THE NATURAL HISTORY OF WAPSIPINICON STATE PARK, JONES COUNTY, IOWA

edited by
Raymond R. Anderson, Thomas Marshall, and Chad Fields

Geological Society of Iowa

October 10, 2009 Guidebook 85

Cover Photograph

Silurian Scotch Grove Formation dolomites exposed along the Wapsipinicon River in Wapsipinicon State Park. Field trip leader Tom Marshall provides the scale.

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TABLE OF CONTENTS

INTRODUCTION TO THE NATURAL HISTORY OF WAPSIPINICON STATE PARK, JONES COUNTY, IOWA

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Figure 1. Oblique aerial photograph (looking west-northwest) of the Wapsipinicon State Park. U.S. Highway 151 crosses the image near the bottom and right, the Wapsipinicon River passes from the upper center of the photo to the lower right and forms the eastern boundary of the park, and the town of Anamosa is visible in the upper right part of the photo.

The 2009 Geological Society of Iowa fall field trip will be examining the Natural History of Wapsipinicon State Park, just south of Anamosa in Jones County, Iowa. In association with this theme, we begin the trip in the historic town of Stone City, about 5 miles west of Anamosa where we will have an opportunity to tour the largest dimension stone (building stone) quarry in Iowa, the Weber Stone Company, Inc. The quarry produces a variety of stone products, most from the Anamosa Member of the Silurian Gower Formation, rock historically called "Anamosa Stone." After the quarry tour, on our way to Wapsipinicon State Park, we will drive to past the Anamosa State Penitentiary to view one of the most spectacular examples of construction with Anamosa Stone.

Stone City and Weber Stone Company, Inc.

We will begin the field trip in historic Stone City, at the Weber Stone Company near their office. Stone City was founded in the late 1850s by a several men who opened very successful quarries in the area to produce the soft, flat-bedded Silurian dolomites in the area for use as building stone bridges for the railroads and military roads that were being constructed in the area, building construction, and other uses. The demand for the stone dropped dramatically in the early 1900s and the quarries were closed. In the early 1930s Grant Wood and others (Fig. 2) established an artist's colony in Stone City which lasted only two years. In the 1950s Weber Stone Company began operating the quarries and has since become a major stone producer in Iowa. For more details see the article on ***Historic Stone City*** beginning on page 5 of this guidebook.

Figure 2. Grant Wood (in bib overalls in the upper left of the photo) and other artists at the Stone City Artist Colony, as photographed by John W. Barry, Jr. in 1932.

The operations and history of the Weber stone company, Inc. is detailed in the guidebook article ***Weber Stone Company, Inc.*** beginning on page 9. After introduction of field trip leaders and some organizational comments field trip participants will board a bus for a tour through the quarry. We will have an opportunity to visit the underground workings (no longer mined) and the surface mining operation as well as getting a tour of the rock finishing facility, including a chance to see the variety of rock saws used in cutting the dolomites slabs to produce many finished products. Figure 3 is a photo of the largest saw in the Weber Stone Company stone finishing facility. ***For your safety please listen to and follow the instructions by field trip leaders and Weber Stone Company personnel while you are at the quarry.***

Anamosa State Penitentiary

Following the quarry tour we will return to our cars and drive to Wapsipinicon State Park via a route though Anamosa shown on the map the back page of the guidebook. This route will take us past one of the most spectacular example of construction with Anamosa Stone, the Anamosa State Penitentiary. The penitentiary, constructed in the late 1800s by inmates who quarried the stone at the nearby Penitentiary Quarry then finished the stones in the prison yard. If you wish to take some photographs at the Penitentiary, please do it quickly and rejoin the caravan and proceed to Wapsipinicon State Park.

Figure 3. Photograph of the largest rock saw at the Weber Stone Company's rock finishing building at Stone City. *Photo by Thomas Marshall*.

Wapsipinicon State Park

At Wapsipinicon State Park we will have a series of stops and discussions about the various aspects of the history of the Park. Discussions will include the geology of the Silurian dolomites exposed throughout the park (led by Brian Witzke of the Iowa Geological and Water Survey -- IGWS) and the Quaternary geology of the area (by Deborah Quade – IGWS), the trees and other flora of the park (by John Pearson – Iowa Department of Natural Resources – DNR), the animals and other fauna of the park (by Daryl Howe – DNR), the archaeology and early history of the park and the Anamosa area (by Joe Artz – Office of the State Archaeologist), and the history of Wapsipinicon State Park itself, by Ray Anderson (IGWS) and our host, Wapsipinicon Park manager Dennis Murphy (DNR). A series of written discussions on all of these topics begin on page 25 of this guidebook.

Please enjoy your visit to Wapsipinicon State Park, and feel free to return and to visit other parks in the State of Iowa's State Park system.

While you are in Wapsipinicon State Park you are not allowed to collect rocks, plants, or other natural materials. Please respect the park and do not litter.

