

5. SOREX RICHARDSONII

7. — COOPERI

6. — FORSTERI

8. — FIMBRIPE



*Some Remarks on the Genus Sorex, with a Monograph of the North American Species.* By JOHN BACHMAN, D. D.; President of the Literary and Philosophical Society of Charleston, South Carolina, &c.

LESS attention appears to have been paid by the naturalists of our country to the quadrupeds belonging to this Genus, than to those of any other. Although several species have been designated few of them have been so accurately described, and figured, as to enable the student of nature to identify the species with any degree of certainty. This is not to be wondered at, when we take into consideration their diminutive size, their nocturnal habits, and their subterranean retreats during the day. The bird, however small, may be detected by its flight and active restless habits. Our larger quadrupeds are pursued and captured on account of the value, either of their flesh, or

skins; or extirpated in consequence of their depredations. But the shrews, being less in size than many of our insects, live in obscure retreats where their habits can only be studied with great difficulty; and are so seldom found, that although their little galleries may be daily seen in our furrows and ditches, not an individual reaches the eye for months.

It was not, indeed, till a recent period (1756) that more than one species of this Genus was known to exist on the Eastern Continent. The celebrated Dr. GALL, who, in his early years, was an enthusiastic student of natural history, devoting himself particularly to an examination of the smaller quadrupeds, made known to Professor HERMANN of Strasburgh, the existence of three new species. M. GEOFFROY ST. HILAIRE subsequently published descriptions of several new species existing in France; and the number of European species has since been considerably augmented by the assiduous labours of naturalists of the present day.

CUVIER, one of the most eminent of modern naturalists, doubted the existence of a single true *Sorex* in America.

Since then, several species have been added to the Fauna of our country, and Dr. RICHARDSON,

in his *Fauna Boreali-Americana*, has published descriptions of three species, as existing in the northern parts of our Continent, none of which, if we may judge from his descriptions, have, to our knowledge, been as yet detected in the United States.

We would remark, as an encouragement to naturalists, that in none of the Genera of quadrupeds in our country, is there a greater probability of new discoveries being made; nor a greater necessity for minute investigations in settling the characters by which the species may be recognised, than in this Genus. We are under an impression that the different species of *Sorex* are restricted to several favourite localities, and that the different portions of our country possess species that are not to be found in others. We have no evidence that any of our species are identical with those found on the Eastern Continent. We even think, that the *SOREX brevicaudus* of SAY, found in Missouri, requires a more careful comparison with the animal found in the middle states, that goes under the same name, before their identity can be fully established. There are, undoubtedly, several species, even in the cultivated districts of the United States, which have not yet been described. We obtained a

specimen in the northern parts of the state of New York, but which we neglected preserving, which, as far as we can recollect after the lapse of twenty years, was a different species from any that we have since seen described; and three years ago, we saw a specimen of another, in the possession of an intelligent naturalist, W. COOPER Esq., of New York, that appeared to be new. Whilst much remains evidently to be done in this department, a good deal of difficulty will be found in defining the different species, in consequence of the difference between the young and adult animals. These often differ, not only in colour, but in the number of their teeth. In Europe, naturalists have for some years been engaged in cutting off nominal species, which can only be done by examining, not only the external forms, size, and colours, but the teeth and heads of many specimens of each. In our own country, naturalists should endeavour to collect and preserve all the specimens that can be procured, so that by possessing a series of each species, in the periods of their different ages, they could be described and figured in a manner not easily to be mistaken. The difficulty in procuring specimens seems to have been considerably overrated. Let our naturalists, in every part of our country,

encourage the farmer to place in spirits every little quadruped of this Genus, that is ploughed up in his fields or dug from his ditches, and they will not fail to procure a considerable number of specimens in a short time. We recently received several shrews, procured by a friend in the country by means of a small board-trap, placed in his rice fields, baited with meat.

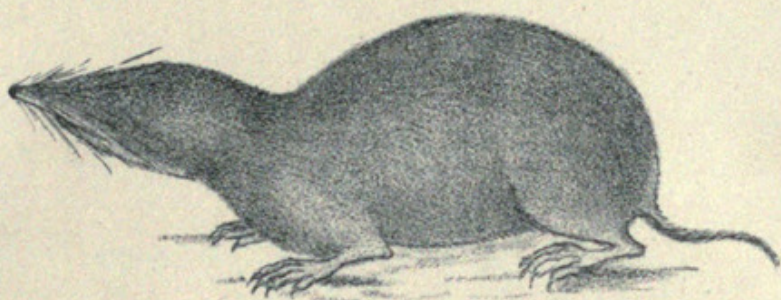
In order to contribute the information we have been able to collect on the animals belonging to this Genus, and to stimulate farther inquiries, we proceed to give an account of species of which we have read no descriptions.

### 1. SOREX *Carolinensis*. Carolina Shrew.

*Characters.* Carolina shrew, with a short flat tail; ears not visible; body of a nearly uniform iron gray colour.

