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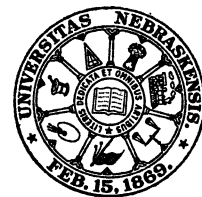
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Mullen Assemblage from the  
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## ABSTRACT

### The Microtine Rodents of the Mullen Assemblage from the Pleistocene of North Central Nebraska

Larry D. Martin

The University of Nebraska State Museum has had an active collecting program in Hooker and Cherry counties, Nebraska, since the 1930's. The following University of Nebraska State Museum collecting localities have been extensively excavated: Cr-10, Cr-102, Cr-11, Ho-101, Ho-102, and Ho-103. These localities have produced a large vertebrate fauna described by Jakway as the Mullen Local Fauna which he considered for the most part to be Early Illinoian. Further study of this local fauna now demonstrates that assemblage does include Early as well as Middle Pleistocene animals. The purpose of this paper is to report on the evidence regarding the microtine rodents of this assemblage. New species of *Pliophenacomys* and *Mimomys* are described. *Pliopotamys meadensis* and *Ondatra idahoensis* are reported from this assemblage for the first time.

CONTRIBUTION OF the Division of Vertebrate Paleontology of the Museum.

# The Microtine Rodents of the Mullen Assemblage from the Pleistocene of North Central Nebraska<sup>2</sup>

## INTRODUCTION

The University of Nebraska State Museum has had an interest in the region around Mullen, Nebraska, since the early 1930's, as the holotypes of *Segomastodon mirificus*, *Mammuthus imperator*, *Equus excelsus*, *Panthera onca augusta*, and *Bison ferox* are believed to be from this vicinity (Schultz, 1934, pp. 372, 373, 383, 391; Jakway, 1962, p. 9).

In 1930 and 1931 Charles Osborn and Louis Luckert discovered the main quarries along the Loup River north of Mullen. These quarries are: U.N.S.M.<sup>3</sup> Coll. Loc. Cr-10 and Cr-102 (on the north side of the North Prong of the Middle Loup River, north and west of Mullen, Cherry County); U.N.S.M. Coll. Loc. Cr-11 (just SW. of U.N.S.M. Coll. Loc. Cr-102); U.N.S.M. Coll. Loc. Ho-101 (north side of the Middle Loup River in a gully 1½ miles north of Mullen, Hooker County); U.N.S.M. Coll. Loc. Ho-103 (2 miles west of Seneca, Hooker County); and U.N.S.M. Coll. Loc.

Ho-102 (in a large gully on the south side of the Middle Loup River, 4 miles north and 2 miles west of Mullen, Hooker County).

Some of the material from these localities was reported by Lugin (1934) and Schultz (1934, including Table A), and Early and Middle Pleistocene sediments and fossils were recognized. Further excavations and study of stratigraphic evidence during 1940, 1941, and 1956 produced important data and a larger collection from these important quarries.

Schultz and Tanner (1957, p. 72) again proposed that the more complex geomorphology and stratigraphy of the fossiliferous deposits of the Middle Loup River near Mullen, and Seneca be re-examined for the reason that, "A few specimens are similar to those from the Broadwater deposits, while some appear to have come from the Sappa near the base of the Terrace-4 fill, but the majority of the fossils are from the Crete sand and silt (early Illinoian age), which is higher in the Terrace-4 fill than the Sappa deposits." Later (1958, 1959, and 1960) George Jakway, under the direction of C. Bertrand Schultz, as part of his Ph.D. program, studied vertebrate remains from the "Mullen Localities." He concluded that for the most part the vertebrates are from Middle Pleistocene sediments. However, such species as *Procastoroides*, *Stegomastodon* and *Mastodon* "rep-

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<sup>2</sup> The research for this paper has been supported by grants from the University of Nebraska Research Council, including a research assistantship (September, 1969 to June, 1970) for the author.

<sup>3</sup> U.N.S.M., University of Nebraska State Museum.

