

Geol. Survey

S
14. GS:
CIR 467
C. 3

STATE OF ILLINOIS
DEPARTMENT OF REGISTRATION AND EDUCATION



Farmdalian Lake Deposits and Faunas in Northern Illinois

**H. B. Willman
A. Byron Leonard
John C. Frye**

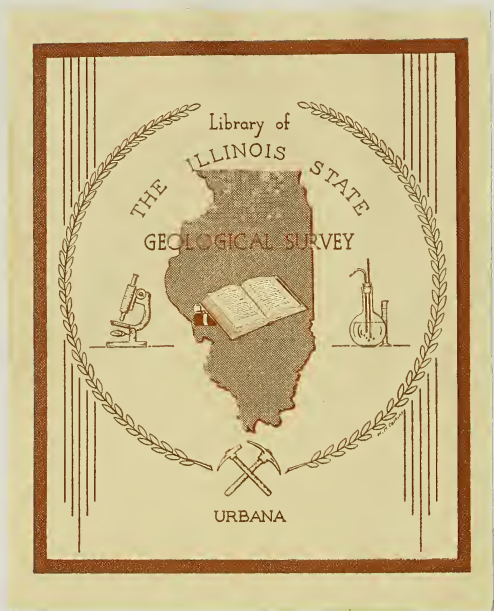
ILLINOIS STATE GEOLOGICAL SURVEY

John C. Frye, Chief

Urbana, IL 61801

CIRCULAR 467

1971



ILLINOIS STATE GEOLOGICAL SURVEY
3 3051 00004 6940

Farmdalian Lake Deposits and Faunas in Northern Illinois

H. B. Willman, A. Byron Leonard, and John C. Frye

ABSTRACT

A recent exposure at Morris, Illinois, reveals that an extensive lake was present in the upper Illinois Valley during Farmdalian time. The exposure and the previously described Wedron Section are the basis for definition of a new unit, the Peddicord Formation. The formation is a massive gray silt overlain by pink silt.

The molluscan fauna from the Peddicord Formation at Morris significantly expands knowledge of Farmdalian aquatic faunas, previously known only from Wedron. These faunas indicate the presence of a lake of cool permanent water and confirm the fact that the Farmdalian, although a time of extensive glacial withdrawal, was characterized by a cool, moist climate.

INTRODUCTION

Recent excavations north of Morris, Illinois, along an erosional escarpment formed by the Chicago Outlet River have furnished significant new information on the Wisconsin stratigraphy and paleontology of the region. The new exposure shows the presence of lake deposits that correlate with similar deposits previously known only from the vicinity of Wedron (fig. 1). The stratigraphic sequence and a radiocarbon date indicate the deposits are of Farmdalian age. The two localities are approximately 20 miles apart, and the similarity of the deposits suggests that an extensive lake existed in this part of the Illinois Valley region during Farmdalian time. Farmdalian aquatic molluscan faunas previously have been known only from the Wedron locality (Leonard and Frye, 1960), and the abundant fauna from the new exposure significantly increases knowledge of Farmdalian faunas. At the Morris North Section, described from the new exposure, a molluscan fauna obtained from the Robein Silt that overlies the lake deposits affords an opportunity for comparison of faunas from two different environments. The lake deposits in the Wedron and Morris North Sections are included in a new formation, herein named the Peddicord Formation.