Length of body,	3 in.
—— of tail,	$\frac{3}{8}$
—— head,	1
—— of palm to the end of the nails,	$\frac{5}{16}$
—— hind-feet,	$\frac{1}{2}$

1.



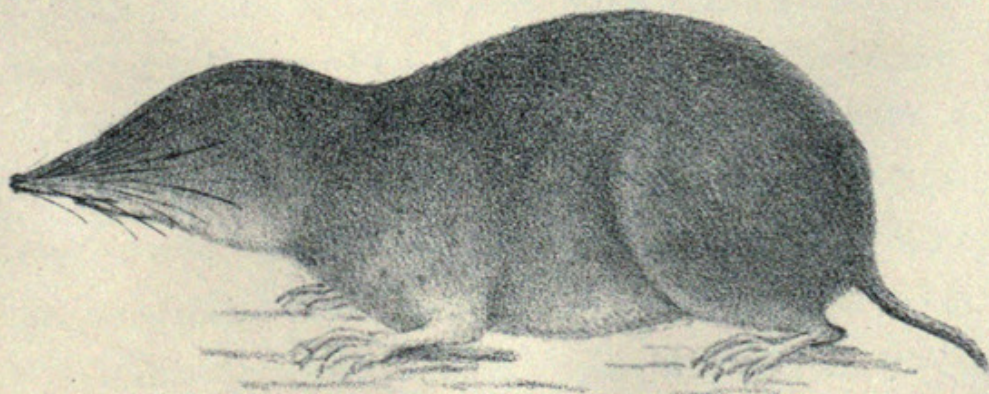
2.



3.



4.



1 SOREX CAROLINENSIS. 3. — CINEREOUS.

2. — LONGIROSTRIS 4. — DEKAYI.



*Dental formula.* Intermediary incisors  $\frac{2}{2}$ ,

Lateral incisors  $\frac{5-5}{2-2}$ , Grinders  $\frac{5-5}{3-3}$ , 34.

The four front teeth are yellowish white with their points deeply tinged with chestnut brown; all the rest are brown, a little lighter near the sockets. The upper intermediary incisors have each, as is the case in most other species of this Genus, an obtuse lobe, which gives it the appearance of having a small tooth growing out from near the roots. The three first lateral incisors are largest; the posterior ones very small; the first and fifth grinders are the smallest; the other three, nearly equal. In the lower jaw, the two first teeth are lobed; the lateral incisors are comparatively large, and crowded near the grinders. The molars are bristled with sharp points, except the last, which is a tuberculous tooth.

The muzzle is moderately long and slender, and pointed with a naked deep lobed lip. The whiskers are composed of hairs apparently all white, a few of those situated in front of the eyes extending to the occiput, the rest rather short. There are no visible ears, even where the fur is removed; the auditory opening is an orifice situated far back on the sides of the head, running obliquely. The

orifice of the eye is so small, that it can only be discovered by the aid of a good magnifying glass. The tail is flat, thickly covered with a coat of close hair, and terminated by a small pencil of hairs. The fore-feet are rather broad for this Genus, measuring a line and a half in breadth—resembling, in some respects, those of the Shrew-mole, (*SCALOPS Canadensis*.) The toes are five; the inner a little shorter than the outer one; the third and fourth nearly equal. The nails are sharp, rather long, a little arched, but not hooked. The hind-feet are more slender than the fore-ones; naked beneath, and covered above, as are also the fore-feet, by a thin coat of short adpressed hairs.

*Colours.* The fur has the same beautiful velvety appearance, with most of the species of this Genus. The colour of the whole body is nearly uniform. It has a considerable lustre on the upper surface, and is in most lights, of a dark iron gray colour, rather darker about the head; on the under surface it has nearly the same general appearance, but is a shade lighter.

*Locality.* This quadruped has been known to us for nearly twenty years. It is found in various

localities, both in the upper and maritime districts of South Carolina. We recently received specimens from our friend Dr. BARRET of Abbeville District; and we have been informed by Dr. PICKERING, to whose inspection we submitted a specimen, and who pronounced it undoubtedly an undescribed species, that it has been observed as far north as Philadelphia.

*Habits.* It is difficult to know much of the habits of the little quadrupeds composing this Genus. Living beneath the surface of the earth—feeding, probably, principally on worms and the larvæ of insects, shunning the light, and restricted to a little world of their own, best suited to their habits and enjoyments—they almost present a barrier to the prying curiosity of man. They are occasionally turned up by the plough on the plantations of the south, when they utter a faint squeaking cry, like young mice, and make awkward and scrambling attempts to escape, trying to conceal themselves in any tuft of grass or under the first clog of earth that may present itself. On two occasions their small, but compact nests were brought to us. They were composed of fibres of roots and withered blades of various kinds of grasses. They had been ploughed up

from about a foot beneath the surface of the earth, and contained in one nest five, and in the other six, young. In digging ditches and in ploughing in moderately high grounds, small holes are frequently seen running in all directions, in a line nearly parallel with the surface, and extending to a great distance, evidently made by this species. We observed, on the sides of one of these galleries, a small cavity containing a hoard of coleopterous insects, principally composed of a rare species (*SCARABÆUS tityus*,) fully the size of the animal itself: some of them were nearly consumed, and the rest mutilated, although still living.