resent earlier forms . . . and should be excluded from the Mullen local fauna" (Jakway p. 114). The results of Jakway's work were reported in an unpublished Ph.D. thesis (Jakway, 1962), which listed the following animals: *Scalopus aquaticus*, (Linnaeus), *Myiodon* cf. *harlani* Owen, *Lepus giganteus* Brown, *Lepus* cf. *townsendi* Bachman, *Sylvilagus* cf. *floridanus* (Allen), *Cynomys niobrarius* Hay, *Spermophilus* sp., *Spermophilus* cf. *tridecemlineatus* (Mitchill), *Geomys* cf. *bursarius* Merriam, *Geomys* sp., *Thomomys* sp., *Procastoroides* sp., *Procastoroides sweeti* Barbour and Schultz, *Castoroides nebraskensis* Barbour, *Castoroides effossarius* (Starrett), *Castor aessor* Hay, *Castor* cf. *californicus* Kellogg, *Ondatra nebrascensis*, (Hollister), *Microtus pennsylvanicus* (Ord), *Aenocyon dirus* Leidy, *Canis latrans* Say, *Ursidae* sp. indet., *Mustela frenata* Lichtenstein, *Taxidea taxus* (Schreber), *Panthera onca augusta* (Leidy), *Felis* cf. *concolor* Kerr, *Stegomastodon mirificus* (Leidy), *Stegomastodon aftoniae* Osborn, *Mastodon americanus* (Kerr), *Mammuthus (Archidiskodon) imperator* (Leidy), *Equus excelsus* Leidy, *Tapirus haysii* Leidy, *Platygonus* cf. *vetus* Leidy, *Camelops kansanus* Leidy, *Tanupoloma* sp., *Alces americana* (Clinton), *Odocoileus* sp., *Stockoceros onusrosagris nebraskensis* Skinner, *Symbos cavifrons* Leidy, *Bison (Gigantobison) latifrons* (Harlan). Jakway felt that these animals except for *Lepus giganteus*, *Castor* cf. *californicus*, *Procastoroides sweeti*, *Stegomastodon mirificus*, *S. aftoniae*, *Bison latifrons*, and *Platygonus* cf. *vetus* composed the Mullen local fauna of Early Illinoian age. The excluded genera and species either did not occur in the quarries or were believed to have been reworked from earlier deposits. The presence of *Symbos*, and *Alces* with *Myiodon*, *Panthera*, and *Tapirus* seems to be questionable, and Jakway (1962, pp. 114, 132) mentions that further "mixing" was possible. A restudy of this material along with additional excavations of U.N.S.M. Coll. Loc. Cr-10 demonstrates that the reworking was more extensive than Jakway had supposed. The evidence, however, indicates that at least two separate faunas can be recognized in the Mullen Assemblage.

It is the purpose of this paper to report on the microtine rodents of this assemblage. One of these rodents is considered to be a new species of *Pliophenacomys* Hibbard, and another is a new species of the Eurasian genus *Mimomys*.

***Pliophenacomys osborni*<sup>4</sup> sp. nov.**

**Holotype.**—A partial left ramus with  $M_{1-3}$ , lacking the anterior portion of the incisor (U.N.S.M. 39216).

**Type Locality.**—U.N.S.M. Coll. Loc. Ho-103, SE. ¼, sec. 23, T. 24 N., R. 31 W., Hooker County, Nebraska.

**Stratigraphic Occurrence.**—?Early Kansan, Early Pleistocene.

**Referred Material.**—Two left  $M_1$ 's (U.N.S.M. 39568 and 39569), three right  $M_1$ 's (U.N.S.M. 39570, 39571, and 39572), and a left  $M_3$  (U.N.S.M. 39598).

**Locality.**—The referred material is from U.N.S.M. Coll. Loc. Cr-10, Pit 3.

**Stratigraphic Occurrence.**—Same as for holotype.

**Diagnosis.**—A medium-sized vole with rooted teeth, lacking cement, and enamel pits; teeth more hypsodont than in *P. primaevus* with better developed dentine tracts (Fig. 1e);  $M_1$  with posterior loop, five alternating triangles and an anterior loop.

**Description.**—A vole with rooted molars; relatively high dentine tracts on lower molars; no cement in re-entrant angles of molars; mental foramen situated dorsally; capsular process small and on labial side of ramus, distal to  $M_3$ ;  $M_1$  having two roots, a posterior loop, five alternating triangles, and an anterior loop; anterior loop of  $M_1$  consisting of two incipient triangles opening broadly into a simple loop;  $M_2$  with posterior loop and four alternating triangles; third and fourth alternating triangles of  $M_2$  broadly confluent;  $M_3$  with a posterior loop and four alternating triangles; third and fourth alternating triangles of  $M_3$  broadly confluent.

<sup>4</sup> This species is named in honor of Charles Osborn who made many of the original discoveries in 1930 in the Mullen area for the University of Nebraska State Museum.

