

OCCASIONAL PAPERS OF THE MUSEUM OF  
ZOOLOGY  
UNIVERSITY OF MICHIGAN

ANN ARBOR, MICHIGAN

UNIVERSITY OF MICHIGAN PRESS

---

A SYNOPSIS OF THE CRICETINE RODENT  
GENUS *NELSONIA*

BY EMMET T. HOOPER

*Nelsonia* is a monotypic genus of cricetine rodents. Its single species, *N. neotomodon*, is not well known. There are few specimens in collections, and there are no detailed accounts of its habits. The present notes review the systematics and morphology of the species and place on record information and specimens that a field assistant, Gordon Garlick, and I obtained in March, 1953. We spent two weeks in the region inhabited by *Nelsonia*. We were primarily interested in observing and collecting tree squirrels, and much of our time was devoted to this aim. As a consequence, general mammal collecting was secondary. In the few days of trapping at four localities, however, we collected seven specimens and the tails of two other individuals of *Nelsonia*.

The species inhabits the mountains of west-central México. It occurs in few habitats, and apparently it is common in none of them. To judge from our trapping records, however, it is no more of a rarity in its native haunts than are some species that are associated with it, *Neotoma mexicana* for example. It probably would be easier to obtain a series of, say, 25 specimens of *Nelsonia* than to assemble a like series of *Neotoma mexicana* in the region.

The first specimens of the genus were collected by Nelson and Goldman in 1897 when, in the period 17 August to 15 September, they obtained ten specimens from three localities, two of which are in southern Zacatecas (near Plateado and in the Sierra Madre west of San Juan Capistrano) and one in northern Jalisco (northwest of Bolaños). The specimens were the basis for Merriam's description (1897) of *Nelsonia neotomodon*. In early December of the same year Goldman obtained two more examples in southern Zacatecas—these in the mountains west of Valparaíso. Six years later, in the period 29 January to 25 February, he and Nelson collected 14 specimens on Cerro de Tancítaro and Cerro Patambán, Michoacán. These were the

basis for the description of *Nelsonia goldmani* Merriam (1903). Between February, 1903, and March, 1953, when we obtained our examples, apparently no additional specimens of the genus were secured.

I have examined all known specimens of *N. neotomodon* except the two holotypes, a specimen in the American Museum, and one in the British Museum (Ellerman, 1941). Viola S. Schantz and Barbara Lawrence kindly permitted me to use specimens in their care. The illustrations were prepared by William L. Brudon, artist for the Museum of Zoology. Financial support for field investigations was provided by the Horace H. Rackham School of Graduate Studies of the University of Michigan.

Specimens employed in comparisons of the body skeleton and those entering in the computations in Figure 1 are listed below. Four specimens of *Nelsonia*: one from Aguascalientes and three from Durango. Seven specimens of *Neotomodon alstoni* from extreme northern Morelos. One specimen of each of the following species of *Peromyscus*: *mexicanus* from Presidio, Veracruz; *difficilis* from Zimapan, Hidalgo; *melanophrys* from Sola de la Vega, Oaxaca; *yucatanensis* from Calcehtok, Yucatán; *eremicus* from Cape San Lucas, Baja California; *banderanus* from Iguala, Guerrero; *leucopus* from vicinity of General Terán, Nuevo León. Two specimens of *P. maniculatus* from Winnebago County, Iowa. One specimen of each species of *Neotoma* as follows: *cinerea* from Sweetwater County, Wyoming; *albígula* from Jaumave, Tamaulipas; *floridana* from Osage County, Oklahoma; *mexicana* and *micropus* from Jeff Davis County, Texas; *lepida* from Turtle Bay, Baja California; *alleni* from near Autlán, Jalisco.

#### HABITAT AND HABITS

*Nelsonia neotomodon* is an inhabitant of cliffs, rimrock, and other rocky situations where there are crevices and ledges suitable for shelter. Such rocky situations also apparently must be comparatively cool and moist, be protected from the sun's rays, and support conifers and understory plants. In the Sierra Madre Occidental of central México such cool rocky situations are found in canyon bottoms and on north-facing slopes, predominantly in the altitude range 6000–10,000 feet. In the lower part of this range the species is associated with pines (*Pinus*). Above approximately 9000 feet it is found with Douglas fir (*Pseudotsuga*) or true fir (*Abies*).

