REPORT
ON THE
QUADRUPEDS
OF
MASSACHUSETTS.

PUBLISHED AGREEABLY TO AN ORDER OF
THE LEGISLATURE,
BY THE COMMISSIONERS ON THE ZOOLOGICAL AND BOTANICAL SURVEY
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A
REPORT
ON THE
QUADRUPEDS OF MASSACHUSETTS.

BY
EBENEZER EMMONS, M. D.

TO GEORGE B. EMERSON, ESQ.,

Chairman of the Zoological Commission :

SIR,

IN the execution of the trust committed to my hands, that of making known the Quadrupeds of the State, I have been governed by the principle, that general utility was the object to be aimed at. In view of the present state of our knowledge, I concluded, not without much hesitation, that this object would be best secured by a faithful and accurate description of the animals within our borders. This conclusion was forced upon my mind, when I found it necessary to study the characters of animals with a view to their recognition ; for I saw, in the course of my investigations, that little had been done in the application of distinctive characters, and that, therefore, in this particular part of science, there was a field which required cultivation. Having adopted these views, it became necessary that I should investigate, examine, and describe for myself those animals in the branch of Natural History which had been assigned me. Of the execution of this task, all that I desire to say is, that it will be found accurate and true to nature. I may not have been sufficiently minute in the description of some of the most characteristic parts, as the teeth, for example. Still, I believe that the most essential characters are given. In drawing up generic and specific characters, I have studied brevity as far as I deemed it useful. My general descriptions and observations, I might have extended to a much greater length ; but, in this particular, I have attempted to avoid extremes. Of the descriptions, characters, observations, and dimensions, I remark, generally, that they are my own, and that they are given from actual inspection, and with the objects before me at the time they were penned ; a few instances only have occurred in which I have not had the specimen before me from which I could draw up a description. In those instances, I have, of course, relied upon the most approved authority. As it regards the additions to our Fauna, I may remark, that I have been able to add only two new species. Both of these belong to the genus *Arvicola*, under which they will be found described. From

this statement, it will be seen that I have not been very successful in the discovery of new species. There are, undoubtedly, several among the small quadrupeds yet to be added, but I have not been fortunate enough to make many such discoveries myself.

In preparing this Report, I have made use of the excellent work of Richardson on the northern animals of this continent, also of the work of Mr. Bell, whose ordinal names I have adopted; both of whom have also essentially aided me in drawing up generic and specific characters. Of American authors, Harlan and Godman have been of essential service. With the publications of Dr. Backman of Charleston I was unacquainted till most of the Report was written, and was only able to avail myself of his labors upon our Squirrels. In justice to the authors already mentioned, as well as others, it becomes me to remark, that I may have made a greater use of them than appears in this acknowledgment; and when this may seem to be the case, in the perusal of the Report, I trust that it will not be considered a design to commit depredations on the property of others who have labored, and more efficiently too, in the same field, but an oversight, arising, it may be, from neglecting to make the references at the proper time. Of unpublished works, Dr. J. E. De Kay's "Report on the Animals of New York" has been quite useful. More especially, however, am I indebted to him for personal observations on many of our Mammalia.

On comparing the old Catalogue with the one I have drawn up, it will be seen that there are several important alterations; all of which were unquestionably necessary. Many of these were made by Dr. De Kay, whose name is familiar not only in this country, but in Europe, and whose authority is acknowledged by the naturalists of the old and new world.

In this Catalogue, I have been averse to the admission of doubtful species, or those which I did not know, from personal observation, to have been found within the limits of the State, excepting those which are well known to have been extirpated. There are a few, however, which I have admitted, which I have not actually seen in Massachusetts; but, having seen them under circumstances which satisfied me that they were residents, if we may rely on the laws which govern the distribution of animals, I have admitted them as such. Living, as I do, in a corner of the State, at a distance from the sea coast, it is probable that there are several smaller quadrupeds, inhabiting the salt marshes and other secluded places, which are well known to other naturalists,

but of which I am entirely ignorant ; these, however, cannot amount to more than three or four species. I consider, therefore, that the following Catalogue is very nearly an accurate list of the quadrupeds of Massachusetts.

CATALOGUE OF THE QUADRUPEDS OF MASSACHUSETTS,

ARRANGED ACCORDING TO THEIR NATURAL FAMILIES.

ORDER CARNIVORA.

Family VESPERTILIONIDÆ.

- Vespertilio pruinosus.
- “ Noveboracensis.
- “ Carolinensis.

Family SORICIDÆ.

- Sorex brevicaudis.

Family TALPIDÆ.

- Scalops Canadensis.
- Condylura longicaudata.
- “ macroura.

Family URSIDÆ.

- Ursus Americanus.
- Procyon lotor.

Family CANIDÆ.

- Canis lupus.
- Vulpes fulvus.
- “ Virginianus.

Family FELIDÆ.

- Lynx borealis.
- “ rufus.
- Felis concolor.

Family MUSTELIDÆ.

- Mustela Canadensis.
- “ martes.
- Putorius vison.
- “ vulgaris.
- “ Noveboracensis.
- Lutra Canadensis.
- Mephitis Americana.

ORDER RODENTIA.

Family CASTORIDÆ.

- Castor fiber.
- Fiber Zibethicus.

Family LEPORIDÆ.

- Lepus Americanus.
- “ Virginianus.

Family MUSCIDÆ.

- Arvicola hirsutus.
- “ albo-rufescens. n. sp.
- “ Emmonsii. n. sp.

Family MUSCIDÆ.

- Mus musculus.
- “ rattus.
- “ decumanus.

Family MUSCIDÆ.

- Arctomys monax.
- Sciurus leucotis.

- “ vulpinus.
- “ niger.
- “ Hudsonius.
- “ striatus.

Family MUSCIDÆ.

- Pteronys volucella.
- Gerbillus Canadensis.

Family HYSTRICIDÆ.

- Hystrix dorsata.

ORDER RUMINANTIA.

Family CERVIDÆ.

- Cervus alces.
- “ tarandus.
- “ Virginianus.

It will be perceived that I have omitted in this Catalogue the domestic animals. I could add nothing to the general stock of information concerning them ; descriptions, therefore, would only have increased the size of this Report, without increasing its value. The

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most important omissions, however, are those which relate to the Seals and Whales. The same reason has operated to produce this result, as in regard to our domestic animals. I could only copy what others had written; no opportunities have occurred by which I could make a single observation. I have, therefore, preferred to leave these subjects entirely untouched, though the Report appears, in consequence thereof, incomplete.

Yours,

With the highest respect and esteem,

E. EMMONS.

Albany, April 1, 1840.

NOTE. The measurements given in this Report are in feet, inches, and tenths.

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CLASS MAMMALIA.

THE class Mammalia is divided by Cuvier into eight orders. The first is Bimana, of which man is the type. The second is Quadrumana, including animals with four hands ; it is entirely wanting in the United States ; no monkey, according to the best naturalists, has been observed beyond the twenty-ninth degree of north latitude. The succeeding order embraces numerous species which are widely distributed. They are characterized as follows :

ORDER III. CARNIVORA.

Characters of the order. Animals feeding mostly on animal food ; destitute of a thumb which is capable of free motion, and opposable to the toes ; possess three kinds of teeth. — It is very naturally divided into four families, viz. CHEIROPTERA, INSECTIVORA, CARNIVORA, and MARSUPIALIA. The first family is distinguished by pectoral mammae, and the fourth by abdominal pouches. The species of the order Carnivora are exceedingly numerous. A more minute subdivision of them is into the following nine families. VESPERTILIONIDÆ, SORICIDÆ, TALPIDÆ, URSIDÆ, CANIDÆ, FELIDÆ, MUSTELIDÆ, PHOCIDÆ, and TRICHECHIDÆ.

FAMILY I. VESPERTILIONIDÆ. THE BAT FAMILY.

Characters of the family. Animals formed for flight, and taking their prey on the wing ; nocturnal ; supplied with nails in the form of hooks for the suspension of the body. Teeth. Incisors $\frac{4}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{4}{5}=\frac{4}{5}$ or $\frac{5}{6}=\frac{5}{6}$; = 32 or 36. Superior incisors in pairs ; the second often minute. Inferior,

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crowded and bilobed ; anterior molars conical, posterior bristled with points ; nose without a furrowed, wrinkled and leaf-like membrane ; tongue smooth ; membranes extended ; tail entirely enveloped in the interfemoral membrane ; fur soft and thick.

Observations. Dr. Richardson assigns sixteen species of Cheiroptera to North America. Other authors have indicated no less than twenty-four. The latter number is considered as too high, or as not being sufficiently well characterized. But nine species, according to De Kay, have been detected in the United States, and five only have been described as belonging to the State of New York.

GENUS VESPERTILIO.

Generic characters. True grinders $\frac{3}{3}=\frac{3}{3}$; without nasal appendages ; ears at most but little longer, and sometimes shorter, than the head.

1. Vespertilio pruinus. Say. The Hoary Bat.

Vespertilio pruinus, *Say*, Long's Exp., vol. i. p. 168. *Richardson*, Fauna Bor. Amer., p. 1.

Nycticeius tessellatus, *Raf.*

Hoary Bat, *Godman*, Am. Nat. Hist., vol. i. p. 68.

Figure ; *Ibid.* p. 68.

Specific characters. Dental system ; incisors $\frac{1}{6}=\frac{1}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{4}{5}=\frac{4}{5}$; = 30. Color about the ears and front, pale tawny ; the remaining parts of the body, including the flanks and interfemoral membrane, except a narrow edging of the latter, dark ferruginous, intermixed with dusky black on the back, and all tipped with white, thus giving it a decidedly hoary appearance.

Description. The superior incisors are conical and sharp-pointed, and separated from each other by a wide space. Inferior incisors very short and almost concealed, and in close contact with each other. The upper canines are almost twice as high as the molars. The nostrils are 2 lines apart, and turned a little outwards, and have a raised margin. Ears shorter than the head, nearly circular. The form of the tragus is nearly that

of a scalene triangle, obtuse and arcuated. Interfemoral membrane triangular, and terminated with a slight projection of the tail; the wing membrane presents some hairy patches above the elbow joint, and at the roots of the metacarpal bone; the hind feet are covered with a hoary fur above, and are furnished with short, curved claws.

Dimensions.

	in. l'ths.
Length of the head and body, ...	4 0
Tail, ...	2 0
Spread of the wings, ...	15 0
Distance between the ears, ...	0 7

Observations. This species of Bat is very widely distributed. It was first noticed by Mr. Nuttall at Council Bluffs, on the Missouri; and Mr. Say describes an individual which was captured in the same neighbourhood, in Long's Expedition. According to Dr. Godman, it has been taken near Philadelphia. It has also been found in Georgia by Major Le Conte, and near Charleston in South Carolina by Dr. Backman. Still farther from the place of its first discovery, it has been found near Salem, Massachusetts. From these facts, this fine species may be considered as common throughout the United States, and especially on the Atlantic coast. Dr. Richardson met with it also as far north as latitude 54° . Mr. William Cooper, whose opinion is always valuable, supposes it may migrate to the South from this high latitude. It is sometimes seen on the wing during the day especially in cloudy weather.

2. *Vespertilio Noveboracensis.* New York Bat.

New York Bat, *Penn.*, Syn. p. 367. *Idem*, *Arct. Zool.* i. p. 184.

Vespertilio Noveboracensis, *Gmel.*, Syst. i. p. 50, sp. 21. *Harlan*, Fauna Am., *Godman*, Am. Nat. Hist. i. p. 68.

Red Bat of Penn., *Wilson*, Amer. Orn., plate 50, p. 60.

Taphozous rufus, *Lesson*, Mamm.

Nyctirea Noveboracensis, *Le Conte*, in App. to *McMurtrie's Cuvier*, i. p. 441.

Figure; *Godman*, Am. Nat. Hist. i. p. 68.

Specific characters. Dental system. Incisors $\frac{1}{1}=\frac{1}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{4}{3}=\frac{4}{3}$; = 30. Color reddish tawny above, varying

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in depth in different individuals ; ears short, roundish, naked on the anterior half above, and furnished within with merely a thin covering of hairs.

Description. There is a slight hoary appearance which arises from the cream-colored fur which is intermixed with the reddish tawny. The reddish tawny prevails on the interfemoral membrane. Wing membranes naked above, excepting a small spot at the base of the thumb and fore fingers. At the insertion of the wing is a white mark, which is most conspicuous on the under side. Color beneath paler than above. Incisors short, minute, crowded, and rise but little above the gum ; nostrils rounded and surrounded by a swollen border, and grooved superficially, and opening obliquely outwards.

Dimensions.

		in. t'ths.	in. t'ths.
Total length, from	. . .	3 0 to	3 8
Tail,	" . . .	1 3 "	1 5
Fore arm,	" . . .	1 3 "	1 5
Tibia,	" . . .	0 7 "	0 8
Spread,	" . . .	10 0 "	11 0, <i>Cooper</i> , <i>Cheiop.</i> U. S.

Observations. This species is found in Williamstown, and is probably more or less common in this State.* Its dental system is obscure, and hence there has arisen some discrepancy in the descriptions. It varies also in the depth of its color, some individuals being much paler than others. During winter it remains in a torpid state, in caverns and similar places. The female is larger than the male, and produces four or five at a birth.

3. *Vespertilio Carolinensis.* Carolina Bat.

Vespertilio Carolinensis, *Geoff. St. Hilaire*, in *Ann. du Muséum*, viii. p. 193, sp. 2. figs., &c. *Le Conte*, in *App. to McMurtrie's Cuvier*, i. p. 441.

Specific characters. Dental system ; incisors $\frac{2-2}{6}$; canines $\frac{1-1}{1}$; molars $\frac{4-4}{5}$; = 32. Color a uniform brown, approaching to chesnut. Fur beneath yellowish, soft, and glossy, and covering

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* It is also common to New York and Pennsylvania, and is even found at the base of the Rocky Mountains.

the upper and inferior parts of the head and body. The remaining parts naked, except a few scattering hairs on the toes. Ears large, naked, except near the head, with the tips obtuse, and curving outwards, emarginate on the posterior edge ; tragus nearly a line broad, linear, obtuse, and destitute of hairs. Last joint of the tail free.

Dimensions.

	in. l'ths.	
Total length, ...	3 8	
Tail, ...	1 5	
Fore arm, ...	1 8	
Tibia, ...	0 8	
Spread, ...	11 1,	Cooper, Cheirop. U. S.
Length of skull, ...	0 8	
Width over the zygoma, ...	0 5	

Observations. This species was taken by one of our College students during a warm day in February. The agreement in the characters of this individual is so perfect, that I have not hesitated to notice it as the *Carolinensis*, though it is not credited to a region so far north as this. Mr. Cooper has frequently procured it on Long Island, and, considering the wide range which the preceding species take, it is to be inferred that this may also be widely distributed. This bat is said to resemble the *subulatus*, and might be mistaken for it, did not the dental system disagree, the latter having six molars in the lower jaw, while the former has only five. It is not improbable, that the *subulatus* is already known to some of the naturalists of Massachusetts, inasmuch as it is credited to New Hampshire by Dr. Pickering. It has not, however, fallen under my notice.

The *noctivagans* is another species known in New York, inhabiting more especially Long Island.

Dental system ; incisors $\frac{2-2}{6}$; canines $\frac{1-1}{1}$; molars $\frac{5-5}{5}$; = 34. It has dark black-brown fur, tipped with white on the back, giving it an aspect which at once distinguishes it from the preceding species. It is considered as being more common at the South than at the North.

The nocturnal habits of the Bats render their investigation somewhat difficult, and probably on this account our known species are so few in number.

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They are undoubtedly useful to man by destroying a great number of insects, and probably they are in no way injurious. They may be preserved in confinement, and fed on flies and meat.

The Bat is very acute in the sense of hearing, its external auditory apparatus being extremely large for an animal so small. This large developement is undoubtedly intended to assist it in taking its prey during a time when the organs of sight are incapable of their fullest exercise.

FAMILY II. SORICIDÆ. THE SHREW FAMILY.

Characters of the family. Insectivorous, or feeding principally on worms and insects. They resemble the bats in the disposition and form of their teeth, more particularly in their molars. The incisors are generally large and robust. Their bodies are cylindrical, and covered with a fine velvety fur of a bluish black, and quite glossy in its lustre. They are furnished with a flexible proboscis, or elongated snout, which projects beyond the incisors, and which is employed both in making its passage in the ground, and for the conveyance of food to its mouth. Their eyes are small and obscure, and concealed in the fur, and their ears scarcely project, though their hearing appears to be acute. Tail moderate in length, and covered with hair. Feet all formed for running. Some of the species are furnished with ciliæ between their toes to aid them in swimming; they all take more or less to the water. All the species subsist on animal food, which they require at short intervals. They feed on carrion or putrid flesh, and are hence to some extent scavengers. Some species are quite pugnacious, so that it is rare to find two together, unless in the act of fighting.

Odor strong and musky, rarely eaten by cats or other animals. The musky glands are situated on the sides nearer the anterior than the posterior extremities. The water species burrow in the banks of streams. They produce from 5 to 8 at a birth. Animals all small, and allied to the true Moles both in structure and habits.

GENUS SOREX. Shrew.

Generic characters. Incisors $\frac{2}{2}$; false grinders $\frac{5}{2}=\frac{5}{2}$; true grinders $\frac{3}{3}=\frac{3}{3}$; = 30. Incisors produced in the lower jaw; base

horizontal, with the extremity turned into a hook ; snout alternate, tail moderately long ; feet all formed for running ; toes weak, separate ; teats six or eight ; sebaceous glands on the flanks.

1. *Sorex brevicaudis*. Say. Short-tailed Shrew.

Sorex brevicandis, Long's Exped., i. p. 164. *Godman*, Am. Nat. Hist. i. p. 79.

Figure ; *Ibid*. p. 81.

Specific characters. Body dark lead color above ; lighter beneath ; ears white, concealed in the fur ; nose emarginate, naked ; feet feeble white, first and fifth toes shortest ; tail depressed, and short. First discovered in Missouri.