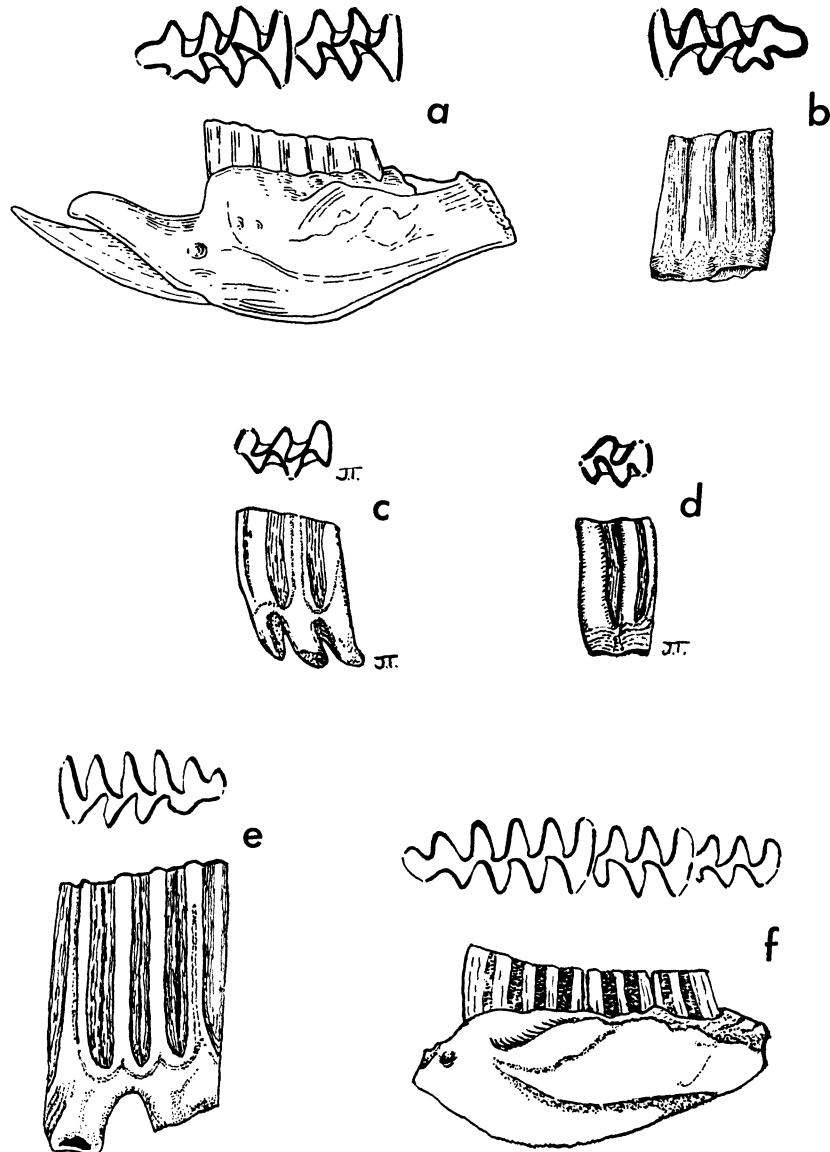


Fig. 1—a-d, *Mimomys monohani*; a, holotype, U.N.S.M. 39209, left ramus with lower molars 1-2, occlusal view X8, labial view X5. b, U.N.S.M. 39575, right  $M_1$ , occlusal view X8, labial view X5. c, U.N.S.M. 39601, right  $M_2$ , occlusal and lingual views X5. d, U.N.S.M. 39595, left  $M_2$ , occlusal and labial views X5. e-f, *Pliophenacomys osborni*; e, U.N.S.M. 39570, right  $M_1$ , occlusal and labial views X8. f, holotype U.N.S.M. 39216, left ramus with lower molars 1-3, occlusal view X8, labial view X5.

**Discussion.**—The holotype U.N.S.M. 39216 is a partial left ramus of an adult but not old individual (Fig. 1f).  $M_1$  consists of a posterior loop, five alternating triangles, and an anterior loop. The anterior loop consists of two incipient triangles opening broadly into a simple loop. In two specimens this anterior loop is similar in

general form to the anterior loop of *Synaptomys*. These two teeth (U.N.S.M. 39570 and U.N.S.M. 39571) also have narrower re-entrant angles than in the other specimens (Fig. 1e). Two teeth (U.N.S.M. 39568 and U.N.S.M. 39569) have the anterior loop similar to that in other *Pliophenacomys*, and the re-entrant angles broader. These

differences are regarded as individual variation probably due in part to stage of wear, although in some microtines they have been used to distinguish species. The third labial re-entrant is sometimes almost "square." The enamel of the anterior loop is often interrupted by a wide dentine tract. The  $M_2$  consists of a posterior loop and four alternating triangles with the third and fourth broadly confluent. The fourth triangle is somewhat oval in shape resembling that triangle in *P. primaevus*. The  $M_3$  consists of a posterior loop and four alternating triangles with the last two broadly confluent. The dental pattern of  $M_{1-2}$  is closely comparable with that of *P. primaevus*, from which *P. osborni* differs in being larger, having better developed dentine tracts and more hypsodont teeth. However, the right  $M_1$  figured by Hibbard as *P. meadensis* (Hibbard, 1956, p. 166, Fig. 6F and Hibbard and Zakrzewski, 1967, p. 262) may pertain to *P. osborni*.