HISTORIC STONE CITY

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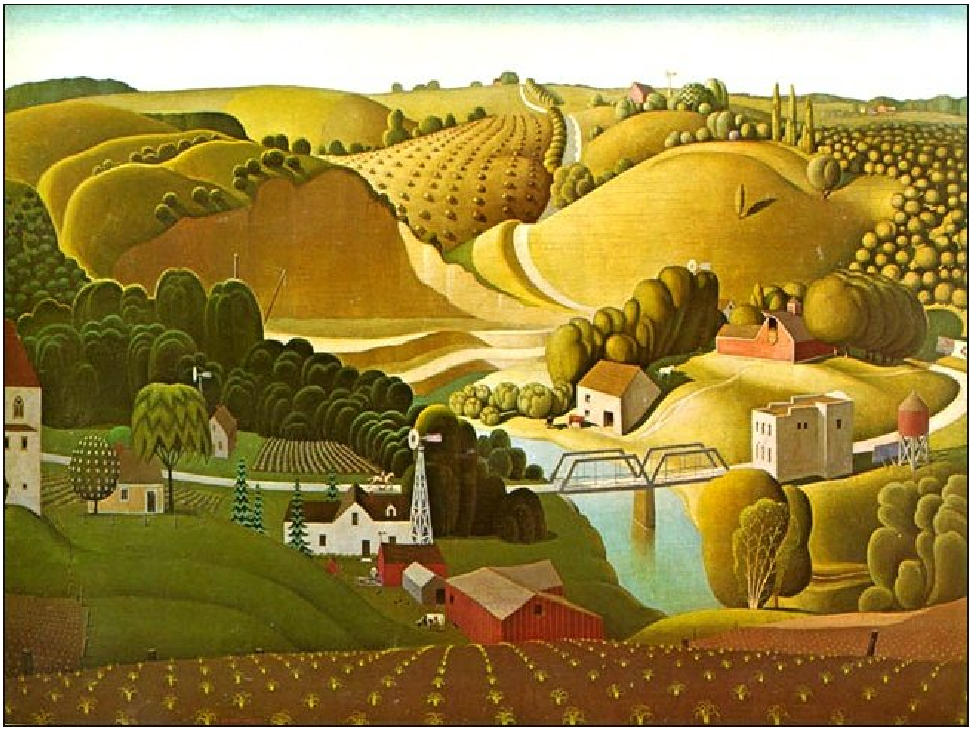


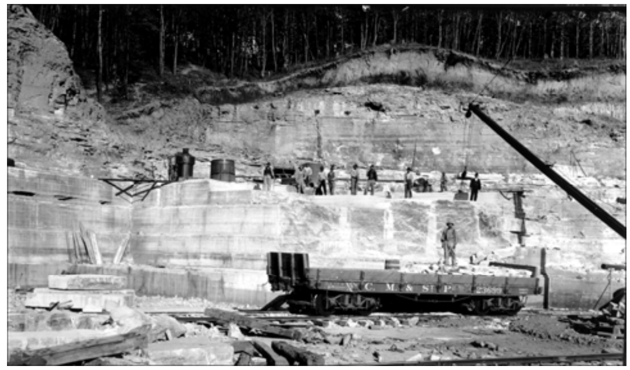
Figure 1. *Stone City, Iowa* as painted by Grant Wood, 1930

THE STONE IN STONE CITY

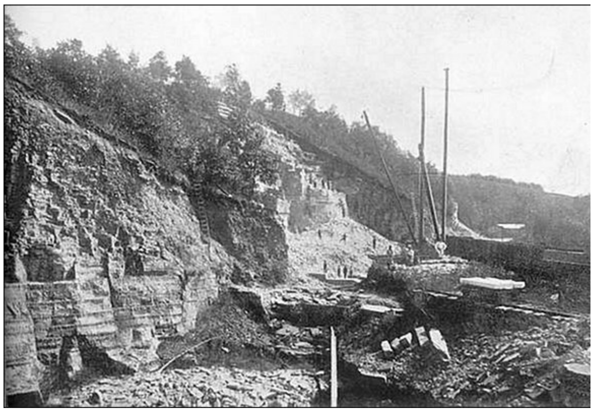
Stone City is an unincorporated community that lies on the bank of the Wapsipinicon River in west-central Jones County, Iowa. It was originally settled as a stone mining town, but later gained fame as an artist colony, hosting many artists, most notably Grant Wood (Fig. 1). In 1850, dolomite was first reported in the area. In the late 1800s, Henry Dearborn, John Green, and John Ronen each opened limestone quarries near Stone City (Fig. 2). As the quarry business flourished, a city of stone emerged as hundreds of people settled in the area. Henry Dearborn moved to Jones County in 1857 where he served as a stone cutter until he established his own quarry in the Stone City area. In 1870 he built a large stone house which is still standing today (Fig. 4). John Green moved to the Stone City area in 1868 when it was still a lonely spot in the wilderness; he soon opened the *Champion 1* (Fig. 2) quarry, the first of several that he operated.

For nearly fifty years, the quarries steadily produced stone, with a value totaling more than $4.5 billion. Records from 1896 indicate that 1,000 men employed among the city's quarries produced 160,000 loads of stone in a single year with a market value of $3.75 million. In his most productive years (1869-1890s), J.A. Green operated three quarries (the *Champion 1*, *Champion 2*, and the *John Allen*) using nearby Anamosa State Penitentiary labor.

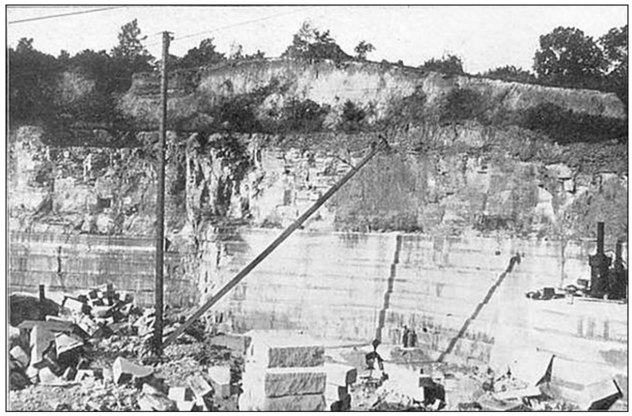
Green's Champion 1 Quarry ca. 1895



Henry Dearborn Quarry ca. 1895



John Ronen Quarry



F. Ericson Quarry

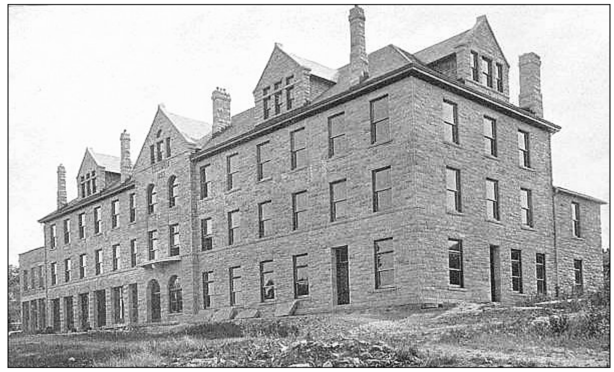
Figure 2. Period photographs of some of Stone City's early quarries.