In the Sierra Fria of northwestern Aguascalientes we found the species at both of our trapping localities, but only in the coolest, most

protected situations. Such situations occupy a small segment of the Sierra Fría, at least in the dry season of the year. In general, those mountains consist of a large mesa, about 8000 feet in elevation, from which rise smaller mesas and low rounded prominences. The terrain is predominantly arid and flat and rolling, consisting principally of grassland dotted with deciduous oaks and a few pines. Pines and lichen-covered live oak occur in the canyons that dissect the mesa, and it is in the deeper and narrower of these canyons, in the altitude range of 7000–8000 feet, that the densest and coolest forests are found. The upper slopes consist of open oak-pine grassland. At lower elevations juniper replaces the pine, and below approximately 7000 feet the terrain is predominantly treeless grassland.

The first specimen of *Nelsonia* from the Sierra Fría was obtained in a valley tributary to the Barranca de los Ricos. The valley is U-shaped—shallow and about one-quarter mile wide—at our collecting stations. The sides rise gradually to rimrock and then extend precipitously for 50 or more feet to the overlying mesa. Garlick trapped the specimen at the base of north-facing rimrock at the mouth of a fissure containing grass and twigs. Sacatón (bunchgrass) and scrub oak, with a few pine and juniper, formed a rather dense growth in the shadow afforded at the base of the rimrock. *Peromyscus difficilis* and *Neotoma mexicana* also were obtained there. Directly across the valley, along the south-facing rimrock, the vegetative cover was open and dry, consisting principally of deciduous scrub oak with an open understory. *Peromyscus difficilis* and *Neotoma mexicana*, but no *Nelsonia*, were trapped there.

At the second locality in the Sierra Fría, an overnight stop, we trapped north-facing rimrock in the upper reaches of the Barranca de Juan Francisco. There the barranca is steep-sided and narrow. The opposing walls of rimrock are perhaps less than one-eighth mile apart. At the base of the north-facing rimrock understory plants—rose, sacatón, and several kinds of shrubs and forbs—in addition to the rocks, lichen-covered oaks, pine, and juniper provide cover. There, on a narrow ledge near piles of feces, we caught another specimen of *Nelsonia*. *Peromyscus difficilis* was the only other species trapped in that locality; it was common.

In Durango the habitats in which we found the species were much more moist and cool, and the environmental conditions probably were more nearly optimum than in Aguascalientes. Our first collecting locality, one and one-half miles west of San Luis, was situated in the valley of the Río Piaxtla. There, in its headwaters, the cool clear river

breaks out of a narrow, boulder-strewn canyon and begins to meander over a long meadow. We trapped on the slopes of this and another V-shaped, tributary canyon. Effects on the biota of slope exposure and depth and width of canyon are evident. The bottom of the canyon and the lower parts of the north-facing slopes are perennially cool and moist. Protected from the sun for all but a few hours of the day, those areas support a cool forest of Douglas fir and juniper, with a mat of forbs, ferns, and moss underfoot. The mat is kept continually damp by spring seepages which issue between the boulders and from crevices in the moss-covered cliffs. Farther up the north-facing slopes Douglas fir is replaced by juniper, then by oak and pine, and the understory becomes open. Nonetheless, those slopes are well forested, compared with the northern side of the canyon. The south-facing slopes, except those immediately above the canyon bottom, are dry and are dominated by oak and pine. The substrate is bare or is covered with pine needles or oak leaves, dotted here and there with a clump of sacatón or scrub oak.

The specimens of *Nelsonia* were all collected on the lower parts of north-facing slopes in situations as follows: One specimen was trapped in a mossy area under a fallen tree that extended across a rocky stream bed. One specimen and tails of two others were obtained in runways through deep, wet moss growing on precipitous rock bordering the river. Two specimens were obtained on a wet ledge beneath a moss-covered boulder. Other species collected there amid the moss, roots of Douglas fir, logs, and boulders include: *Sorex durangae*, *Peromyscus difficilis*, *P. boylei*, and *Microtus mexicanus*. To judge from our trapping results, *P. difficilis* was more common than *P. boylei*. On the south-facing slopes *boylei* was abundant, and *difficilis* was uncommon. *Reithrodontomys megalotis* and *Neotoma mexicana* are the other species obtained on the south-facing slopes.

The specimen from Cerro Huehuento ("Cerro Huehuento" on some maps) was trapped beneath a moss-covered boulder on the side of a small draw in an open Douglas fir forest. *P. boylei* was abundant there. In some areas between approximately 9500 and 10,000 feet on the north slopes of Huehuento the Douglas fir forests cover the tops of ridges as well as the creek valleys. In rocky areas in those extensive forests it is probable that *Nelsonia* is fairly common.