## 2. *SOREX longirostris*. Long-Nosed Shrew.

*Characters.* Nose long; ears large and prominent; general colour chestnut.

*Dental formula.* Intermediate incisors  $\frac{2}{2}$ , Lat.  
 Incisors  $\frac{3-3}{2-2}$ , Grinders  $\frac{4-4}{3-3}$ , 28.

I have recently had an opportunity of examining

another specimen of *S. longirostris*—an old male precisely of the size and colour of the one figured—his dentition was as follows :—

Intermediate incisors	$\frac{2}{2}$	Lateral incisors	$\frac{5-5}{2-2}$
Grinders	$\frac{4-4}{3-3}$		32.

I am apprehensive the teeth in my other specimens were deficient.

*Description.* The nose is very long; the whole upper jaw is bordered with whiskers, extending to the middle of the ear; the lower, sparsely covered with the same kinds of hair, but shorter; extremity of the muzzle naked, deeply indented and two-lobed; the eyes are distinctly visible, and larger than in most of the species of this genus; the ear extends considerably beyond the fur, is comparatively large, and thickly clothed within and without with short soft hairs; the auditory opening is covered with a large oblong lobe, on which are sprinkled a few stiff, long hairs; tail square, clothed with short hair above and beneath, as also the feet and palms to the extremity of the nails; toes five; the whole body is slender, and the feet are small and weak.

The fur above is close, fine and glossy. This quadruped is of an uniform chestnut colour, a little lighter beneath; muzzle of the nose, in the dried specimen, black; points of the teeth dark brown; nails horn colour, tipped with black.

*Dimensions.*

Length from the nose to the origin of	
the tail,	1 $\frac{7}{8}$ in.
——— of the tail,	1
——— of the head,	$\frac{7}{8}$
Height of the ear,	$\frac{1}{4}$
Length of hind-foot, from heel to the	
end of the nails,	$\frac{3}{8}$

The specimen from which the above description was taken, was obtained in the swamps of Santee by Dr. ALEXANDER HUME. His labourers found it whilst digging a ditch through grounds nearly overflowed with water.

We have only seen one other individual of this species, which was obtained in a singular manner. Whilst at the house of a relative in Colleton District, his huntsman brought in some wild ducks, and among the rest a Hooded Merganser (*MERGUS cucullatus*.) There was a protuberance on the throat of this bird, appearing as if it

had not fully swallowed some article of food at the time it was killed. On opening the throat, it was found to contain this little shrew, which was neither much mutilated or decayed.

From the above circumstances, we are induced to think this quadruped aquatic in its habits.

### 3. SOREX *cinereus*. The Cinereous Shrew.

*Characters.* Small feet; eyes small but visible; ears not perceptible; dark iron gray above, and silver gray beneath.

*Dental formula.* Intermediate incisors  $\begin{smallmatrix} 2 \\ - \\ 2 \end{smallmatrix}$ ,  
 Lateral incisors  $\begin{smallmatrix} 3-3 \\ - \\ 0-0 \end{smallmatrix}$ , Grinders  $\begin{smallmatrix} 4-4 \\ - \\ 4-4 \end{smallmatrix}$ , 26.

#### *Dimensions.*

Length from nose to origin of tail,	$2\frac{3}{8}$ in.
—— of the tail,	$\frac{7}{8}$
—— of head,	$\frac{3}{4}$
—— of nose from upper incisors,	$\frac{1}{8}$
—— from nose to eye,	$\frac{5}{16}$
—— of hind-foot, from heel to end of nails,	$\frac{7}{16}$

*Form.* The head is rather short when compared with that of the *S. Carolinensis*. The whole upper lip is sparsely bordered with whiskers reaching to the ears; extremity of the muzzle two-lobed, and naked; the ear is not perceptible; tail nearly round, slightly flattened at the end, clothed with short hairs; feet small and slender; palms of the fore-feet a little more than half the size of *S. Carolinensis*; both the fore and hind-feet covered with short adpressed hairs extending to the roots of the nails; nails moderately long, slightly arched.

*Colour.* The teeth are white and at the ends nearly black; fur soft, close, and lustrous; it is dark iron gray above, and blueish gray at the roots; the belly and sides dingy white, or silver gray; the line of separation, between the colours of the upper and lower surface is distinctly drawn; nails white.

The above description and measurements were taken from six specimens procured at Goose Creek about twenty-two miles from Charleston, by Mr. W. WESNER. They were ploughed up from time to time from an old field which had laid in an uncultivated state for some years and was partially overgrown with weeds and bushes. We

have received about twenty other specimens from various parts of the low country of Carolina—all of the size and colour of the above.