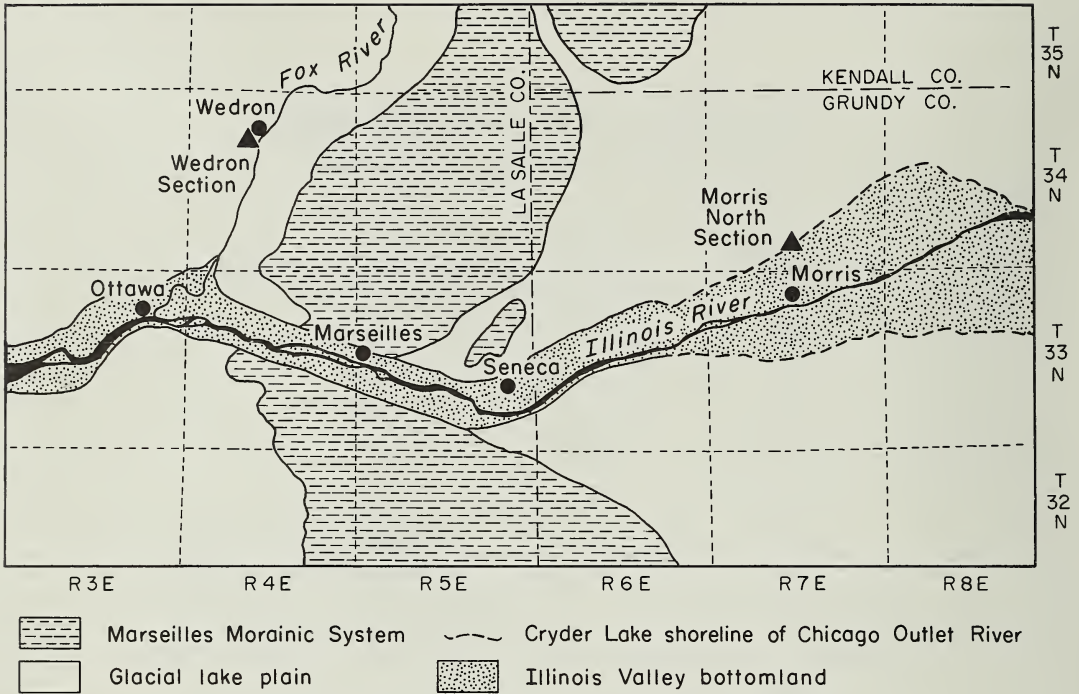


Fig. 1 - Location of Morris North and Wedron Sections.

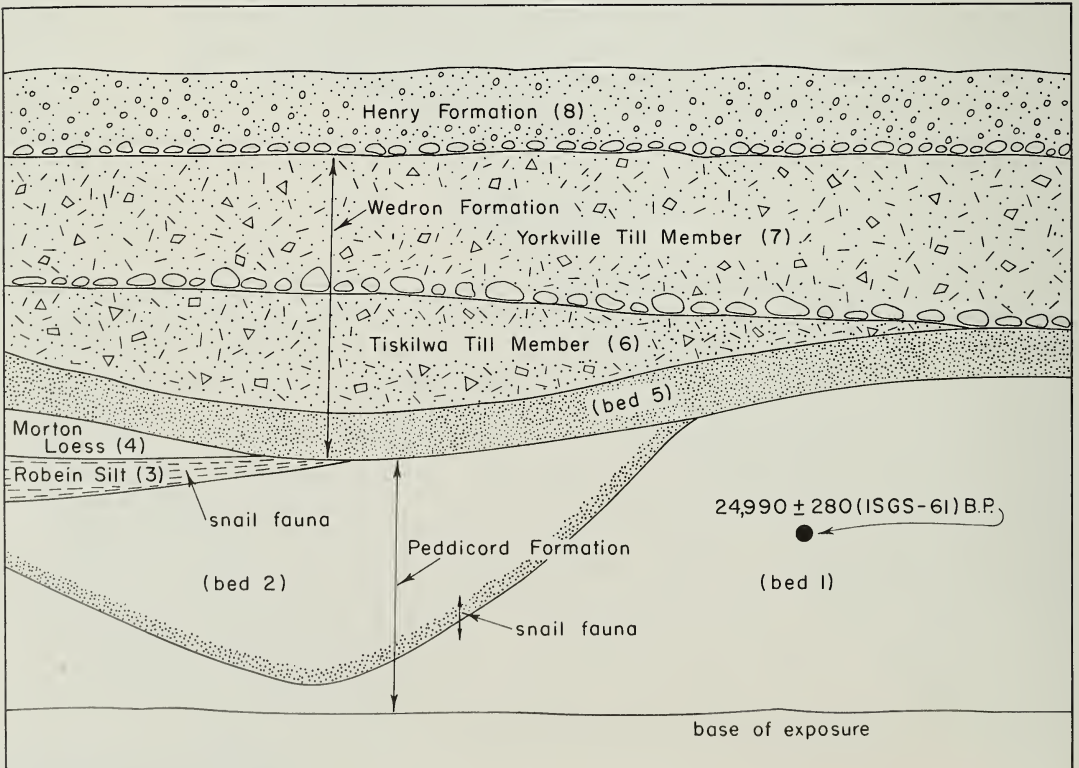


Fig. 2 - Diagram of Morris North Section.

STRATIGRAPHY

The new roadcut 1.5 miles north of Morris and 100 yards west of the junction of highways U. S. 6 and Illinois 47, described below as the Morris North Section, reveals a condensed section of many of the glacial, glacial-fluvial, and lacustrine deposits in the Morris region, including five formations of Wisconsinan age (fig. 2). The base of the drift is not exposed, but, as Pennsylvanian bedrock occurs in coal strip mines near by, it probably is not more than 10 or 15 feet below the base of the Morris North Section.

Morris North Section

Morris North Section, in fresh excavations for access road in SE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$, Sec. 33, T. 34 N., R. 7 E., Grundy County, Illinois (1970, 1971).
 Sample numbers preceded by "P" are the numbers used in the Illinois State Geological Survey collection.