*Pliophenacomys osborni* has the anterior enamel of the alternating triangles thicker than the posterior, and the mental foramen is higher and larger in *P. primaevus*. *Ophiomys* has a less dorsally placed mental foramen than does *Pliophenacomys* and lacks the high dentine tracts found in *P. osborni*. The teeth of *P. osborni* are more hypsodont and have higher dentine tracts than do the teeth of *Nebraskomys*, *Ogmodontomys*, *Cosomys*, or *Ophiomys*. The first three of these genera also have fewer alternating triangles on the  $M_1$ . *Mimomys* has fewer alternating triangles on  $M_1$  than does *P. osborni* and usually has cement developed on its cheek teeth. *Ogmodontomys*, *Cosomys*, and *Mimomys* may have a prism fold on  $M_1$  and often have an enamel pit on that tooth. *Pliolemmus* has ever-growing teeth.

***Mimomys monahani*<sup>5</sup> sp. nov.**

**Holotype.**—Partial left ramus with incisor and  $M_{1-2}$ ; U.N.S.M. 39209.

<sup>5</sup> This species is named in honor of the Earl Monahan family in recognition of their cooperation in permitting the field parties of the University of Nebraska State Museum to excavate fossils on their property.

**Type Locality.**—From U.N.S.M. Coll. Loc. Cr-10, Pit 3, NW.  $\frac{1}{4}$ , sec. 18, T. 25 N., R. 33 W., north of Mullen, Cherry County, Nebraska.

**Stratigraphic occurrence.**—?Early Kansan, Early Pleistocene.

**Referred Material.**—Left ramus with incisor and  $M_{1-2}$  (U.N.S.M. 39213), left ramus with  $M_2$  (U.N.S.M. 39208), right ramus with incisor and  $M_1$  (U.N.S.M. 39576), one left  $M_1$  (U.N.S.M. 39573), two right  $M_1$ 's (U.N.S.M. 39574 and 39575), one left  $M_2$  (U.N.S.M. 39594), one left and three right  $M_1$ 's (U.N.S.M. 39588, 39589, 39600, and 39601), and one left  $M^2$  (U.N.S.M. 39595).

**Locality.**—From the type locality and from U.N.S.M. Coll. Loc. Cr-10, Pit 1.

**Stratigraphic Occurrence.**—Same as for holotype.

**Diagnosis.**—A vole near the size of *Microtus pennsylvanicus* with relatively hypsodont rooted teeth; high dentine tracts; cement in re-entrant angles;  $M_1$  with posterior loop, three nearly closed alternating triangles and an anterior loop; anterior loop lacking enamel pit, but having well-developed prism fold; mental foramen not situated high on ramus.

**Description.**—A small vole with rooted molars; relatively high dentine tracts on lower molars; small amount of cement in re-entrant angles of lower and upper molars; mental foramen at about midline between dorsal and ventral borders of diastema; incisor with a ventral border of smooth enamel;  $M_1$  with posterior loop, three nearly closed alternating triangles, and an anterior loop; anterior loop  $M_1$  consisting of two small alternating triangles and a prism fold;  $M_2$  with a posterior loop, two nearly closed alternating triangles and the third and fourth alternating triangles broadly confluent;  $M^1$  with three roots, four alternating triangles and an anterior loop;  $M^2$  having two roots, three alternating triangles, and an anterior loop.

**Discussion.**—This vole differs from all described species of *Ogmodontomys*, *Pliophenacomys*, *Nebraskomys*, *Ophiomys*, and *Cosomys*