Dimensions.

	in. t'hs.	
Whole length, ...	4	5
Head and snout, ...	1	1
Lower jaw, ...	0	7

Observations. The general character of the species may be learnt from the remarks already made. The Shrews are remarkable for their glandular apparatus, which gives them the strong musky odor ; it is supposed by Geoffroy to be connected with the sexual appetite, and to serve as a guide to conduct the sexes to each other. The species which is described, is retained on the authority of the former catalogues. I have not been able to meet with it, and I have some doubts of the existence of this species within the limits of this State.

Although the Shrews form burrows in the ground, it cannot be inferred that they are at all injurious to the agriculturist, but, on the contrary, that they are rather beneficial ; at any rate, no positive injury is known to be produced by them. There is, however, a tradition abroad concerning them, which, if true, would justly raise a prejudice against them ; it is this, that if a Shrew should run over the leg of a cow or a horse while reposing in the grass, it would cause lameness ; for this reason the animal is invariably killed when an opportunity occurs. The Shrews, like the Moles, are impatient of hunger. All the species form a nest of grass in some sheltered place on the surface, among the

thick herbage, or in a hole in a bank. From the fact, that in the summer many are found dead without any external injury, it is supposed that an annual mortality prevails among them. It is suggested, however, that it may arise from a deficiency of food produced in a dry season by the escape of worms on which they feed, either deep in the earth, or into the more distant moist places.

The Shrews are extremely expert in the water, darting over its surface, or diving to the bottom with the greatest agility. While in the pursuit of their food, the least noise or motion disturbs them, when they escape instantly into their holes in the bank. In the specimens of *Sorex* which have fallen under my observation, I have not been able to discover, even with the microscope, any nostrils, the termination, or the extremity, of the nose being apparently an imperforate membrane.

FAMILY III. TALPIDÆ. THE MOLE FAMILY.

Characters of the family. The animal known as the Mole, may be considered as the type of the family. The most essential characters are derived from the feet and teeth. In the *Soricidæ*, the feet are formed for running, but in the *Talpidæ* for digging; and so perfect is their construction, that they are enabled to make their way in the earth with great rapidity. The means of subsistence in both families are much the same; their favorite food consisting of earth-worms and insects, which they require almost constantly; hence their toil is necessarily unremitted, and the animal is constantly engaged in burrowing in search of a constant supply.

The *Soricidæ*, by the structure of their feet, are much better formed for dwelling on the surface, while the *Talpidæ* are almost entirely prevented from moving except in their burrows. This family embraces three genera, the *Talpa*, or true mole, which has not yet been discovered in the United States, the *Scalops* and the *Condylura*. The *Scalops* has no canine teeth, whereas the *Talpa* has two in each jaw, and the *Condylura* two in the upper only. In each genus, the fore feet are palmate; the fingers are short, and are supplied with long and slightly arcuate nails, admirably adapted to the removal of earth, and the making subterranean

galleries. They take to the water readily, and swim rapidly, and being supplied with a dense, thick coat of fur, they leave it without being wetted. The form of the body is cylindrical, terminating anteriorly in an acute snout, which extends beyond the incisors. The sight is much less perfect than in the *Soricidæ*; indeed, the eyes appear rather as rudiments of an organ, than as intended for the performance of the important function of sight. The nostrils are exceedingly small, and invisible in the dried specimens. A groove divides the snout into two equal parts. In the *Condylura* the front teeth project forward, while in the *Scalops* they stand at right angles to the jaw, or in the position of human teeth; besides the difference in the position of the teeth, the *Condylura* is furnished with a circular fringe at the extremity of the nose, whence it has received the appellation of the *Star-nosed Mole*.

GENUS SCALOPS. Cuv.

Generic characters. Incisors $\frac{2}{2}$; molars $\frac{10}{10} \equiv \frac{10}{10}$; = 44.*
Snout long and pointed; fore feet palmate, and formed for excavation, and concealed in the skin up to the wrists.

1. *Scalops Canadensis*. Shrew Mole.

Brown Mole, *Penn.*, Arct. Zool. i. p. 141.

Sorex aquaticus, *Lin.*, System.

Shrew Mole, *Godman*, Am. Nat. Hist. i. p. 84.

Mole, *Lewis and Clark*, Journal.

Figure; *Godman*, i. p. 81.

Specific characters. Color uniformly a light slate; body elongated, cylindrical, and tapering rapidly from the insertion of the fore feet to the snout, which is elongated and grooved on the upper and lower surfaces; tail short, tapering, and terminated in a thin pencil of hair.

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* The number of teeth is stated as only 30 in Stark's "Elements of Natural History," an error easily proved by inspecting the mouth of the true *Scalops*. The same author has erred also in giving the dental system of *Sorex*. There is more excuse in this case, as the false grinders are small and crowded.

Description. The upper incisors are white, and stand at right angles to the jaw ; they are comparatively wide, and resemble the middle incisors in man ; they are also longer and more robust than the lower. The grinders have a considerable resemblance to those of Bats, being studded, or rather bristled, with points. In the specimen before me, there are no vacant spaces between the incisors and false grinders. The extremity of the nose is naked and grooved. It is a flexible proboscis, capable of extension, and is used for the conveyance of food to the mouth. There are numerous hair-like, grayish whiskers, both on the upper and lower jaw. There is no distinct neck, but a gradual tapering from the anterior legs to the nose. The body is long, thick, and cylindrical, and having but a slight taper towards the tail. The anterior legs are short and stout, and the whole arm and fore-arm is concealed beneath the skin. The back of the hand is adpressed, and sparsely covered with hair of a lighter color than that upon the body. They are situated far towards the anterior extremity of the body. Nails white, long, linear-lanceolate, and rather obtuse, curved above, and slightly hollowed out beneath. Fingers extremely short. Posterior extremities smaller by one half than the anterior ; nails, somewhat curved, but not hooked ; middle one the longest and largest ; palm turned outwards and backwards ; fur light slate, darker beneath, velvety.

Dimensions.

	in. t'ths.
Whole length of the head and body, ...	6 0
Tail, ...	1 0
Pencil of hair terminating the tail, ...	0 5
Length of the hand, ...	0 7
" middle nail, ...	0 3
" foot, ...	0 7
" skull, ...	1 3
Width of the hand, ...	0 5
" foot, ...	0 2½

Observations. This animal is usually met with in low, damp places, as such are the most productive of its natural food. The whole body is formed for securing strength, and its shape and the structure of its limbs fit it admirably for an underground residence.

It lives on insects and earth-worms, which it obtains by constant labor in excavating the earth ; and so perfect are its adaptations, that it suffers no fatigue in this constant and laborious pursuit.

This animal renders some considerable service to man in loosening the soil, and in destroying insects which injure the roots and herbage of plants.

It has a great resemblance to the English Mole, and might be mistaken for it, if its dental system were not examined.

The Shrew, says Godman, is the most active in the morning, at mid-day, and in the evening ; they come regularly to the surface at 12 o'clock. When their habitations are attacked and injured, they will repair them ; hence they appear to be attached to their habitations. In eating, they employ their flexible snout, with which they thrust their food into their mouths by doubling it backwards.

When taken, they become partially domesticated, as they will receive their food from the hand, and will follow it when moved about in the place of their confinement.

GENUS CONDYLURA.

Generic characters. Dental system ; incisors $\frac{2}{2}$; canine $\frac{1}{0}=\frac{1}{0}$; molars $\frac{3}{0}=\frac{3}{0}$; = 38. Fore feet broad, palmate, formed for digging. External ears none ; nose crested and slender ; tail long.

1. *Condylura longicaudata*. Desm. Star-nose Mole.

Long-tailed Mole, *Penn.*, Hist. Quad., ii.

Talpa longicaudata, *Erzl.*, Syst., tom. i. p. 118.

Condylura longicaudata, *Harlan.*, Faun. p. 38.

Condylura longicaudata (*Illiger*). *Richardson*, Fauna Bor. Am. p. 13.

Specific characters. Color bluish black ; body thick, and covered with a thick velvety coat of fur ; head long and tapering ; nose furnished with a cartilaginous star-like fringe, with eighteen rays in the circumference, and two short bifid ones attached beneath the nostrils ; tail long and tapering.

Description. The color is uniformly bluish black, and the fur covering the whole body soft and velvety. The tail is rather thick near the body, but becomes slender and tapering towards

the extremity ; it is covered with short hair. The length of the tail is about one third of that of the body. Extremities short and robust, especially the anterior ones, which are covered on the back with scales intermixed with a few hairs. Posterior extremities longer than the anterior, but more slender, and furnished with scales and hairs thinly interspersed ; hind claws white, narrow, and sharp pointed.

Dimensions.

	in. t ^{ths} .
Length of the head and body, ...	4 9
Tail, ...	2 9
Head, ...	1 3, <i>Richardson.</i>

Observations. The preceding species is less common than the succeeding, indeed, it has not fallen under my observation, while the *Macroura* is quite common.

2. *Condylura macroura.* Harlan.

Condylura Macroura, *Harlan*, Fauna Am. p. 39. *Richardson*, Fauna, Bor. Am. 284.

Figure ; *Ibid.*, p. 284, plate 24.

Specific characters. Color bluish black ; fur thick and darker beneath ; tail long, thick near the body, and tapering towards the extremity.

Description. The upper incisors project forward, and approach each other obliquely from their sockets, leaving a triangular vacant space at their roots ; canines conical, longer by one half than the succeeding teeth ; canines as well as the false grinders hooked a little backwards ; of the latter there are four ; grinders four on each side, and bristled with points ; teeth white ; the phalanges short ; nails long, standing obliquely to the hand, more slender than in the *Scalops* ; tail long, strangulated at the base, and largest about one third its distance from the body ; slightly compressed ; pelvis small and narrow ; humerus remarkably thick and stout ; clavicles supported by an arch of bones which are braced against the sternum ; scapula long and narrow, and without a broad expansion of bone ; vertebræ somewhat quadrangular, rounded on the inner surface ; lower jaw long and slightly arched, with the incisors standing forward and forming a small segment of

its arch, which is convex upwards, accommodating it to the concavity of the upper jaw.

Dimensions of the Skeleton.

	in. t'hs.
Length of the skull, ...	1 6
Greatest breadth posteriorly, ...	0 6
Length of the lower jaw, ...	0 9
Tail, ...	2 9
Whole skeleton, ...	7 0

Observations. By comparing these dimensions with those in the "Fauna Americana," it will be seen that there is an essential difference. Having, however, the skeleton before me, I am able to express myself confidently as it regards the measurement now given, and also as to the entire accuracy of the whole description.

FAMILY IV. URSIDÆ. THE BEAR FAMILY.

Characters of the family. This family is distinguished by the form of the feet, being, as it is termed, *plantigrade*. They have the long canine teeth of the true carnivora, but the form of their molars is such, that they may feed on roots, grain, &c. Their nose or snout is generally elongated. They are capable of sitting on their haunches, and using their fore feet in conveying food to the mouth.

Two species only are now known to belong to this State, the Black Bear and Raccoon. The Badger may possibly be found on the Green Mountain range. My information, however, is too imperfect to enable me to speak confidently in relation to it. The same may be said of the Gulo, or Glutton.

GENUS URSUS.

Generic characters. Dental system; incisors $\frac{6}{6}$; canines $\frac{2}{2}$; molars $\frac{6}{7} \equiv \frac{6}{7}$; = 42. In the upper jaw the two anterior molars small, the three posterior tuberculated, the last of which is the roughest. Ears and tail short; feet plantigrade.

20 QUADRUPEDS OF MASSACHUSETTS.

1. *Ursus Americanus*. Pallas. The Black Bear.

Ursus Americanus, *Harlan*, Fauna, p. 51.

Black Bear, *Penn.*, Arct. Zool., i. p. 57. *Warden*, United States, i. p. 195.

Godman, Nat. Hist., i. p. 114.

Mucquaw, Algonquins.

Figure; *Godman*, i. p. 114.

Specific characters. Nose on the same line as the forehead, which is gibbous; hair black, straight, and shining.

Description. The muzzle is often brownish. There are also two brown or fawn-colored spots in some individuals over the eyes; hair coarse and black to the roots; fur brown beneath, thick and somewhat curly in the cub; tail short; ears high, oval, far apart, and rounded at their tips; palms and soles of the feet short in comparison with those of the Brown Bear of Europe; nails long and curved. There is a long, vacant space between the first and second molar. First molar situated at the root of the canine, both projecting forward.

Dimensions.

The whole length of a full grown individual is not far from 4 feet 10 inches.

1. Skull.

	in. l'ths.
Length from the incisors to the occipital crest, ...	11 2
Measured over the palatine bones, ...	9 0
From the incisors to the meatus externus, ...	8 2
Lower jaw from the incisors to the condyles, ...	6 6
Height of the cranium, ...	3 8
Depth of the frontal sinus, ...	1 0

2. Skull.

Length measured over the skull from the incisors to the occipital crest, ...	13 0
Length over palatine bones, ...	11 8
Length from the incisors to the meatus externus, ...	9 8
Greatest width at the zygomatic arches, ...	7 2
Length of the projecting part of the canine tooth, ...	1 0
Length from the occipital crest to the extreme of the nasal bones, ...	11 2
From one orbit to the other, across the forehead, ...	3 0
From one canine tooth to the other at their base, ...	1 8
From their tips, ...	2 0

	in. l'ths.
Length of the posterior molar, ...	1 0
Width of the zygomatic space, ...	2 8
Length of the lower jaw measured on the outside, ...	8 0

Observations. So far as information can be gathered from writers or hunters, there is but one species of bear inhabiting the New England States. Individuals present, it is true, considerable diversity in size, color, and form ; but they furnish no permanent marks by which a distinct species can be formed. Thus, some individuals have the fawn-colored spots over the eyes ; others are marked with a white stripe along the forehead, or nose ; and others still have a white spot beneath the chin. There is also a difference in the general color of individuals ; some are much blacker than others ; this character, however, varies somewhat with the season of the year, as they are always darker in the spring. There is too, a marked difference in the length of the legs, so much so, that hunters always notice it, and speak of this character as marking a distinct variety or kind. The above differences are to be considered as only accidental, and not occurring with sufficient uniformity to make specific characters.

The configuration of the cranium of the Bear is a very distinctive family mark or character. Thus, the line extending from the base of the incisors to the occipital crest, is uniformly arched. The length is also great in proportion to the width, or, in other words, the skull is deep, narrow, and elongated. In conformity with the general form, the axes of the eyes are almost on a line with the long axis of the cranium. The middle of the skull is narrow, the zygomatic arches long, and the portion occupied by the eye small. This arrangement gives a large space for the powerful temporal muscles, thus increasing immensely the power of the jaws. The Bear subsists principally on fruit, such as apples, acorns, and nuts. Grubs and worms are also sought for, as is well known by their turning over logs, and removing the bark from stumps and decayed trees. Honey and all sweet fruits are peculiarly grateful, and furnish for him a rich repast. An indication of this is afforded by his selecting, when he visits an orchard, the sweetest fruit for his meal. The Bear frequently destroys pigs and sheep. He is, however, more injurious to the

farmer, by his visits to the fields of corn. The time, selected for his depredation, is when the corn is soft and in its milk ; he then eats much, and breaks down much more. The Bear, when taken young, is susceptible of domestication, and becomes playful, though, as it increases in age and size, it is apt to take offence, plays rather roughly, and becomes rather a dangerous pet. It recognises all who may belong to the family ; but, in order to keep it in subjection and obedience, the free use of the whip is necessary, and it learns very soon who is master.

In the domestic state it does not hibernate, nor can it be compelled to go into that state. In one instance where two had been confined in a hole, and shut in for the winter, it was found that the stronger had devoured the weaker, and had become extremely thin and poor. Bears in New England go into winter quarters at the fall of the first snow, if it is in considerable quantity. Unless the ground is covered, however, to the depth of 5 or 6 inches, it does not seek a winter retreat. When this has taken place, they may be traced to their lodging which they may have selected at some previous time. This they approach not directly, but by a number of diminishing circles, as if aware that by such routes they increase the difficulty of pursuit, and thereby secured a more safe resting-place for the winter. The male goes into this retreat alone, while the female, if she has cubs, is accompanied by them. In arranging themselves for their winter's sleep, the dam places herself foremost, or towards the entrance of their retreat, and the young immediately in the rear, an arrangement which is intended to secure the safety of the family. When their position is once taken, it is probable that it is not changed until they are aroused by warm weather, as it is invariably found that the old one is always in front ; and instances have occurred, where the snow has been broken away, and disclosed the old one in her sitting posture, though still fast asleep. The precise period, at which the bear goes into winter quarters, depends on the fall of snow. If that is late, he wanders about, feeding on mast or acorns, &c., and is very often quite poor before his retirement. Occasionally they leave their retreats in January or February, if the weather is warm for several days in succession. The female goes with young seven months, and brings forth pretty uniformly two cubs at a birth. The

time for parturition is either in January or February, or early in March. The young continue with the dam the whole of the first year, and part of the succeeding, as they are frequently found in company. The cubs, and sometimes an old female, become extremely fat ; they have been known to yield sixty pounds of oil. The Bear is habitually a great traveller, removing from place to place during the summer and fall. His travels, however, are confined to a certain circuit, unless disturbed, for he seems to go the rounds, and follows each time the same beaten track. In his travels he frequently turns aside to wallow in mud holes, especially when the weather is hot and sultry. When suddenly met by man, or any uncommon incident occurs to arrest his attention, he rises and stands upright on his posterior legs, and surveys with attention the object before him. In this position he reconnoitres till he is apprehensive of danger, when he instantly escapes into the neighbouring thicket.

The Bear is a difficult animal to destroy, in consequence of its tenacity of life. The skull is so formed, that it very effectually protects the brain from injury. The space between the tables is at least an inch beneath a large portion of the frontal bone. Hence it is a fortunate shot to lodge a ball within the head. Bears leave the vicinity of settlements and dwell during the summer in the most secluded places, choosing those which are marshy, or in the immediate vicinity of lakes and ponds. They are induced to this procedure by the security it furnishes for rearing their young. At the first appearance of corn and cultivated fruits and grain, they return to the settlements. In the pursuit of their objects, they travel the same routes, which are termed by hunters the *run-ways*. It is near one of these travelled paths, that the hunter places his traps, knowing by long experience, that, if any are in the neighbouring mountains, they will sooner or later come that way, and that they will invariably travel the common road. It is often the case, however, that when an old Bear is pursued, instead of leading in the run-way, he selects the worst passages that can possibly be found in the whole mountain. He will go through the most impassable thickets, over the fallen bushy tops of trees, up the steepest cliffs, where it is difficult for dogs to pursue, and next to impossible for man to follow. I have

known them to elude their pursuers for a whole week together, and, when finally taken by means of fresh pursuers, it has been found that the hard flesh on their feet was worn off to the bone. Such instances show that the understanding of this animal is of a superior cast ; indeed, Bruin has won himself some celebrity for his cunning, and by no means ranks low in the scale of intelligence.