None of the six females collected gave evidence of breeding. They were collected in the period 11–27 March. The stomach of one of the specimens from San Luis was filled with a bright green mass which had the odor and appearance of mashed and ground Douglas fir or

juniper needles. Juniper cuttings were observed on a nearby moss-covered ledge.

#### GEOGRAPHIC VARIATION

Two allopatric, intergrading forms appear to be represented by the samples at hand. The type locality, distribution, and other characteristics of each are outlined below:

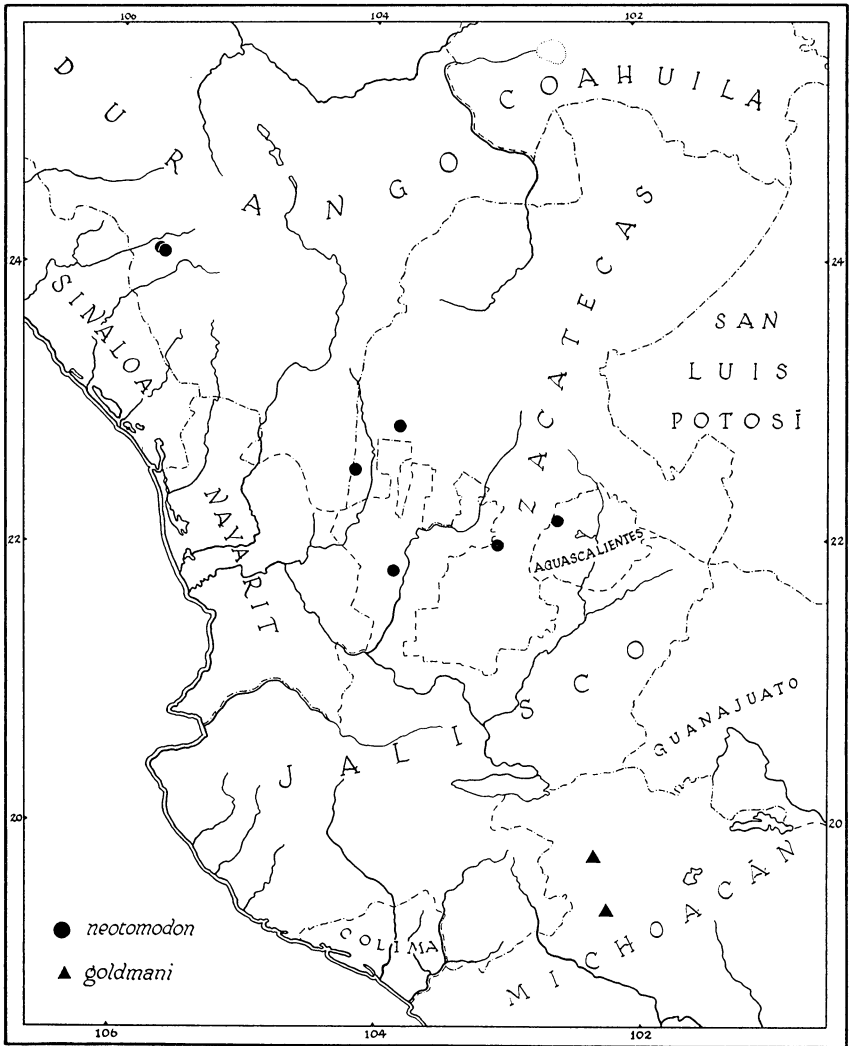
#### *Nelsonia neotomodon neotomodon* Merriam

*Nelsonia neotomodon* Merriam (1897). México, Zacatecas, mountains near Plateado, about 8200 feet elevation.

DISTRIBUTION.—Sierra Madre Occidental and outlying ranges in Jalisco, Aguascalientes, Zacatecas, and Durango (Map 1). Known vertical range approximately 7500–9500 feet in the pine-oak and Douglas fir belts.