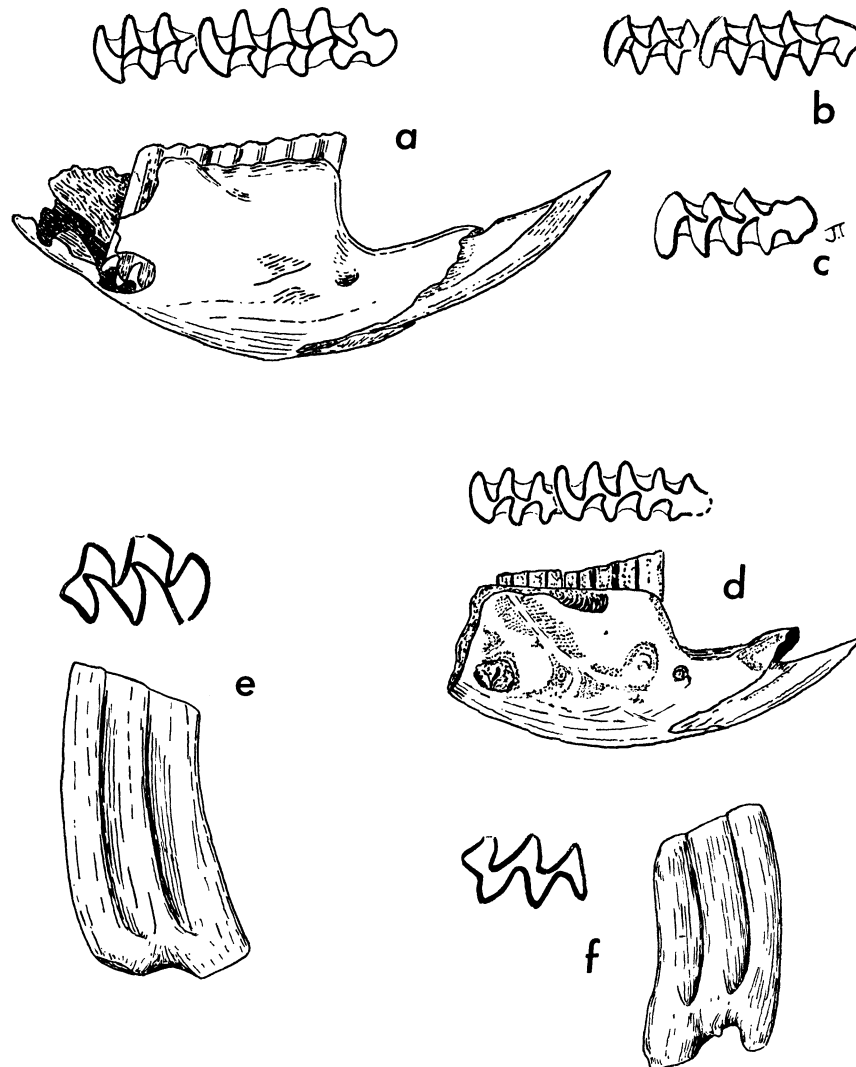


Fig. 2—*a*, *Microtus pennsylvanicus*, U.N.S.M. 39206, right ramus with lower molars 1-2, occlusal view X8, labial view X5. *b-c*, *Microtus pennsylvanicus*?; *b*, U.N.S.M. 39210, occlusal view X8. *c*, U.N.S.M. 39578, left  $M_1$  occlusal view X8. *d*, *Microtus* sp., U.N.S.M. 39215, right ramus with lower molars 1-2, occlusal view X8, labial view X5. *e-f*, *Pliophenacomys*; *e*, U.N.S.M. 39592, left  $M_1$ , occlusal and labial views X8. *f*, U.N.S.M. 39597, right  $M_1$ , occlusal and labial views X8.

in being a microtine with more hypsodont teeth, high dentine tracts, and cement in the re-entrant angles. It does resemble some of the European species of *Mimomys* in these characteristics, and I have referred it to that genus. The  $M_1$  is relatively hypsodont. The young teeth are not actually rooted but show closure at their bases (Fig. 1b). The teeth of older individuals are well rooted. The  $M_1$  consists of a posterior loop, three closed or nearly closed alternating triangles,

and anterior loop consisting of two confluent triangles and a prism fold (Fig. 1a and b). The enamel is often interrupted by the dentine tracts which range up to 4.3 mm. in height. Unlike many of the European species, an enamel pit is not present in any of the specimens available. The  $M_2$  has a posterior loop and four alternating triangles. The anterior two triangles are confluent (Fig. 1b). The mental foramen is more ventrally located than in *Pliophenacomys* (Plate

1, Fig. 1).  $M^1$  (Fig. 1c) consists of an anterior loop and four alternating triangles. It has three roots and cement. The  $M^2$  (Fig. 1d) consists of an anterior loop and three alternating triangles. It has two roots and cement. Eight  $M^1$ 's remain unassigned (U.N.S.M. 39592, 39597, 39596, 39591, 39590, 39593, 39595, and 39599). They have an anterior loop, four alternating triangles, two roots, and lack cement (Fig. 2g). A few specimens show a vestigial third root (Fig. 2f). Some, if not all, of these  $M^1$ 's must belong to *Pliophenacomys osborni*. However, I am uncertain as to the amount of variation in the  $M^1$  of *Mimomys monahani*, and at the present time do not wish to refer these teeth to either genus. *Mimomys monahani* is more advanced than *M. pliocaenus* Major and differs from that species as well as from most other species of *Mimomys* in having higher crowned teeth, a better developed prism fold, and in lacking an enamel pit. It may very well be a descendent of *Cosomys* Wilson.

The reference of this material to *Mimomys* must be regarded as tentative, but as it cannot presently be separated from that genus and cannot be assigned to any known North American genus, this seems to be the most reasonable course to take. The faunas of the North American Blancan and the European Villifranchian may be expected to have many genera in common as they become better known. One such example is the presence of *Megantereon* on both continents (Schultz and Martin, 1970).

#### ***Microtus pennsylvanicus***

**Referred Material.**—A right ramus with  $M_{1-2}$  (U.N.S.M. 39206), a partial left ramus with  $M_{1-2}$  (U.N.S.M. 39210), one right and two left  $M_1$ 's (U.N.S.M.) 39578 and 39580).

