

Putorius cicognani Rich., Zool. Beechey's Voyage, p. 10,* 1839.

Baird, Mamm. N. Am., p. 161, 1857.

Samuels, Rept. Agric. Mass., p. 154, plate I, fig. 6, 1861–1862.

Gilpin, Trans. Nova Scotia Inst., II, p. 13, 1866 (read March, 1866).

Putorius richardsoni Gilpin, Trans. Nova Scotia Inst., p. 15, 1866 (read March, 1866).

Putorius vulgaris Emmons, Rept. Quad. Mass., p. 44, 1840.

Thompson, Nat. Hist. Vermont, p. 30, 1842.

Allen, Proc. Boston Soc. Nat. Hist., XIII, p. 183, 1869; Bull. Mus. Comp. Zoöl., I, p. 167, 1870.

Merriam, Mammals Adirondacks, p. 54, 1882.

Mustela fusca Aud. and Bach., Journal Acad. Nat. Sci. Phila., VIII, pt. II, p. 288, 1842.

DeKay, Zoöl. New York, I, p. 35, 1842.

Putorius fuscus Aud. and Bach., Quad. N. Am., III, p. 184, pl. 140, 1853.
Mustela pusilla DeKay, Zoöl. New York, I, p. 34, plate XIV, fig. 1, 1842.
Putorius vulgaris var. *Americana* Gray, P. Z. S., p. 113, 1865; Cat. Carnivora British Mus., p. 91, 1869.
Putorius (*Gale*) *erminea* Coues, Fur-Bearing Animals, p. 109, 1877 (in part).

Type locality.—Eastern United States.

Geographic distribution.—Northeastern North America from Long Island and Connecticut north to Labrador and Newfoundland, west at least to Minnesota (Fort Snelling and Elk river), and probably following the transcontinental forest belt nearly, if not quite, across the continent; inhabits the whole of the Hudsonian, Canadian, and Transition zones.

P. richardsoni cicognani is the characteristic weasel of northeastern North America and the only one occupying a large area in the Canadian and Hudsonian zones. It extends south to the southern limit of the Transition zone, but no farther. It begins to overlap the range of *P. noveboracensis* in the lower Canadian zone, and thence southward gradually becomes rarer as *noveboracensis* becomes commoner, until it disappears altogether in the valley of the lower Hudson. I have never seen a specimen from any point farther south. All through Connecticut, Massachusetts, New York, New Hampshire, and Vermont both species occur together.

General characters.—Size small; tail short, a little more than one-fourth of the total length tipped with black; feet large and broad.

Color.—Summer pelage: Upper parts rich, dark brown, varying from Prout's brown to almost seal brown, examples in fresh pelage sometimes having the peculiar purplish tone of seal brown; ear often bordered by a narrow white margin (not a lingering of the white coat, as I have often seen it in the young that had never changed to the white winter dress), which in worn midsummer specimens usually disappears. Southern specimens are rather darker, as a rule, than northern ones. Under parts usually pure silvery white in the more southern examples, but sometimes tinged with greenish yellow in specimens from Newfoundland and Labrador. The line of demarkation between colors of upper and under parts is high up, straight, unbroken, and very distinct, owing to the great contrast in color. Occasionally a specimen can be found with one or more irregular spots of brown on the chest and belly. The color of the under parts covers the under sides of the arms and hands and the inside of the legs and the toes. Upper lips always white; tail same color as back, both above and below, with a short black tip, which, including the pencil, occupies about one-third of the tail; under fur about the same color as the long hair. Winter pelage: Pure white all over, with usually a strong yellowish tinge on the hindquarters, tail, and belly; end of tail for a little more than the pencil, jet black; coat long and full; feet heavily furred. The change to a white winter pelage takes place over the entire range of the subspecies. In Connecticut *P. richardsoni cicognani* always turns white in winter, while *P. noveboracensis* never does.

It is rather curious that in changing back to the brown summer coat in spring (the change taking place in March or April, according to locality)

the white hairs persist longer in a well defined spot between the eyes and in front of the ears than elsewhere on the head. In the bridled weasel this spot between the eyes is a constant character, and in *P. peninsulae* the white patch in front of the ears is a constant character; and still these weasels have no white winter coat.