John Green also constructed a series of stone buildings in the Stone City area, many of which are still standing. One of the first of Green's buildings was Columbia Hall, a magnificent three story hotel and opera house, completed in 1883 and made of 500,000 tons of limestone (Fig. 4). Unfortunately, the property was sold in the 1930s and torn down in 1938 to use the stone elsewhere. Another of his magnificent structures was the Green Mansion built in 1883, first damaged by fire in1963, and finally demolished in the 1990s. The water tower built to serve the mansion still stands today (Fig. 4). In 1889, John Green built the famous three story stone barn (Fig. 4). The structure measuring 120 by 60 by 30 feet high is one of the largest stone barns in Iowa. It was used to stable Green's thoroughbred and quarry horses. Inside, a horse-powered treadmill was used for pumping water, and the barn housed its own blacksmith shop. Today, Green's stone barn is a private residence.

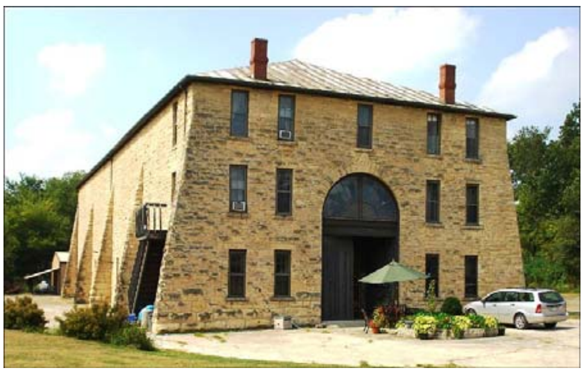
Stone City dolomite has also been used to construct many other buildings in Iowa. Prominent among these is King's Chapel (Fig. 3) at Cornell College in Mount Vernon, Iowa. The cornerstone was laid in 1876, but one month later the contractor went bankrupt and skipped town, leaving the college with a nearly insurmountable financial burden. In 1882 the college was debt-free and ready to complete construction. The main tower of the chapel is almost 130 feet high and can be seen from miles away as it rises above the hilltop campus; the main auditorium can seat 1,600 people.

Figure 3. King's Chapel, Cornell College

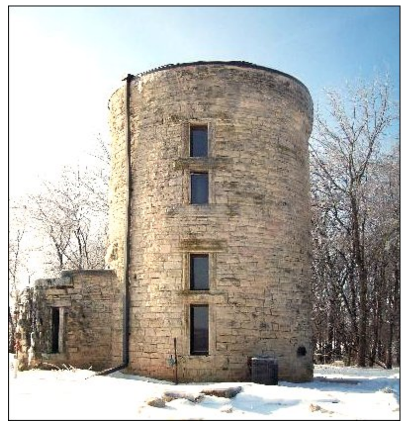
Henry Dearborn Home 1870



John Green's Columbia Hall 1883



Green's Stone barn 1889



Green's stone water tower 1883

Figure 4. Stone buildings constructed in Stone City. All still stand today except Columbia Hall.

By the early 1900s, the advent of Portland cement was having an adverse effect on the economy of the Stone City quarries; one by one, they began to shut down. During the next half century, nature reclaimed most of the quarries. In 1952, the quarries underwent an economic revival under a new owner, Bill Weber. The Weber Stone Company's Stone City quarries have continued to grow and have become one of the largest quarries in the Midwest. The Stone City quarries now ship stone all over the United States.

The Stone City Historic District has been placed on the National Register of Historic Places. In addition, the Green Stone Barn and St. Patrick's Catholic Church in Stone City have been individually added to the list.

THE STONE CITY ARTIST COLONY

Another feature for which Stone City is most famously known is the Stone City Art Colony. In 1932, Grant Wood, Edward Rowan, and Adrian Dornbush established an art colony in Stone City (Fig. 5). With little more than $100 and a number of promissory notes based on the success of the art colony, they leased 10 acres of land on the Green Estate. An area of 200 acres of the estate had been purchased by Frank Nissen in 1920. The parcel of leased land included the Green Mansion, the Ice House and Water Tower. The upstairs portion of the house was converted into a dormitory. The rest of the house was used for business offices, kitchen, a sculpture studio and showers for the men. The basement of the ice house was made into a bar called The Sickle and Sheaf where instructor/student Dennis Burlingame tended bar. The upper portion of the water tower was converted into an apartment where Adrian Dornbush lived. It was called Adrian's Tomb. Ten ice wagons also served as dormitories (Fig. 6). The colony attracted painters from Iowa and elsewhere, and its "campus" excited the mostly young artists. Many of these artists would later work with Wood in the New Deal's Public Works of Art Project (PWAP) after he was appointed head of Iowa's PWAP in 1934**.** Because of Wood's commitment to the PWAP, the colony did not continue beyond its second year.

Figure 5. 1932 painting class at Stone City. People pictured include Marvin Cone, Adrian Dornbush, Marjory Nuhn, Persis Weaver Robinson, and Lela Powers Bigs.

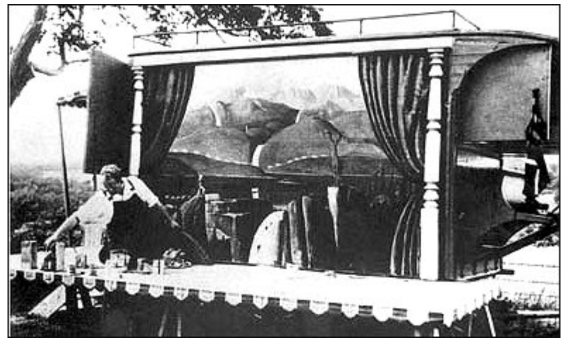


Figure 6. 1932 photograph of Grant Wood decorating his ice wagon dormitory.