The Bear is hunted by a half breed of hounds, or by cur-dogs. The object of the hunter is to compel him to take to a tree. This he is disposed to do when the dog bites him severely behind, or annoys him by a continual bark. Sometimes a small courageous dog is more successful in treeing him than a large one. Their strength is great. I have known them, when in the trap, if it became fixed, to tear off the entire foot at the ankle by one effort, and escape on three legs. When attacked, they always rise upon their hind legs, or sit upon their haunches, and defend themselves by their fore feet, or, we might say, by their arms ; and their mode and manner of doing this is effectual to preserve them from the most furious attack of many dogs ; some of which get their ribs broken, others get severely scratched, and others are scalped. But their most effectual way of dealing with their pursuers is to squeeze them in their brawny arms against their bodies.

The Bear is a stranger in most parts of this State, and probably far more common on the Hoosic Mountain range than in any other part. It is not many years since great numbers appeared there at once, and between twenty and thirty were taken in the course of one autumn, on the mountains in Adams and Williamstown. They are still to be found, and several have been taken every year since.

The valuable parts of this animal are its oil and skin ; the oil sells for about one dollar per pound. The skins vary in value from four dollars to twelve. A Bear-skin robe which is made out of the best parts of good skins, sells for from thirty to fifty dollars. These robes wear much longer than those of the Buffalo, being in texture much stronger, and more impervious to rain ; and, besides, they are considered much handsomer and richer in appearance.

The *Ursus Americanus* inhabits every wooded district on the American continent, and is found in the whole range between the

Atlantic and Pacific Oceans ; and from the shores of Carolina to the Arctic seas.

Hence he may be considered as one of the most widely distributed animals of the globe. Undoubtedly his constitution is fitted more particularly for a temperate climate ; still his thick coat of fur effectually enables him to inhabit the cold regions of the North, and secures him a safe residence wherever food can be procured. Being an eater of vegetables as well as of flesh, he is still better enabled to take this wide range of territory, than most of the mammalia, man excepted.

GENUS PROCYON. STORR.

Generic characters. Dental system ; incisors $\frac{6}{6}$; canines $\frac{2}{2}$; molars $\frac{6}{6} = \frac{6}{6}$; = 40. The last three grinders of each jaw tuberculated ; feet pentadactyle ; nails sharp ; muzzle pointed ; ears moderate ; tail long ; six ventral mammæ.

1. *Procyon lotor.* Cuv. The Raccoon.

Ursus lotor, Lin. Gm., i. p. 103. Harlan, Fauna, 54.

Le Raton, Buffon, viii. pp. 337, t. 43.

Procyon lotor, Cuv., Règ. An., i. p. 143. Sabine, Franklin's Jour., p. 649. Harlan, Fauna, p. 53.

The Raccoon, Godman, Nat. Hist., i. p. 163.

Figure ; Ibid., p. 161.

Specific characters. Fur brownish ; muzzle black, naked, and flexible ; a wide black or dark-brown band passes through each eye and cheek ; another of a similar color passes between the eyes, and is continued upon the forehead ; lips black ; pupils of the eyes circular ; ears erect, elliptical, with rounded tips, which, together with their edges, are of a soiled white ; tail ringed and bushy like the fox.

Description. The Raccoon has a round head, tapering and terminating in a rather acute snout, which projects considerably beyond the mouth. The dark bands, passing through the eyes and over the forehead, impart to the animal a very characteristic look. The general color is more or less gray, which is produced by a mixture of brown, black, and dirty white hairs. The back

is a grizzled brown, its fur consisting of a mixture of dirty white, ringed with black. The belly is considerably paler. The tail is long, pendant, and bushy, and has generally 5 dark rings around it. The extremities are short, and all the feet are provided with five toes, armed with strong nails. The animal is full-bellied, especially at its flanks, and, as it is partially plantigrade and its posterior extremities are longer than the anterior, it makes rather an awkward appearance when walking. It walks generally upon its toes, but, when it sits, it brings the whole of the sole of the foot upon the ground ; it easily assumes the sitting posture of the Bear, erects, and feeds itself with its paws.

Dimensions.

	ft.	in.	ths.
Length of the head and body, ...	2	0	0
“ “ head, ...	0	6	0
“ “ tail, ...	0	9	5
Height of the back, ... (Richardson)	1	1	0

Skull.

Length from the incisors to the occipital spine over the frontal bone,	5	3
“ “ “ to the foramen magnum, ...	4	0
“ “ “ to the meatus externus, ...	3	5
Height, ...	1	9
Length of the lower jaw, ...	3	3
Width at the condyles, ...	2	6

Observations. This animal has a distribution almost as wide as that of the Bear. It is a native of all the States of the Union, and is supposed to inhabit the shores of the Pacific Ocean. Its countenance is much like that of the Fox, but its gait and motions are those of the Bear ; it also partakes of the habits of the latter in its modes of living. The Raccoon sleeps by day and wanders about by night in quest of food, and to enjoy its gambols, for it is fond of play and frolic. Its food is green corn when it can be obtained, and it is especially fond of all sweet vegetables, and even of sugar, molasses, preserves, &c. It will also receive fresh meat, though it is not known to destroy any of the smaller animals. In a state of nature, therefore, it is supposed to subsist entirely on vegetables, though I have been informed that it often resorts to the water for the purpose of taking fish, for the truth of which I cannot vouch.

If taken young, it becomes perfectly tame and domesticated, in which state, however, it is very uneasy if confined, which it signifies by a most troublesome cry. When awake, he is always in motion, and appears to be examining every thing in his way, climbing chairs and tables, searching for sugar and sweet meats, feeling every little thing with his paws, thrusting them into every little hole it can find, and, when his curiosity is excited, taking up the object with his flexible fingers, and rolling it between his hands till its nature is fully ascertained.

This animal lives in hollow trees, which it scarcely ever leaves during the day ; but at twilight it goes abroad, and wanders about till break of day, when it returns to its retreat. It is rare, therefore, to meet with it in open daylight. The female produces from four to six at a birth, about the last of March or first of April. The young do not appear to continue so long with the mother as in the case of bears. The skin of the Raccoon is the most valuable part ; several of them make a handsome and durable robe. The meat of the young is frequently eaten, and is quite esteemed by some persons ; but the flavor of the old ones is not such as to recommend it in civilized life.*

FAMILY V. CANIDÆ. THE DOG FAMILY.

Characters of the family. Teeth formed entirely for eating flesh. Two tuberculated teeth posterior to the large carnivorous tooth in the upper jaw. This family embraces the dog, wolf, fox, &c.

GENUS CANIS. Lin.

Generic characters. Dental system ; incisors $\frac{6}{6}$; canines $\frac{2}{2}$; molars $\frac{1}{1} \frac{2}{2}$; = 42. The first three molars in the upper jaw, and the four small, edged ; the great carnivorous tooth above, bicuspid, with a tubercle on the inner side ; pupils circular, diurnal ; muzzle

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* A pair, which the author had in possession for some time, and which were taken quite young, not more than a week old, acquired partially the power of barking, or rather their growl, when offended, was much of the nature of the bark of a puppy. The inquiry which this fact suggests to me is, whether, by perfect domestication, this animal would not fully acquire the bark of a dog, a faculty or power which it is supposed the latter animal has acquired by intercourse with man.

elongated ; tongue soft ; ears erect ; fore feet pentadactylous, hind feet tetradactylous ; teats inguinal and ventral.

1. *Canis lupus*. Lin. Desm. The Common Wolf.

Canis Lupus, *Harlan*, *Fauna*, p. 79. *Godman*, *Nat. Hist.* i. p. 255.
Figure ; *Ibid.*, 255.

Specific characters. Tail straight, pendant, bushy ; fur gray, fawn-colored, with a black stripe on the fore legs ; eyes oblique.

Description. Color varies somewhat with the season and with age. In the summer the hair is short and yellowish-red ; in the winter, blackish along the back, and obscurely striped, with black along the sides ; large patch of white beneath the lower jaw, and another between the fore legs ; head thick, but the snout long and slender ; tail bushy, tufted with white and black, but never re-curved like the dog's ; fore feet black in front ; voice a howl ; snaps when it bites, without retaining its hold.

Dimensions.

	ft.	to	ft.	in.
Whole length, from	3		3	6
Height, ...			2	5
Tail, ...				12
Head, ...				10
Ears, ...				3 or 2½

Skull.

	in.	t'ths.
Whole length measured over the frontal bones, . . .	9½	0
From the incisors to the meatus externus, . . .	8	0
Breadth at the base of the zygomatic process, . . .	3	5
Greatest breadth at the zygomatic arches, . . .	5	0
“ “ of the cerebral mass over the meatus, . . .	2	3
Height over the same line, ...	2	1

Observations. The Wolf is capable of domestication and of forming attachments. It acquires its full size in about three years. It is savage and cruel in the wild state, and is compelled to wander, like a fugitive from justice, from place to place. When it has been taken young, and treated kindly, its nature is somewhat changed, and it is probable it would become kind and improved, like the dog. The Greyhound and the Wolf possess characters

somewhat allied, particularly in their memories ; both are forgetful, and little disposed to watch and guard the premises of a master. It would appear from the measurements below, that the American Wolf is somewhat longer than the European. It is not, from some cause or other, so dangerous, as it does not attack travellers as the European Wolf is known to do. The exact measurement of a Wolf in my possession, which was taken in Vermont, is as follows ;

	ft.	in.	ths.
Whole length, exclusive of the tuft of hair at the extremity of the tail, ...	5	0	0
Length of the shaft of the tail, ...	0	14	0
Length of the tuft, ...	0	3	0
Height at the fore legs, ...	2	1	0
“ “ posterior, ...	2	4	0
From the nose to the ear, ...	0	7	5
Length of the ear, ...	0	3	0
Circumference just behind the fore legs, ...	1	9	0

The measurement of a dried specimen of the American Black Wolf is as follows ;

	ft.	in.
Whole length, ...	4	4
Tail, ...	0	12
From the foot to the centre of the back, ...	1	5
Height posteriorly, ...	1	8
From the nose to the ear, ...	0	7
Length of the ear, ...	0	2

If the skin of the Black Wolf was from a full grown individual, it would indicate that it really may be a distinct species. The ear is narrower, and the nose rather more pointed, tail not quite so bushy, and the whole size is less. This individual was taken in Maine.

The Wolf brings forth from four to six young at a birth, which are born blind. They frequently hunt in packs, and act in concert. Their voice is a howl, which they greatly modify. A single Wolf produces such a variety of sounds, that the distant hearer often supposes it proceeds from half a dozen in a pack.

GENUS VULPES. The Fox.

Generic characters. Dental system ; incisors $\frac{6}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{6}{7}=\frac{6}{7}$; = 42 ; pupil elliptical ; tongue soft ; ears large and

pointed ; body slender and compressed ; tail long and bushy ; claws not retractile.

1. *Vulpes fulvus*. Lin. The Red Fox.

Canis fulvus, *Hartan*, Fauna, p. 89.

The Red Fox, *G. dman*, i. p. 276.

Canis (Vulpes) fulvus, *Richardson*, Fauna Bor. Am. p. 91.

Figure ; *Ibid.*, plate 6.

Specific characters. Fur reddish or fulvous ; white beneath ; ears black behind ; fore feet and legs black before ; tail long, bushy, and terminated with white.

Description. The head is pointed ; color above fulvous, but varying in degree with season, age, and sex ; some individuals are quite red, while others are pale-yellow. In the spring, the color appears to fade. The quantity of white on the tail varies much in individuals ; in some, there is a larger intermixture of long, black, glossy hairs ; in others, the back is quite gray.

Observations. The Fox, like some of the smaller animals, instead of flying from civilized life, seems rather to increase in its neighbourhood, or at least this would be the case in mountainous districts, if laws for its extirpation were not enacted, and these would be ineffectual, were it not for the fact, that they take effect upon the young. During the operation of the late act in this State for destroying those animals which are injurious to the farmer, great numbers were taken, so that now, in the county of Berkshire, their number is very sensibly diminished. The Fox is unquestionably injurious in the sheep-fold, especially in the spring. It makes some little compensation by destroying mice, but its benefits to the farmer are not sufficient to entitle it to his protection. Its numbers will, therefore, always be kept within moderate bounds.

The habits of the Fox are so well known, his sagacity and cunning having become proverbial, that it is unnecessary to dwell upon this part of the subject. He is, moreover, oftener exposed to observation, than any of our larger animals.

In connexion with this species, it is proper to speak of the

Vulpes Decussatus, or Cross Fox, and the Black Fox. The former, if we may credit the statements of hunters, has been taken in Williamstown, while the latter has been observed in several instances, and has been captured in Stamford, Vt., an adjacent town. I have not, however, seen either, neither am I disposed to give full credit to the reports of hunters. The Cross Fox is found in New York, particularly in the northern counties. The Black Fox is rare throughout the Union, and only here and there is an individual known. Their skins sell for about twelve dollars.

2. *Vulpes Virginianus*. Gmel. The Gray Fox.

Description. Body silvery-gray, with a shade of red about the ears ; darker from the shoulders to the posterior part of the back ; near the body the hair is plumbeous, then yellowish, then white, and then tipped with lustrous black on the front ; from the top of the head to the edge of the orbits, gray, while on the rest of the face, from the internal angle of the eye to within half an inch of the extremity of the nose, it is blackish ; at the extremity on each side of the granulated tip of the nose, it is yellowish white. A fine line of black-tipped hairs extends upwards and outwards, from half an inch below the internal angle of the eyes, until it is intersected by a similar one about half an inch beyond the external angle of the eye, thus forming a very acute triangle, whose base is on the side of the face. Mystachial bristles black ; under jaw blackish ; inner surface of the ears yellowish ; tips on the outside blackish-gray ; remainder yellow. There is a white spot on the breast, and it is also white beneath ; tail thick and bushy ; extremity black.

The length of the head and body is about twenty-four inches, and the tail eleven. *Godman.*

This species is termed by furriers the *Wood-gray Fox*. It is rather smaller than the red, is less robust, and is sooner run down by hounds. It runs more like the hare, as it regards the width of its circles, when pursued. The species is rare in Massachusetts, but is common in the southern portion of New York, and in New Jersey and Pennsylvania.

FAMILY VI. FELIDÆ. THE CAT FAMILY.

GENUS LYNXUS. The Lynx.

Generic characters. Dental system ; incisors $\frac{6}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{3}{3}=\frac{3}{3}$; = 28 ; feet four-toed ; nails retractile ; head short ; ears tufted, triangular.

1. *Lynx borealis.* The Canada Lynx.

Felis Canadensis, *Lin.*, Cat Lynx, *Penn.*, Arct. Zool., i. p. 50.

Felis Canadensis, *Geoff.* An. du Mus. *Sabine*, Franklin's Journ., p. 659. *Richardson*, Fauna Bor. Am. p. 101. *Harlan*, Fauna Am. p. 98.

The Northern Lynx, *Godman*, Nat. Hist. i. p. 302.

Figure ; *Ibid.*, p. 302.

Specific characters. Color gray ; ears tufted, with long black hair springing just behind the apex, bordered posteriorly with black, and running into the tuft ; hair long and soft ; tail short, terminated with black.

Description. The general color is rather a silvery gray, with a yellowish tint beneath, which appears if the hair is but slightly disturbed ; extremities of the hairs brownish, then white, and then brownish extending to the base, intermixed with others entirely black ; darker along the back ; the fur along the back and head is brown ; along the back of the neck, sides, tail, and its base, yellowish ; the tail beneath has a white stripe ; hair upon the breast and belly long, white, but still terminated with brownish ; one brown spot on each fore leg near the body, and several on the breast behind the legs ; ears terminated with pencils or tufts entirely black ; bordered with black, which extends near to the base on the posterior, but only about half that distance on the anterior side ; inside of this border it is yellowish, but more distinct posteriorly ; base of the lower jaw surrounded with a fringe of long hair, shorter in the female ; it is intermixed with gray, black, and white, the middle portion black ; mouth surrounded with brownish fur or hair, more distinct at the extremity of the lower jaw ; white beneath ; whiskers black and white ; tail terminated with black ; white beneath ; legs yellowish behind ; toes

and nails concealed in long, dense, silky hair, and fur which is somewhat curled or crisped.

Dimensions.

	ft.	in.	t ^{ths} .
Length of the head and body, ...	3	1	0
“ “ tail, ...	0	4	0
“ “ ear, ...	0	2	0
“ “ tuft, ...	0	2	0
Fringe and hair beneath, ...	0	4	5
Height at the back, ...	1	9	0
“ at the anterior legs, ...	1	7	0

Observations. The Northern or Canada Lynx presents a very striking resemblance to the cat. Its head is round, and the nose is obtuse; its canine teeth are also grooved like the domestic cat's; it is more convex between the eyes. The two most remarkable characters of the Lynx are the beautiful pencils of black hair which ornament the ears, and the perfect hairiness of the soles of the feet, which have no naked spots or tubercles like the other species of the feline race. There are no very distinct stripes of black or brown; still we may perceive a tendency thereto in a good light; it is, however, more like a mottling, than an arrangement into stripes. The legs of this animal appear thick, in consequence of the length of the hair; it makes a round track, in which neither the marks of the toes nor of the nails appear. It was once common in this State, but appears now only in the depth of winter, and as a straggler. One was captured a few years since in the neighbourhood of Chester village in Hampden County. It was a fine, large male, and was able to resist the attacks of several dogs; it ascended trees with the utmost facility, leaping up their trunks at fifteen or twenty feet in single bounds. It is timid and shy, and never attacks man or the larger animals. Its flesh is eaten, and is esteemed by connoisseurs, and is said to resemble that of the hare in its flavor. Nature has supplied it with clothing remarkably well adapted to a cold climate; it is strictly a northern animal, and is found as far north as latitude 66°. It subsists principally on the Hare, and is most sure to be found where this animal abounds. The specimen which has given me an opportunity of describing it, was taken in Maine. It was a male, and was captured in the

depth of winter, and was evidently full grown and perfect in all respects. The fur of the Lynx is highly esteemed on account of its length and softness ; for this very reason, however, it is not so durable as the fur of the Otter or Beaver. The skins are generally purchased for three or three and a half dollars.