Size.—Average of ten adult males from the lower Canadian and Transition zones: total length, 285; tail vertebræ, 77.5; hind foot, 37. Average of three adult females from the lower Canadian and Transition zones: total length, 254; tail vertebræ, 69; hind foot, 30.5.

P. cicognani varies somewhat in size all through its range, but apart from this individual variation there is a gradual increase from south to north, and specimens from Newfoundland and Labrador and also those from Lake Edward and Godbout, Quebec, are nearly equal in size to *richardsoni*. A specimen from Codroy, Newfoundland (No. 3751, male, old adult, coll. E. A. and O. Bangs), measures: total length, 339; tail vertebræ, 97; hind foot, 48.

Skull.—Skull smooth and light, not developing sagittal crest with age. It differs very little from the skull of *richardsoni*, but perhaps is a little narrower and deeper, with the inflated squamosal a trifle more inflated and larger, and usually quite flush with the audital bulla, from which it is separated by an almost straight line; mandible and teeth rather lighter.

Two skulls from Codroy, Newfoundland (Nos. 1164 and 1177, coll. E. A. and O. Bangs), present a very remarkable character that I have never seen in any other skulls of *Gale*. Each has an extra molar on each side of the upper jaw, placed behind the regular last upper molar. These teeth are small and round, but well shaped and symmetrical on the two sides.

Remarks.—Bonaparte first described this little weasel under the name *Mustela cicognani* (*Fauna Italica*, fasc. xxii, 1838), giving a very brief and imperfect account of it, and no definite type locality; but his description indicates this animal and can apply to no other. Furthermore, the following statement, made by him the same year in Charlesworth's Magazine of Natural History, leaves no doubt as to the animal he had. He said: "During my stay in the United States I only saw a small species of *Mustela*, very common throughout the Union, which all the naturalists at that time considered as the *M. vulgaris*. I at once perceived that it was not that European animal, and that it approached more to the *M. erminea*. From that remark of mine the name was changed, as, for example, in Dr. Godman's Natural History. I have since, in my Iconography of the Italian Fauna, speaking of the new *M. boccamela*, taken an opportunity of revising the group *Mustela*, and of distinguishing the American under the name of *M. cicognanii*, as it is intermediate between the two European species." *P. cicognani*, before Bonaparte separated it, was, as he states, generally confused with the European *P. vul-*

garis (= *P. nivalis*). Richardson's *P. vulgaris* from Carlton House, Saskatchewan (Fauna Boreali-Americana, I, p. 46), is clearly this species. It was an adult female and the measurements given were taken before skinning. Richardson himself positively states this on page 10* of the Zoölogy of Beechey's Voyage.*

Professor Baird, in 1857, gave a clear and accurate description of *P. cicognani* (Mammals of North America, 161-162), but unfortunately he was not followed by subsequent authors.

Although the extremes of *richardsoni* and *cicognani* are very different-looking weasels, the evidence seems to prove that they are only races of one species. The larger light-colored weasels from Newfoundland and Labrador may safely be considered as intermediate, though rather nearer *cicognani*, while the Fort Albany specimen, referred to under *richardsoni*, is an intermediate, rather nearer to *richardsoni*.

***Putorius rixosus* sp. nov.** Least Weasel.

Pl. I, fig. 6; II, fig. 6; III, fig. 4.

Putorius pusillus Baird, Mamm. N. Am., p. 159, 1857 (not DeKay).

Putorius vulgaris Coues, Fur-Bearing Animals, p. 102, 1879 (in part).

Type from Osler, Saskatchewan, No. 642, female, young adult, coll. E. A. and O. Bangs, coll. by W. C. Colt, July 15, 1893. Original No., 79.

Geographic distribution.—Arctic and boreal America from Alaska south at least to Saskatchewan and Moose Factory.

General characters.—Size very small; tail very short, without black; pencil short.