REFERENCES

Information for this article was extracted from the following web sites:

Cornell College at:
www.cornellcollege.edu/tours_maps/buildings/kingchapel.shtml

Grant Wood Art Gallery at:
www.grantwoodartgallery.org/stonecitycolony.htm

When Tillage Begins*: The Stone City Art Colony and School at:
www.mtmercy.edu/busselibrary/schome.html

WEBER STONE COMPANY, INC.

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Figure 1. Oblique aerial photograph (looking north-northeast) of the Weber Stone Company quarries at

INTRODUCTION

The Weber Stone Products Company, Inc. in Stone City is one of only two quarries that produces dimension stone (split or cut blocks of building stone) in Iowa. We will start our field trip with a tour of the quarries and their processing facilities. Quarrying began at Stone City in the 1840s and 1850s as the soft, flat-bedded dolomites provided excellent material for the construction of early military roads, railroad bridges, and buildings. The stone, known as Anamosa Stone, from the nearby town of Anamosa, was shipped throughout Iowa and many surrounding states from numerous quarries in the area. However, by the early 1900s, easily-cast Portland-cement-based concrete was rapidly replacing dimension stone and adversely affecting sales of stone from the Stone City quarries. One by one, the quarries began to shut down. During the next half century, nature reclaimed most of the quarries. After many years of very limited activity, in 1952 several Stone City quarries underwent an economic revival under a new owner, Bill Weber. The Weber Stone Company's Stone City quarries have continued to grow and have become one of the largest quarries in the Midwest. The Stone City quarries now ship stone throughout the United States for use in both old and new construction. One of the most recent uses of this limestone can be seen in the new Disney Concert Hall in Los Angeles. Buildings in Iowa include many of those at Cornell College in Mt. Vernon, the State Capitol in Des Moines, and the state penitentiary in Anamosa. The

Figure 2. Anamosa Stone used for residential construction

Figure 3. Anamosa Stone used for construction of the Iowa Firefighters Memorial in Coralville

Figure 4. Anamosa Stone used in retaining wall construction at the Coral Ridge Mall, Coralville

Figure 5. Anamosa Stone used as flagstone in walks and patios.

company produces a full range of stone products, including dimensional and landscaping stone and aggregate. This includes the most common stones used in residential construction (Fig. 2), commemorative structures (Fig. 3), retaining walls (Fig. 4), stone walkways (Fig. 5), and similar projects in Iowa.

The Weber Stone Company produces most of its stone from surface mines in the Stone City area. Underground facilities formerly used for winter stone production is now used only for sizing of stone in the winter. To produce the stone, first, unwanted materials are removed from the stone ledges to be quarried (Fig. 6). Next, a 7 foot ledging saw (Fig. 7) is used to cut large strips of rock in the quarry floor which are split to manageable size by hand (Fig. 8). These blocks may be mechanically split to a specific size with a hydraulic cutter (Fig. 9) or sawed to provide a smooth surface (Fig. 10) depending on the desired product. Stone for gravel roads or similar uses are produced by crushing (Fig. 11).

Figure 6. Unwanted overburden is removed from the rock ledge to be mined.

Figure 7. The rock is sawed into strip with a ledging saw.

Figure 8. The stone is then split into manageable size blocks by hand.

Figure 9. Some blocks are split to specific size with a hydraulic cutter.

Figure 10. Other blocks are sawed to specific shape using one of a variety of water-cooled saws.

Figure 11. Some stone is crushed for use as gravel or other products.

Our tour of the Weber Stone Company quarries will include an opportunity to observe most phases of the rock mining and preparation process. We will see the stone split from the ground, split to specific size, and crushed. We will also have an opportunity to observe the rock being sawed by a variety of rock saws from giant to merely large.

GEOLOGY OF THE STONE CITY QUARRIES

At the Weber Stone Company quarries in Stone City the lowest rocks exposed are dolomites of the Waubeek Member of the Silurian Scotch Grove Formation, overlain by the Anamosa Member of the Gower Formation (the principle quarry ledges), with Middle Devonian strata of the Otis Formation capping the rock section. During our visit to the quarry, we will observe only the dolomites of the Anamosa Member of the Gower Formation

The history of study of Silurian rocks in eastern Iowa (Fig. 12) has been detailed in a number of past GSI guidebooks, specifically Guidebook 35 (Witzke, 1981), Guidebook 11 (Witzke, 1992), Guidebook 68 (Witzke, 1999), Guidebook 72 (Witzke, 2001), and Guidebook 74 (Witzke, 2003) and in Iowa Geological Survey Guidebook 11 (Witzke, 1992). This discussion will be limited to the rocks of the Gower Formation, Anamosa Member, and depositionally-related units.

Anamosa Member, Gower Formation

The Anamosa Member of the Gower Formation was named from a sequence of laminated dolomites at Stone City. These rocks include both wavy-(or crinkly-) laminated and planar-laminated rock types. The laminae range from less than a millimeter to about 1 cm in thickness and are usually uninterrupted; they sometimes can be traced laterally along quarry walls for hundreds of feet. These laminated dolomites are interbedded at some localities with dense, microcrystalline to fine crystalline dolomites ranging from less than 1 cm to more than one meter in thickness. These dense interbedded layers are referred to as “flints” by the quarrymen. Individual “flint” beds may be traceable for distances up to 2 miles. Although the rocks at Stone City are largely unfossiliferous, a few thin bands of brachiopod-moldic and bivalve/ostracod-bearing strata may be observed. Enigmatic rod-shaped bodies about 1cm x 2 mm in size are frequently observed in the Anamosa Member dolomites. These “rods” are locally abundant along bedding surfaces and have been variably interpreted as fecal pellets to gelatinous dwelling tubes (Henry, 1972).