This diminutive animal may be easily distinguished from the *S. Carolinensis* by its smaller size, lighter colour beneath, and the size and form of the fore-feet. But whilst it may, at first sight, be known as a different species from the *S. Carolinensis*, we have found a much greater difficulty in separating it from SAY'S *S. parvus*. The differences in measurement and colouring are not so great that they might not be reconciled, and we felt at one time a strong inclination to set it down as that animal: but knowing the strong general resemblance of the different species of shrews to each other, being able to make nothing of the diminutive figure of GODMAN, and thinking it highly probable that on a comparison of specimens they might be found to differ materially; perceiving, also, that Dr. RICHARDSON, in his *Fauna Boreali-Americana*, (vol. 1., page 8.,) has published a description of a SOREX under the same name, which differs so widely from the one above described and from SAY'S, that we do not believe it belongs to either species, we have concluded to publish it under the above name. We have added the best figure we were able to procure

leaving it for future naturalists to determine by authentic specimens whether, instead of cutting off species and adding synonyms, it may not be necessary to supply a specific name to the SOREX described by RICHARDSON.

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*April, 1837.*—Since the above was written, we have been furnished with a number of specimens of shrews, which enable us to notice several other species, existing in the United States. A specimen was procured for us by Dr. THOMAS M. BREWER of Boston; another, which had been sent for the Academy of Natural Sciences by Professor JOHNSON, was submitted to our inspection; and W. COOPER, Esq., of New York, having ascertained that we were investigating this difficult Genus, with characteristic liberality, sent us his whole and interesting collection, with his notes, which proved of great service in preparing the remainder of this article. We take pleasure in acknowledging the above instances of kindness and liberality. It is by such means only, and not by locking up in our own cabinets specimens which might enable others to give descriptions, that true science can be promoted.

4. SOREX *Dekayi*. (Cooper.) DEKAY'S Shrew.

This is the species which (as we mentioned in a former communication) we saw in the cabinet of Mr. COOPER. It has, we believe, been usually considered identical with the *S. brevicaudus* of SAY. It proves, however, to be a distinct species, larger in size, more robust in shape, and differing in colour.

*Characters.* Larger than the short-tailed shrew; rusty gray colour above, cinereous beneath; tail short and cylindrical.

*Dental formula.* Incisors  $\begin{smallmatrix} 2 \\ 2 \end{smallmatrix}$ , Lat. incisors  $\begin{smallmatrix} 5-5 \\ 2-2 \end{smallmatrix}$ ,

Grinders  $\begin{smallmatrix} 4-4 \\ 3-3 \end{smallmatrix}$ , 32.

The two upper incisors are much curved and pointed at tip; the lateral incisors are all crowned with two tubercles, except the fifth, which is smooth; each of the grinders is furnished, on the

upper surface, with four sharp points; in the lower jaw, the incisors are also much curved; the first intermediate incisor is smaller than the second; and the molars are similar to those in the upper jaw. From this description of the number and character of the teeth, it will be observed how exactly they correspond with the skull of the individual described by Dr. HARLAN as having been received from Mr. ORD, and referred to *S. brevicaudus*. Although he observed but three grinders in the upper jaw—he probably overlooked the small posterior grinder, or his specimen might have been that of a young animal, with the dentition incomplete. Both the allied species, however, have certainly thirty-two teeth. His specimen, also, having been obtained from the neighbourhood of Philadelphia, where this species exists, and where the other has not yet been discovered, leaves little room to doubt of his having described the skull of one species, for that of another. The heads of both are now before us, and they differ in several particulars as will be seen hereafter.

*Form.* The body bears a resemblance to that of the Shrew-mole (*SCALOPS Canadensis*) in

shape. Head rather short; nose lobed at tip; the eye is a mere speck, and appears covered by the common integument; there are no external ears: the whiskers spring from the upper lip, anterior to the eye; most of them are short, a few of them extend to the length of the head: the feet are more robust than in any American shrew we have examined, and are clothed with short fine hairs; the tail is round, slightly dilated in the middle; the first and fifth claws, on the fore-feet, are nearly equal in length; the middle claw is the longest, and the second and third equal. On the hind-foot, the inner claw is the shortest; the outer a little longer; the second and third equal.

*Colour.* The teeth are white at base, broadly tipped with dark brown, and towards the points quite black, except the small posterior intermediate incisor, which is white. The whole of the upper surface is dark rusty gray, appearing hoary and lustrous when held to the light; below cinereous; point of nose nearly black; whiskers dark gray; feet light brown in some specimens, much darker in others; nails white.

Length from nose to origin of tail,	4 in.
Length of head,	$1\frac{1}{8}$
Breadth across the head,	$\frac{1\frac{1}{2}}{16}$
Length of tail,	$\frac{3}{4}$
Length of hind-foot from heel to end of nails,	$\frac{1}{2}$

In this species we observed some of the specimens rather lighter coloured than others, and a slight difference in the length of tail. Out of four specimens which we examined, the tails of some were a little less than three-fourths of an inch; but in none were they an inch long.