Color.—Summer pelage: Upper parts rich reddish brown, from burnt umber to Vandyke brown; under parts pure white in every example but the type. The type has the under parts a soiled white or pale drabbish, that I attribute rather to staining than to coloring matter in the hair itself, as many of the hairs when taken singly are white; line of demarcation between colors of upper and under parts high up and even; color of under parts covering under side of arms and hands and inside of legs and toes; upper lips white; tail to very end same color as back; under fur same color as the long hairs. Winter pelage: Entirely pure white all over, including end of tail. The change to a white winter pelage probably takes place over the entire range of the species.

Size.—Type (female yg. ad.): Head and body, 150; tail, 31 (taken in flesh by collector, W. C. Colt).

* In many worn midsummer specimens of *P. cicognani* the black tip to the tail fades to a blackish brown, and is then not in very marked contrast to the rest of the tail. Specimens in this condition may have strengthened the opinion, so generally held by early writers, that the animal was identical with the European *P. nivalis*.

Skull.—Skull very small and light, with the same oblong brain case and large inflated squamosal as in all the *richardsoni* group, from which it differs in exceedingly small size only.

Remarks.—This rare and little known weasel was first described by Baird in 1857. But Baird referred it to *Mustela pusilla* of DeKay, with the remark, "It is barely possible that the specimen here described may be different from the New York species as given by Dr. DeKay." De Kay's *M. pusilla* was the *M. cicognani* of Bonaparte, as shown by his description and measurements and by its geographical distribution.

P. rixosus is at present very imperfectly represented in collections. There are a few skins in the United States National Museum from points in Arctic America, from Fort Albany to Alaska. Most of these skins are in poor condition and have what is left of the skull inside the skin. They are also unsexed. There are two very good skins from Moose Factory, Ontario, made by C. Drexler (No. 5532, Museum Comparative Zoölogy, Cambridge, Mass., and No. 4231, United States National Museum. The latter is labeled male, but I think it is really a female). Two of the Alaska examples are in winter pelage and are pure white all over, including the end of the tail. One from the upper Yukon (No. 13904, collected by E. W. Nelson) is apparently a male. All the others are apparently females. Even this male, although unmeasured, is, so far as can be judged, smaller than full-grown females of the European *P. nivalis*.

In summer pelage *P. rixosus* can be distinguished from the European *P. nivalis* by its darker color, and at all seasons by its very much smaller size.

Dr. Coues, in his 'Fur-Bearing Animals,' speaks of larger examples with longer tails, the ends of which are dusky, and refers such specimens to this species (which he called *P. vulgaris*). In this he was in error, as was Professor Baird in considering No. 2319 from Steilacoom, Washington, to be this animal. I have seen many such, and in every case close examination has proved them to be the young of either *P. richardsoni* or *P. cicognani*, with the milk dentition plainly visible. The short, closely haired tails of young weasels of this group, with the end not distinctly black, owing to the hairs of the tail not being full grown, gives them a superficial resemblance to *P. rixosus*. But in all such cases the teeth at once tell the story. Two specimens in the National Museum, No. 5686, from Big Island, and No. 5691, from Fort Rae, are very good examples in point.

P. rixosus is, I believe, the smallest known carnivorous animal.

Table of Average Cranial Measurements of *Putorius*.