**Discussion.**—This material is from U.N.S.M. Coll. Loc. Cr-10, pits 1 and 2. The  $M_1$ 's all have five alternating triangles and an anterior loop (Fig. 2a). Most of the *M. pennsylvanicus* from Illinoian deposits which I have examined have had five alternating triangles while recent *M. pennsylvanicus* from Nebraska usually have six or more. Paulson (Paulson, 1961, p. 144) found

that in his sample of *M. paroperaius* from the Cudahy fauna that 20 per cent of the  $M_1$ 's had five triangles. In a mixed assemblage this could be a serious problem, but the shape of the anterior loop and the slightly larger size of the  $M_1$ 's strengthens the assignment of this material to *M. pennsylvanicus*. One specimen (U.N.S.M. 39210) seems to be an aberrant *M. pennsylvanicus* with a "hook" shaped anterior loop (Fig. 2b); however it is only tentatively assigned to that species.

Two specimens, a right  $M_1$  (U.N.S.M. 39577) and a left  $M_1$  (U.N.S.M. 39578) seem to be *Microtus paroperaius* Hibbard. These are from U.N.S.M. Coll. Loc. Cr-10, Pit 3. The  $M_1$  consists of a posterior loop, four closed triangles and a fifth triangle confluent with the anterior loop (Fig. 2c). *Microtus paroperaius* is ancestral to *M. pennsylvanicus* and is apparently restricted to deposits of middle or late Kansan age. It would not be impossible for populations of *M. pennsylvanicus* from early Illinoian localities to include a small percentage of individuals with the more primitive pattern of  $M_1$ . At the present time there is no additional evidence for a middle or late Kansan component to the assemblage. Because of this, it seems best to include these two specimens as *M. pennsylvanicus*.

#### ***Microtus* sp.**

**Referred Material.**—Two partial right ramus with  $M_{1-2}$  (U.N.S.M. 39215 and 39212), one left ramus with  $M_{1-2}$  and a right  $M_1$  (U.N.S.M. 39585)

**Discussion.**—This material is from U.N.S.M. Coll. Loc. Cr-10. The  $M_1$ 's have the crown pattern found in *Microtus ochrogaster*, *M. pine-torium*, and *M. llanensis* (Fig. 2d). *Microtus llanensis* ordinarily does not have the sixth and seventh triangles on the  $M_1$  as well developed as they are on the Mullen specimens, but some of them do have the broad re-entrant angles sometimes associated with the extinct species. Because of the mixing of environments and age in this assemblage I have for the time being refrained from referring any of this material to the above species.

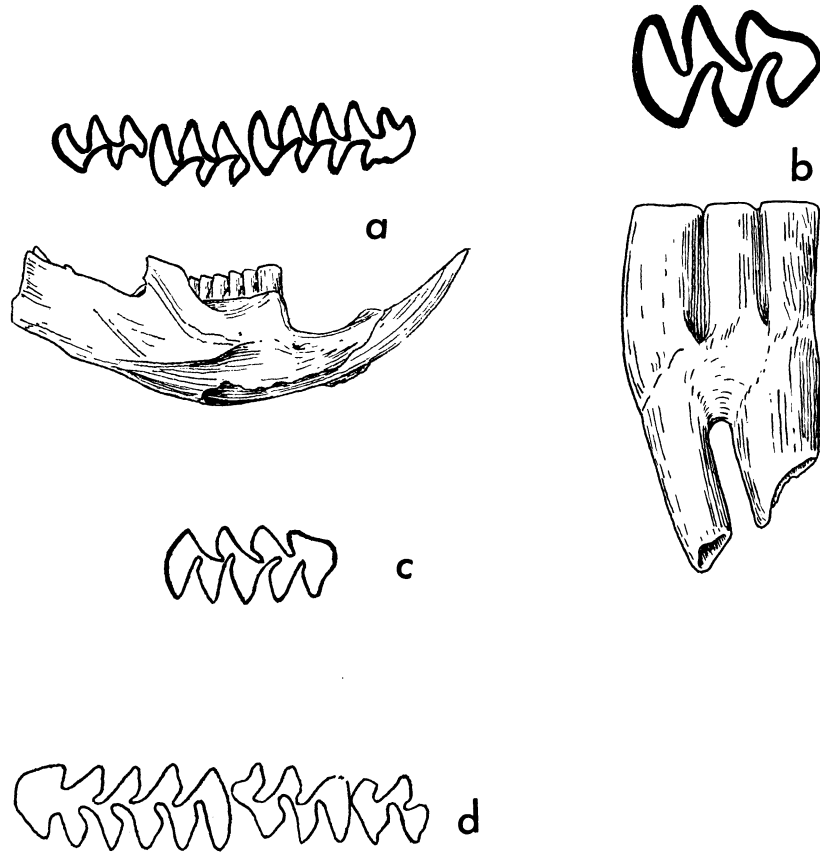


Fig. 3—*a*, *Pliopotamys meadensis*, U.N.S.M. 39205, right ramus with lower molars 1-3, occlusal view X5, lateral view X2. *b-c*, *Ondatra idahoensis*; *b*, U.N.S.M. 39587, left  $M^3$  occlusal and lingual views X8. *c*, U.N.S.M. 39583, left  $M_1$ , occlusal view X4.5, *d*, *Ondatra nebrascensis*, U.N.S.M. 39197, right ramus with lower molars 1-3, occlusal view X5.