We have received specimens of this animal from Mr. COOPER, who obtained them in New Jersey. We possess another from Albany, and have heard of its existence in Maryland, Virginia, and New England. Its habits must be left to some resident naturalist to describe.

The specimens, from which this description was made, were labelled with the above name. From a memorandum found among the notes which Mr. COOPER kindly transmitted to us, we think it possible, that a description of it was read before some society, or perhaps, published in some scientific journal, to which we have had no access. He is, under any circumstances, entitled

to the credit of having first named, and designated it as a new species.

5. *SOREX brevicaudus*. (SAY.)

LONG's Expedition, vol. 1., page 164.—GODMAN, vol. 1., page 79., plate 3., fig. 1.—HARLAN, page 29.

We are again indebted to Mr. COOPER for a specimen of this rare species, which was sent from the North Western Territory by Messrs. JAMES and PITE. By a careful comparison of this specimen with the *S. Dekayi*, existing in New York and Pennsylvania, which has by many persons been considered as identical with the present, we have been satisfied that our former conjectures, of their being distinct, were correct.

*Characters.* Blackish plumbeous above, a little lighter beneath; smaller than *S. Dekayi*; tail a little longer.

*Dental formula.* Intermediate incisors  $\frac{2}{2}$ , Lat.

Incisors  $\frac{5-5}{2-2}$ , Grinders  $\frac{4-4}{3-3}$ , 32.



of the other species; the fore-feet are naked; the hind ones sparsely covered with hair; the nose is distinctly lobed; the orifice to the internal ear is large, with two distinct half divisions; the tail, in the dried specimen, appears to be square, sparsely clothed with hair, which extends beyond the tip.

*Colour.* The nose and tail are dark brown; feet and nails white; the whole upper surface of a blackish plumbeous colour; the under surface a little lighter.

6. SOREX *Richardsonii*. RICHARDSON'S Shrew.

*S. parvus*, RICHARDSON non SAY.

In our remarks on the *S. cinereus*, which bears some resemblance to *S. parvus* of SAY, we expressed a belief, founded on a comparison of the description of these authors (which differs in many important characteristics) that the *S. parvus* of RICHARDSON, was distinct from that described under the same name by SAY. This impression was forcibly made in consequence of our knowledge of the usual accuracy with which

these naturalists were in the habit of describing their specimens. Since then, we have been able to ascertain that our conjectures were well founded. We recently received from Mr. COOPER, who had obtained them from the North Western Territory, two specimens, so exactly agreeing with the description of Dr. RICHARDSON, that we have no hesitation in referring them to the shrew he described, under the name of another and very distinct species. As the *S. parvus* of RICHARDSON is not the *S. parvus* of SAY, it is necessary to supply a specific name; we have, therefore cheerfully complied with the suggestions of Mr. COOPER, and named it after its first describer, a naturalist who has rendered essential service to the mammalogy of our country.

*Dental formula.* Intermediary incisors  $\frac{2}{2}$ ,

Lateral incisors  $\frac{5-5}{2-2}$ , Grinders  $\frac{4-4}{3-3}$ , 32.

Length of head and body,	2 $\frac{3}{4}$ in.
——— of tail,	1 $\frac{5}{8}$
——— of head,	$\frac{7}{8}$
——— from upper incisors to nostrils,	$\frac{1}{8}$
——— from eye to point of nose,	$\frac{7}{16}$

*Description.* Ears short, about half the length of the fur, covered by short fine hairs; muzzle long and slender, the tip slightly lobed; the whole upper lip bordered with whiskers, reaching to the ears; the tail square, pointed at tip; its body is longer and thicker than that of *S. Forsteri*,—to be noticed hereafter; its feet are slender, partaking, in this respect, of the character of most of the species of this Genus; nails short and slightly hooked.

*Colour.* The fur, from its roots to near the tip, has a dark blueish gray colour; from its closeness, however, this colour is not seen till the fur is removed; the whole upper surface is of a rusty brown colour; beneath cinereous; the feet and nails are light brown.

From this description of the specimens before us it will be perceived that both in size and colour they bear an exact resemblance to the *S. parvus* of RICHARDSON; and having been also obtained from the North Western portions of our country, there can scarcely be any doubt of its being the same species.

7. SOREX *Forsteri*. (RICHARDSON.) FORSTER'S  
Shrew.

This little quadruped, which is said by RICHARDSON to exist as far as the 67° of latitude, appears also to be found in the neighbourhood of New York, as we received two specimens from Mr. COOPER, obtained on Long Island. These agree in so many particulars with the description of Dr. RICHARDSON, that we have been induced, after some hesitation, to refer them to that species. The following description is drawn from the specimens now in our possession.

*Dental formula.* Incisors  $\begin{smallmatrix} 2 \\ - \\ 2 \end{smallmatrix}$ , Lat. incisors  $\begin{smallmatrix} 5-5 \\ - \\ 2-2 \end{smallmatrix}$ ,  
Grinders  $\begin{smallmatrix} 4-4 \\ - \\ 3-3 \end{smallmatrix}$ , 32.