2. *Lyncus rufus*.   The Wild Cat.

Bay Lynx, *Penn.*, Hist. Quad. A.   Arct. Zool., i. p. 51.

Felis rufa, *Harlan*, Fauna, p. 99.   *Richardson*, Fauna Bor. Am., p. 103.

Specific characters. Color yellowish, or reddish-brown, mingled with darker spots of brown ; inferior parts of the throat and body white or whitish ; ears tufted ; inside of the legs spotted with brown ; tail terminated with dark brown, and with a small portion of whitish beneath, obscurely banded.

Description. The general color is rufous ; some individuals are gray or yellowish-gray ; ear triangular, and surrounded posteriorly with a blackish border, within which there is a triangular patch of yellowish white ; tips ornamented with a black, but short pencil of hairs, which springs from just behind the apex ; irides yellow ; eyes partially encircled with a whitish stripe ; front, and portions about the upper lip, striped with darkish-brown ; fringe near the base of the jaw mixed with black ; posterior legs dark-brown below the gambrels ; fore legs lighter colored, and spotted inside ; one spot larger, near the body.

Dimensions.

	ft.	in.	t'hs.
Length of the head and body, ...	2	0	0
“ “ tail, ...	0	4	5
Length of another individual, ...	2	5	0
Length from the nose to the base of the ear, ...	0	3	0
“ “ ear, ...	0	1	0
Height behind, ...	1	5	0
“ before, ...	1	4	0

Observations. The Wild Cat stands high on its legs, has a short, curved tail, which makes the animal appear somewhat disproportioned. It resembles the common Cat more than the pre-

ceding. It varies somewhat in color ; some individuals are more gray than others, though not so much so as to conceal the general fulvous aspect. This species is easily distinguished from the preceding by the shorter pencils of hair upon the ear, and by the nakedness of the balls of the toes. This last character, it appears to me, is sufficiently important in the *borealis*, to constitute it a genus by itself. The tail is longer in proportion in the *rufus* than in the *borealis*, so that it is scarcely possible to confound the two. It resides in wooded and rocky districts, at a distance from habitations, or the resorts of men ; it lives on squirrels, birds, hares, &c. ; it is also very injurious to sheep-folds. It is still found in the mountainous districts of this State, particularly in Middlefield, Chester, Russel, and Blandford. The animal, like most of the feline race, is nocturnal in its habits, and is hence rarely exposed to observation in the day time.

GENUS FELIS.

Generic characters. Dental system ; incisors $\frac{6}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{4}{3}=\frac{4}{3}$; = 30. Five toes on the fore feet ; hind feet tetradactyle ; ears long, erect ; tail long.

1. *Felis concolor.* Lin. The Puma, or American Lion.

Felis concolor, *Harlan*, Fauna, p. 94.

The Cougar, *Godman*, Nat. Hist. i. p. 291.

Figure ; *Ibid.*, p. 291.

Specific characters. Color uniformly dun or fulvous ; beneath paler ; tail long, extremity dark-brown in the male ; ears rather rounded and prominent ; limbs thick and stout.

Description. The color of the Puma is remarkably uniform at all seasons of the year. Head rather long ; ears light-colored inside, but blackish posteriorly ; face whitish about the internal angles of the eyes, upper lips, chin, and the angles of the jaw ; hair of the whole body thick and short ; tail of the male longer than the female, and darker brown at the extremity.

Dimensions.

	ft.	in.	ths.
Whole length of one of the largest individuals, ...	9	4	0
Tail of a female, ...	1	9	0
“ “ male, ...	2	3	0
Length of the ear, ...	0	2	0

Skull.		ft.	in.	ths.
Length measured along the palatine bones to the foramen,		0	6	4
“ over the frontal bones to the crucial ridge, ...		0	9	4
“ incisors to the meatus externus, ...		0	5	5
Width at the zygomatic arches, ...		0	5	3
Greatest width of the lower jaw, ...		0	4	0
Length of the canine tooth of the upper jaw above the gum,		0	0	9

Observations. The Puma is not found at present in this State. It has, however, been seen in the western portion long since its settlement. It is a cowardly animal, rarely if ever attacks man, and most of the tales relating to its depredations are fictitious ; in that portion of St. Lawrence County, New York, where they most abound, no instance is known of their having destroyed a single individual, man or child.* It preys of course upon all the animals weaker than itself ; it does not refuse even the hedge-hog, which it contrives to eat without swallowing its quills, by commencing its meal at the nose, and drawing the body through the skin as it proceeds. The skull from which the above measurements were taken, belonged to an individual not fully mature. The most remarkable feature of the skull is the convexity of the face ; the nasal and frontal bones being very distinctly arched, and, besides, the bones of the face, together with the frontal, form the largest portion of the skull, so that the part containing the brain is thrown back far in the rear. The thickest portion of brain is evidently immediately over the meatus auditorius externus. The sockets for the eyes are much larger than in the Bear, and their direction is more oblique to the axis of the cranium. The width of the skull is great in proportion to the length. In the absence of the teeth we may distinguish the skull by attentively marking the above characters. The tails of females which have fallen under my observation, are shorter than of the males, yet there may not be a constancy of character in this particular, which can be depended upon. The female brings forth two young ones at a litter, which are beautifully spotted with rather irregular, oblong spots of brown. These mostly disappear at the first shedding of

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* A single hunter, in St. Lawrence County, not many years since, met five Panthers together, of which, with his dog and gun, he killed three at the time, and the next day the other two.

the hair. The Panther, though it will not venture to attack man, yet will follow his track a great distance ; if it is near the evening, he frequently utters a scream which can be heard for miles. When treed by dogs, if it is not much disturbed or wounded, it will often sit quietly on a branch, and purr like a cat, though much louder. In the day time it travels but little ; it usually lies concealed beside a log or rock until towards night, when it sallies out in quest of food. This animal, though known to be powerful, yet, in one instance, has been mastered and killed by a single dog. It was one, too, which was of about the common size. Still, there are very few dogs who may safely attack it. The description and observations apply to the species now found in the State of New York. It is quite doubtful whether I have delineated the entire species, and it is still a question whether the southern animal known as the Panther or Catamount, is the same as the northern. No opportunity has been furnished me of forming a satisfactory opinion by inspection and examination of specimens. From what I have been able to learn, the Puma's northern range is not much beyond the latitude of 45°, and it is evident that the terrestrial conditions most suited to it are the regions farther south.

FAMILY VII. MUSTELIDÆ. THE WEASEL FAMILY.

Characters of the family. The Mustelidæ have long slender bodies, and short legs. Most, if not all the species, have odoriferous glands at the roots of their tails, which, in some instances, are extremely strong-scented. They are strictly carnivorous, and being powerful, active, and sanguinary in their habits, they are able to overcome animals larger than themselves ; this is true, however, only of a portion of the family, the Weasels and Martens ; the Mephitis or Skunk is rather clumsy, and less active, though equally fond of animal food. They differ somewhat also in their modes of living ; a portion preferring a dry wooded region, as the Marten, and others the banks of rivers and wet places, as the Mink and Otter.

GENUS MUSTELA.

Generic characters. Dental system ; incisors $\frac{6}{6}$; canines $\frac{2}{2}$; molars $\frac{5}{6}=\frac{5}{6}$; = 38. Body elongated, ears rounded, legs short, feet pentadactyle.

1. *Mustela Canadensis.* Lin. The Fisher or Pekan.

Le Pekan, *Buffon*, xiii. p. 304. t. xlii. opt.

Mustela Canadensis, *Lin.*, *Gmel.*, i. p. 95. *Harlan*, *Fauna Amer.* p. 65.

Mustela Pennanti, *Sabine*, *Franklin's First Journ.* *Erl. Syst.*

Fisher, *Pennant*, *Zool.*, i. p. 82.

Pennant's Marten, *Godman*, *Nat. Hist.*, i. p. 203.

Figure ; *Ibid.*, p. 185.

Specific characters. Color mostly black ; nose, rump, tail, and extremities black ; face yellowish-gray ; head round ; ears low and wide at base, and semicircular ; margins whitish ; tail long and bushy.

Description. The color of the head and shoulders lighter, being of a yellowish, or brownish, or ash-gray ; hair and fur also of those parts shorter than on the rest of the body, darker beneath than above ; hair black or dark-brown at the extremity, then ash, and then darker at the roots ; fur uniformly brown, and of one color over the body ; head rather round, which contracts suddenly, and forms rather a pointed nose ; mystachical bristles brown ; the ears are wide asunder ; feet and legs short, strong ; toes free, black, and armed with sharp nails ; tubercles small, and concealed by the dense hair ; tail black, and rather bushy. There are white spots at the base of the anterior, and a large one between the posterior legs, and a small one on the throat. In another individual, there were no white spots. The general color of this was ash above, and nearly black beneath ; inner toe shortest.

Dimensions.

	ft.	in.	t'hs.
Whole length, ...	3	1	0
Tail, ...	1	1	0
From the nose to the ear, ...	0	3	0
Height at the fore legs, ...	0	8	5
" " posterior, ...	0	9	5

Skull.			ft.	in.	t'hs.
Length along the palatine bones,	.	.	0	4	0
Over the frontal to the crucial ridge,	.	.	0	4	5
From the incisors to the meatus,	.	.	0	3	2
Width at the zygoma,	.	.	0	2	1
Height,	.	.	0	1	4

Observations. The variations in the color and size of the Pekan, have induced naturalists to divide it into two species. Probably as to color, the same individual varies with the season, and with age ; in the summer it is lighter than in the winter ; and as to size, it varies considerably ; there is one in the Albany museum larger than the one whose measurements are given above, but which differs from it in no other respect. This animal is extremely tough, and tenacious of life. It is active and sanguinary, and lives by plunder and bloodshed. In this respect it is fully equal to the feline race. It dwells in hollow trees, to which it confines itself generally during the day. Hence it is very rarely seen, even in those districts where it is quite common. It preys upon squirrels and other small animals. It is extremely troublesome to the hunter by robbing his traps, especially of sable. It becomes skilled in the practice, and will follow the sable line for miles, and destroy in the route every one which has been taken. To prevent these depredations, the hunter makes a large log trap sufficiently strong to hold the enemy, and his voracity generally causes him to fall a victim ; but occasionally the sagacity of the animal is more than a match for the hunter. He will entirely demolish the trap by tearing down the materials from the back side, and by this means obtain the bait without danger of being crushed.

The fur of the Pekan is not so fine and beautiful as that of the Marten. Still, it has some beauty, especially when combined with the long, black, glossy hair. It climbs trees with facility, and destroys the eggs of birds when it can gain access to them. It prefers damp places, or those in the vicinity of water, in consequence, as is supposed, of its fondness for frogs and other aquatic animals. The skin, when in good condition, is worth about one dollar and a half. It is occasionally found in the vicinity of Williamstown, particularly in that range of mountains

which extends northeast through Stamford, Vermont. Whether it is found in any other part of this State, I have not been able to learn.

2. *Mustela martes*. Lin. The Pine Marten.

Id., *Richardson*, Fauna Bor. Am., p. 51. *Harlan*, Fauna Am., p. 67.

Pine Marten, *Pennant*, Arct. Zool., i. p. 77. *Godman*, Nat. Hist. i. p. 200.

La Marte, *Buffon*.

Martes abietum, *Ray*.

Figure; *Godman*, i. p. 208.

Specific characters. Brown; yellow stripe along the throat and belly; head and margin of the ears whitish; legs and tail black.

Description. The color is yellowish-brown, varying somewhat with the season; in the fall, before the fur is good, it is reddish, and rather dirty or soiled in its appearance, but becomes pale towards spring; head triangular; muzzle pointed, and the nose extending beyond the lips; ears rounded, with whitish margins, rather large and open; eyes large, prominent, and remarkably lively; body long and flexible; tail long and bushy; feet rather short; fur of two kinds, the inner fine, soft, and of a light-yellowish color, or grayish, the outer long, shining; and ash-colored at the roots, but brown and glossy at the extremity, yet varying in intensity; some are black at their ends; legs and tail black; toes five, free, inner shortest, and armed with slender nails.

Dimensions.

Full grown male.

	ft.	in.	t'hs.
Whole length, ...	1	11	0
Tail, ...	0	6	0
Nose to the meatus, ...	0	3	0
Height at the fore legs, ...	0	4	6 to 6 0

Skull.

From the incisors to the occiput, ...	0	3	3
“ “ along the palatine bones, ...	0	3	0
“ “ “ “ meatus, ...	0	2	5
Width at the zygoma, ...	0	1	9
Height, ...	0	1	2

Observations. The Pine Marten inhabits the mountainous districts of Berkshire, especially where pine forests abound. It is, however, often found in beech woods, where it is sure of a more ready supply of food. Its nocturnal habits, and native shyness, effectually screen it from observation, even in districts where it abounds. Though this animal is formed for subsisting on animal food, still, when nuts are plentiful, it resorts to them for sustenance, and hence, in those seasons, the hunter is unable to procure it in much abundance, as it will not then take the bait, as they say. It is taken in a log trap, made and baited in such a way, that it cannot reach the meat without passing under the *dead fall*; the bait being fixed to a spindle, it springs the trap, and lets the log fall upon itself while devouring the bait. To lead the animal along the line of traps, the hunter drags after him a dead squirrel, or a tainted piece of meat. By this means the Marten falls upon the course whenever he happens to cross the track, and is led along to the nearest trap. A line of Marten traps sometimes extends forty miles, though not in a direct line. The course is always in a circle, so that the hunter in visiting his traps comes round nearly to the place where he commenced his route. The Marten, if taken young, can be domesticated, in which state it is lively, playful, and cleanly, and is entirely free from any thing unpleasant; it emits, on the contrary, rather an agreeable odor, and is hence termed the *sweet Marten*. It has all the sprightliness of the squirrel, and is very active in pursuing its game; ascends trees readily, and in them it principally dwells. Its chattering is much like that of the gray squirrel. When it encounters an enemy, it bristles up, shows its teeth, and arches its back, and, when attacked, it bites unmercifully, and will not readily let go its hold. Hence, when a dog attempts to seize it, it resists so actively, that it often escapes, even from its jaws, unless the dog is accustomed to its warfare.

A remarkable arrangement is found in the organ of hearing in the animals living by the destruction of others; thus, in the *Pekkan* and Pine Marten, the bony process of the meatus auditorius is directed forward; by this very structure they are fitted for the pursuit of prey; and their moral qualities also seem to correspond, as they are far from being timid, or disposed to fly from an enemy,

but are rather inclined to meet and encounter him. Nature, too, seems to have given them the sense of smell in great perfection, as is evident from their following the tracks of other animals, and also that of the hunter who drags the bait after him. This arrangement of the outer ear, is an adaptation to an inward sense, if we may use the expression, an adaptation which shows design and fitness in a manner worthy of our admiration. In the Hare, we see a different arrangement. The meatus is directed backwards, and the difference of structure is no greater than the difference in the propensities of the two animals ; the one advances to the attack, the other flies for its life ; the one resists and bites to its latest breath, the other, if it cannot escape by flight, scarcely attempts to inflict a wound upon its pursuer. The one directs its ear forwards to catch the distant sounds of its flying victim, the other directs them backwards, that it may learn the progress of the pursuer, that it may know whether it is safe to repose, or whether its efforts to escape must be redoubled.

The skin of the Marten is worth from ninety cents to one dollar twelve and a half cents. The fur improves with the coldness of the climate ; hence, the farther north the animal is obtained, the more esteemed is the fur. It breeds in the spring, and the female has from four to six young at a birth.

Its northern range is stated by Richardson as about the sixty-eighth degree of latitude.

The Martens have been separated from the Weasels in consequence of the difference which exists in their teeth, habits, length of fur, and the more elongated form of the latter. The ears of the Marten are larger, and more conspicuous ; their fur is longer, and they have fewer teeth by two in each jaw. They seem to form a connecting link between the Mustelidæ and the Canidæ.

GENUS PUTORIUS. Cuv.

Generic characters. Dental system ; incisors $\frac{6}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{4}{2}=\frac{4}{2}$; = 34. Body elongated ; legs short ; toes united by a membrane.

1. *Putorius vison*. The Mink.

Foutereau, *La Hontan*, Voyage, i. p. 81.

Mink, *Kalm*. Jour. Minx, *Lawson*.

Le Vison, *Buffon*, xiii. p. 308, t. 43.

Mustela lutreola, *Foster*, Phil. Trans., lxii. p. 371.

Minx Otter, *Pennant*, Arct. Zool., i. p. 87.

Mustela vison, *Cuvier*, Règne Animal., i. p. 150.

“ *lutreola*, *Sabine*, Franklin's Journ., p. 652.

The Mink, *Godman*, Nat. Hist., i. p. 206.

Specific characters. Dark, glossy brown, above and beneath ; fur shortest upon the head, and longest upon the posterior parts of the body ; body greatly elongated, especially the neck ; legs short ; nails white ; usually a white spot beneath the chin ; ears short, and mostly concealed in the fur.

Description. Head and nose slightly convex ; the latter black, obtuse, and extending beyond the chin ; ears short, distinctly rounded, and concealed beneath the fur ; head small and depressed ; eyes small, and placed far forward ; neck very long ; whole body cylindrical ; legs very short ; toes connected by a hairy membrane ; nails white, shorter than the hair, but not concealed ; tail thick at the base, round, and gradually tapering to its extremity ; fur short, but dense and thick, intermediate between brown and gray ; the lower jaw often tipped with white, and sometimes there are other white spots about the throat and breast ; whiskers brown, shorter than the head ; two glands situated at the base of the tail, which secretes a fetid liquid that exhales the odor of the skunk and cat combined.