	Thickness (feet)
Pleistocene Series	
Wisconsinan Stage	
Woodfordian Substage	
Henry Formation	
8. Sand, gravel, and silt; silt at top; tan, loose; top at level of Cryder Lake beach ridge of Lake Chicago outlet . . .	2.0
Wedron Formation	
Yorkville Till Member	
7. Till, calcareous, gray, clayey, silty, massive; layer of pebble concentrate at top derived from erosion of the till (P-7244)	4.0
Tiskilwa Till Member	
6. Till, calcareous, pink-tan, sandy, silty, massive; boulder pavement at top contains boulders up to 2 feet in diameter; some of the boulders are weathered and readily disaggregate, and therefore their possible origin as a concentrate by an early Lake Chicago outlet implies subsequent weathering; till pinches out to the east and boulder pavement rests on underlying sand bed (P-7243 till); maximum thickness	4.0
5. Sand, fine, and silt, bedded, calcareous, tan; present throughout the exposure (P-7242); maximum thickness	2.0
Morton Loess	
4. Silt, calcareous, tan-gray, streaked, vesicular with thin clay skins in vesicles; occurs only at SW part of exposure and pinches out to the NE (P-7263 from middle part); maximum thickness	1.0
Farmdalian Substage	
Robein Silt	
3. Silt, calcareous, yellow-gray, streaked with organic material, cryoturbated; contains a few fragmentary mollusk shells (P-7262); pinches out to the NE; maximum thickness	1.0

	Thickness (feet)
Peddicord Formation	
2. Silt, clayey, calcareous, massive, pink-tan (P-7261 upper, P-7241 middle); contains abundant shells of mollusks in bottom 1 foot; basal part contains fine to very fine sand; overlies gray silt and clay with a sharp contact; confined to the SW part of the exposure; truncated to the NE by the overlying sand bed (unit 5 of this section) which there rests directly on the gray silt and clay below (unit 1); maximum thickness	5.0
1. Silt, clayey, calcareous, gray, massive; a few small pebbles sparsely dispersed throughout; contains some fragments of wood, one piece of which from the middle of the unit was dated at $24,990 \pm 280$ (ISGS-61) radiocarbon years B.P.; in the area where this unit is overlain by unit 2, fossil mollusk shells occur in the top few inches (P-7240 from middle part); maximum thickness exposed	<u>6.0</u>
Total thickness	25.0

Peddicord Formation

The basal gray silt and the overlying pink silt in the Morris North Section (beds 1 and 2) are almost identical in physical characteristics and stratigraphic position to beds 1 and 2 in the Wedron Section (Farndale Silt of Leonard and Frye, 1960, p. 32; Robein Silt of Willman and Frye, 1970). They differ in that more wood fragments are found in the Wedron Section and a molluscan fauna is present in both the top of bed 1 and the base of bed 2 at Morris, whereas it occurs only in bed 1 at Wedron.

Because of their similarity in lithology, the two exposures are included in a new formation, herein named the Peddicord Formation after the Peddicord School shown on the Ottawa 15-minute quadrangle map and located 1 mile east of the Wedron Section. The Wedron Section (Willman and Frye, 1970) is designated the type section. As the deposits are lacustrine, the lake in which they were deposited will be referred to as Lake Peddicord.

The top of the Peddicord Formation is approximately 535 feet above sea level in both the Morris and Wedron exposures. The formation was deposited in a lake that occupied the Ticona Valley (Willman, 1940; Willman and Payne, 1942), a deep bedrock valley that in early Wisconsinan time was only partially filled with Illinoian and older glacial deposits. As the Ticona Valley and its major tributaries are buried by Woodfordian drift and are crossed at sharp angles by the much younger Illinois Valley, there are few exposures of the Peddicord Formation. Much of the area covered by Lake Peddicord is deeply buried by the drift of the Marseilles Moraine (fig. 1).

At Wedron the Peddicord Formation is exposed along the Fox Valley where the valley crosses a tributary of the buried Ticona Valley (Willman and Payne, 1942, p. 150). The principal exposure is in the overburden at the silica sand pit of the Wedron Silica Company. The formation is largely confined to the southern part of the exposure. The bedrock valley was partly re-excavated during late Sangamonian or early Wisconsinan time, and the lacustrine beds occur in a steep-sided channel that cuts into the St. Peter Sandstone.

At Morris the Peddicord Formation is exposed by a shallow roadcut and the adjacent excavation in the sloping face of the Cryder Lake shoreline. The shore-

line is an erosional escarpment about 25 feet high that was formed by the entrenchment of the Chicago Outlet River into the glacial deposits of the Morris Basin. Although deeply entrenched in bedrock both above and below the Morris Basin, the river eroded a wide bench in the glacial deposits of the basin and filled a lake-like expanse about 6 miles wide (Culver, 1922; Willman, 1971). Erosion of the escarpment is correlated with the deepening, by about 20 feet, of the Lake Chicago outlet at Chicago down to the Calumet shoreline. The escarpment, therefore, is believed to have been formed between 12,000 and 13,000 years before the present (B.P.).

