

ward to Bristol Bay. Extended range: Southward about 400 miles.

Turbonilla eyerdami Bartsch. Dredged, Hinchinbrook Island, Alaska (coll. Norberg). Former range: Drier Bay, Knight Island, Prince William Sound (*Type locality*).

Retusa pertenuis Mighels. On eelgrass roots, Hinchinbrook Island, Alaska (coll. Norberg). Former range: Arctic Ocean, Bering Sea (Krause), also Atlantic Ocean. Extended range: About 1000 miles southward.

NEW LAND AND FRESHWATER MOLLUSCA FROM
THE UPPER PLIOCENE OF KANSAS AND A
NEW SPECIES OF *GYRAULUS* FROM
EARLY PLEISTOCENE STRATA

BY FRANK C. BAKER

Pliocene Mollusca from freshwater deposits in the middle west are apparently rare. Henderson (Fossil Non-marine Mollusca of North America) does not list a single locality from this region and none has come under the writer's observation. It is with great satisfaction, therefore, that it is now possible to describe a rather large fauna of both land and freshwater species from Meade County, Kansas. The entire fauna will be treated in detail in a later paper. The deposit occurs 90 feet beneath the surface in a clay bed with lenses of sand, the fauna being in the clay. The deposit contained a large vertebrate fauna which will be described in due course of time. The material was collected by Mr. Claude W. Hibbard, Assistant Curator of Vertebrate Paleontology in the Dyche Museum of Natural History of the University of Kansas. Four apparently new species were observed which are diagnosed in this paper. My thanks are due Mr. Hibbard for the opportunity of studying this fauna.

VERTIGO HIBBARDI n. sp.—The shell has 5 whorls and is very ventricose over the body whorl. The sutures are impressed, the apex is obtuse and bluntly rounded. There is a conspicuous crest behind the outer lip, behind which are two pits showing the position of the palatal laminae. The body whorl is flattened laterally and the base of the shell is trumpet-shaped when viewed from

below. Base subumbilicate. Aperture more than half the length of the last whorl, the lips expanding outward. Outer lip biarcuate. Lamellae and plications 7 in number. The angular and parietal lamellae are long and extend some distance within the aperture, the angular emerging further than the parietal, the parietal curving spirally inward toward the left. Columellar lamella large and conspicuous, curving backward toward the base of the shell. The lower palatal fold is stout, nearly straight and somewhat flattened on top. The upper palatal is stout, high and lamellar and curves downward toward the lower palatal. Both palatal folds rest in front on a rounded callus and they terminate abruptly at an equal distance within the aperture and both increase in height as they extend backward. There is a strong, curved basal fold and a strong tubercular suprapalatal fold.

Length 1.9; diameter 1.2 mm. Holotype.

“ 2.1 “ 1.3 mm. Paratype.

“ 2.0 “ 1.3 mm. Paratype.

Holotype and paratypes, Museum of Natural History, University of Illinois, No. P6773. Paratypes, Academy of Natural Sciences of Philadelphia, No. 169883.

Vertigo hibbardi belongs to the group *Angustula*, apparently, as evidenced by the development of the palatal folds. It is much larger than *Vertigo milium* (Gould) and is very different in shape and size. It is totally unlike any described American species. It is named in honor of Mr. Claude W. Hibbard who collected the material.

STROBILOPS SPARSICOSTATA n. sp.—Shell broadly conic with somewhat elevated, dome-shaped spire. Whorls $5\frac{1}{2}$, the first $1\frac{1}{2}$ smooth, the balance sculptured with distinct ribs, widely spaced, with frequently a faint riblet between. The umbilicus is contained about seven times in the diameter of the shell. Last whorl decidedly angular, the base of the shell smooth or with occasional faint riblets extending over it from the dorsal surface. Aperture with expanded, thickened peristome and a heavy palatal callus. There is a very heavy parietal lamella emerging to the edge of the callus and a weak infraparietal lamella which emerges within the aperture almost to the parietal callus in some specimens. This is often not developed outside of the aperture. The parietal lamella penetrates within the aperture more than three-fourths of a whorl. Half a whorl within the aperture there is a short, stout lamella on the axis. There are five baso-parietal folds, the first two basal folds are large and heavy, the first kidney-shaped, the second larger and lamellar, erect. The other three folds are low, rather long and curved. All basal folds are arranged radially.

Height	2.0;	diameter	2.7 mm.	Holotype.
"	2.2	"	2.5 mm.	Paratype.
"	2.0	"	2.6 mm.	Paratype.
"	2.0	"	2.8 mm.	Paratype.