REMARKS.—Characteristics of *Nelsonia n. neotomodon* are given by Merriam (1897). Externally, it resembles a large *Peromyscus*—*P. californicus*, *P. hylocetes*, or *P. difficilis* for example. The upper parts are a mixture of Pinkish Cinnamon (Ridgway, 1912) of the cover hairs and black of the guard hairs. The underparts are white; all of the hairs are Plumbeous basally. The feet are white dorsally. The soles are almost naked; there are a few short hairs between the heel and distal pad. There are five plantar pads on the forefoot and six on the hind foot. The tail is covered with long hairs; it is dusky dorsally and white ventrally, sharply bicolor, and white-tipped. The ears are rounded and scantily haired. In the flesh they stand out from the fur more conspicuously than in *Peromyscus*. The vibrissae when unworn are exceedingly long, extending almost to the mid-back. There are few items in the exterior appearance that are distinctive. The coloration resembles that of many species of *Peromyscus*, *Neotoma*, and other cricetines. Only the long vibrissae, large rounded ears, and hairy tail give an inkling of the unique internal features that set *Nelsonia* apart.

The cranium, figured by Merriam (1897), resembles that of a miniature *Neotoma* rather than that of a *Peromyscus*. The grossness or apparent solidity of the cranium and the strong, broadly spread zygomata, for example, are typical of *Neotoma* rather than of *Peromyscus*. So also are the prismatic teeth and the thick, deeply concave and



MAP 1. A part of México showing the known distribution of *Nelsonia neotomodon*. Solid circles represent records of *N. n. neotomodon*; triangles represent records of *N. n. goldmani*.

longitudinally grooved hard palate. Other similarities and distinctions are given on following pages.

Two items regarding variations in coloration warrant mention. Of the specimens at hand, those in pelage of the wet season are slightly

darker dorsally than those in dry season pelage. The buffy bands are slightly deeper in tone, nearer Cinnamon than Pinkish Cinnamon. Also, the hind feet are not entirely white in all specimens. In the two from Aguascalientes the feet are lightly washed with dusky for about half the distance from ankle to toes, in which respect the specimens grade toward *goldmani*.

SPECIMENS EXAMINED.—Aguascalientes: 15 mi. W Presa Calles, Sierra Fría, 8000–8200 ft., 2. Durango: 1½ mi. W San Luis, 8000 ft., 4; east slope of Cerro Huehuento, 9500 ft., 1. Jalisco: Sierra Madre near Bolaños, 7600 ft., 2. Zacatecas: near Plateado, altitude between 7600 and 8500 ft., 3; Sierra Madre between Huazamata, Durango, and San Juan Capistrano, Zacatecas, 8500 ft., 4; Sierra de Valparaíso west of Valparaíso, 8700 ft., 2. The specimens from Aguascalientes and Durango are in the University of Michigan Museum of Zoology. The others are in the U. S. Fish and Wildlife Service collections.

MEASUREMENTS.—Averages and extremes of eight specimens in adult pelage from southern Zacatecas and northern Jalisco follow (in millimeters): total length, 244 (233–249); tail vertebrae, 121 (106–129); hind foot, 29 (27–30). Greatest length of skull, 32.4 (31.9–32.8); zygomatic breadth, 17.0 (16.5–17.8); interorbital breadth, 4.5 (4.3–4.7); greatest length of nasals, 11.9 (11.5–12.1); least breadth of zygomatic plate, 2.9 (2.7–3.1); breadth of rostrum (measured on capsule just anterior to zygomatic plate), 5.0 (4.7–5.2); least length of hard palate, 5.8 (5.3–5.9); length of alveoli of molars, 6.4 (6.2–6.7). Length of ear from notch on two fresh specimens from Aguascalientes, 22–23.

*Nelsonia neotomodon goldmani* Merriam

*Nelsonia goldmani* Merriam (1903). México, Michoacán, Cerro de Tancítaro, elevation approximately 9500 feet.

DISTRIBUTION.—Known only from the pine and fir belts on Cerro de Tancítaro and Cerro Patambán, Michoacán.

REMARKS.—Some distinctions between *goldmani* and *neotomodon* are pointed out by Merriam (1903). To judge from present samples the two populations are similar in size of body and of skull. In the measurements employed here the samples differ significantly only in breadth of zygomatic plate. They differ in coloration and in cranial features as follows: upper parts much darker dorsally in those of *goldmani*, the buffy color similar in hue but suppressed with respect to the black. Tail not as sharply bicolor in the examples of *goldmani*; it lacks a white tip. Hind feet dusky to or including the toes. Forefeet

white dorsally, with or without a dusky wedge extending to the base of the toes. The principal cranial differences are in the area of the zygomatic plate. In skulls of *neotomodon* the zygomatic plate is narrow (least breadth no more than 3.1 mm. in the specimens at hand), and the dorsal face of the zygomatic process of the maxilla is broad, scarcely or not at all notched anteriorly. The zygomatic plate is broader in the specimens of *goldmani* (least breadth 3.1–3.4 mm. in subadults and 3.4–3.5 mm. in adults), and the maxilla bears a distinct zygomatic notch.