Lacustrine sediments below the distinctive pink till of the Bloomington Morainic System (classified as the Tiskilwa Member of the Wedron Formation) are exposed at many places along the Illinois Valley from Morris to La Salle. These deposits, collectively, were formerly called "Kickapoo beds" from exposures along North Kickapoo Creek east of Marseilles (Sauer, 1916). Later they were referred to as "Lake Kickapoo deposits" and were included in the Shelbyville Drift (Willman and Payne, 1942). Lake Kickapoo was interpreted as having been formed in the Ticona Valley after the Shelbyville Moraine dammed the valley at Peoria. It therefore preceded Lake Illinois (Leighton, 1928, and in Fisher, 1925; Willman and Payne, 1942), which was formed when the Illinois Valley was dammed by the Bloomington Moraine (Leighton, 1928) or by the younger Dover Moraine (Willman and Frye, 1970). Lake Illinois is represented by numerous gravel deltas overlying the Bloomington and younger drifts.

In most exposures the "Lake Kickapoo deposits" consist of silty clay in beds 1 to 2 inches thick that are separated by thin laminae of coarse silt or fine sand. However, it was noted that at Wedron the lake sediments included in the "Lake Kickapoo deposits" differ in being massive and in containing large fragments of wood (Willman and Payne, 1942, fig. 93).

Restudy of the Wisconsin part of the Wedron Section (Leonard and Frye, 1960, p. 31, 32) revealed a gray till below the pink till of the Bloomington Drift and above the lake silts, which suggested that the silts were older than Shelbyville Drift. This was confirmed by radiocarbon dates of the wood, 24,000 \pm 700 (W-79) years B.P. from the upper pink silt and 26,800 \pm 700 (W-871) years B.P. from the lower gray silt. The lake sediments, therefore, were included in the Farmdalian Substage and assigned to the Farmdale Silt.

When the name "Farmdale Silt" was replaced by the term "Robein Silt" to correct a duplication in nomenclature (Willman and Frye, 1970), the deposits at Wedron were included in the Robein Silt. As the Robein Silt is dominantly silt rich in organic material and in many places contains beds of peat, the formation is made more uniform by differentiating the distinctive lacustrine sediments as the Peddicord Formation.

The laminated clays and silts in the "Lake Kickapoo deposits" occur at a stratigraphically higher position and they are retained in the Wedron Formation. It is possible, however, that other sediments included in the "Lake Kickapoo deposits," particularly in the areas near Wedron and Seneca, will be found to belong instead to the Peddicord Formation.

The Peddicord Formation is Farmdalian in age, as shown by the radiocarbon dates previously mentioned and by its stratigraphic position. At Morris the formation is overlain locally by silt rich in organic material that has been assigned to the Farmdalian Robein Silt, but the oldest overlying Woodfordian till is the pink till of the Bloomington Drift. The base of the Peddicord Formation is not exposed at Morris.

At Wedron the Peddicord Formation is overlain by sand, gravel, and till of the Lee Center Till Member of the Wedron Formation (Willman and Frye, 1970,

p. 191), formerly called Shelbyville Drift. The Peddicord Formation overlies the Sangamon Soil on Illinoian drift (Willman and Payne, 1942, p. 148, 307), except where the drift is eroded and it rests directly on the Ordovician St. Peter Sandstone.

The stratigraphic relations of the Peddicord Formation, therefore, place it as Wisconsinan in age but older than the earliest Woodfordian glaciation. The nearest Wisconsinan drift definitely identified as Altonian (pre-Farmlandian) in age, and thus older than the Peddicord Formation, is about 18 miles north of the Morris North Section. However, Lake Peddicord could have existed during later Altonian and Farmlandian time, and it might have been formed by Altonian glaciers reaching the Ticona Valley farther west and depositing drift that blocked the drainage.

Robein Silt

The Robein Silt is represented in the Morris North Section by a truncated bed of yellow-gray silt, as much as 1 foot thick, that contains dark gray to black streaks rich in organic material (bed 3). The organic material is not abundant enough to be radiocarbon dated. The Robein Silt is rarely found this far back from the front of Woodfordian moraines, but the deposit is correlated with the Robein on the basis of its organic content and stratigraphic position. It contains mollusk shells that indicate an environment different from that of the Peddicord Formation, as will be described in the discussion of the paleontology. The tight folding of the organic streaks in the silt suggests that permafrost conditions existed during the advance of the Woodfordian glaciers.

Morton Loess

The truncated 1-foot thick bed of tan-gray, loess-like silt (bed 4) overlying the Robein Silt in the western part of the exposure strongly resembles the Morton Loess and is correlated with it on the basis of stratigraphic position. The Morton Loess is composed of silt blown from the outwash of the advancing Woodfordian glaciers.

Wedron Formation

Tiskilwa Till Member

The Tiskilwa Till Member (beds 5 and 6) consists of 1 to 2 feet of sand overlain by the pink sandy till characteristic of the member and of the Bloomington Drift throughout most of central northern Illinois. The till is as much as 4 feet thick, but it is truncated by the overlying Yorkville Till Member in the eastern part of the exposure. The top of the till is at an elevation of about 540 feet, which is 50 or 60 feet lower than it is in many exposures farther east along the Illinois Valley where the till forms a persistent layer about 20 feet thick (Willman and Payne, 1942).