Name.	Locality.	Sex and age.	Number of specimens.	Basilar length from anterior lip of foramen magnum to front of premaxillary.	Occipito-nasal length.	Greatest zygomatic breadth.	Greatest mastoid breadth.	Breadth across post-orbital processes.	Distance from audital bulla to post-glenoid process.	Greatest length of lower jaw.
<i>P. longicauda</i>	Alberta, Sask., and N. Dak.....	♂ ad.	6	47.4	46.8	29.6	25.8	14.0	3.7	29.0
".....	Alberta, Mont., and N. Dak....	♂ ad.	6	42.8	42.4	25.7	22.9	12.0	3.9	25.4
<i>P. l. spadix</i>	Fort Snelling and Elk river, Minn.	♂ ad.	5	48.2	47.6	29.5	25.8	14.4	3.3	30.4
".....	" " "	♀ ad.	2	44.1	42.3	25.1	22.5	11.9	3.6	26.5
<i>P. frenatus</i>	Brownsville, Texas.....	♂ ad.	6	50.5	49.3	30.2	25.8	14.3	4.0	31.2
<i>P. peninsulæ</i>	Tarpon Springs, Fla.....	♂ ad.	1	45.8	46.2	26.8	24.2	14.4	3.0	29.4
<i>P. noveboracensis</i> ...	Liberty Hill, Conn.....	♂ ad.	10	45.4	45.6	26.5	22.4	14.2	4.4	27.8
".....	" " "	♀ ad.	6	37.9	38.3	20.8	18.3	11.0	4.6	21.6
<i>P. richardsoni</i>	St. Michaels and Yukon, Alaska.	♂ ad.	6	43.2	43.7	26.3	22.8	13.9	5.0	25.4
".....	" " "	♀ ad.	3	37.8	38.8	21.7	19.1	12.0	4.8	21.1
<i>P. r. cicognani</i>	Codroy, Newfoundland.....	♂ ad.	7	41.3	41.5	23.5	20.3	12.3	5.1	23.3
".....	Bucksport, Maine.....	♂ ad.	5	39.0	39.9	21.6	19.4	11.3	5.2	21.7
".....	Ossipee, N. H.....	♂ ad.	4	38.6	39.0	20.9	18.8	10.7	5.3	21.2
".....	Liberty Hill, Conn.....	♂ ad.	1	37.2	37.2	19.8	18.2	9.8	5.0	20.0
".....	Codroy, Newfoundland.....	♂ ad.	3	36.6	36.2	19.3	17.1	10.3	5.1	18.9
".....	Mt. Forest, Ontario.....	♀ ad.	1	32.6	33.2	17.8	16.0	8.8	5.0	17.4
<i>P. rixosus</i> (type).....	Osler, Sask.....	♀ ad.	1	.....	27.2	14.2	13.4	7.0	3.8	14.0
<i>P. ermineus</i>	England.....	♂ ad.	1	46.0	46.6	28.0	24.0	14.0	5.2	28.4
".....	".....	♀ ad.	1	40.6	42.4	24.2	21.2	13.4	5.2	23.2
<i>P. nivalis</i>	".....	♂ ad.	4	35.8	35.7	20.7	18.1	10.4	4.1	20.0
".....	".....	♀ ad.	3	31.5	31.7	16.9	15.3	9.0	4.4	17.3

Table of Average Measurements.

Name.	Locality.	Sex and age.	Total length.	Tail.	Hind foot.	No. of specimens in average.
<i>Putorius longicauda</i>	Wingard, Sask.....	♂ old ad.	466.0	173.0	50.0	1
".....	Osler, Sask.....	♂ ad.....	440.5	158.0	.....	2
".....	Wingard, Sask.....	♂ old ad.	417.0	162.0	48.0	1
".....	South Edmonton, Alberta.....	♀ yg. ad.	389.0	145.0	45.0	1
<i>Putorius longicauda spadix</i>	Fort Snelling, Minn. (type loc.).....	♂ ad.....	461.0	170.5	54.4	5
".....	" " ".....	♂ old ad.	375.0	123.0	42.5	1
<i>Putorius brasiliensis frenatus</i>	Brownsville, Texas.....	♂ ad.....	496.4	220.0	47.1	7
".....	" " ".....	♂ ad.....	416.0	172.0	36.6	3
<i>Putorius peninsulæ</i>	Tarpon Springs, Fla.....	♂ ad.....	374.0	127.0	44.5	1
<i>Putorius noveboracensis</i>	Liberty Hill, Conn.....	♂ ad.....	407.9	138.4	47.5	10
".....	" " ".....	♂ ad.....	319.0	106.5	33.7	6
<i>Putorius richardsoni</i>	Fort Franklin, Great Bear lake.....	♂ ad.....	*	102.0	.....	1
".....	Fort Simpson, Mackenzie river.....	♂ ad.....	†	107.5	43.0	1
<i>Putorius richardsoni cicognani</i> ..	Codroy, Newfoundland.....	♂ ad.....	327.3	94.7	46.1	7
".....	Bucksport, Maine.....	♂ ad.....	298.9	82.1	39.2	5
".....	Ossipee, N. H.....	♂ ad.....	277.8	79.6	36.6	5
".....	Liberty Hill, Conn.....	♂ ad.....	261.0	60.0	34.0	1
".....	Codroy, Newfoundland.....	♂ ad.....	256.7	77.3	33.3	3
".....	Mt. Forest, Ontario.....	♂ ad.....	258.5	74.0	31.5	1
<i>Putorius rixosus</i> (type).....	Osler, Sask.....	♂ ad.....	181.0	31.0	.....	1
".....	Yukon, mouth of Porcupine river, Alaska.	♂ ad.....	177.5	17.5	.....	1
<i>Putorius ermineus</i>	England.....	♂ ad.....	393.0	123.0	47.0	1
".....	".....	♀ ad.....	314.0	88.0	40.0	1
<i>Putorius nivalis</i>	Scotland.....	♂ ad.....	257.5	52.0	31.0	2
".....	".....	♀ ad.....	237.0	49.0	26.0	1