Observations.

	in. l'ths.
Length of the head and body, ...	14 6
“ “ tail, ...	7 0
“ “ nose to the shoulder, ...	5 8
“ “ incisors to the meatus, ...	2 0

Skull.

Length from the incisors to the crucial ridge, ...	2 3
“ “ “ to the foramen magnum over the palate, ...	2 0
“ “ “ to the meatus, ...	1 7
Width at the zygomatic arch, ...	1 3

	in. t'hs.
Height at the zygomatic arch, ...	0 8
Length of the lower jaw, ...	1 3
Width, ...	1 2

Observations. The legs of the Mink are shorter, in proportion to the size and length of the body, than those of the Weasel. It is intimately related to the Otter in its form, depressed skull, webbed feet, thick tail, and in its habits, &c. It is common in Massachusetts; it is found in the vicinity of ponds and streams, in and around which it obtains its subsistence. The Mink is easily tamed, if taken young, and is susceptible of forming strong attachments. Its fur is of but little value, on account of its shortness, though it is quite fine. Its value, however, varies with the fashions of the day, and may, therefore, become more marketable than at the present time. It is common throughout the length and breadth of America, or it ranges from the Carolinas to 69° north latitude. It is said to have from four to seven young at a birth.

2. *Putorius vulgaris*. Cuv. The Weasel.

Mustela vulgaris, Lin. Harlan, Fauna Am., p. 61.

Mustela (Putorius) vulgaris, Richardson, Fauna Bor. Am., p. 45.

Figure; Godman, Nat. Hist., i. p. 208.

Specific characters. Reddish-brown above, white beneath, tail short, and of the same color as the body.

Description. The color is uniform through the year, and rather brighter and paler than that of the Stoat in his summer dress. Richardson describes it as yellowish-brown, varying into chesnut-brown, and the under parts as yellowish-white, together with the legs, thighs, and the whole of the chin, and which extends to one half of the upper lip; tip of the tail blackish-brown.

Dimensions.

	in. t'hs.
Whole length, ...	10 8
Head and neck, ...	2 8
Body, ...	6 0
Tail including hair, ...	2 0
Shaft of the bone, ...	1 7

Observations. There is some doubt in relation to the identity of the European and American Weasel. The tail of the American is evidently shorter than that of the European. In other respects there is a great similarity. It is not so common as the following species, at least in the western part of the State. There is no occasion for mistaking this species for its congener, commonly called the White Weasel, as the latter is always larger, and has a longer tail, which is always terminated with a black pencil of hairs, whereas, in the former, it is always short, and of a uniform color. It feeds upon mice, moles, eggs, chickens, &c. The smallness of the animal fits it better for pursuing mice than larger animals, and hence it may be of great service in barns, and hay and grain ricks, in the destruction of vermin; and hence, too, it should be protected, even if it should occasionally take an egg or a chicken for a change of diet.

3. *Putorius Noveboracensis.* De Kay. The Ermine Weasel.

Mustela erminea, Lin. Gmel. Harlan, Fauna Am., p. 62.

Stoat Weasel, Penn., Arct. Zool., i. p. 75.

Mustela (Putorius) erminea, Richardson, Fauna Bor. Am., p. 46.

The Ermine Weasel, Godman, Nat. Hist., i. p. 193.

Figure; Ibid., p. 213, f. 2.

Specific characters. Reddish-brown above, white beneath; in winter wholly white; slightly tinged with yellow, except the extremity of the tail, which is always black.

Description. The neck, body, and tail long and cylindrical; nose slightly convex; legs short and stout; ears low, rounded, or but slightly pointed, wide at base, standing obliquely to the axis of the head; eyes black, large, and full of animation; mystachial bristles of two kinds; the coarsest, brown at base, and whitish at the extremities, intermixed with a few entirely white; the shortest and finest all white; feet five-toed, the inner one shortest; in the winter covered with glossy hair, concealing the five small terminal tubercles; soles nearly covered with hair; some individuals are more yellow than others on the posterior parts.

Dimensions.

	in. & ^t ths.
Length of the head and body, ...	11 0
“ of the tail bone, ...	5 4
“ of the tail, including the terminal tuft, ...	6 6
“ from the nose to the posterior base of the ear,	1 9

Observations. This little animal is one of the most lively and active of any which are known to us. It is common to the Middle and Northern States. It is bold and courageous, and is ready to attack animals larger than itself. It often domesticates itself in cellars and barns, which it speedily clears of rats and mice. It is, however, somewhat prone to mischief, and is not very conscientious in the division of eggs, and of the young poultry; yet it is productive of much good by ridding us of foes whose evils are much greater than the loss of a few eggs, and occasionally a chicken. Formerly the skins were in great demand, especially those taken in higher latitudes, as their fineness and beauty are superior to those of southern or warmer regions. At present they are not considered of so much value as formerly, and they can scarcely be considered as articles of traffic. It is reported that the female produces ten or eleven young at a birth; but I have not had an opportunity of seeing their retreats while breeding, and therefore cannot vouch for its accuracy. The latter remarks apply rather to the true ermine; it is considered as differing specifically from this, though so strongly resembling it, that, without careful attention, it is very likely to be mistaken for it.

GENUS LUTRA. STORR.

Generic characters. Dental system; incisors $\frac{6}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{5}{5}=\frac{5}{5}$; = 36. Body elongated and cylindrical; legs short and strong; toes five on the anterior feet, and four on the posterior, and the rudiment of a fifth; webbed; tail depressed, and wide at its insertion.

1. *Lutra Canadensis*. SABINE. The Otter.

Lutra Canadensis, Richardson, Fauna Bor. Am., p. 57.

Mustela Hudsonica, Lacepède.

Lutra Brasiliensis, Harlan, Fauna Am., p. 72.

The American Otter, Godman, Nat. Hist., i. p. 222.

Figure; Ibid., p. 228, f. 2.

Specific characters. Fur glossy brown ; chin and throat dusky white, grayish, or yellowish-brown ; neck and head long ; legs short ; tail pointed, and shorter than the body.

Description. Color dark, glossy brown, pale or whitish about the throat and face ; body long and cylindrical ; neck nearly as thick as the body ; feet with five toes on the anterior feet, and four, with a rudiment of a fifth, on the posterior feet, short, strong, and webbed ; tail depressed at base ; the skull is wide and depressed posteriorly ; muzzle short and wide ; upper lip thick ; eyes small, and placed near together, and far in advance ; ears small, slightly rounded, and partly concealed in fur ; the two last grinders of the upper jaw large, the three others small and crowded ; the last but one largest in the lower jaw ; at the base of the tail there are two oval glandular bodies about the size of a butter-nut, in which there is a yellowish substance about the thickness of cream, when the animal is dead, which has rather a strong, disagreeable odor, but not so much so as in the Mink ; kidney lobulated ; skin tough ; females smaller than the males.

Dimensions.

	Male.			Female.		
	ft.	in.	t'hs.	ft.	in.	t'hs.
Whole length,	4	0	0	3	5	0
Tail,	1	5	0	1	2	0
Height at the fore legs,				0	8	0
Length of the head,	0	4	5			
Circumference at the middle of the back,	1	7	0			
Length of another female,				3	8	0
Height at the shoulder,				0	9	0
Tail,				1	4	0
From the nose to the meatus,				0	4	0

Skull.

Length,	0	4	3
Height,	0	1	5
Greatest width of the zygomatic arches,	0	2	5
Length of another old skull,	0	4	0
Width,	0	2	6
Length from the incisors to the meatus,	0	3	0
“ “ meatus to the other,	0	2	3

Observations. The Otter is still an inhabitant of our waters, but, from its shyness, watchfulness, and aquatic habits, is rarely seen, and still more rarely captured. It lives in holes in the banks of streams, and subsists on fish, as salmon, bull-pouts, clams,* &c., the heads being more of a luxury than the bodies. It is very expert in fishing, moves rapidly in the water, in which it is greatly aided by the extreme mobility of its shoulder joints.

The fur of the Otter ranks next to that of the Beaver in value, being nearly as fine, but not quite so long. It is more valuable in March and April than in the autumn, the fur then having attained its greatest length. In spring, Otter skins of the best quality generally sell for seven dollars, though the price varies with the fashions of the day. From the shortness of its limbs, the Otter is not a swift runner, yet it is difficult to capture it even on the land; the hide is thick and tough, and defended by a coat of fur, and being a sharp biter, and quite active, the animal repels the attacks of most dogs, unless they have the assistance of their masters. It is rare to find an Otter thin in flesh; but, though its condition is good, and though it is fat, yet its meat is no great dainty, except to an Esquimaux. Its breeding season is in the spring, or about the middle of April; it has but one litter annually, and it numbers only two or three young at a birth. The range of the species is wide, but its home seems to be in the colder regions of the North, as Canada and the British Provinces. It travels much, and does not confine itself to one locality, but wanders up and down the streams, as its wants and caprices seem to dictate; it even travels over mountain ridges to reach some favorite fishing ground, in a route more direct than the windings of rivers. As has been already remarked, it is supplied with two glandular bodies situated at the base of the tail; these seem to be connected with sexual propensities, and enable the animals to discover their mates, as they are supposed to eject or cast it on stones or weeds, somewhat in the manner of dogs. The hunters call it castor, and employ it to allure them into their traps. The usual method of trapping the Otter, is to seek first

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* Unios are so extensively used as food by the Otter and Mink, that they are quite scarce in many places where they formerly abounded.

the banks of clay or snow on the river's side, where they resort for the amusement of sliding. Having found one, they place the trap just under the water, that when the animal plunges in, his fore feet will spring it by striking the pan. This habit of sliding is evidently an indication that it is of a playful disposition, for there can be no other reason for it than amusement. It is susceptible of domestication, and of becoming obedient to a master, and being trained to follow him. It has a whine much resembling the Dog's. The American Otter is distinguished from the European by its greater size, comparatively shorter tail, and a greater uniformity of brown on its inferior parts.

GENUS MEPHITIS. Cuv.

Generic characters. Dental system ; incisors $\frac{6}{6}$; canines $\frac{1}{1}=\frac{1}{1}$; molars $\frac{4}{5}=\frac{4}{5}$; = 34. Body elongated ; arched ; toes free and armed with strong nails, and formed for digging ; tail long and bushy.

1. Mephitis Americana. Desm. The Skunk.

Memphitis Americana, Harlan, Fauna Am., p. 70.

The Skunk, *Godman*, Nat. Hist., i. p. 213.

Figure ; *Ibid.*, p. 213.

Specific characters. Color black, marked with white, longitudinal bands, which vary somewhat in form and extent.

Description. The head of the Skunk is small ; eyes small, and placed more laterally than in the true Weasels or Mink ; ears short and round ; forehead wide. Individuals present a variety of markings ; sometimes the white stripes extend from the tip of the nose to the rump ; sides of the head and under surface black or blackish-brown ; more generally there is an insulated white stripe along the forehead, and a large patch of white covering the whole of the upper part of the neck, from which two white lines bifurcate and extend on the back ; tail tipped with long, white, coarse hair, and many such hairs appear on the shaft of the tail, intermixed with the black ; nails before very robust ; it is provided with odoriferous glands at the root of the tail.

Observations. The general aspect of the Skunk is that of a wicked sort of cunning ; he walks along quite deliberately in the

path before you, as if perfectly conscious of his means of defence. His head is small, and carried low, which, in connexion with his thick, arched body, imparts to him the appearance of clumsiness, foreign to the Weasels. The female breeds once a year, and produces four or five at a time. It extends to the north of the great Lakes, but is apparently most abundant in an old settled country.*

ORDER RODENTIA.

Characters of the order. The order is characterized by the presence of two cutting teeth in the form of chisels in each jaw, and which are separated from the molars by a vacant space; canines none; molars have flat crowns, or blunt tubercles; jaws admit of motion backward and forward, rather than laterally; the posterior extremities longest; the number of toes varies according to the species; mammae variable also in number; stomach simple; intestines long.

FAMILY VIII. CASTORIDÆ. THE BEAVER FAMILY.

GENUS CASTOR. Lin. Cuv. Geoff.

Generic characters. Dental system; incisors $\frac{2}{2}$; molars $\frac{4}{4} \equiv \frac{4}{4}$; = 20. Crowns of the molars flat; toes five, anterior short, the posterior long and palmated; tail broad, thick, depressed, or flattened horizontally, of an oval form, naked, and covered with scales.

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* In the methodical arrangement of the species comprising the animal kingdom, there are two families which should be placed there, the PHOCIDÆ and the TRICHECHIDÆ, commonly known as Seals. Of the first, there are probably two genera, as at present constituted, the *Calocephalus*, and the *Stenmatopus*; of the last family, only one genus, viz. *Trichechus*, which may be an occasional visitant to the coast.

In relation to the seals, it is proper to remark, that I have but little personal knowledge, my information being derived from books. I deemed it inexpedient, therefore, to furnish any matter for this Report, to which I was unable to add something from my own observation. I have, therefore, omitted the usual descriptions, and shall pass at once to the next order.

Castor fiber. Lin. The Beaver.

Castor Fiber, *Harlan*, p. 122.

The Beaver, *Godman*, Nat. Hist., ii. p. 21.

Castor Fiber Americanus, *Richardson*, p. 105.

Figure ; *Godman*, ii. p. 21.

Specific characters. The fur consists of two sorts of hair, one coarse and brownish, the other downy, more or less gray.

Description. The head of the Beaver is rather large, with a short and blunt snout ; the upper lip is divided ; eyes and ears small ; body thick ; the fore limbs somewhat stouter than the posterior ; feet five-toed, the membrane forming the web broader on the posterior than on the anterior feet ; middle toe longest, all armed with strong nails, fit for burrowing ; tail flattened transversely, oval, broad, and covered at base with thick fur, the remainder covered with scales. Incisors yellow in front, strong, and furnished with a single plate of enamel ; the upper stand at right angles to the axis of the jaw ; molar teeth of the upper jaw directed backwards and outwards ; each tooth upon the inside presents a distinct longitudinal groove, formed by the folding of the enamel upon itself, and which divides it into two nearly equal parts ; on the outside, the two middle teeth present two indistinct grooves, and the extremes are merely striated ; the lower molars are directed forward and inwards ; the outside presents a strong groove dividing it into two parts by the folding of the enamel, while, upon the inside, there are three rather distinct grooves formed in the same manner by the enamel, but less distinct than the single outside groove. When the tooth is worn down, the enamel upon the inside presents three foldings upon itself, but on the outside, only one ; the middle folding is the shortest, and the point of flexure is a little in advance of the one from the outside, in the first tooth, which is always less worn than the others, in which the middle foldings stand face to face. In the upper molars the inside groove throws the smallest division of the tooth to the anterior side, and the posterior half has one general fold of enamel, which embraces two foldings from the outside, an arrangement the reverse of that in the molars of the lower jaw ; the inferior

grinders wear away most behind, the front remaining the longest ; but the whole presents a concave, while in the upper jaw, the wearing produces a uniform convex surface.

Dimensions.

(Measurements taken from an old female skull.)

	in. t'hs.
Length of the lower jaw over the palatine bones, ...	4 5
“ from the nasal bones to the crucial ridge, ...	4 9
“ “ end of the incisors to the nasal bones, ...	1 6
Width at the arches, ...	3 5
Length from the incisors to the meatus, ...	4 0
“ of the molars above the sockets, ...	0 5
“ from the incisors to the base of the molars, ...	1 8
“ “ base of the first molar to the foramen magnum, . .	2 5
“ of the space occupied by the upper molars, ...	1 ½
Width from outside of the posterior grinder to the other, .	1 3
Height of the skull at the insertion of the molars, ...	2 0
Breadth of the skull at the base of the processes of the meatus,	2 4

Observations. This remarkable animal is probably driven entirely from the bounds of Massachusetts. It has become, like some other animals, extinct, and is known only in historical records as having formerly been a tenant of our waters.

There is but little doubt, that all the larger streams, as the Connecticut, the Hoosic, Housatonic, and Merrimack, as well as some of the lakes, were more or less frequented by this animal. The principal circumstance on which our evidence of the fact rests, is the frequent occurrence of such names as these, the Beaver-Dam, Beaver-Meadow, Beaver-Lake, Beaver-Falls, &c.

I shall not enter largely into the history of the Beaver, though volumes have been written on its sagacity and remarkable intelligence, from which it would seem that the authors could not say too much in its praise, nor relate stories too wonderful to be believed, or too fictitious to satisfy the curiosity of the credulous.

That it possesses a degree of sagacity above some animals, is, perhaps, not too wonderful to be believed ; but it is probable that all the curious stories have arisen from the circumstance of its being a quadruped endowed with the instinct of accommodating itself to circumstances, and of providing for itself a curious habitation. What is this more than that possessed by the Squirrel, who builds

his nest in the tree-top in the summer when the leaves are thick, and serve to conceal his habitation, but, as soon as the leaves fall, betakes itself to a more secure retreat in the hollow trunk?

The Beaver is a social animal, and dwells, when undisturbed, in a community. Individuals labor together for the common welfare to a certain extent, each pair, however, preparing their own habitation. The houses are made of sticks, mud, and stones, mixed up together without order. These the Beaver carries, stones, sticks, &c., by holding them with his fore paws against his throat and breast. The work is always performed in the night, and carried on with celerity and despatch. The door leading to the hut is always on the side farthest from the land, and is placed deep in the water, and near the foundation of the house.

Perhaps one of the most remarkable facts in the history of the Beaver is its ability to accommodate itself to circumstances. Thus, when it is frequently disturbed, it ceases to build dams or houses, and takes up its abode in the banks of streams. This, however, is not singular, nor confined to the Beaver. Other animals, also, are driven to this alternative, and accommodate themselves to a course which seems at first view constrained and unnatural.

In its travels from place to place, it is extremely cautious and wary, and guards against detection; and, were it not obliged to satisfy the calls of nature by cutting down small trees, it would ordinarily escape the vigilance of the hunter.

It feeds on the willow, birch, poplar, and alder, and but rarely on any of the pine tribe; also upon the roots of the nuphar, which grow at the bottom of lakes, ponds, and rivers.