#### *Ondatra nebrascensis* (Hollister)

**Referred Material.**—Partial right ramus with  $M_{1-2}$  (U.N.S.M. 39197), partial right ramus with  $M_1$  (U.N.S.M. 39198), four partial left rami with  $M_{1-2}$  (U.N.S.M. 39199, 39201, 39202, 39203), and two partial left rami with  $M_1$  (U.N.S.M. 39201 and 39584).

**Discussion.**—The above material came from U.N.S.M. Coll. Loc.'s Cr-10 (pits 1, 2, and 3), Cr-102 and Cr-11. The length of  $M_1$  on these specimens ranges from 5.9–6.7 mm. There are five closed alternating triangles and confluent sixth and seventh triangles opening into an anterior loop on the  $M_1$  (Fig. 3d). This material compares favorably with *O. nebrascensis* from the Hay Springs and Angus Local Faunas.

#### *Ondatra idahoensis* Wilson

**Referred Material.**—A right ramus with  $M_{2-3}$  (U.N.S.M. 39204), 3 left  $M_1$ 's (U.N.S.M. 39581, 39582, and 39583), right  $M^2$  (U.N.S.M. 39586), and a left  $M^3$  (U.N.S.M. 39587).

**Discussion.**—The ramus is from U.N.S.M. Coll. Loc. Cr-102 and the rest of the material is from Cr-10, Pit 3. This is a muskrat smaller than either *O. nebrascensis* or *O. annectens* having a posterior loop, five closed alternating triangles and an anterior loop on  $M_1$  (Fig. 3c). A very small amount of cement is present at the base of the crown of that tooth. The dentine tracts are best developed on the labial side and are better developed than those described for this species by Hibbard (Hibbard, 1959, p. 31).  $M^2$

and  $M^3$  have two roots each (Fig. 2b). The ramus lacks  $M_1$  and is referred on the basis of its small size only.

***Pliopotamys meadensis* Hibbard**

**Referred Material.**—A right ramus with incisor and  $M_{1-3}$  (U.N.S.M. 39205)

**Discussion.**—The above specimen is from U.N.S.M. Coll. Loc. Ho-101. This is a muskrat smaller than *O. idahoensis*. The  $M_1$  has four closed or nearly closed alternating triangles with the fifth opening into the anterior loop (Fig. 3a). The anterior loop shows a trace of crenulations on the labial side. Little or no cement is present on the teeth. The dentine tracts are well enough developed to interrupt the enamel of the anterior loop on the labial side. According to Hibbard (1959, p. 29) and Zakrzewski (1969, p. 27). *Pliopotamys meadensis* Hibbard can be separated from *P. minor* (Wilson) by the higher degree of constriction between the fifth triangle and the anterior loop of the  $M_1$  in *P. meadensis*. *Pliopotamys minor* is also generally smaller than *P. meadensis* (Zakrzewski, 1969, p. 30, Fig. 11). In a sample of twenty-five  $M_1$ 's of *Pliopotamys* from the Broadwater local fauna about 20 per cent have the connection between the fifth triangle and the anterior loop broadly open. Considering the amount of variation in the closure of the anterior triangles shown by other microtines, for example *Microtus pennsylvanicus* (Semkin, 1966, p. 160), it might be doubted that this character is very useful for the separation of species.

The genus *Pliopotamys* Hibbard is an early stage in muskrat evolution which is characterized by the small size, the lack of cement and well-developed dentine tracts on the cheek teeth, and the presence of crenulations and an enamel pit on the anterior loop of  $M_1$ .

**SUMMARY**

Most of the fauna collected from U.N.S.M. Coll. Loc. Cr-10 comes from a deposit of sand and greenish-grey nodules which is about 30 inches above a compact clayey silt layer that Jakway (1962, Fig. 2) regarded as a possible

paleosol. The bulk of the exposure consists of cross-bedded fluvial sands overlain by dune sand. U.N.S.M. Coll. Loc.'s Cr-102 and Cr-11 are adjacent to U.N.S.M. Coll. Loc. Cr-10 but are at a slightly higher elevation.