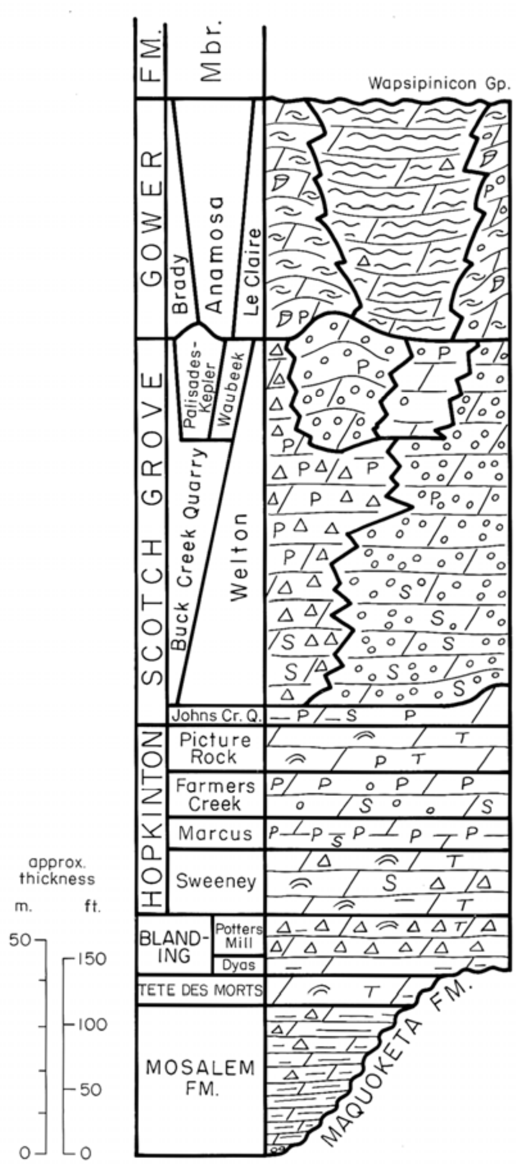

Figure 12. Generalized Silurian stratigraphic section for eastern Iowa.

The Anamosa Member at the Weber Quarries was described by Witzke (1981, 1992) and in Figure 14. He noted that the basal unit is known as the "Gray beds" or "Gray unit" by quarrymen (about 20 feet thick). Wavy to stomatolitic laminations are characteristic of this interval, and interbedded "flints" (dense dolomites) are scattered throughout. The laminations are especially stromatolitic in appearance 8 to 10 feet above the base of the Gower. A band of brachiopod molds is present about 11 feet above the base of the Anamosa, and "rods" are scattered throughout the sequence. Large ostracods (L*eperditia*) and bivalves (*Pterinea*) are noted in a single bed. Quarrymen term the 4-foot thick unit above the "Gray unit" the "Bad Ledge", and Henry (1972) noted strangely laminated rocks, in part cherty, intraclastic, and with evaporate crystal molds, in the "Bad Ledge". Above the "Bad Ledge" the "White unit", a 40-foot thick interval of planar laminated to thinly bedded dolomites, in part cherty, is present. "Rods" are present in the upper 5 feet of the "White unit." The uppermost interval, termed by Witzke (1981) as the "upper unit", is accessible up-sequence from the underground mine area ½ mile east of the Weber Co. office. The discovery of *Leperditia* ostracods in the "upper unit" suggests inclusion in the Gower Formation.

Deposition of the Anamosa Member

Witzke (1981) concluded that the deposition of the laminated Anamosa Member needs to be considered in light of its relation to 1) the sub-Gower surface, and 2) the contemporary mounded Gower facies (Brady Member) (see Fig.13). Both considerations suggest that Anamosa facies deposition began in water deeper than the contemporary Brady Member mounds, most commonly in areas down-slope from the pre-existing Palisades-Kepler mounds. The older Scotch Grove mounds were progressively buried by Gower rocks of the Brady and Anamosa members. Additionally, the lateral continuity of individual laminae and "flints", the general absence of mudcracks and enrolled laminae, the scarcity of intraclasts, the absence of scour surfaces and wave-washed sediment, and the relation of the laminated rocks to the Brady Member collectively indicate a subtidal origin for most of the Anamosa Member. Although supratidal flats and sabkhas are modern examples of environments where laminated sediments can be deposited, the laminated Anamosa rocks differ significantly from such deposits. The wavy- to crinkly-laminations in the Anamosa Member have been reasonably interpreted as stromatolitic sheets (Philcox, 1972; Henry, 1972) and much of the Anamosa was probably deposited as "subtidal organic mats" (Henry, 1972, p. 96). Planar-laminations in the Anamosa may have been deposited under different conditions, perhaps as rhythmic alternations during carbonate precipitation.