The Beaver produces from two to five young at a litter. Young Beavers are said to be playful, and to imitate both in their action and voice the gambols of children.

The Beaver is susceptible of domestication, and becomes a great pet, and extremely fond of being handled. It is said, that, in this state, they still preserve some of their instincts; for, on the approach of a storm, they will uniformly cut the furniture of the room, such as chair-posts, &c., and lay the foundation of a dam. The sticks which they thus cut, are usually placed against some open space, as a door, or laid across the corner of the room.

Though the Beaver, in its savage state, subsists entirely on vegetables, as bark and roots, yet, when tamed, it does not refuse meat.

GENUS FIBER. Cuv. Geoff.

Generic characters. Dental system ; incisors $\frac{2}{2}$; canines $\frac{0}{0}=\frac{0}{0}$; molars $\frac{3}{3}=\frac{3}{3}$; = 16. Molars with a flat crown and zigzag plates of enamel ; fore feet with four toes, and the rudiment of a thumb ; posterior with five, edged with stiff and coarse bristles ; tail long, compressed laterally ; naked, except a few scattering hairs, somewhat granulated.

1. Fiber Zibethicus. Desm. Muskrat.

Mus Zibethicus, *Lin.*, Turton's, p. 79.

Fiber Zibethicus, *Hartan*, Fauna Am., p. 132. *Richardson*, Fauna Bor. Am., p. 115.

Musk-Rat, *Godman*, Nat. Hist., ii. p. 58.

Figure ; *Ibid.*, p. 21.

Fur clear brown, tinged with red above, cinereous beneath.

Description. Body thick, and somewhat oval ; neck short ; ears short and partially concealed in a dense fur, and about as wide as high ; eyes small, mystachial bristles numerous ; tail long, somewhat linear, naked, compressed laterally, and slightly curved.

Observations. This animal is still numerous in our marshes and mill-ponds, though it is hunted with a good deal of avidity. It makes holes or burrows in the banks, and sometimes builds houses with some ingenuity in the marshes, which appear like little hillocks. From these habitations it may be driven by being disturbed, and makes its escape by plunging into the water. The fur of the Muskrat is quite fine, and is used in various ways. In August, it is sometimes preserved on account of its pale color. It is not till November that it is good, and it is still more valuable in the spring.

FAMILY IX. LEPORIDÆ. THE HARE FAMILY.

Characters of the family. The family of the Leporidæ is considered by naturalists as the best defined group of beings in the

animal kingdom. It is distinguished from every other by well marked characters, whether we consider its habits or configuration. The great length of the ears, the prominence of the eyes, the length of the posterior extremities, and the shortness of the tail, are characters which are obvious at the first glance, and which are so prominent, that they may be considered as family features sufficiently common to distinguish the whole group. Besides, being, as it were, unarmed, their instinct of escaping their foes by flight may be considered common to the whole race.

The heads of the individuals belonging to this family, are narrow, or compressed, which arises from the straightness of the zygomatic arches, which, in the Carnivora, swell outwards, and help to extend the width of the cranium immediately in advance of, and above the insertion of the ear. The head, too, is comparatively long, though not terminated by an acute or extended snout. The eyes are prominent, and placed laterally; the ears are planted apparently near each other; the bony process of the meatus externus is directed upward and backward, a direction almost the reverse of some of the pugnacious animals, as the Weasels. This circumstance, connected with its size, may be ranked as a remarkable adaptation, in which organization and instinctive properties blend and harmoniously combine. The external ear, as has already been remarked, is very large; it is elastic also, and very movable, and its position during its ordinary pursuits, as feeding, tending its young, &c., is directed backwards on the line with the bony canal, which opens downwards and forwards. This canal is comparatively long, and serves thereby to increase the strength of the vibrations of the air; a whisper, the snap of a stick, the rustling of the leaves, is heard at a distance to give timely warning of danger from behind, while the prominent eye, quite lateral as to position, perceives in time the approach of an enemy before. Thus it is, that nature has taken care that this unprotected race should not be left to the mercy of implacable enemies, without guarding it almost as effectually as the less powerful of the Carnivora.

GENUS LEPUS. Lin.

Generic characters. Dental system ; incisors $\frac{4}{2}$; canines $\frac{0}{0} \equiv \frac{0}{0}$; molars $\frac{12}{0}$; = 28. Grinders flat, with the plates of enamel transverse ; tail short.

1. *Lepus Americanus*. Erxl. American Hare.

Lepus Hudsonius, *Pallas*, *Glires*, p. 30, An. 1778.

American Hare, *Foster*, *Phil. Trans.*, lxii. p. 376. *Pennant*, *Arct. Zool.*, i. p. 90. *Hearne*, *Journ.*, p. 384. *Godman*, *Nat. Hist.*, ii. p. 157.

Lepus Americanus, *Sabine*, *Franklin's Journ.* p. 664. *Richardson*, *App. Parry's 2d Voyage*, p. 324, and *Fauna Bor. Am.*, p. 217. *Harlan*, *Fauna*, p. 192.

Specific characters. Head, body, and upper side of the tail, brown ; ears shorter than the head, the upper portion bordered in the winter on the outside by a dark brown edge, internally pale, and nearly naked in summer ; tail white beneath.

Description. The dress of this animal varies but little during the year. Along the back, the brown is darker during the winter, and there is also a greater predominance of black shining hairs ; the general color of the head, rump, and sides, is paler, or a yellowish or grayish-brown ; belly, sides, and thighs, white, with a slight tinge of yellowish ; chin yellowish white, the lower portion grayish ; the upper portion of the tail yellowish-brown ; the darker portions of the back arranged somewhat in lines ; ears edged with blackish, but this does not extend to the base at the posterior margin ; fur plumbeous for two thirds of its length, then dull yellowish-brown ; the intermixed coarse hairs are whitish at their roots, then black, and then whitish, or slightly tinged with brown, terminating in a glossy black ; the fur of the belly is plumbeous near the skin, and terminated with white ; general color of the legs yellowish-brown ; mystachial bristles black at base, and terminated usually with brown, in addition to which, there are three or four black, stiff hairs over the eyes ; around the eyes, also, there is a circle of yellowish-white ; nails brownish, nearly straight, five upon the fore, and four upon the hind feet ; incisors white, linear, external surface grooved near the inner mar-

gins, inferior flat on the external surfaces, and slightly grooved on the internal, which are considerably narrower ; cutting surfaces oblique, and ground down like a chisel.

Dimensions.

	ft.	in.	t'hs.
Length of the head and body, ...	1	1	0
Head, ...	0	3	5
Tail, ...	0	1	5
Ears behind, ...	0	2	2
Middle claw of the fore foot, ...	0	0	3
“ “ “ hind foot, ...	0	0	4½
Height at the fore legs, ...	0	7	0

Skull.

From the incisors to the occipital spine, ...	0	3	2½
From the incisors to the foramen magnum, ...	0	2	3
“ “ “ meatus externus, ...	0	2	4
Height, ...	0	1	2
Width at the zygomatic arches, ...	0	1	5
Length of the lower jaw, ...	0	2	3

Observations. The American Rabbit, as it is sometimes called, exhibits more of the habits of the English animal of this name, than either of the other species peculiar to this country. Thus, when pursued, it flies to a hole for shelter, and, though it does not burrow, it seeks some excavation, shallow, it is true, for the rearing of its young. Its color scarcely changes in this climate. Those in the neighbourhood of Williamstown are of a beautiful glossy brown during the winter. I have, however, seen individuals which were distinctly gray during winter in the mountain towns of Hampshire County. These were always confined to swamps, though it would be perhaps safer to make the remark in qualified terms, as my observations are too limited to be made a general expression. I have thought it possible that we might have two species of small hares, one of which is confined mostly to wet and low places, and changes its coat in winter from brown to gray. The suggestion is made for the purpose of exciting inquiry. I have not been able to procure one of the gray varieties, since engaged in this work.

2. *Lepus Virginianus*.   Harlan.   Prairie Hare.

Lepus Virginianus, *Harlan*, Fauna Am., p. 196.   *Richardson*, Fauna Bor. Am., p. 224.

The Varying Hare, *Godman*, Nat. Hist., ii. p. 163.

Specific characters. Color of the summer dress on the upper parts, dark umber-brown, of the winter, white ; ears shorter than the head ; ends and margins mixed with white and blackish-brown ; tail white beneath.

Description. In winter, the dress consists of a long coat of fine fur, which, when lying smooth, is a pure white ; if it is ruffled, the wood-brown appears beneath. The ears are more or less mottled with oblong, brown, and yellowish-brown spots, which are more numerous on the anterior than on the posterior side, and which extend quite down to the insertion ; they are also bordered with blackish-brown one third of the distance to the base, slightly intermixed with yellow-brown ; the inside is white, with a tinge of yellow ; the mystachial bristles are black at base, and terminated with white, or black throughout ; there are four or five stiff, black hairs above the eyelids, and many beneath the chin ; the fur on the back is plumbeous at base, then wood-brown, and lastly snow-white ; there are also interspersed many hairs, which are strong and white their whole length ; on the throat it is paler, while on the head it is darker, but on the belly white ; the arrangement of the colors of the tail is the same as on the other parts, but less conspicuous ; upon the outer portion of the extremities it is the same as on the back, while on the inner, it is like that of the belly. Nails narrow, nearly straight, hind one broader and longer than those before. In the summer, the color of the dress on the upper parts is dark umber-brown, which arises partly from an intermixture of black, shining hairs ; the fur at the roots is the same as in winter, but towards the extremity, tinged with yellowish-brown and black ; under jaw smoke gray ; a white circle surrounds each eye, but the margin of the eyelids is dark-brown as in winter ; the white color commences between the fore legs, and extends over the belly, and predominates on the extremities ; the sides present a dull, pale yellowish-brown, in the midst of which there are scattered black hairs ; the ears are nearly naked in sum-

mer, but the fur remains on the margins, of a mixed white and blackish-brown, the latter prevailing at the tips ; the tail is white beneath ; on its upper surface, the gray and brown colors appear through the white ; mystachial bristles as in winter.

Dimensions.

	ft.	in.	l'ths.
Length of the head and body, ...	1	7	0
“ from the nose to the middle claw, ...	2	3	5
“ of the head, ...	0	4	3
“ from the nose to the insertion of the ear, ...	0	3	5
“ “ “ ears posteriorly, ...	0	3	5
“ of the three inside nails of the hind feet, ...	0	0	5
Tail, ...	0	1	5

Skull.

From the insertion of the incisors to the occipital spine, ...	0	4	6½
“ “ “ “ foramen magnum, ...	0	2	6½
“ “ “ “ meatus externus, ...	0	2	9
Width, ...	0	1	7
Height, ...	0	1	4

Observations. Godman, in his “Natural History,” gives the length of this animal as 14 inches, while Richardson, in his “Northern Zoology,” gives it as 19 inches. The specimen before me is 16 inches. There is, therefore, some variation, probably, in full grown individuals, which depends on climate, food, &c. The skull of my specimen is longer and larger than the one measured by Richardson. This species is common throughout the New England States, and is known generally as the White Rabbit. It is found, however, far to the north, as at Fort Enterprise on McKenzie’s River, in latitude 68°. As food, it is usually esteemed. It is taken in snares and traps set in its paths, into which it is often driven by hounds. The fur is not much esteemed. The limbs of Rabbits and Hares are so constructed, that their movements are almost necessarily in leaps or bounds.

FAMILY X. MURIDÆ. THE RAT FAMILY.

GENUS ARVICOLA. Desm. Mus. Lin.

Generic characters. Dental system ; incisors $\frac{2}{2}$; canines $\frac{0}{0}=\frac{0}{0}$; molars $\frac{3}{3}=\frac{3}{3}$; = 16 ; deeply grooved externally. Muzzle obtuse ; tail round and hairy, shorter than the body.

1. *Arvicola hirsutus*.

Color of the head and body above, tawny brown, beneath, ash-gray ; tail less than half the length of the body, thinly covered with hair.

Description. Fur beneath bluish-black, the extremities of most of the hairs are reddish, and hence give it somewhat of a tawny or reddish appearance ; these are intermixed with a few which are entirely black ; the color of the fur upon the belly the same as above, though the hairs are light, or ash-gray ; the nose is obtuse, and surrounded by numerous dark-brown mystacial bristles ; incisors yellow ; fore feet short ; the three middle nails of the posterior feet, and the two middle ones of the anterior, longest, and nearly of equal length ; external ears rather large, and partly concealed in the fur, broad at base, and rounded ; tail obscurely ringed and tapering.

Dimensions.

	in.	l'ths.
Whole length, ...	6	5
Tail, ...	1	7½

Observations. The Meadow Mouse makes its burrows in banks of soft earth, under stones and stone heaps, from which there are well-trod paths diverging in all directions. It is a vegetable feeder, and subsists on seeds, grains, nuts, &c. It is injurious by feeding upon the roots of vegetables, and in hay ricks, by cutting up the dried hay into mere fragments, and rendering it entirely unfit for the use of cattle. It has a great many enemies, but, notwithstanding, by its excessive multiplication, it is scarcely diminished in numbers.

This species seems to be more uniformly colored than others of this genus, the lighter color beneath being confined to a comparatively small portion of the belly, and is never white.

2. *Arvicola albo-rufescens*. Nobis.

Specific characters. Fur entirely white ; hairs at the extremities pale yellowish-brown ; white beneath ; upon the belly and chin paler than above.

Dimensions.

	in. t'hs.
Whole length, ...	5 1
Tail, ...	1 5

Observations. This species differs from the preceding in color. It is far less common. I have met with only two individuals. These were discovered in Williamstown, four years since. That it is not an albino, is rendered probable by the color of its eyes, which were black, and that it is not an accidental variety, is also probable from the fact, that the two individuals belonged to the same nest. The size appears to be less than the common Field Mouse.

3. *Arvicola Emmonsii.* De Kay.

Specific characters. Color brown above, which extends along the tail in the form of a rather wide line ; white beneath, including the feet ; hind legs longer and more robust than the fore legs ; tail a little longer than the body.

Description. Head rather large and obtuse ; ears roundish ; naked on the upper border on both sides ; tongue smooth ; incisors without grooves ; molars tuberculated, the first in each jaw the largest, diminishing in size to the last, which, when worn, present a circular disc, but almost without tubercles ; four toes on the fore feet, with a rudiment of a thumb, but without a nail ; five on the hind feet ; nails concealed in the white hair ; hind legs the longest ; tail tapering, hairy ; mystachial bristles numerous, some of which are black or dark-brown for one half their length, the remainder grayish or whitish ; color brown above ; darker along the back than the sides ; the former color extends along the upper side of the tail in the form of a stripe, and occupies about one third of its circumference ; nose also brown, the upper part like the back ; the brownish extends to the heel joint behind ; white beneath, including also the feet, nostrils, the front and back part of the fore legs, and extending along the sides to the thighs, which are also white on the front and back parts, and running to the extremity of the tail ; feet all white, which gives a very clean and neat appearance to the animal ; line dividing the brown from the white well defined ; fur bluish-black on all those parts which are brown.

Dimensions.

	in.	t'hs.
Whole length, ...	6	0
Head, from the nose to the ears, ...	1	0
Tail, ...	2	5
Longest of the whiskers, ...	1	5

Observations. This beautiful animal inhabits meadows and wooded places. It is often seen in fields recently mowed, and is known by the name of Deer Mouse, in which is also included the Gerbillus or Jumping Mouse. Our animal, though it leaps well, yet cannot take such long and rapid strides as the true Jumping Mouse. It is, however, quite active, and difficult to capture. It is probably native, and originally inhabited woods and woody places, but has now taken up its abode in places where grain and seeds of grass are plentiful. It appears to be the connecting link between the Arvicola and Gerbillus, having quite a long tail, and stout posterior extremities.

GENUS MUS. Lin.

Generic characters. Dental system ; incisors $\frac{2}{2}$; canines $\frac{0}{0} \equiv \frac{0}{0}$; molars $\frac{3}{3} \equiv \frac{1}{3}$; = 16 ; grinders simple, with tubercular summits ; superior incisive teeth wedge-shaped ; inferior compressed and pointed. Tail nearly naked, annulated with scales.

1. Mus musculus. Lin. The Common Mouse.

Common Mouse, *Pennant*, Brit. Zool., i. p. 122.

Mus domesticus vulgaris, minor, *Ray*.

The Common Monse, *Godman*, Nat. Hist., ii. p. 84.

Specific characters. Fur brownish ash above, light ash beneath ; tail rather shorter than the body ; ears about half the length of the head.

Description. Head tapering ; muzzle acute ; ears rounded ; ears, feet, and tail clothed with only a small quantity of hair ; eyes prominent and bright ; whiskers numerous, extending in graceful lines around the head. It has four digits on its anterior feet, and a rudimental thumb destitute of a claw ; on the hind feet there are five.

Observations. This animal is not a native of this country, but is supposed to have been introduced. Though a beautiful little animal, still it is not regarded with much favor; the unpleasant odor produced where it resides, serving to produce a strong prejudice and disgust.

2. *Mus rattus.* Lin. Black Rat.

Mus domesticus major, Ray.

Black Rat, *Pennant*, Zool., i. p. 113. *Harlan*, Fauna Am., p. 148. *Godman*, Nat. Hist., ii. p. 83.

Specific characters. Grayish-black above, ash beneath; ears half the length of the head; tail longer than the body.

Description. Head elongated; muzzle tapering; mystachial bristles numerous; upper jaw projects beyond the lower, which is remarkably short; tongue smooth; ears rounded, simple, naked, and half as long as the head; eyes large and projecting, though not remarkably so; feet plantigrade; five toes on each foot, concealed in the skin, excepting the terminal joint and claw; tail longer than the body, almost destitute of hair, but covered with rings of scales; color of the upper parts grayish-black; of the lower, dull ash; feet and tail dusky.

Observations. The Black Rat is supposed by many to have been introduced into this country from Europe. Others, however, are undecided as it regards this question. It was once more numerous than it is at present. This animal I found quite numerous a few years since about an old mill in Williamstown, which is the only place in which I have met with it. It is supposed to have been extirpated, or driven away from its former residences by the Brown or Norway Rat.