Holotype and Paratypes, Mus. Nat. Hist., Univ. Ill., No. P6774; Paratypes, Acad. Nat. Sci. Phil., No. 169886.

Strobilops sparsicostata is related to *S. texasiana* P. & F. but differs from that species in having a more angular periphery, the costae more widely separated and not as heavy, and an almost smooth base which is distinctly costate in *texasiana*. The parietal lamella is also heavier. The arrangement of the baso-palatal folds is similar. The fossil form might be considered a race of *texasiana*, possibly ancestral, but in the light of our present imperfect knowledge of the geological distribution of this group in America it seems best to consider it a distinct species.

CARYCHIUM PEREXIGUUM n. sp.—Shell shorter and more solid than that of *exiguum*, the sutures more deeply impressed and whorls rounder, sometimes shouldered at the upper part. Whorls 5, the apical whorls somewhat smaller than in *exiguum*. Aperture a trifle more than one third of the length of the shell. Margin of aperture with thickened, callus-like lip extending basally to the parietal callus, which is well marked. There is a conspicuous callosity just above the middle of the outer lip. Umbilical region closed by the thickened basal lip. Lamella on columella conspicuous, tubercular, the fold extending upward spirally within the whorls much as in *exiguum* but it is narrower and bent upward over the axis in front. Lower lamella inconspicuous but heavier than in *exiguum*.

Length	1.8;	diameter	8.5 mm.	Holotype.
"	1.5	"	9.0 mm.	Paratype.
"	1.5	"	8.0 mm.	Paratype.
"	1.6	"	8.0 mm.	Paratype.

Holotype and Paratypes, Mus. Nat. Hist. Univ. Ill., No. P6776; Paratypes, Acad. Nat. Sci. Phil., No. 169885.

Carychium perexiguum is related to *exiguum*, having much the same form of shell and arrangement of lamellae. The shorter shell, heavier lip, and the upward bending columellar lamella will distinguish it from the recent species. As far as known to the writer this is the first record of *Carychium* from Tertiary strata. The genus occurs in many Pleistocene formations.

MENETUS KANSASENSIS n. sp.—Shell lenticular as in *M. exacuons* (Say). Periphery carinate with a 'pinched' border as *M. a. megas* (Dall). Whorls $3\frac{1}{2}$. Umbilicus wide, shallow, the whorls rounding into it. Sculpture consisting of more or less regularly spaced ribs extending from the suture in a backward curve to and over the periphery to the base and into the umbilicus. The ribs may be equally spaced, with strong growth lines between, or they may be so crowded together as to form a continuous series of ribs without intervening spaces. The surface above and below is covered with strong spiral lines.

Length	1.0;	diameter	5.0 mm.	Holotype.
"	0.8	"	4.0 mm.	Paratype.
"	1.0	"	4.0 mm.	Paratype.
"	0.8	"	3.5 mm.	Paratype.

Holotype and Paratypes, Mus. Nat. Hist. Univ. Ill., No. P6778; Paratypes Acad. Nat. Sci. Phil., No. 169884.

Menetus kansasensis is related to the common *M. exacuons* and especially the form *megas* with the pinched periphery. It differs from this species in the presence of the ribbed sculpture. The genus *Menetus* is known from the Tertiary of North America, principally in strata in Oregon and California, but it has not before been reported from the Tertiary of the middle west. The genus is common in Pleistocene deposits.

GYRAULUS PATTERSONI n. sp.—Shell completely discoidal, flat on upper and lower sides (right and left); periphery flattened and almost as high as the height of the shell, a rounded angle bordering the body whorl above and below; whorls $3\frac{1}{2}$, slowly and regularly increasing in diameter; sutures well impressed; sculpture consisting of fine lines of growth crossed by fine spiral lines; on the nucleus only the spiral lines are developed, the growth lines beginning at about a fourth of the turn of the first whorl; aperture not expanded, wider than high, roundly flattened at the upper part (the shell is ultra dextral), almost horizontal at the lower part, without peripheral callus; the peristome is thickened in adult specimens.

Height .50; diameter 2.10; aperture height .45; diameter .35 mm. Holotype.

Height .50; diameter 2.00; aperture height .45; diameter .35 mm. Paratype.

Height .50; diameter 1.90; aperture height .40; diameter .40 mm. Paratype.

Locality: Six miles north of Ainsworth, Brown County, Nebraska. *Horizon*: Early Pleistocene, most probably the

Aftonian interglacial interval. *Types*: Holotype, Field Museum of Natural History, No. P26128, Paratypes, No. P26129. Paratypes: Museum of Natural History, University of Illinois, No. P6778; Academy of Natural Sciences, Philadelphia, No. 169948.