*Description.* The form of the teeth corresponds in every particular with the description given by RICHARDSON. Nose long, somewhat divided at tip; ears hairy, not much shorter than the fur, but

still concealed; body slender; feet small; tail long, four-sided; hair short, fine, and smooth; the teeth, as in most of our species, are white at base, and at their points chestnut brown; the fur is, for two-thirds of its length, of a dark cinereous colour above, tipped with brown; beneath, it is cinereous; feet flesh-coloured; nails slender and white.

*Dimensions.*

Length of head and body,	$2\frac{3}{8}$ in.
Length of head,	$\frac{3}{4}$
Height of ear,	$\frac{1}{8}$
Length of tail,	$1\frac{1}{2}$
Length from eye to point of nose,	$\frac{3}{8}$

Dr. RICHARDSON speaks of the power which this diminutive species must possess in generating heat, as its footsteps are often seen on the snow, even when the temperature sinks forty or fifty degrees below zero. Its pathway is frequently traced to a stalk of grass, by which it appears to descend from the surface of the snow. We have frequently observed similar tracks during winter, in the northern parts of New York, which must have been made either by this species or one of similar size and habits.

8. SOREX *Cooperi*. COOPER'S Shrew.

This is the most diminutive quadruped that has yet been found on our Continent. It was procured in the North Western Territory, and forwarded to us, with several other rare species, by Mr. COOPER. On comparing it with the *S. Forsteri*, we soon ascertained it to be new, and at the same time, one of the most distinctly marked species in our country. We have named it after the gentleman from whom we received it,—whose untiring labours in various departments of science have contributed so much to advance and embellish the natural history of our country.

*Characters.* Very small; nose long; no external ears; tail as long as the body; colour, dark brown.

*Dental formula.* Intermediate incisors  $\begin{smallmatrix} 2 \\ - \\ 2 \end{smallmatrix}$ ,  
 Lateral incisors  $\begin{smallmatrix} 5-5 \\ - \\ 2-2 \end{smallmatrix}$ , Grinders  $\begin{smallmatrix} 4-4 \\ - \\ 4-4 \end{smallmatrix}$ , 34.

From a careful examination with a good magnifying glass, of the skull of this specimen, we have found two more teeth than have hitherto been discovered in any other American species, except the *S. Carolinensis*. The posterior incisors, in the upper jaw, have a large pointed lobe, resembling a tooth. The four anterior lateral incisors, are conical in shape, not crowded, but leaving a vacant space between them; the fifth is very small, and flat on the crown. The three first grinders appear to be of an equal size,—the posterior one is the smallest. In the lower jaw, the intermediary incisors have three distinct and widely separated lobes, resembling the prints of teeth. The first grinder is a little larger than the rest, which are of equal size. All the teeth are white, and, with the exception of the fifth upper lateral incisor, are tinged with light brown at the tips.

### *Dimensions.*

Length from point of nose to tail,	$1\frac{7}{8}$ in.
——— of tail,	$1\frac{7}{8}$
——— from eye to point of nose,	$\frac{3}{8}$
——— of head,	$\frac{3}{4}$
——— from heel to middle claw,	$\frac{7}{16}$

*Description.* In form this shrew is very slender,

and more diminutive than the *S. longirostris*; its head is also longer, and its muzzle thinner and more pointed; its legs are slender but long, and the hind-ones strikingly so; they are covered with fine adpressed hairs to the extremities of the nails; its tail is large and thick for the size of the animal, flattened on the sides and beneath, rounded above, clothed with fine hair, and tipped with a pencil of hairs; the eye is small, but visible through the fur, and apparently not covered by an integument; the point of the nose is slightly divided; there is no external ear, and the transverse auditory opening is completely concealed by the fur.

*Colour.* Hair, which is very soft and moderately long, cinereous for two-thirds of its length above, and tipped with shining chestnut brown; beneath with ash colour; feet thickly covered with silvery gray hair; tail above, brown; beneath, silver gray.

9. SOREX *fimbripes*. Fringe-footed Shrew.

For the discovery of this new and strikingly marked species, we are indebted to Professor WALTER R. JOHNSON, the result of whose labours, in other departments of science, may be traced in his various communications to this Society.

*Characters.* No external ears; tail a little shorter than the body; feet broad, fringed at the edges; body of a dark brown colour.

*Dental formula.* Intermediate incisors  $\frac{2}{2}$ ,

Lateral incisors  $\frac{6-6}{2-2}$ , Grinders  $\frac{4-4}{3-3}$ , 34.

The upper intermediate incisors are much curved, and widely separated; the anterior lateral incisor is simple and appears to be springing from the roots of the front teeth; the four next in succession have two distinct obtuse lobes; the sixth is very diminutive, and perceptible only

with a good magnifier; in the lower jaw the intermediary incisors, which are long, have three prominent lobes, resembling additional teeth; the second lateral incisor is larger than the first, and all the molars are bristled with sharp points.