3. *Mus decumanus.* Pallas. Brown Rat.

Mus Norwegicus, Brisson, Reg. An., p. 173. *Erxl.*, Syst., p. 381.

Norway Rat, *Pennant*, Brit. Zool., i. p. 115.

The Common, Brown, or Norway Rat, *Godman*, Nat. Hist., ii. p. 78.

Specific characters. Color of the upper parts grayish-brown, with a tawny tint; dirty white beneath; ears and muzzle nearly

naked ; tail ringed and scaly, each scale having a small hair growing from beneath it.

Description. The muzzle is less tapering than in the preceding species. The tail has about 180 rings formed by the scales.

Dimensions.

	in. l'ths.
Length of the head and body, ...	10 8
Head, ...	2 0
Ear, ...	0 8
Tail, ...	8 2

Observations. The habits of the two preceding species of Rats are quite similar ; they feed on every thing of household consumption, and frequently make great havoc in cellars, fields of corn, and granaries. They are fond of meat, and will frequently destroy large quantities of pork. Their depredations do not end here, as they destroy eggs and young poultry. They are bold and furious when attacked by man or dog, and fly at either with fury when so confined that escape is hopeless. They breed several times annually, and produce from ten to fourteen at a litter. Much might be said of this bold and mischievous animal ; but it is sufficient to remark, that it is an annoying plague, whose extirpation is universally sought, but which cannot be effected, in consequence of its cunning, and great fecundity. The best method of destroying it is to mix plaster of Paris largely with meal, which it will eat, and which, by hardening in its stomach and intestines, produces death in a short time.

GENUS ARCTOMYS. Desm.

Generic characters. Dental system ; incisors $\frac{2}{2}$; canines $\frac{0}{0} \equiv \frac{0}{0}$; molars $\frac{5}{4} \equiv \frac{5}{4}$; = 22. Head somewhat triangular ; ears as wide as long ; eyes small ; feet robust ; tail half the length of the body.

1. *Arctomys monax*. Gmel. The Marmot. The Woodchuck.

Mus monax, Lin.

Ground Hog, *Harlan*, Fauna Am., p. 158.

The Maryland Marmot, *Penn.*, Synop. 27 ; Quad., ii. 398. *Godman*, Nat. Hist., ii. p. 100.

Figure (poor) ; Griffith's *Cuvier*, iii. 170.

Specific characters. Fur rusty-brown ; hair grayish at the tips ; face pale bluish-ash ; ears short and broad ; fore feet four-toed, those behind have five ; tail black, somewhat bushy.

Description. Body thick ; the general color is a rusty brown ; the tail and feet black ; ears rounded, and broad at base, placed high up and far back on the head, provided with a muscular apparatus for bringing down the upper portion over the orifice, bordered with grayish anteriorly ; tail somewhat bushy at the extremity, and black or very dark-brown ; mystachial bristles black ; the fore feet have only four toes with the rudiment of a fifth ; legs robust and strong ; nails long, curved, sharp, and brown, and fitted for burrowing ; stronger before than behind.

Observations. This interesting animal is one of the most common in New England. It is vigilant, and though not very active, still it is almost impossible to surprise and take it at a distance from the burrow. It is perfectly cleanly in all its habits, is susceptible of domestication, and becomes a very agreeable pet. It is well known to hibernate. It goes into winter quarters some time in October, unless the weather is quite mild, and the means of subsistence plentiful ; it is then very fat. Its sense of hearing is extremely acute, and hence it is so rarely surprised away from home, as the least noise, when it is collecting the materials for its nest, or feeding, is timely perceived, so that it escapes while the suspicious object is at a distance.

GENUS SCIURUS. Lin. The Squirrel.

Generic characters. Dental system ; incisors $\frac{2}{2}$; canines $\frac{0}{0} \equiv \frac{0}{0}$; molars $\frac{5}{4} \equiv \frac{5}{4}$; = 22. Body elongated ; upper lip divided ; posterior extremities longer than the anterior ; upper incisive teeth chisel-shaped ; lower pointed ; molars tuberculated ; feet five-toed ; tail long, bushy, with the hairs directed laterally.

1. *Sciurus leucotis*.   Gappar.   Common, or Little Gray Squirrel.*Sciurus cinereus*, Harlan, Fauna Am., p. 173.The Common Gray Squirrel, *Godman*, Nat. Hist., ii. p. 131.Figure ; *Ibid.*, p. 133, f. 2.

Specific characters. Color fine bluish-gray, varying somewhat in kind and degree ; on some parts, as on the head and along the sides, there is a yellow or golden hue intermixed with the general color ; this yellowness is quite obvious where the white hair of the belly approaches the gray of the sides, and also on the anterior part of the fore, and superior part of the hind feet.

Description. Without entering into a detailed description of this common species, I shall barely remark upon the skull and teeth. Incisors yellow externally, convex outwardly ; upper, slightly grooved, and nearly if not quite uniform in width from their insertion to their points ; the lower become narrower towards their points ; in the upper jaw there are four true molars, and a rudiment of the fifth placed towards the inside of the first true molar ; it is a mere conical peg inserted into the jaw, which probably falls out in early life.

Dimensions.

	in.	pths.
Length from the extreme of the nasal bones to the occipital spine,	2	7
“ from the incisor to the meatus, ...	1	7½

2. *Sciurus vulpinus*.   Gmel.   The Gray Squirrel.   Fox Squirrel.The Fox Squirrel, *Godman*, Nat. Hist., ii. p. 128.

Specific characters. Color varies from white to pale-gray and black ; various shades of red, mottled, &c. ; generally larger than the preceding.

Observations. This Squirrel presents so many variations of color, especially in a more southern latitude, that many individuals have mistaken it for two or three distinct species. It is not very common in the woods of Massachusetts ; the black, or tawny

black, variety is the most common ; the mottled varieties I have never met with. Some individuals which were tawny upon the belly, and gray, I have repeatedly seen. The flesh is not so sweet as that of the common gray variety ; it is usually red, and not so white as in the former species. The body is about fourteen inches in length, the tail sixteen ; ears quite hairy inside and out, and not so high as in the former species.

3. *Sciurus niger*. Lin. The Black Squirrel.

Black Squirrel, *Pennant*, Arct. Zool., i. 138.

Sciurus niger, *Harlan*, Fauna Am., p. 177. *Richardson*, Fauna Bor. Am., p. 191.

The Black Squirrel, *Godman*, Nat. Hist., ii. p. 133.

Figure ; *Ibid.*, p. 138, f. 3.

Specific characters. Color jet black, with a fine, short, glossy pelage, with but a small quantity of intermixed gray ; on the belly there is a prevalence of reddish-brown ; in the summer the black is not so pure as in winter.

Observations. The Black Squirrel rarely varies much in its color. It may be distinguished from the black varieties of the other species, by the pureness of the black, which in the mere varieties of the other species partakes largely of the brown and reddish hues, and also by the softness and fineness of the hair. It is far less common in the western part of Massachusetts than the Gray Squirrel, and, indeed, it is very rare to meet with one.

4. *Sciurus Hudsonius*. Gmel. The Common Red Squirrel.
Chickaree.

Sciurus Hudsonius, *Harlan*, Fauna Am., p. 185. *Richardson*, Fauna Bor. Am., p. 187.

The Hudson's Bay Squirrel, *Godman*, Nat. Hist., ii. p. 138.

Figure ; *Ibid.*, p. 133, f. 1.

Specific characters. Superior parts of the body reddish brown, varying in intensity, and shaded with black ; inferior, white, tarnished more or less with reddish yellow ; longitudinal line between the white and red somewhat darker than the back ; ears tufted.

Description. The under part of the head and front of the fore limbs are reddish-brown, like the back ; the insides of the thighs are colored like the belly, and on each side, or on the flanks, there is a blackish line ; the tail is of a reddish-brown color above ; mystachial bristles long and black. It resembles the common Red Squirrel, or *Sciurus vulgaris*, of Europe, more than any species which we have. The range of the species is much farther to the north than either of the preceding. They are subject to a disease of the incisive teeth, in the progress of which they grow to an excessive length. All the Rodentia appear also subject to the same misfortune.

5. *Sciurus Striatus*. Klein. The Striped Squirrel.

Sciurus Carolinensis, *Brisson*, Reg. An. 155, No. 9.

Sciurus Lysteri, *Ray*.

Sciurus striatus, *Harlan*, Fauna Am., p. 183.

The Ground Squirrel, *Godman*, Nat. Hist., ii. p. 142.

Sciurus (*Tamias*) *Lysteri*, *Richardson*, Fauna Bor. Am., p. 181.

Figure ; *Godman*, ii. p. 143, f. 3. *Richardson*, p. 181.

Specific characters. Striped with five parallel and longitudinal black lines ; the two lateral ones separated from each other by a white line ; white beneath ; eyelids bordered with white, which runs back a little towards the ear, in which there is a touch of black running in the same direction.

Description. The general color inclines to reddish rather than brown ; the lines are obscurely bordered with red ; the white beneath extends down the fore legs behind ; the sides of the body are paler, and inclining to yellowish ; tail gray, the proportion of black greatest, and with a tendency to form a lateral stripe, red at base, sub-ancipital ; ears are proportionally high and rounded.

Dimensions.

		in. l'ths.
Whole length,	. . . . .	6 0
Tail,	. . . . .	3 8

Observations. This common little animal lives entirely under ground or in hollow logs. It very rarely ascends trees in search

of fruit, nuts, &c., but seeks them on the ground, and lays up an abundant store. It ascends trees to conceal itself when pursued, if no other way of escape presents itself; but, if alarmed, it escapes from its place of refuge at all hazards, with an instinctive knowledge, that the place of greatest safety is its burrow. It does considerable injury to corn fields when the plant is just out of the ground, by destroying the kernel.

GENUS PTEROMYS. Illiger.

Generic characters. Dental system; incisors $\frac{2}{2}$; canines $\frac{0}{0}=\frac{0}{0}$; molars $\frac{5}{4}=\frac{5}{4}$; = 22. Skin of the sides extended between the anterior and posterior extremities, so as to form a sail; tail moderate, flattened, and distichous; anterior feet four-toed, posterior five-toed.

1. *Pteromys volucella*. Lin. The Flying Squirrel.

Pteromys volucella, *Harlan*, Fauna Am., p. 187.

The Common Flying Squirrel, *Godman*, Nat. Hist., ii. p. 146.

Figure; *Ibid.*, p. 143, f. 1.

Specific characters. Color brownish-ash; the under parts of the body white, with a yellowish margin where the color of the back and belly approach each other; the four toes of the anterior feet nearly equal; the four of the posterior feet are also equal, or nearly so, while the fifth or outside one is shortest.

Description. Some individuals are darker than others, and the upper side of the tail is fawn-colored; the ears are large, thin, and rounded, nearly naked; mystachial bristles numerous; eyes black and prominent. This animal is about five inches in length, and the tail three and a half, or nearly four. It is common throughout the States, is nocturnal in its habits, and may be tamed. It has a fine, soft, beautiful fur, more so than either of the species of Squirrels. It builds its nest generally in hollow stumps or trees, and sometimes in thick brush-wood.

GENUS GERBILLUS. Desm.

Generic characters. Dental system; incisors $\frac{2}{2}$; canines $\frac{0}{0}=\frac{0}{0}$; molars $\frac{3}{3}=\frac{3}{3}$; = 16. Anterior extremities short; posterior long,

and formed for jumping ; the former four-toed, and the latter five-toed ; tail long, round, and covered with hair.

1. *Gerbillus Canadensis*.   Desm.   The Jumping Mouse.

Dipus Canadensis, *Davies*, Lin. Trans., iv. p. 155.

Dipus Americanus, *Barton*, Am. Phil. Trans., iv. p. 114.

Gerbillus Canadensis, *Harlan*, Fauna Am., p. 155.

The Jumping Mouse, *Godman*, Nat. Hist., ii. p. 94.

Figure ; *Ibid.*, p. 93, f. 1 and 2.

Specific characters. Head, back, and upper parts of the body reddish-brown ; the under parts, and inside of the limbs yellowish-white, or cream-colored ; tail longer than the body.

Description. The size of this animal is nearly the same as that of the common Mouse ; the color on the back is a darker brown than elsewhere ; near the lower part of the nostrils there is a band, or yellowish streak, extending the whole length of the head, and the superior and inferior side of the fore limbs ; it passes also along the body, and terminates at the joint of the thighs ; the upper jaw projects beyond the lower ; ears not large, oval and hairy ; mystachial bristles numerous and long ; on the posterior extremities the distance from the heel to the toes is great ; the three middle toes are nearly equal in length ; the inner one shortest ; the tail is much longer than the body ; upper sides slate-brown, beneath yellowish cream-color, and terminated with a pencil of hairs.

FAMILY XI. HYSTRICIDÆ. THE PORCUPINE FAMILY.

GENUS HYSTRIX.   Lin.

Generic characters. Dental system ; incisors $\frac{2}{2}$; canines $\frac{0}{0} \equiv \frac{0}{0}$; molars $\frac{4}{4} \equiv \frac{4}{4}$; = 20. Body thick, and covered partly with spines, coarse hair, and fur ; four feet four-toed, and hind feet five-toed ; tail prehensile.

1. *Hystrix dorsata*. Lin. Gmel. The Porcupine.*Hystrix Hudsonius*, *Briss.*, 128.*Hystrix dorsata*, *Harlan*, *Fauna Am.*, p. 190.The Canada Porcupine, *Godman*, *Nat. Hist.*, ii. p. 150.*Hystrix pilosus*, *Richardson*, *Fauna Bor. Am.*, p. 214.Figure; *Godman*, ii. p. 150, f. 2. Griffith's *Cuvier*, iii. p. 206.

Specific characters. Color black; body covered with coarse hair, intermingled with pointed spines, whose shafts are white, but their ends or tips are black; tail thick, prehensile, and ancipital; nails long, and moderately curved.

Description. The general color is somewhat various; it is black, or brownish black; limbs robust; quills upon the head and extremities short and stiff; those upon the back long; many short ones intermingled with the hair all over the animal; neck thick, belly large, and limbs nearly equal in length; nose obtuse; molar teeth of the upper jaw inclining outwards; those of the lower inwards; each set or line standing in an angular direction; crowns flat; each molar of the upper jaw presents a single sulcus on the inside, deeper and more strongly marked in the first and last; the outside presents three sulci separated by double lines of enamel, or a plate of enamel folded on itself; the lower molars resemble the upper, except that the arrangement of the sulci is reversed, the single deep sulcus appearing on the outside, and the three which constitute the principal grinding surface, on the inside; there are no lateral grooves as in the teeth of the Beaver; the grinders wear posteriorly, the jaw admitting of motion principally from before, backwards, or the reverse.

Dimensions.

	ft.	in.	ths.
Whole length, ...	2	2	0
Tail, ...	0	7	5
Height of the back, ...	1	2	0

Skull.

Length from the nasal to the occipital spine, ...	0	3	9
From the insertion of the incisors to the foramen magnum, ...	0	3	8
Height of the upper jaw, ...	0	1	6
Width of the top of the skull over the eyes, ...	0	1	4
Longest spines, ...	0	2	5

Observations. The Porcupine is a sluggish animal, passing much of its time in sleep. It is clumsy in its form, though it climbs and moves about on trees with much more agility than one would expect when seeing it upon the ground. It is herbivorous, living on fruits, grain, and bark of the roots and branches of trees. It dwells in dens, or under rocks, and in the hollows of trees. When assailed, it immediately throws its head between the fore legs, and erects the spines on its back, and at the same time elevates its posterior parts and tail ; if it is now touched, it gives a smart lateral blow with its tail ; if this happens to come in contact with any object, it is left with numerous detached quills adhering to it, which, if not removed, will gradually work into the flesh. It therefore becomes a formidable weapon of defence, and serves to keep dogs, foxes, and wolves at bay. If it is irritated with a stick, it utters a plaintive cry, and immediately throws itself into a posture of defence, with a quick motion, and holds itself in readiness to inflict a blow on the disturbing object. The flesh is red, exhales an unpleasant, sweetish odor, and is rarely relished by individuals, except those in a savage state. It travels two or three miles from home, but returns ordinarily to its den. Those about Williamstown seem to reside under rocks, or to live in families, or at least they are known to maintain a residence at one place for a long time, which becomes the abode of one or more individuals successively for years. They are supposed to bring forth two at a time. Like other wild animals, they travel in what are termed by hunters *run-ways*, and form thereby well beaten paths. This animal is more nearly allied to the Beaver than to the Squirrels. The general form of the skull, the arrangement of the teeth, and the food on which it lives, &c., make a very close approximation to it, though the spines and coarseness of the hair and fur present features very unlike it. Its range north extends beyond Churchill's River. It is also found far west and south ; hence it is widely distributed. Though it is common on the mountains in the vicinity of Williamstown, I have never seen it in Middlefield or Chester, or even heard of it in any of the neighbouring towns. An albino is sometimes met with in the north part of the State of New York.

In the young, long, white, coarse hairs appear to take the place of quills along the back and sides.

ORDER RUMINANTIA.

Characters of the order. Animals embraced in this order are distinguished from others by the want of incisive teeth in the upper jaw. Between the molar teeth and the place usually occupied by the incisive teeth, there is a vacant space, as in the Rodentia ; in a few of the genera, however, there are canine teeth. There are generally six molars on each side of both jaws. The incisors of the lower jaw are almost universally eight in number. The feet are all two-toed, and the toes are covered with hoofs ; in some genera there are rudimental toes covered also with small hoofs.

The most singular faculty possessed by this order is that of rumination, or the power of returning the food to the mouth, to subject it to a second mastication after it has once been swallowed.

To the animals of this order, Dr. Godman remarks, that man is more largely indebted, than to all the rest of animated nature. The mass of his food is obtained from their flesh, and there is no part of their bodies from which he does not derive additions to his comforts, and assistance to his arts. Their hides, horns, bones, hair, flesh, fat, milk, and even their blood, are in hourly demand. Many of them, during their lives, yield him valuable services, as beasts of draught and burden, and contribute largely to his sustenance and luxury when they are finally slaughtered. Peaceful and patient in their dispositions, they feed exclusively on the verdure which is scattered over the earth, and prepare this vegetable matter most efficiently for the use of man and other creatures, by converting it into their own flesh, which is edible throughout all the members of this order, and, in a large proportion, is delicious food.