At least two faunas are represented in the Mullen Assemblage. One fauna is probably early Illinoian in age and contains most of the forms which Jakway listed as the Mullen Local Fauna (Jakway, 1962, p. 129). This fauna was mostly derived from U.N.S.M. Coll. Loc.'s Cr-102 and Cr-10 particularly in pits 1 and 3 of the latter locality. The other fauna seems to be of an Early Pleistocene age and includes *Pliophenacomys osborni*, *Mimomys monahani*, *Ondatra idahoensis*, and *Castor accessor*. These forms are intermediate in their stage of evolutionary development between forms found in the Nebraskan or Aftonian Broadwater Local Fauna and the fauna of the Middle or Late Kansan Sappa formation. It seems plausible, therefore, that these are members of an Early Kansan fauna. Two of the forms listed (*Ondatra idahoensis* and *Castor accessor*) are also known from the Grandview Local Fauna of Idaho (Wilson, 1933). I regard the Yarmouth Age assigned to this Local Fauna on the basis of the supposed similarity of *Ondatra idahoensis* to the Borchers muskrat (Hibbard, 1959, p. 31-33) as highly unlikely. The presence of four such primitive rodents as *Mimomys*, *Pliophenacomys*, *Ophiomys*, and *Ondatra idahoensis* in the Grandview Local Fauna and the Mullen Assemblage would seem to preclude such a possibility, especially since such primitive rodents are absent from the pre-Borchers Cudahy Fauna. Hibbard now appears to regard the Grandview Local Fauna as Late Blancan (Hibbard and Zakrzewski, 1967) and this would seem to be a reasonable interpretation. Shotwell's recent suggestion (Shotwell, 1970) that the Grandview and Hagerman local faunas are about the same age is not supported by the generally more advanced nature of the rodents in the Grandview fauna when they are compared with those from the Hagerman. For the present time I am also retaining *Ondatra idahoensis* in *Ondatra* rather than placing it in *Pliopotamys* as does Shotwell (1970, p. 65).

U.N.S.M. Coll. Loc. Ho-101, from which *Pliopotamys meadensis* was recovered, probably represents a still older deposit which may be near the age of the Broadwater Local Fauna. King Richey and the author recovered a *Plesippus* tooth from about the same horizon as Ho-101 in the SW. ¼, SE. ¼, NW. ¼, sec. 9, T. 24 N., R. 32 W., NE. of Mullen, Hooker County, Nebraska, during the summer of 1969. This would lend additional support to an Early Pleistocene age for these beds.

TABLE I  
Measurements of:  
*Pliophenacomys osborni*, n. sp.

			Length mm.	Width mm.
U.N.S.M. 39216	M <sub>1-3</sub>		6.3	
(Holotype)				
	M <sub>1</sub>		3.1	1.3
	M <sub>2</sub>		1.7	1.1
	M <sub>3</sub>		1.4	.9
U.N.S.M. 39568	M <sub>1</sub>		2.7	1.0
U.N.S.M. 39569	M <sub>1</sub>		3.0	1.1
U.N.S.M. 39570	M <sub>1</sub>		2.8	1.2
U.N.S.M. 39571	M <sub>1</sub>		3.0	1.2
		<i>Mimomys monahani</i> , n. sp.		
U.N.S.M. 39209	M <sub>1</sub>		2.5	1.2
(Holotype)				
	M <sub>2</sub>		1.4	1.0
U.N.S.M. 39208	M <sub>2</sub>		1.9	1.2
U.N.S.M. 39213	M <sub>1</sub>		2.5	1.2
	M <sub>2</sub>		1.4	1.0
U.N.S.M. 39576	M <sub>1</sub>		2.6	1.2
U.N.S.M. 39573	M <sub>1</sub>		2.4	1.3
U.N.S.M. 39574	M <sub>1</sub>		2.9	1.3
U.N.S.M. 39575	M <sub>1</sub>		2.8	1.2
U.N.S.M. 39594	M <sub>2</sub>		1.9	1.2
U.N.S.M. 39589	M <sup>1</sup>		2.4	1.5
U.N.S.M. 39600	M <sup>1</sup>		2.5	1.5
U.N.S.M. 39601	M <sup>1</sup>		2.6	1.4
U.N.S.M. 39595	M <sup>2</sup>		2.0	1.3
		<i>Microtus ?pennsylvanicus</i>		
U.N.S.M. 39577	M <sub>1</sub>		3.4	1.3
U.N.S.M. 39578	M <sub>1</sub>		3.3	1.3
		<i>Ondatra idahoensis</i>		
U.N.S.M. 39581	M <sub>1</sub>		5.1	2.5
U.N.S.M. 39582	M <sub>1</sub>		5.3	2.3
U.N.S.M. 39583	M <sub>1</sub>		5.1	2.4

*Pliopotamys meadensis*

			Length mm.	Width mm.
U.N.S.M. 39205	M <sub>1-3</sub>		9.8	
	M <sub>1</sub>		4.6	1.9
	M <sub>2</sub>		2.7	1.9
	M <sub>3</sub>		2.5	1.6

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