Gyraulus pattersoni is unlike any species of *Gyraulus* known in America, recent or fossil, easily distinguished by its disc-like shell, with its flat base and spire, and by the very flat-sided whorls. More material of this species is desirable.

Dr. Bryan Patterson, of the Geology Department of the Field Museum of Natural History, has placed in the hands of the author material from a marl deposit occurring in Brown County, Nebraska, which is of more than usual interest because of its association with a deposit containing vertebrate remains. The marl bed is seven feet four inches in thickness and underlies deposits of sand, clay, and gravel 18 ft. 10 in. in thickness. A part of the upper layers are believed to represent material from the Kansan ice which was about 100 miles east of the locality from which the fossils came. A lobe of the Wisconsin ice also extended southward to the junction of the Missouri and Niobrara rivers and the upper layers probably represent sediment from the ice at this point. A layer of cross-bedded sand and gravel 2 ft. 4 in. in thickness beneath the top soil may represent floods from the Wisconsin ice. The presence of *Menetus kansasensis*, a species known from Upper Pliocene deposits in Kansas, and also from early Pleistocene deposits of that state, suggests that the marl bed near Ainsworth is of Aftonian age.

The fauna from this and one other locality nearby contains the following species:

Valvata lewisi helicoidea Dall. Small form.

Stagnicola cf reflexa (Say). Fragments and young shells.

Stagnicola caperata (Say). Mostly immature.

Physa species, young and fragments.

Physa species, young of small, narrow species.

Menetus kansasensis F. C. Baker. Much variation in sculpture.

Menetus umbilicatellus (Ckll.). Mostly immature.

Gyraulus altissimus (F. C. Baker). Mostly immature.

Gyraulus pattersoni F. C. Baker. Apparently rare.

Gastrocopta cristata Pilsbry & Vanatta. Only one specimen.

Vertigo ovata Say. Several specimens.

From a locality about two miles west of the above section the following species were collected. These are probably from the same horizon.

Pisidium species.

Lymnaea cf stagnalis jugularis Say. Fragments.

Stagnicola species, immature possibly undescribed.

Stagnicola species, immature and broken specimens.

Fossaria dalli grandis F. C. Baker. Rare.

Menetus kansasensis F. C. Baker.

Gyraulus altissimus (F. C. Baker). Mostly immature.

Gastrocopta tappaniana (C. B. Adams). One specimen.

A NEW *ANGUISPIRA* FROM KENTUCKY

BY LESLIE HUBRICHT

ANGUISPIRA *RUGODERMA* n. sp.

Shell similar in general form and color to *Anguispira alternata* (Say), but larger. Whorls 5.5 to 6, periphery rounded in adults, subangulate when young. Body-whorl with about 14 strong ribs to the cm., which extend over the periphery and into the umbilicus. Under a hand-lens the epidermis of *A. alternata* shows very fine wrinkles; in this species the wrinkles are quite conspicuous.

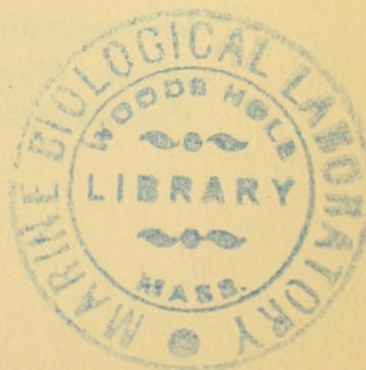
Holotype: Whorls 5.9; gr. diam. 25.0; less. diam. 22.5; height 14.0 mm.

Paratype: Whorls 5.7; gr. diam. 23.5; less. diam. 21.0; height 12.5 mm.

Paratype: Whorls 4.1; gr. diam. 10.0; less. diam. 9.0; height 5.5 mm.

Type locality: Under logs in well developed, second-growth, deciduous forest, lower half of the north side of Pine Mountain, 5.6 miles east of Pineville, Bell Co., Kentucky. Collected by the author. Holotype No. 169882, Academy of Natural Sciences of Philadelphia; paratypes No. A3892, author's collection.

The largest specimen of a variety of *A. alternata* found with this species measured: Whorls 5.5; gr. diam. 19.0; less. diam. 16.0; height 10.0 mm.





Baker, Frank Collins. 1938. "New land and freshwater Mollusca from the Upper Pliocene of Kansas and a new species of *Gyraulus* from Early Pleistocene strata." *The Nautilus* 51, 126–131.

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