FAMILY XII. CERVIDÆ. THE DEER FAMILY.

GENUS CERVUS. Lin. Deer.

Generic characters. Dental system ; incisors $\frac{0}{8}$; canines $\frac{0}{0} \equiv \frac{0}{0}$; molars $\frac{6}{6} \equiv \frac{6}{6}$; = 32 ; head elongated, and terminated with a muzzle ; males all provided with horns, covered at first by a hairy membrane ; horns solid, branched, deciduous ; feet provided with hoofs ; tail short.

1. Cervus Alces.   Lin.   The Moose.

Cervus Alces, *Harlan*, Fauna Am., p. 229.   *Richardson*, Fauna Bor. Am., p. 232.

The Moose, *Godman*, Nat. Hist., ii. p. 274.

Figure ; Ibid., p. 274.   Griffith's *Cuvier*, iv. p. 72.

Specific characters. Color black, or blackish-brown, intermixed with gray ; neck surmounted with a short mane ; head large, elongated, and terminating in a large, thick, curved nose, with a small triangular muzzle, and adorned in the male with large palmated horns ; nostrils long, slouched, and narrow ; neck short, and furnished with a hairy appendage beneath.

Description. The head is long, with a thick upper lip ; the neck extremely short, and the body rather thick, and supported on long and rather slender legs ; ears long ; horns palmated and situated between the eyes and the crest of the skull ; female destitute of horns ; the color in the winter is almost black on the superior parts ; lighter below, and yellowish, or dirty white, on the belly ; legs long, and toes capable of being widely separated ; tail very short ; in the skull the horn is inserted nearer to the orbit of the eye than to the crucial ridge ; between the insertion of the horns and the orbits, there exists a deep and wide depression, and above, a heavy ridge or projection, on which the horns are supported, and which is on the line of the coronal suture, or the suture may be said to traverse this projection on the posterior part ; inward and beneath the orbit, there is a large, triangular, vacant space, which does not communicate directly with the orbit, but extends far up beneath the os frontis.

Dimensions.

	ft.	in.	t ^{hs} .
Length of the body,	6	10	0
Tail,	0	1	5
Head,	1	6	0
Neck,	1	6	0
Ears,	0	10	0
Height,	5	4	0

Skull.			ft.	in.	l'ths.
Length measured over the os frontis,	.	.	2	2	0
“ “ over the palatine bones to the foramen,	.	.	1	9	0
“ from the occipital crest to a prominence between the horns,	.	.	0	4	5
“ from the prominence to the bottom of the depression,	.	.	0	2	0
Depth of the depression,	.	.	0	1	5
Length from the prominence to the lower end of the nasal bones,	.	.	0	9	0
“ from the lower end of the nasal to the end of the maxillary,	.	.	0	10	5
“ from the centre of the horn to the centre of the orbit,	.	.	0	3	5
“ from the tip of one horn to the other,	.	.	2	8	0
“ of the horn,	.	.	2	4	0
Breadth of the jaw over the palatine bones,	.	.	0	5	0
Length over the processes of ossa malarum,	.	.	0	7	8
Height of the upper jaw,	.	.	0	7	2½
Width over the centre of the orbits,	.	.	0	7	0
Length of the lower jaw,	.	.	1	6	5
Number of prongs to the horn measured,			8		

Observations. The Moose is not found at present within the limits of this State, neither has it probably been taken within its bounds for the last thirty or forty years. It may, therefore, be considered as extinct, so far as Massachusetts is concerned. It is still found in Maine, and in the northern parts of New York, Vermont, and New Hampshire.

The Moose, which, in the Indian language, means *wood-eater*, comes to maturity in about five years. The female brings forth two calves in the spring, which, in the course of the season, present a growth of horn in the form and size of a small knob; in the second year, it is a round spike, and slightly curved at the extremity, and it is not until the third year that it begins to branch and flatten, and to present the appearance of being palmate. In the summer, the Moose frequents swamps and marshy grounds in the vicinity of lakes and ponds. In those places it finds a supply of its peculiar food, which consists of coarse grass, and twigs of young trees, especially the striped maple; it is also in the habit of peeling old trees, and feeding on the bark. We have but to inspect this animal to be satisfied that its habits must be different from those of our common domesticated animals, for it will be observed at a glance, that it stands so high upon its legs, and its neck is so short, that it cannot conveniently feed in ordinary

pastures ; hence we see that it is peculiarly fitted to feed on the high coarse grasses of marshes, or on the leaves of the water lily, or on the twigs and bark of trees ; and it is thus we find that its habits correspond to its organization.

In the winter these animals herd together to the number of eight or ten individuals, which, unless when disturbed by hunters, occupy a common space or enclosure, during the whole period in which the ground is covered with snow. Those spaces are selected in which a supply of food is found, which must then consist entirely of twigs and the branches of trees, together with their bark. The snow is trodden down hard, and the space gradually extended as the food diminishes within ; they do not, therefore, roam about at this season, as in summer, but confine themselves to the vicinity of the places originally selected for their abode during the winter. The movements of the Moose are rapid, when pursued, and they make their way with the greatest ease through thickets, over fallen trees, and through brush almost impenetrable to man. Their gait is a long trot, in which the hoofs are spread wide apart, which makes them tender-footed, and unequal to the task of long continued flight ; hence they are overtaken by dogs and held at bay, even in that part of the season most favorable to their escape.

This animal has been domesticated, and broken to the harness, although naturally of a shy and timid disposition. Its sense of seeing is comparatively obtuse, but those of smell and hearing are extremely acute, both being greatly favored by the size of their respective organs. Thus the ears are large and quite movable, and well calculated to collect sounds, and transmit them to the auditory apparatus ; the nose, together with the spongoid bones within the cavity, is very large, and thereby permits of a great extension of the schneiderian membrane, to which the olfactory nerves are distributed ; hence it is impossible to approach them when the wind is blowing towards them, as a strange odor wafted to them in the air excites at once their attention, and puts them into the attitude of examination. When, on the contrary, the wind blows in the other direction, they may be approached directly without exciting suspicion. In some respects, it is desirable that so fine an animal should be saved from entire extirpation, though

it is quite doubtful whether it could be made profitable to man in the present state of society. If it could be suffered to exist in those parts of the country which are so sterile and cold that they cannot be cultivated with much profit, it is all that could be expected or wished for. Its meat is certainly delicious, partaking more of the nature of beef than of venison, and its flavor, in the males, would probably be improved by emasculation, which would render it also more susceptible of accumulating fat. For its preservation, however, it is difficult to enforce laws ; so that there is very little probability of saving the species from a total extirpation. So far as game and hunting are concerned, the sooner our wild animals are extinct the better, for they serve to support a few individuals just on the borders of a savage state, whose labors in the family of man are more injurious than beneficial. It is not, therefore, so much to be regretted that our larger animals of the chase have disappeared. What comforts their fur and their skins have provided, can be abundantly supplied by animals already domesticated, at far less expense, both of time and money, and are not subject to that drawback, the deterioration of morals.

The young in October are fine-flavored, and, as we should expect, their meat partakes of the qualities of veal. An individual at this time gave the following measurements ;

	ft.	in.	pths.
Length from the nose to the insertion of the tail, ...	5	8	0
Ear, measured behind, ...	0	7	6
Height, ...	3	10	0

The color, at this period, is a dark, rusty brown, quite uniform on the upper parts, and lighter on the legs. They continue in company with the mother, if undisturbed, the two first years. In the autumn, it is not uncommon to meet with from three to five individuals of different ages. The young, when only a few days old, is perfectly manageable, and will as readily follow its captor as its mother, provided she has been killed ; it becomes, therefore, at this age, perfectly domesticated at once, and drinks milk, or feeds from the hand, with very little instruction. It soon learns to distinguish the inmates of the family, by whom it may be handled with perfect safety, but it is quite suspicious of strangers, and is very apt to give a severe blow with its knees, or fore feet.

2. *Cervus tarandus*. Lin. The Reindeer.

Caribou, *Charlevoix*, *Nouv. France*, iii., p. 129.

Greenland Deer, *Catesby*.

Reindeer, *Pennant*, *Arct. Zool.*

Cervus tarandus, *Harlan*, *Fauna Am.*, p. 232.

The Reindeer, *Godman*, *Nat. Hist.*, ii. p. 283.

Figure ; *Ibid.*, ii. p. 274, f. 2.

Specific characters. Dental system ; incisors $\frac{0}{8}$; canines $\frac{1}{6} \pm \frac{1}{6}$; molars $\frac{6}{6} \pm \frac{6}{6}$; = 34 ; horns flat, smooth, and possessed by both sexes ; hoofs rounded, broad, and consisting of a single plate folded immediately upon itself, so as to form the anterior and posterior surfaces, without the intervention of any substance between them.

Description. The general form of the animal is thick and heavy, more so at least than in the common deer, and its legs are proportionally shorter ; horns palmate, rather smooth, or free from those rugosities common to the horns of the fallow deer ; more or less irregular in their mode of branching ; brow antler basal, and standing inwards towards its fellow ; muzzle small, triangular ; hoofs rounded before, hollowed out behind, thin, and consisting of a plate of horny matter, which is folded in such a manner, that the posterior portion is in contact with the anterior ; none of that peculiar substance called "the frog of the foot," intervenes between the two portions ; color above, brown ; beneath, paler ; chin, lower portion of the neck, and about the hoofs and tail beneath, whitish, or yellowish-white ; a few hairs entirely white are sparsely scattered over the body ; the hair very uniform as it regards length, tapering, brown at the extremity and whitish below, and slightly crisped ; the winter coat very thick, and intermixed with brown fur ; there is a palish patch back of the fore legs, and a triangular patch of brown between the fore legs, but all anterior, yellowish-white ; there is also a dark-brown patch adjacent to the terminal white chin.

Dimensions.

				ft.	in.	t'ths.
Length from the nose to the root of the tail,	.	.	.	5	6	0
" of tail including the hair,	.	.	.	0	5	0
" from the nose to the base of the ear,	.	.	.	1	2	0

	ft.	in.	t'hs.
Length of the posterior portion of the ear, ...	0	5	0
“ of the long hair under the neck, ...	0	5	0
“ of the common hair, ...	0	1	3
Height at the fore legs, ...	3	0	0

Description and measurements from a male, said to be three years old, and in his winter dress.

Skull.

	ft.	in.	t'hs.
Length measured over the nasal bones, ...	1	2	0
“ along the palatine bones, ...	1	0	5
Width between the orbits, ...	0	4	8
Length from the canine tooth to the meatus, ...	0	10	1
“ from the upper edge of the orbit of the left side to the centre of the base of the horn, ...	0	2	7
The same measurement on the right side gives only	0	2	0

This difference in the position of the horns of opposite sides may be accidental.

Observations. Whether the Caribou was ever an inhabitant of this State, is now difficult to determine. Civilization we know early drove away the more shy and timid animals, especially those of the larger kinds, and hence, as in the case of the Moose, this too may have fled on the first approach of civilized man. It is only a few years since this animal occasionally appeared in the northern parts of Vermont and New Hampshire, from which it is not unreasonable to infer, that, in still earlier times, it may have passed still farther South, and, in fact, have occupied a portion of Massachusetts. It is never seen in this State at the present day. It is still possible that some light may be thrown upon this subject at some future day, by the discovery of the bones of the animal in the bogs, or alluvials along our water courses. This is the only resource which we have left for information on this subject. It will, I think, be perceived, that the Genus *Cervus*, as now constituted, requires some change, in order to adapt it to the present state of our knowledge of the principles of classification, and I think that it will not be long before naturalists will see the propriety of separating the Caribou* from the Genus *Cervus*.

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* Since the above was written, I am informed by Dr. De Kay, that the Caribou has already been made into a new genus, but I am unable to refer to the author, and therefore am obliged to let the species remain in its old place in the system.

The differences are well marked and constant. For example, the male and female are both supplied with antlers ; the presence also of the canine tooth is another very important difference ; and again the structure of the hoof, and, lastly, the general shape and form of the body, though the most important differences are those relating to the teeth, and to the form and structure of the hoof. From an opportunity which I had of examining the skull of the Californian Moose, I was led to infer that it resembled more the Caribou of Nova Scotia, than the Moose, inasmuch as its size was less than the Moose, and it possessed the canine tooth. The form of this tooth is, however, very different, and would constitute, were there no other differences, a good specific character. There are many important differences in the skull of the Moose and Caribou, which it may be well to notice. In the Caribou, the nasal bones are longer, and these, together with the maxillæ, form a nearly cylindrical portion of the face below the eyes, whereas, in the Moose, this portion is compressed and flattened. The depression between the eyes is less in the Caribou than in the Moose. In the Caribou, the horns are placed farther from the eyes, while in the Moose, they stand over, and rest nearly on the superior and posterior portion of the orbit, and the cuneiform process is much wider, and the nasal septum extends backwards, and rests on its anterior portion in the former animal. The whole length of the skull in the Caribou, is proportionally longer, reckoning from the crest to the inferior termination of the nasal bones ; while, in the Moose, the prolongation of the nose is greater than in the Caribou, there being a great extent of cartilage, while, in addition to length, it forms a high arch, as in the horse. The prominence in the os frontis of the Moose, is situated a little higher than the horns, but, in the Caribou, lower, making the depression, spoken of above, nearly between the eyes, while, in the Moose, it is above. Again, in the Caribou, the base on which the antlers are implanted, projects upward and backward, but in the Moose, laterally.

3. *Cervus Virginianus*. Fallow Deer.

Virginian Deer, *Pennant*.

Cervus Virginianus, *Harlan*, Fauna Am., p. 238.

The Common Deer, *Godman*, Nat. Hist., ii. p. 306.

Figure ; *Ibid.*, p. 306.

Specific characters. Horns bent forwards, with an antler on the internal face of each ; stem directed inwards, and two or three others at the posterior face directed backwards ; fur of a cinnamon fawn-color in summer, brownish-gray in winter ; in the young, spotted with white, irregularly arranged on the sides, but in one continuous line along the back.

Description. General form slender and light ; legs thin, rather long ; color cinnamon-brown or fawn early in the summer, afterwards bluish ; in the winter, yellowish or rusty-brown ; hairs angular, tapering to a fine point, which is dark-brown, then a ring of yellow, then of brown, gradually fading into white or whitish, the last of which occupies nearly its whole length. The edge of the under lip is white, also the belly ; a stripe on the anterior part of the hind leg, and the posterior part of the fore leg, and also the under part of the tail. Besides this distribution of colors, there is a gray, a little above the extremity of the nose, around the eyes, and inside of the ears ; the latter are edged with dark brown. The general color is darker along the back than upon the sides ; hoofs black, sharp, or pointed ; on the inside of the hind legs there is a thick odoriferous brush of hair, situated near the joint, which seems to be connected with the sexual appetite.

Dimensions.

	ft.	in.	t'hs.
Medium length from the nose to the root of the tail, . . .	5	0	0
Tail, including the hair, ...	0	10	0
Ear, on the back side, ...	0	6	0
From the nose to the space between the ears, ...	1	0	0
Height, ...	3	2	5

Observations. The *Cervus Virginianus* is still preserved in the eastern part of the State, on one or more islands near the main shore. It has also been taken within the last year in Williamstown, at the base of Saddle Mountain, and it is not very rare in

the towns upon the Hoosic Mountain range, and there is but little doubt, that in the more wooded parts of the State it would become an inhabitant again if unmolested by dogs and hunters.

Fossil Species.

A subject of great interest to the naturalist is the extinction of species. It will be perceived, on consulting the preceding pages, that a few animals which were once common to this State, are now driven from its bounds, and that when civilization shall have extended a little farther into the wilds of the forest, they, together with many more, will become extinct. In the course of my investigations or inquiries, I have ascertained that another animal of the deer tribe must have been also common to New England and New York, but that it has now totally disappeared. This animal was either the Canada Elk, or else was a distinct species from any now known to America. I am not able to satisfy myself whether the animal in question was the Canada Elk, in consequence of not having a skull for comparison; but I am rather inclined to think that it was a larger animal, and analogous to the Irish Elk. In this conjecture, it is quite possible I may be mistaken. Without, however, wasting time in conjecture, I proceed to state the facts in my possession relating to it.

The most important relics of this animal which have fallen under my observation, are a tooth, and a horn of the second year's growth. The tooth was taken from a clay bed along with several others in Chautauque County, New York. It is the last molar of the right side of the upper jaw; to it were attached a portion of the palatine bone, and the whole of the alveolar process. It is in a state of good preservation, and is not changed in its substance. It is an old tooth, being worn considerably. The following are its dimensions.

	in. l'ths.
Greatest spread of the fangs, ...	1 7½
Transverse diameter of the crown, ...	1 5
Shortest diameter of the crown, ...	1 2

I understood from the person who furnished me with the tooth, that it was the smallest of several taken from the same place. The horn, spoken of above, belongs to the Museum of the Col-

lege of Natural History, in the University of Vermont. It was thrown out by the plough from an elevated piece of ground on Grand Isle, and near a spring of water. It was found in a vertical position. One side is corroded in spots. It is the second year's growth probably, as it has no branches, nor portions which exhibit appearances of having been branched. The following are its dimensions.

	in.	l'ths.
From the tip to the root in a straight line, . . .	28	5
“ “ along the curve, ...	33	5
Circumference just above the tuberosities, . . .	7	2½
“ at the highest part of the curve, . . .	4	5
“ five inches from the tip, . . .	3	2½

By comparing this and the horn of the Moose of the second year, it is apparent that they are totally unlike. This, however, may be the horn of the young Elk, and the tooth in question may also belong to the same species ; if so, the facts go to prove the former existence of this animal much farther to the east than it is now found. Or they may belong to an extinct species, and it is only by a record of similar facts, that the question can be settled. It is for the purpose of calling the attention of the public to this subject, that the preceding facts are given, in hopes that thereby all bones, teeth, and horns, discovered, may be preserved for examination by those who are qualified for the task.

ERRATUM.

Page 5, for *Family MUSCIDÆ*, read *Family MURIDÆ*.

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