The upper surface of the till has a prominent boulder pavement, with boulders as much as 2 feet in maximum diameter. Many of the boulders of igneous and metamorphic rocks are so weathered that they disintegrate into sand upon exposure. As boulders of this size are not common in the Tiskilwa Till, they may represent a lag concentrate from the Malden Till Member (Willman and Frye, 1970), which is missing in this exposure. On the other hand, the weathered character of

the boulders may indicate exposure during the major ice withdrawal that followed deposition of the Tiskilwa Till Member and before the readvance that deposited the Malden Till Member.

The absence of the Lee Center Till Member, the earliest Woodfordian till, which normally occurs below the Tiskilwa Till Member, may result from erosion, but, as deposits definitely related to the Lee Center Till Member have not been identified east of this area, the Woodfordian ice front may not have retreated this far before the Bloomington readvance. If this is true, the sand and silt deposits of bed 5 may be outwash from the first advance of Woodfordian glaciers.

Yorkville Till Member

The upper gray clayey till (bed 7) of the Morris North Section is similar in lithology to the Yorkville Till Member, which is the surface till of the Marseilles Morainic System and of the area east of the moraine (fig. 1). Although a pebble concentrate shows the upper surface of the till at the Morris North Section has been eroded, the surface of the till is about 225 feet lower than it is on the crest of the moraine north of Marseilles, where the till is at least 150 feet thick.

Henry Formation

Two feet of sand and gravel with a silt layer at the top (bed 8) forms the top of the Morris North Section. It is a remnant of the beach deposit that commonly occurs along the top of the escarpment at the Cryder Lake shoreline (Culver, 1922). It is a surficial sand and gravel deposit assigned to the Henry Formation.

PALEONTOLOGY

The molluscan fauna of the Peddicord Formation at the Morris North Section was collected during October 1970 and was handpicked from the outcrop; bulk samples were taken in June 1971, and the fauna of the overlying Robein Silt also was sampled in bulk in June. The faunas from the Peddicord Formation and the overlying Robein Silt at the Morris North Section are described. The two faunas are contrasted and compared with the fauna from the Farmdalian lake deposits (the Peddicord Formation) at the Wedron Section, which previously was the only lacustrine fauna of Farmdalian age described from Illinois (Leonard and Frye, 1960). The specimens from the Peddicord Formation and the Robein Silt are in the collections of the Illinois State Geological Survey, cataloged under the prefix 55P.

Peddicord Formation

The fossil assemblage recovered from the Peddicord Formation at the Morris North Section is described below.

Amnicola gelida Baker. This branchiate gastropod, assumed to be extinct, is known as a fossil from Illinois and Ohio. Baker described this gastropod (1921, p. 22) as a subspecies of *Amnicola lustrica*, but he later raised it to specific rank (1928, p. 110). The type locality is given as "Morris, Grundy County, Illinois, in Pleistocene deposits," and it was included in a list prepared by Baker and reported by Culver (1922, p. 159) from a former strip mine called "Bells Stripping"

1 mile southeast of the Morris North Section. Baker somewhat doubtfully records the species from Wisconsin, for after saying "Wisconsin records: None," he goes on to say "Wisconsin distribution: Known only from Spring Lake, east of Green Lake, Green Lake Co.," which would indicate that the species was living there at that time. La Rocque lists the species from Ohio but mentions no specific locality or stratigraphic horizon.

From the known physiological requirements of the several members of the genus, and from the associates of *Amnicola gelida*, it may be safely inferred that this species required a permanent, relatively cool pond or lake in which to live. At the Morris North locality the deduced habitat of a cool lake of relative permanence fits the inferred requirements of *A. gelida*.

Although not as numerous as *Amnicola precursor*, *A. gelida* is relatively common in the sediments studied; it may be considered as having been a successful species at the time the lake was in existence.

Although the types of the species came from Morris, the specimens we collected there from the Peddicord Formation are shorter and more slender than those described by Baker. If the type locality is "Bells Stripping," it is in deposits younger than the Peddicord Formation.

Amnicola precursor Baker. According to Baker (1928, p. 116), *Amnicola precursor* is an extinct species of *Amnicola*, known only from Illinois and Wisconsin. It has always been found in associations of mollusks that require permanent cool water. The type locality is at Green Lake, Wisconsin, below 7 meters of mud. Baker (1928, p. 117) considered *A. precursor* the ancestor of *A. walkeri* Pilsbry, a living species widely distributed in the Upper St. Lawrence and Upper Mississippi drainages. Although *A. precursor* is the most numerous of the species recovered at the Morris North locality, it had not been found previously at other localities reported by Leonard and Frye (1960) or by Leonard, Frye, and Johnson (1971).