The juvenile pelage, which is evident in varying amounts in all of the specimens from Patambán, resembles that of other cricetines, wood rats for example. It is dark plumbeous; the subapical buffy bands of the hairs of the upper parts and the apical white bands of the hairs of the underparts are narrow. The juvenile pelage of *goldmani* apparently is darker than that of *neotomodon*.

SPECIMENS EXAMINED.—Michoacán: Cerro de Tancítaro, about 9500 ft., 6; Cerro Patambán, about 10,000 ft., 7. One specimen from Cerro Patambán is in the Museum of Comparative Zoology. The others are in the U. S. Fish and Wildlife Service collections.

#### COMPARISONS WITH OTHER GENERA

A detailed comparison of *Nelsonia* with other genera, for the purpose of gaining clues to its relationships, heretofore has not been made. Merriam (1897) pointed out various resemblances and differences in a comparison of *Nelsonia* with *Neotoma* and *Peromyscus*, and he inferred that *Nelsonia* probably is closely related to those genera. Subsequently, *Nelsonia* has been treated as one of the neotomine genera (Miller and Rehn, 1901; Goldman, 1910; Ellerman, 1941), but Merriam (1894) did not originally include it in his subfamily Neotominae, as Goldman has stated (Goldman, 1910: 13). Apparently, it was mainly on the basis of the prismatic teeth that *Nelsonia* has been associated with *Neotoma*, *Xenomys*, and other neotomine groups. Similarities or differences in other structures, if perceived at all, were considered of less importance in defining affinities.

I compared *Nelsonia* with *Peromyscus*, *Neotoma*, and *Neotomodon*, three genera which resemble *Nelsonia* and likely are closely related to it. Other genera, of the sigmodont and oryzomyine groups especially, appear to be less like it. Some of the similarities and differences between two or more of the four genera are summarized below.

Tail.—*Nelsonia*: covered with long hairs, sharply bicolor, with or



without a white terminal pencil. *Peromyscus* and *Neotoma*: varying from hairy to almost naked, bicolor or monicolor, and with or without a terminal pencil. *Neotomodon*: hairy, sharply bicolor, and without a terminal tuft.

Vibrissae.—*Nelsonia*: when unworn, the longest vibrissae reach almost to the lumbar region. *Peromyscus*, *Neotoma*, and *Neotomodon*: moderate in length; extend to anterior part of the thoracic region.

Soles of hind feet.—*Nelsonia*, *Neotoma*, *Peromyscus*: almost naked; a few short hairs between heel and distal plantar pad. *Neotomodon*: hairy from heel to base of toes between plantar pads.

Brain case.—*Nelsonia*, *Peromyscus*, *Neotoma*: elongate, as viewed dorsally. *Neotomodon*: oval as viewed dorsally, with long narrow interorbital area making the brain case appear smaller and more rounded than in the other genera.

Interparietal.—*Nelsonia*: large; its anteroposterior length about one-third its greatest breadth. *Peromyscus*: small to large; its length usually less than one-half its breadth. *Neotoma*: large; its length one-third to one-half its breadth. *Neotomodon*: strap-shaped; its length about one-fourth or one-fifth its breadth.

Zygomatic plate.—*Nelsonia*: more deeply concave on its lateral face than in the other genera. Scarcely prolonged anterior to the zygomatic arch; zygomatic notch in maxilla slight or absent. *Peromyscus* and *Neotoma*: slightly concave laterally. Prolonged slightly or well beyond the zygomatic arch; zygomatic notch slight or large. *Neotomodon*: lateral face moderately concave. Strongly prolonged anteriorly, with a prominent zygomatic notch.

Sphenorbital foramen.—*Nelsonia*: absent or small and hidden behind roots of molars, when the skull is viewed laterally. *Neotoma*: variable in size, partly hidden by roots of molars. *Peromyscus* and *Neotomodon*: large; partly hidden or clearly visible when viewed laterally.