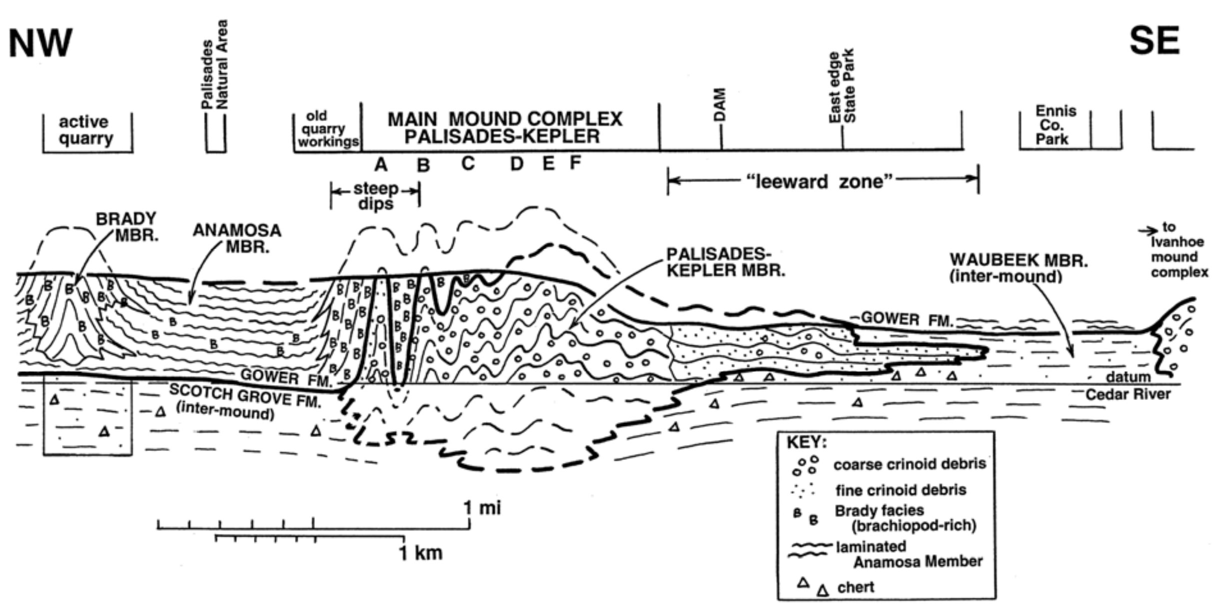

Figure 13. Schematic cross-section of mound and facies relationships in deposition of the upper Scotch Grove and Gower formations in eastern Iowa.

The laminated rocks of the Anamosa Member are characterized by an absence of burrowers and general scarcity or absence of benthic organisms. These features suggest benthic conditions were hostile to many organisms. Additionally, in the non-laminated beds of the Anamosa Member, skeletal fossils are commonly absent, and, when present, are characterized by low-diversity communities. The absence or scarcity of several probably stenohaline groups of organisms (trilobites, nautiloids, stromatoporoids, echinoderms) further suggests that benthic conditions were unsuitable for many common marine organisms. Philcox (1972, p. 701) interpreted the depositional environment of the Anamosa facies as on of "low energy", "hostile to most organisms", perhaps in a situation of "restricted circulation" that "led to high salinities." Henry (1972, p. 78) also suggested that the Anamosa facies "was deposited under unusual, possibly highly saline, conditions in which a normal marine fauna could not develop." Evaporate crystal molds (probably gypsum) in Anamosa beds at Stone City further suggest the presence of hypersaline waters during Anamosa deposition (Henry, 1972). The Anamosa Member shares a number of similarities with carbonate rocks of the A-1 evaporite cycle in the Silurian of the Michigan Basin, although salinities during deposition of the Anamosa Member never reached concentrations high enough to begin precipitation of halite.

What conditions in eastern Iowa might be responsible for the change from "normal" marine deposition in the upper Scotch Grove Formation to hypersaline deposition in the Anamosa Member? Clearly, some change in circulation needs to be proposed that the progressive regression of the seas during the Middle and Late Silurian left central Iowa emergent at the beginning of Gower deposition, and open circulation across the carbonate shelf was thereby cut off. This situation would have left east-central Iowa as a restricted embayment of the Silurian sea. Such an interpretation is further corroborated by the fact that laminated Gower rocks are only noted within the general confines of the East-Central Iowa Basin.

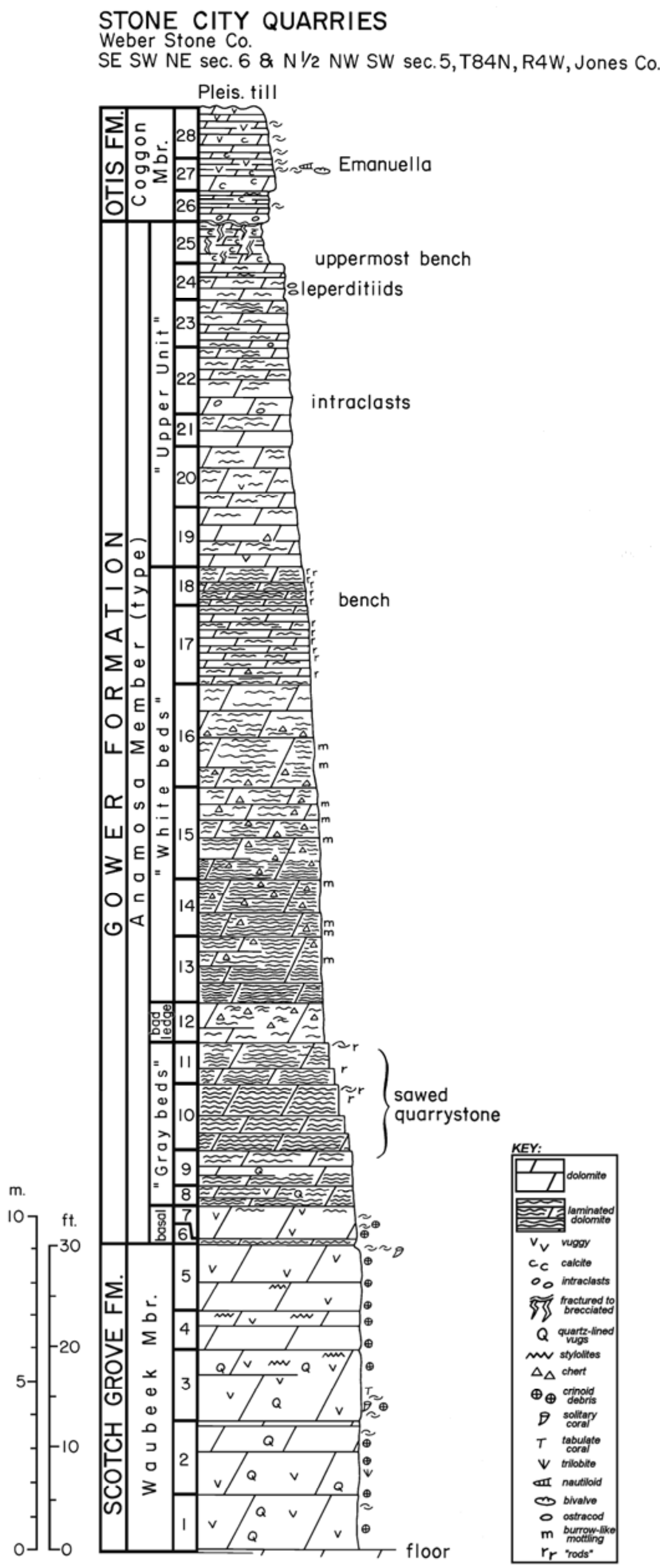

Figure 14. Stratigraphic section measured at Weber Stone Company quarries at Stone City (modified from Witzke, 1992). See following pages for written description.