*Dimensions.*

Length from point of nose to insertion of	
tail,	2 $\frac{1}{8}$ in.
——— of tail,	1 $\frac{3}{4}$
——— from orifice of ear to point of nose,	$\frac{3}{4}$
——— from eye to point of nose,	$\frac{3}{8}$
——— of heel to end of middle claw,	$\frac{1}{2}$
Breadth of fore-feet,	$\frac{3}{16}$
Length of whiskers,	1

*Form.* The body is a little less in size than that of FORSTER'S Shrew, and is not very unlike to it in colour. It differs, however, from that, and every other known species, in many particulars. Its muzzle is long, moveable with the tip slightly lobed; the head is large and flat; the eye is a mere speck, covered by the common integument, and is found with great difficulty; the whiskers are long, extending considerably beyond the head; there are no external ears and the transverse auditory opening is smaller than that of any other

American species that we have seen; the fore-feet are broad and singularly formed, bearing some resemblance to the fins of a turtle; the interior toe is the shortest, the third and fourth of about equal length, and the exterior a little longer than the interior one; on the hind-foot, the inner toe is the shortest, the next a little longer, and the fourth the longest; they are armed with sharp claws; those of the hind-feet are much longer than the rest; the feet are clothed with short fine hairs extending to the extremities of the nails; the edges on the lower surface are fringed considerably, beneath the palms, with much longer brownish hairs; from this singularity of formation so different from all our other species, we have chosen the specific name; the tail is of a moderate size, square, gradually tapering to the point; the fur is considerably longer than in any other of our species of the same size. This species approaches nearer to the GENUS *Mygale* of CUVIER, than any other yet discovered in America.

*Colour.* The teeth are yellowish at base; broadly tipped with light brown; whiskers white; a lightish edge around the upper lip; the feet are of a dingy yellow colour; the fur on the upper

surface is, for two-thirds of its length, of a blueish ash tipped with brown, giving it a changeable brown appearance. Under the throat and beneath, a dark fawn; the under surface of the tail, of a buff colour; extremity of the tail nearly black.

Of this species we have seen only the specimen from which this description was made. From a note of Professor JOHNSON, accompanying the specimen, we learn that it "was found on the high table-land on a branch of DRURY'S Run, a tributary of the west branch of the Susquehannah river."

*The following Species, described as belonging to our country, we have had no opportunity of examining.*

10. SOREX *parvus*. SAY. "Small Shrew.

*S. parvus*. SAY in LONG'S Expedition, vol. 1., p. 163.—HARLAN'S Fauna, p. 28.—GODMAN'S Natural History, vol. 1., p. 78., plate 3.

This species has not been satisfactorily identified since its first discovery. It, however, agrees with a specimen obtained at BEHRING'S Straits, by Mr. COLLIE, surgeon of his Majesty's ship Blossom, as referred to by Dr. RICHARDSON, (*Fauna Boreali-Americana*, vol. 1., p. 8.) This is described as having a dark brownish gray colour above, and a gray tint beneath; measuring from the tip of the snout to the root of the tail two inches and four lines,—and its tail was one inch long. Having never had an opportunity of examining this species, we subjoin for the sake of convenient comparison, the description of SAY, in whose accuracy perfect reliance may be placed:

“Body above, brownish cinereous; beneath, cinereous; head elongated; eyes and ears concealed; whiskers long, the longest nearly attaining the back of the head; nose naked, emarginate; front teeth black, lateral ones piceous; feet whitish, five-toed; nails prominent, acute, white; tail short, subcylindric, of moderate thickness, slightly thicker in the middle, whitish beneath.”

*Dimensions.*

Length from the tip of the nose to the	
root of tail,	2 $\frac{1}{2}$ in.
Length of tail,	$\frac{3}{4}$
Length from upper teeth to the tip of the	
nose,	$\frac{3}{20}$

This species was obtained at Engineer Cantonment on the Missouri; where it was caught in a pit-fall, set for a wolf, by Mr. TITIAN PEALE. GODMAN says (vol. 1., p. 79,) it may properly be considered as one of the smallest mammiferous animals belonging to this Continent.

In this conjecture he was mistaken, as other species, still less in size, have since been discovered in our country.

11. *SOREX palustris.*

RICHARDSON'S Fauna Boreali-Americana, vol. 1., p. 5.

This animal, which HEARNE informs us often takes up its abode in the beaver-houses of the fur

countries, is described as three inches six lines long in body; and its tail two inches seven lines; height of ear three lines; on the superior dorsal aspect it is black with a slight hoary appearance when turned to the light, a little paler beneath.

RICHARDSON describes the tail of this Shrew as longer than the body, but his measurements make it nearly an inch less.

## 12. *SOREX talpoides*.

GAPPER in Zoological Journal, No. xviii., p. 202., plate 8.