Carychium canadense Clapp. Described originally as a subspecies of *Carychium exile*, *C. canadense* is distinctive enough to warrant specific rank. It is a terrestrial species of northern affinities, and, according to Pilsbry, it replaces *C. exile* to the north, where it is distributed in "the Canadian Zone, Maine and Ontario to Michigan and Manitoba" (Pilsbry, 1948, p. 1059). *C. canadense* is, according to its discoverer, "always some distance from water." The two examples recovered from the Morris North locality must have drifted on the water as dead shells until they sank to become incorporated in the silts where they were found. They attest to a cooler ambiance than exists there at present.

Gyraulus sp. A single juvenile shell, not clearly recognizable as to species, represents this genus of aquatic planorbid pulmonate gastropods. These animals live in ponds, lakes, and sluggish streams, where they are most frequently associated with aquatic vegetation. The habitat at Morris, therefore, must have included a pond or lake.

Ostracoda. Numerous, as yet unidentified valves of several species of ostracodes occur in the Peddicord Formation at the Morris North locality. These calcareous valves, which protected the soft bodies of tiny arthropods, are readily preserved in unleached sediments. Their presence in such abundance bears witness to an aquatic habitat of relatively permanent nature.

Pisidium compressum Prime. This small species of sphaeriid clam was named from examples obtained from Fresh Pond, near Cambridge, Massachusetts, but according to Baker (1928, p. 371) the typical form is confined to creeks and rivers. It thrives (or at least formerly did so) in the small brook formed by flow from the artesian spring in Meade County State Park, Kansas, but there is considerable evidence that *Pisidium compressum* does thrive in ponds, not to mention

the fact that the type locality is a clear, quiet pond. Only a few examples were taken from the Morris Section, and it seems not to have been a prominent item of the local fauna.

Pisidium pauperculum Sterki. This is a variant of *Pisidium nitidum*, according to some malacologists; La Rocque (1967, p. 334) lists it as *P. nitidum* form *pauperculum* Sterki. The consensus of authors who have studied the ecology of this small clam is that its preferred habitat is quiet, shallow water with a mud or sand bottom and with depths from 1.5 meters to 5.0 meters. Only a few valves were recovered in our samples; it does not form a prominent part of the total fauna at the Morris North locality.

Potamogeton seeds. *Potamogeton* is a weed that lives in ponds of permanent water. Two seeds found at the Morris North Section are tentatively referred to this genus (Martin and Barkley, 1961).

Sphaerium lacustre (Müller). This clam, larger than *Pisidium*, forms a conspicuous feature of the molluscan fauna at the Morris North locality. *Sphaerium lacustre*, which is also widely distributed in Europe, is a highly adaptable species and has been recorded in the southern United States, although most occurrences are northern. Herrington (1962, p. 20) stated that it is most plentiful in small lakes and ponds but also occurs in large lakes, creeks, and rivers. It seems to prefer muddy bottoms.

Strobilops labyrinthica (Say) (?). A single damaged shell is referred to this species. As this gastropod is terrestrial in habit and lives in deciduous forest environments, the shell must have been carried into the lake at this locality. Its presence, however, suggests a permanent arboreal vegetation near by.

Unionid shell fragments. No unionid mussel shells sufficiently intact to identify were recovered from the Morris locality, but the deposit contains many fragments of nacreous plates of these animals, and an internal cast of a mussel, probably an *Anodonta*, was secured. Because these mussels live in permanent water and require fish for the completion of their life cycle, their presence has an important implication in the interpretation of the local environment.

Valvata tricarinata Say. This branchiate gastropod occurs with relative abundance in the Peddicord Formation at the Morris North locality. It is a species of essentially northern distribution, living from Ohio and Illinois to Great Slave Lake. *Valvata tricarinata* adapts easily to a variety of aquatic habitats, including lakes and streams with or without vegetation, to depths of nine meters in a wide variety of bottom sediments. Its evident success in the local environment at the Morris North site is consistent with a cool, permanent pond or lake.

Robein Silt

The fauna recovered from the Robein Silt at the Morris North Section is described below. This sediment is not abundantly fossiliferous, but its fauna shows distinct variations from that of the underlying Peddicord Formation. Unfortunately, each of the several species is so sparsely represented that it is difficult to draw firm conclusions regarding the habitat.

Discus cronkhitei (Newcomb). Damaged shells of four individuals were recovered. *Discus cronkhitei* is a terrestrial gastropod; its habitat today is mainly river floodplains, where it lives under fallen logs, bark, and other dead vegetation. It appears throughout the northern half of Illinois and at higher latitudes and altitudes elsewhere in the United States; it is found as far south as Arizona, where it lives in the higher elevations of the mountains. Although the sediments at the site where these specimens were collected may be waterlaid, the species must have lived in near-by woodlands.

Gyraulus altissimus Baker. Only two shells of this aquatic pulmonate gastropod were collected. La Rocque (1967, p. 493) wrote about the ecological requirements of this extinct gastropod: "This species, from its association with other mollusks in Pleistocene deposits, can be said to have preferred shallow bodies of water with abundant vegetation." He went on to show in detailed studies of Pleistocene ponds that after the development of vegetation these snails increased several-fold over previous population levels. *Potamogeton natans*, a pond weed, occurs in these deposits.