STONE CITY; Weber Quarries

secs. 5 & 6, T84N, R4W, Jones Co.
units 1-12 described in old west quarry area, SE SW NE sec. 6
units 10-28 described in east quarry workings, N 1/2 NW SW sec. 5
measured B.J.Witzke & G.A.Ludvigson, Aug. 24, 1989

MIDDLE DEVONIAN
WAPSIPINICON GROUP
OTIS FORMATION, COGGON MEMBER

Unit 28
Dol., xf xlln, upper half is porous and vuggy, poikilotopic calcite cements common; bedded ledges 10-20 cm, becomes recessive upward, overlain by unoxidized to oxidized Pleistocene glacial till; contains scattered brachiopods (*Emanuella*); 1.5 m.

Unit 27
Dol., xf xlln, xf-f xlln in lower half, common brown poikilotopic calcite nodular cements through, calcite spar void fills; basal 47 cm is overhanging ledge-former, single bed; upper 50 cm in 4-6 beds, top 35 cm is very porous and skeletal moldic with scattered to abundant brachiopods (*Emanuella*), rare bivalves, gastropods, nautiloids (unit processed for conodonts; barren); 97 cm.

Unit 26
Dol., xf xlln, dense, scattered small pores, sparse skeletal molds (brachiopods) in middle part, small (mm-scale) intra- or lithoclasts 20 cm above base, irregular base (up to 7 cm relief); lower 41-48 cm is well bedded in 4-5 beds; upper 48 cm is thin flaggy bedded (beds 1-5 cm), poikilotopic calcite nodules and cements in part, some faint laminations at top; 89-96 cm.

SILURIAN
GOWER FORMATION
ANAMOSA MEMBER
"Upper Unit"

Unit 25
Dol., xf-f xlln, locally c-vc saccharoidal, abundant calcite cements and vein fills, light gray, highly weathered, rubbly, highly fractured to brecciated, fractures and voids locally filled with green clay, green clay locally in seams and along stylolitic surfaces; top 10-20 cm becomes very shaley, green silty shale fills in irregularities on dolomite surface; unit represents pre-Middle Devonian weathering surface developed on Silurian bedrock; 1.25 m.

Unit 24
Dol., vf-f xlln, some xf (appears "sublithographic" in part), dense, hard, more coarsely crystalline and harder than below, bedded 10-20 cm, faintly and irregularly laminated in part, green clay along partings in upper beds; leperditiid ostracods common in lower interval; top of unit is uppermost quarry bench; thickness approximate, 1.1 m.

Unit 23
Dol., xf-vf xlln, in 4 to 6 beds; lower half irregularly and faintly laminated, very porous, abundant small rounded pores (most < 1 mm), quartz sand rare, small intraclasts noted; upper half if irregularly wavy laminated with common small pores in lower part, becomes more finely laminated (planar to wavy) in upper part, laminae are in part discontinuous, some are obliquely truncated; 1.4 m.

Unit 22

Dol., xf-vf xlln, in 5 to 6 beds, very porous in lower 1.05 m, abundant small rounded pores (most < 1 mm, some 3-4 mm), scattered rounded elongate intraclasts to 3 cm, interval faintly laminated internally, prominent lithologic break at base; upper 95 cm less porous, faint irregular wavy laminae, some laminae are disrupted (or truncated), top 10 cm interlaminated on cm-scale with porous rock similar to unit 23; 2.0 m.

Unit 21
Dol., xf-vf, dense, in two beds; lower half has common small molds and pores as above; upper half has faint planar to wavy laminations; 1.0 m.

Unit 20
Dol., xf-vf, faint irregular laminations, laminae are locally disrupted and discontinuous, laminae scattered in upper part; 40-56 cm above base is non-laminated mudstone with small vugs; 1.75 m.

Unit 19
Dol., xf, rubbly weathered in 4 to 6 beds, primarily non-laminated, porous, common small indeterminate molds and voids; scattered smooth chert nodules 80 cm above base; faintly laminated 40-80 cm above base; 1.8 m.

"White beds"
Unit 18
Dol., xf-vf, in 4 beds, faint to prominent wavy laminations, small pores along some laminae; 5 cm thick dense mudstone 70 cm above base; “rods” common to abundant along laminae; lithologic break at top; 1.18 m.

Unit 17
Dol., xf, dense, pale gray to white, in 11-14 beds, faint planar laminae through most of unit; wavy laminations in basal 3 cm, 1.8-1.9 m above base, and scattered in top 47 cm; becomes non-laminated near top; nodular chert band (nodules to 7 cm) 47 cm above base; “rods” scattered along some laminae at 30 cm and 1.0-1.9 m above base; top of unit is major quarry bench; 2.37 m.

Unit 16
Dol., as above, faint planar laminations (mm to cm separation), laminations become fainter in top 1.0 m; dense except microporous laminations 1.35-1.5 m above base and small pores or molds (<1 mm) in top 75 cm; small nodular chert bands 8 cm, 45 cm, 1.68 m, 1.8 m above base; burrow-like mottling noted 63 cm and 1.1-1.2 m above base; 3.08 m.

Unit 15
Dol., as above, faint planar laminations through most of unit, laminae become more indistinct in upper 75 cm; nonlaminated mudstone 67-88 cm above base; burrowlike mottling noted 1.22 m, 1.87 m, 2.24 m, 2.51 m above base; bands of scattered nodular chert noted 28 cm, 49 cm, 53 cm, 72 cm, 97 cm, 1.12 m, 1.35 m, 1.38 m, 1.61 m, 1.79 m, 2.06 m, 2.14 m, 2.31 m, 2.36 m, 2.42 m above base; 2.79 m.