* Head and body, 280.

† Head and body, 261.

EXPLANATION OF PLATES.

PLATES I AND II.

(Explanation of figures the same in both plates.)

Fig. 1. *Putorius longicauda* (Bonap.).

1. ♂ ad. Wingard, Saskatchewan (No. 73183, U. S. Nat. Mus., Dept. Agric. coll.).
- 1a. ♀ ad. Wingard, Saskatchewan (No. 75483, U. S. Nat. Mus., Dept. Agric. coll.).
2. *Putorius noveboracensis* Emmons.
 2. ♂ ad. Adirondacks, New York (No. 3843, Merriam coll.).
 - 2a. ♀ ad. Adirondacks, New York (No. 5598, Merriam coll.).
3. *Putorius richardsoni* (Bonap.).
 3. ♂ ad. St. Michaels, Alaska (No. 36243, U. S. Nat. Mus.).
 - 3a. ♀ ad. St. Michaels, Alaska (No. 36246, U. S. Nat. Mus.).
4. *Putorius richardsoni cicognani* (Bonap.).
 4. ♂. Bucksport, Maine (No. 4247, coll. E. A. and O. Bangs).
 - 4a. ♀. Mt. Forest, Ontario (No. 789, coll. E. A. and O. Bangs).
5. *Putorius peninsulæ* Rhoads.
 - ♀ old. Tarpon Springs, Florida (No. 2379, coll. S. N. Rhoads).
6. *Putorius rixosus* nob.
 - ♀ ad. (type). Osler, Saskatchewan (No. 642, coll. E. A. and O. Bangs).

PLATE III.

Fig. 1. *Putorius longicauda* (Bonap.).

1. ♂ ad. Wingard, Sask. (No. 73183, U. S. Nat. Mus., Dept. Agric. coll.).
- 1a. ♀ ad. Wingard, Sask. (No. 75483, U. S. Nat. Mus., Dept. Agric. coll.).
2. *Putorius richardsoni cicognani* (Bonap.).
 2. ♂. Bucksport, Maine (No. 4247, coll. E. A. and O. Bangs).
 - 2a. ♀. Mt. Forest, Ontario (No. 789, coll. E. A. and O. Bangs).
3. *Putorius noveboracensis* Emmons.
 3. ♂ ad. Adirondacks, New York (No. 3843, Merriam coll.).
 - 3a. ♀ ad. Adirondacks, New York (No. 5598, Merriam coll.).
4. *Putorius rixosus* nob.
 - ♀ ad. (type). Osler, Sask. (No. 642, coll. E. A. and O. Bangs).
5. *Putorius peninsulæ* Rhoads.
 - ♀ old. Tarpon Springs, Florida (No. 2379, coll. S. N. Rhoads).
6. *Putorius richardsoni* (Bonap.).
 6. ♂. St. Michaels, Alaska (No. 36243, U. S. Nat. Mus.).
 - 6a. ♀. St. Michaels, Alaska (No. 36246, U. S. Nat. Mus.).



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