This species is described as four and a half inches long without the tail, but the figure measures only three and a half, or four and a half inches with the tail. It agrees with the dimensions of *SOREX brevicaudus* of SAY, but the descriptions of the two species differ materially from each other.

13. *SOREX personatus*.

ISOD. ST. HILAIRE in Mém. du Mus., tom. 15., p. 122.

A small species; tail one-third of the total length, which is three inches. Sent from this country by MILBERT. (1827.)

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The *S. araneus*, *S. constrictus*, and *S. minutissimus*, which have by some authors been attributed to this country, are European species, and cannot be admitted into our Fauna, in the present state of our knowledge.

*General Remarks.*

In having attempted to give a monograph of the most difficult genus among the Mammalia of our country, of which Major LE CONTE a few years since said, that although many species existed, not one had been properly determined (see Translation of CUVIER, vol. 1., Catalogue,)

we have been fully aware of the danger of multiplying species on the one hand, and of confounding those that are distinct on the other. Many of the species here described are now, for the first time, brought to the view of naturalists. Those that were previously named, were so imperfectly described, that it was almost impossible for the unpractised naturalist to designate the species. We can scarcely hope, even after having used the utmost caution, and compared many specimens, that we have fully succeeded in establishing all the species which we have attempted to describe. We still entertain some doubts whether the *S. cinereus* may not yet prove to be the young of some other species. All the specimens we examined were so deficient in the number of teeth usually found in this Genus, that we have not been satisfied of our having, as yet, found the adult animal. The Carolina Shrew is the only one, in this vicinity, that resembles it, yet the smaller animal has invariably a longer tail than the larger species. In uniting the *S. Carolinensis* with the species existing in the middle States, we may possibly have blended two distinct species; the same may be said of the *S. Forsteri*, as existing in New Jersey and the far North West. We have, however, found no such decided marks of difference

as would warrant us in separating them. Future naturalists will, no doubt, be able to discover and correct some errors into which we have inadvertently fallen. But we still hope that the science will not suffer from this attempt, and that a commencement has here been made, which will be more successfully prosecuted by others. We have met with almost insuperable difficulties in describing the colours of this genus of animals. They vary so much in different lights, that scarcely two naturalists will be found to agree on the true colour of any one species. The number and arrangement of the teeth, in many species, do not seem to differ so widely as to enable us to separate closely allied species with certainty, by the dentition. In size, however, there does not appear to be much difference among individuals of the same species. The length of tail we have usually found a tolerably safe guide; and, above all, the shape and length of the ear, we have found the best criterion; for these we have never found to vary. In deciding between young and old animals, the number of teeth will, in general, aid us in the investigation. Whenever there is a material deficiency in these, there is reason to suppose that the animal has not arrived at full maturity. In examining the length of tail we

should always bear in mind, that the tails of young quadrupeds are always longer in proportion to their size, than in the adult; and that their tails do not increase in length in the same ratio with their bodies. We have observed, in the species of *Mus* and *Arvicola*, that whilst the body may increase in length, to double the size, the tail scarcely lengthens a fourth.

In deciding on those species that we have described, and which seem to approach each other very nearly in some particulars, the following observations may be of some importance. The *S. Dekayi*, may be distinguished from *S. brevicaudus* by its larger head, longer body, shorter tail, and different colour. The *S. cinereus* may be known from *S. Carolinensis*,\* by its smaller feet and body, and by its lighter colour beneath. The *S. longirostris* may always be recognised by its ears protruding distinctly beyond the fur, it

\* We received from Mr. COOPER three specimens, which we have, with some hesitation, referred to *Sorex Carolinensis*, agreeing with those in shape and colour; yet we remarked, that their bodies were about half an inch, and their tails one-third of an inch, longer than those of Carolina. Out of many specimens found here, we have never seen much difference in size, and their tails are usually less than three-fourths of an inch. On the other hand, all the New York specimens closely resembled each other, and were not only larger in size, but their tails were uniformly an inch in length.

being the only species yet found in our country possessing this peculiarity; the *S. Forsteri*, by its broad ears, concealed slightly beneath the fur; the *S. Cooperi*, by its very diminutive size, its peculiar colour, and by its being destitute of ears; the *S. parvus* and *S. Richardsonii*, by the difference in the ears and tails of the two species; and the *S. fimbripes*, by its broad, furry, turtle-like feet, and by its fawn colour beneath.

Several of our species, which we have had an opportunity of examining, exhale that kind of musky odour ascribed to the shrews of Europe. The glandular apparatus in which this odour is contained, appears to be more enlarged during the breeding season, than at other periods, and is more perceptible in the males than in the females. We observed a cat occasionally bringing to her young brood the Carolina shrew, these readily fed on the young shrews, but rejected the old, probably on account of their offensive odour.



Bachman, John and Martin, Maria. 1837. "Some remarks on the genus *Sorex*, with a monograph of the North American species." *Journal of the Academy of Natural Sciences of Philadelphia* 7, 362–402.

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