Hendersonia occulta (Say). Two well preserved shells of this terrestrial gastropod were found. *Hendersonia occulta* lives in dry woodlands or on floodplains of creeks; it is extremely rare as a living mollusk in Illinois. Baker (1939, p. 39) noted that it is known from only a single locality near Athens, Menard County. The general distribution of living populations includes the north-central United States, although the species has been reported as far south as Kentucky. As a fossil, *H. occulta* is known from numerous localities in Pleistocene deposits, from the Kansan Stage to the late Wisconsinan (Leonard and Frye, 1960, fig. 2; Leonard, Frye, and Johnson, 1971, fig. 3).

Polygyrid fragments, large species. The large polygyrids are terrestrial snails that frequent deciduous forests. As the fragments recovered do not allow specific identification, about all that can be said is that their presence implies the near-by areas were forested.

Potamogeton natans (?). Fairly numerous seeds of this pond weed were recovered from the Robein Silt in the type section.

Strobilops labyrinthica (Say). Two well preserved examples were found in the sample. The species, found also in the Peddicord Formation in this type section, was discussed above.

Succinea retusa Lea. *Succinea* is a genus of terrestrial gastropods, but *S. retusa* (*Oxyloma retusa*), found at this locality, may be described as semi-aquatic; it lives among sedges and other aquatic vegetation at the edges of ponds and marshes in very wet places. Populations of *S. retusa* are distributed throughout the northern half of the United States and over much of Canada; in Illinois *S. retusa* is widely distributed, especially in the northern half of the state (Baker, 1939, p. 125).

Valvata tricarinata (Say). One specimen was collected in the Robein Silt. The species was discussed with the Peddicord fauna.

Ostracoda. Ostracodes of at least two kinds, neither of them identified, were found in the Robein Silt at the Morris North Section, but they are more numerous in the Peddicord Formation.

Comparison of the Robein and Peddicord Fossils

Although the assemblages from the Robein Silt and the Peddicord Formation include about the same number of items, several differences should be emphasized. First, the population density per unit volume of sample is much greater in Peddicord deposits, from which it may be inferred that the habitat was the more favorable of the two because in neither locality does any mechanism seem to be operating to condense or disperse the faunas. Second, the Peddicord fauna lived in a cool, large pond or lake; the fauna is composed entirely of gastropods and pelecypods restricted to such a habitat. The Robein fossils seem also to have come from a pond deposit, since they include two aquatic snails (*Gyraulus altissimus* and *Valvata tricarinata*), seeds of the pond weed *Potamogeton*, and valves of ostracodes. However, the greater part of the Robein assemblage is composed

of terrestrial gastropods that drifted from near-by wooded land surfaces. From this it may be inferred that the pond, although relatively permanent, was small in area and possibly surrounded by a marshy zone.

Comparison of Peddicord Fossils from
Morris North and Wedron

The fauna from the Wedron Section (Leonard and Frye, 1960) comprises nine species, all of which are mollusks of aquatic habits except one species of *Lymnaea* that lives on the moist mud, near water rather than in it. The faunal assemblage includes:

<i>Amnicola leightoni</i> Baker	<i>Lymnaea parva</i> Lea
<i>Amnicola lustrica</i> Pilsbry	<i>Pisidium compressum</i> Prime
<i>Gyraulus altissimus</i> Baker	<i>Pisidium pauperculum</i> Sterki
<i>Helisoma campanulata</i> (Say)	<i>Valvata sincera</i> Say
<i>Valvata tricarinata</i> (Say)	

The predominant species is *Valvata tricarinata*, followed by *Amnicola lustrica* and *Gyraulus altissimus*. *A. leightoni*, *Helisoma campanulata*, and the two species of *Pisidium* are present in goodly numbers, but *Lymnaea parva* and *Valvata sincera* are poorly represented in the Wedron assemblage.

The ecological correlation between the fauna at Wedron and Morris North is more real than apparent. For example, although the amnicolids at the two localities do not bear the same specific names, three of the four species are extinct and may represent nothing more than changes in form that result from local conditions. Furthermore, all amnicolids are branchiate gastropods requiring permanent water for their life processes, and almost all of the North American species have a northern distribution. The occurrence of *Strobilops* only at Morris North and *Lymnaea* only at Wedron may be accidents of collection, since only one or two specimens of each were found. Furthermore, the Wedron sample was not treated properly for recovery of ostracodes or pond weed seeds, both of which very probably occur in this lacustrine environment. In the light of these facts, it may be concluded that ecologically the two faunas are almost identical; both reflect the presence of a lake of cool, permanent water. Radiocarbon dates at the Wedron locality (26,800 ± 700 B.P., W-871) are so close to those at Morris North (24,990 ± 280 B.P., ISGS-61) that they make a discussion of the age interpretation of the faunas unnecessary.