Palate.—*Peromyscus* and *Neotomodon*: broad and rather evenly concave; dental ridges low. More than one-half of its length made up by the palatines. Posterior palatine foramina situated anteriorly, lying immediately ventral to, and confluent with, the sphenorbital foramina. When laid out on the palate posteriad from incisive foramina, the least breadth of the palate (measured between M<sup>1</sup>) extends well beyond the maxillopalatine junction and includes the posterior palatine foramina. *Neotoma*: narrow, often rugose with prominent dental ridges. The posterior one-third to one-half of its length made up by palatines. Posterior palatine foramina situated posteriorly, not lying immediately below, and not confluent with, the sphenorbital foramina.

Anterior breadth of palate when laid out on palate barely reaches the maxillopalatine junction and excludes the posterior palatine foramina. *Nelsonia*: essentially as in *Neotoma*.

Roots of molars.—Two roots in each lower and three in each upper tooth, except in  $M^3$  of *Neotomodon*, where there is only one root. This may represent three roots coalesced into one.

Molar pattern.—*Nelsonia*: prismatic, the sections sharply acute laterally, and alternate in position. *Neotoma*: prismatic, the sections rounded laterally and located opposite each other. *Peromyscus*: bunodont, the cusps alternate in position. *Neotomodon*: semibunodont, the enamel folds of the lophs and cusps not completely closed. Cusps alternate in position.

Pelvis.—Ilium and ischium more slender in *Nelsonia* than in the other genera.

Scapula.—Neck of scapula broad and short in *Nelsonia* and *Neotoma*, narrower and longer in *Neotomodon* and *Peromyscus*.

Humerus.—Deltoid ridge lowest in *Nelsonia*, intermediate in height in *Neotoma* and *Peromyscus* (in that order), and highest in *Neotomodon*. Humerus longest, relative to skull length and to length of ulna, in *Neotoma*, and shortest in *Neotomodon* (Fig. 1).

Radius and ulna.—Each of these foreleg members in *Nelsonia* is similar in absolute size to its counterpart in *Neotomodon*. The ulna is shorter relative to skull length in *Peromyscus* and longer relative to length of humerus in *Neotomodon* than in the other genera (Fig. 1). The radius is shorter than the humerus in *Neotoma* (its length averages 93, the maximum 97, per cent of length of humerus in the seven specimens); it is about equal to it in *Nelsonia* (100 per cent) and *Peromyscus* (the average 103, the range 101–107, per cent in nine specimens), and the radius is longer than the humerus in *Neotomodon* (range 112–118 per cent in the seven specimens).

Femur.—The third trochanter is lower in height in *Nelsonia* than in the other genera. The greater trochanter and the dorsolateral limits of the trochanteric fossa lie farther laterally in *Nelsonia* than in the other genera. The femur is longest with respect to length of tibia and length of skull in *Neotoma* and shortest with respect to tibia and skull in *Peromyscus* or *Neotomodon*. *Nelsonia* approaches *Neotoma* in this respect. Femur length equals or exceeds fibula length in *Neotoma*, the two are about equal in *Nelsonia*, and femur length is less than fibula length in *Peromyscus* and *Neotomodon*. The femur is shortest in *Neotomodon* (83–90 per cent of length of fibula in the specimens at hand).

Independence of tibia and fibula.—*Neotoma* and *Neotomodon* are extremes as regards independence of the fibula. In *Neotoma* the fibula is free of the tibia for the proximal two-thirds of its length, and distally the two are but lightly ankylosed. In *Neotomodon* scarcely more than the proximal half is free, and the distal part is firmly joined to the tibia; the sutures between the two are obscure. *Nelsonia* and *Peromyscus* lie between these extremes.

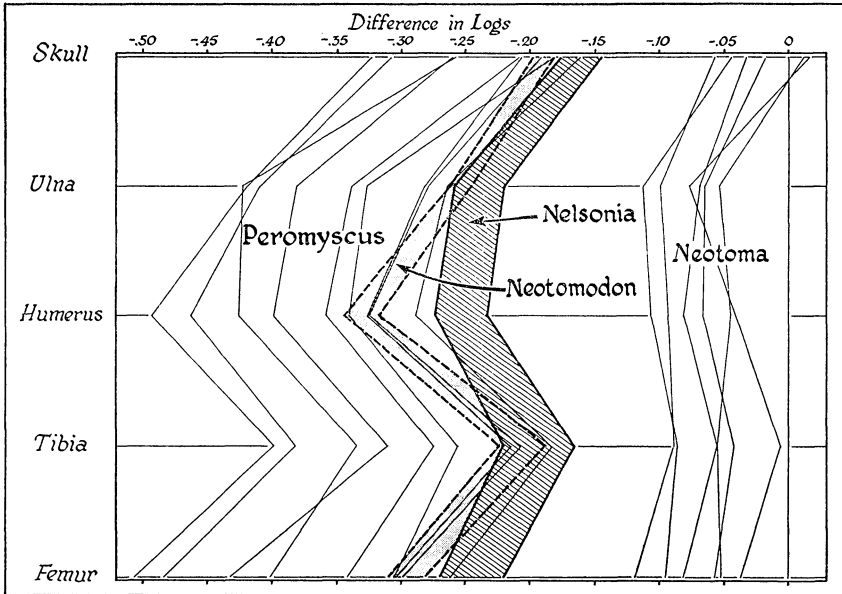


FIG. 1. Ratio diagram comparing five skeletal dimensions in *Neotoma*, *Peromyscus*, *Nelsonia*, and *Neotomodon*. The species represented are mentioned in the text. The logarithms of the measurements of a specimen of *Neotoma* are taken as standards (marked by vertical line at zero). The amount that the log of each other measurement differs from the standard is plotted on the horizontal scale. Values for *Neotoma* and *Peromyscus* are for each specimen. Only parameters are indicated for the specimens of *Nelsonia* and *Neotomodon*. The curve of *Nelsonia* is most similar to that of *Neotoma* and least like that of *Neotomodon*. For further explanation of the ratio diagram see Simpson (1941) or Hooper (1952).

#### CONCLUSIONS

Superficially, *Nelsonia neotomodon* appears to be a hairy-tailed white-footed mouse about the size of *Peromyscus californicus* or *P. difficilis*. Internal structures indicate, however, that it is in essence a diminutive wood rat. Of the four genera with which it is here com-

pared, *Nelsonia* is least like *Neotomodon*, more similar to *Peromyscus*, and most like *Neotoma*. It is nearer *Neotoma* in shape of skull, brain case, and interparietal; in characters of the palate, sphenorbital foramen, and teeth; and in configuration of the scapula and humerus. In amount of independence of the tibia and fibula, length of radius relative to length of humerus, and shape of zygomatic plate it is perhaps nearer *Peromyscus* than *Neotoma*. In no character does it resemble *Neotomodon* exclusively. (*Neotomodon* is set apart morphologically from the other genera, especially from *Neotoma* and *Nelsonia*.) Although *Nelsonia neotomodon* resembles species of *Neotoma*, it is sufficiently distinct from those and from all other species to warrant generic separation. Morphologically, ecologically, and geographically it meets many of the requirements that might be expected in an ancestor of *Neotoma*.

## LITERATURE CITED

ELLERMAN, JOHN R.

1941 The Families and Genera of Living Rodents. Family Muridae. London: British Museum. Vol. II. Pp. xii+690, 50 figs.

GOLDMAN, EDWARD A.

1910 Revision of the Wood Rats of the Genus *Neotoma*. N. Amer. Fauna, 31: 1-124, 8 pls., 14 figs.

HOOPER, EMMET T.

1952 Notes on Mice of the Species *Peromyscus boylei* and *P. pectoralis*. Journ. Mammal., 33: 371-78, 2 figs.

MERRIAM, C. HART

1894 A New Subfamily of Murine Rodents—The Neotominae—With Description of a New Genus and Species and a Synopsis of the Known Forms. Proc. Acad. Nat. Sci. Phila., pp. 225-52, 1 pl., 5 figs.

1897 *Nelsonia neotomodon*, a New Genus and Species of Murine Rodent from Mexico. Proc. Biol. Soc. Wash., 11: 277-79.

1903 Four New Mammals, Including a New Genus (*Teonopus*), from Mexico. *Ibid.*, 16: 79-82.

MILLER, GERRIT S., and J. A. G. REHN

1901 Systematic Results of the Study of North American Land Mammals to the Close of the Year 1900. Proc. Boston Soc. Nat. Hist., 30: 1-352.

RIDGWAY, ROBERT

1912 Color Standards and Color Nomenclature. Washington, D.C.: Published by the author. Pp. iv+44, 53 pls.

SIMPSON, GEORGE G.

1941 Large Pleistocene Felines of North America. Amer. Mus. Novitates, 1136: 1-27.

*Submitted for publication March 26, 1954*