SUMMARY

The newly described exposure in the Morris North Section confirms the presence of an extensive lake in Farmdalian time that was related to the buried Ticona Valley. This lake is herein named Lake Peddicord. The deposits that accumulated in the lake are largely buried by younger drift. Lake Peddicord is the first of a series of late Pleistocene lakes that covered various parts of the Morris Basin. Successively younger lakes of different areal extent include Lake Kickapoo, Lake Illinois, Lake Wauponsee, Lake Morris, and Cryder Lake, the last two of which are related to outlet stages of Lake Chicago.

The only area where these lake deposits were known previously is at Wedron, and there they have at various times been included in the "Kickapoo

beds," "Lake Kickapoo deposits," Farmdale Silt, or Robein Silt. The lake deposits at Wedron and at Morris North are here assigned to a new formation, the Peddicord Formation. Their Farmdalian age is confirmed by a radiocarbon date of $24,990 \pm 280$ B.P. (ISGS-61).

The molluscan fauna from the Peddicord Formation at Morris North significantly expands knowledge of Farmdalian aquatic faunas, previously known only from Wedron. These faunas indicate the presence of a lake of cool, permanent water, and confirm the fact that the Farmdalian, a time of extensive glacial withdrawal, was characterized by a cool, moist climate.

REFERENCES

- Baker, F. C., 1921, New forms of Pleistocene mollusks from Illinois: *Nautilus*, v. 35, no. 1, p. 22-24.
- Baker, F. C., 1928, Freshwater mollusca of Wisconsin: *Wisconsin Geol. and Nat. History Survey Bull.* 70, pt. I, Gastropoda, 507 p., 28 pls., pt. II, Pelecypoda, 495 p., pls. 29-105.
- Baker, F. C., 1939, Field book of Illinois land snails: *Illinois Nat. History Survey Manual* 2, 166 p., figs. 1-8, 175 unnumbered figs.
- Culver, H. E., 1922, Geology and mineral resources of the Morris Quadrangle: *Illinois Geol. Survey Extract Bull.* 43B, 114 p.
- Fisher, D. J., 1925, Geology and mineral resources of the Joliet Quadrangle: *Illinois Geol. Survey Bull.* 51, 160 p.
- Herrington, H. A., 1962, A revision of the Sphaeriidae of North America: *Michigan Univ. Mus. Zool. Misc. Pub.* no. 118, 74 p., 7 pls., 2 figs.
- La Rocque, Aurèle, 1967, Pleistocene mollusca of Ohio: pt. 2, *Ohio Geol. Survey Bull.* 62, 356 p., 8 pls., 208 figs.; pt. 3, Freshwater gastropoda, p. 357-553, pls. 9-14, figs. 209-408; pt. 4, Terrestrial gastropoda, p. 554-800, pls. 15-18, figs. 409-624.
- Leighton, M. M., 1928, Lake Illinois and the question of post-early Wisconsin deformation in northern Illinois [abs.]: *Geol. Soc. America Bull.*, v. 39, p. 215.
- Leonard, A. B., and J. C. Frye, 1960, Wisconsinan molluscan faunas of the Illinois Valley Region: *Illinois Geol. Survey Circ.* 304, 32 p., 4 pls., 3 figs.
- Leonard, A. B., J. C. Frye, and W. H. Johnson, 1971, Illinoian and Kansan molluscan faunas in Illinois: *Illinois Geol. Survey Circ.* 461, 23 p., 4 figs.
- Martin, C. M., and W. D. Barkley, 1961, Seed identification manual: Univ. California Press, 221 p., 824 pls., 288 figs.
- Pilsbry, H. A., 1948, Land mollusca of North America: v. II, pt. 2, p. ixlvii, 521-1113, 585 figs.
- Sauer, C. O., 1916, Geography of the upper Illinois Valley and history of development: *Illinois Geol. Survey Bull.* 27, 208 p.
- Willman, H. B., 1940, Pre-glacial River Ticona: *Illinois Acad. Sci. Trans.*, v. 33, no. 2, p. 172-175.
- Willman, H. B., 1971, Summary of the geology of the Chicago area: *Illinois Geol. Survey Circ.* 460, 77 p.
- Willman, H. B., and J. C. Frye, 1970, Pleistocene stratigraphy of Illinois: *Illinois Geol. Survey Bull.* 94, 204 p.
- Willman, H. B., and J. N. Payne, 1942, Geology and mineral resources of the Marseilles, Ottawa, and Streator Quadrangles: *Illinois Geol. Survey Bull.* 66, 388 p.

Illinois State Geological Survey Circular 467
12 p., 2 figs., 3000 cop., 1971
Urbana, Illinois 61801

Printed by Authority of State of Illinois, Ch. 127, IRS, Par. 58.25.

(10-71-3000-36572)

CIRCULAR 467

ILLINOIS STATE GEOLOGICAL SURVEY

URBANA 61801