Unit 14
Dol., as above, fine planar laminae throughout; burrowlike mottling along some laminae 7 cm, 10 cm, 13 cm, 19 cm, 22 cm, 29 cm, 42 cm, 84 cm, 1.06 m, 1.1 m, 1.58 m, 1.65 m above base; sparse nodular chert bands noted 25 cm, 48 cm, 91 cm, 1.05 m, 1.11 m, 1.23 m, 1.33 m, 1.42 m, 1.51 m, 1.65 m above base; 1.69 m.

Unit 13
Dol., as above, fine planar laminae throughout, laminae locally form small monoclinal flexure in lower 65 cm; burrowlike mottling noted 1.35 m above base; sparse nodular chert bands noted 1.32 m, 1.71 m, 1.86 m, 2.0 m above base; 2.03 m.

"Bad Ledge"
Unit 12

Dol., xf-vf, laminated in part, lower 45 cm with wavy laminae and small pores or molds along laminae; upper 70 cm irregularly laminated in part, laminae faint to prominent, laminae form stromatolitic-like heads to 7 cm high x 25-30 cm wide in upper part, some laminae disrupted, local small vugs and pores (evaporite molds in part), intraclasts noted locally; brown to white nodular chert in bands at 45 cm and 65 cm above base, chert nodules scattered 85 cm-1.0 m above base; contact appears gradational above; 1.15 m.

"Gray beds"
Unit 11
Dol., light gray, xf-vf, wavy laminations through most, laminae become fainter upward; top 15 cm becomes more porous; dense mudstones ("flints" 1-4 cm thick) noted 27 cm and 83 cm above base and near top; “rods” scattered along laminae in middle to upper part, “rods” abundant near top; scattered rhynchonellid brachiopods and bivalves present at top; unit sawed into two benched cuts; 1.32 m.

Unit 10
Dol., as above, prominent wavy laminations, scattered to common small interlaminar pores; “rods” scattered along laminae in upper part; 2 cm thick mudstone (“flint”) layer 1.05 m above base and near top; rhynchonellid brachiopods, leperditiids, and bivalves locally noted in upper part; unit sawed into three benched cuts; 1.98 m.

Unit 9
Dol., xf-vf, lower 15 cm with prominent wavy laminations, some laminations form stromatolitic doming to 25 cm wide x 1 cm high; 15-37 cm above base is faintly laminated to non-laminated mudrock, scattered vugs (some quartz-lined); 30-60 cm above base is non-laminated, scattered small pores or molds; 60-72 cm above base is dense, hard mudstone (“flint”), bedding split in middle; upper 36 cm faintly laminated in part, scattered indeterminate small pores or molds; 1.08 m.

Unit 8
Dol., xf-vf, very light gray, finely laminated throughout, laminae slightly wavy, alternating (<1 mm-2 mm) denser and more porous layers; in 1 to 3 beds; lower 15 cm has small indeterminate pores or molds; small vugs (some quartz-lined) noted 4 cm and 21 cm below top; 60 cm.

basal Gower interval
Unit 7
Dol., xf-vf, single massive bed; sparse to common molds and small vugs (increasing upward); scattered to common skeletal molds (especially small crinoid debris) through most, decreasing in abundance upward, indistinct m gray mottlings (burrows?) in upper part; brachiopods (?gypidulids) in band 42 cm above base, indeterminate brachiopods 35 cm below top; upper 7 cm is faintly laminated with indeterminate small molds scattered through; 98 cm.

Unit 6
Dol., in 2 beds, lower 12 cm is finely planar laminated; top 3 cm is finely skeletal moldic (small crinoid debris); 15 cm.

SCOTCH GROVE FORMATION
WAUBEEK MEMBER
Unit 5
Dol., xf-vf, pale gray, sparse to common skeletal molds, scattered vugs (1-4 cm diameter, some calcite lined) especially 40-50 cm and 1.1-1.5 m above base; prominent stylolite at 90 cm above base forms bedding surface; skeletal molds dominantly small crinoid debris, molds slightly more common upward; top 5 cm splits off as separate bed, very fossiliferous, brachiopods (rhynchonellids, *Protathyris, Spirinella, Coolinia,* others), corals (small tabulates, cup corals, *Pycnostylus*); 2.0 m.

Unit 4

Dol., xf-vf, sparse skeletal moldic (small crinoid debris), denser and fewer vugs than below; prominent stylolites at top and 12 cm down; in 2 beds (top bed 35 cm); 1.1-1.3 m.

Unit 3

Dol., xf-vf, sparse skeletal moldic (dominantly small crinoid debris); vugs scattered throughout, especially common 40-90 cm below top, some vugs lined with calcite, chalcedony, or megaquartz; in 1 to 2 beds, bedding break 1.45 m above base, prominent bedding break at top, stylolites at top and 35 cm down; scattered indeterminate brachiopods (orthids), silicified cup coral 60 cm above base, small silicified *Favosites* (5 cm) 1.0 m above base; 2.15 m.

Unit 2

Dol., xf-vf, as above; vugs most common in lower 70 cm, some with calcite and quartz (chalcedony, megaquartz), vugs scattered above; in 2 thick beds (lower is 1.3 m), top 12 cm is ledge with prominent bedding breaks; small crinoid debris molds throughout, trilobite (*Encrinurus*) in lower part, scattered brachiopods (including gypidulids, resserellids); 2.15 m.

Unit 1

Dol., xf-vf, sparse skeletal molds; scattered vugs (2-8 cm), some with chalcedony and megaquartz vug linings; basal 10 cm seen in quarry floor adjacent to sump, remainder forms single bed, prominent bedding plane at top; small crinoid debris molds throughout, scattered indeterminate brachiopods in upper part; 1.75 m.

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ANAMOSA STATE REFORMATORY

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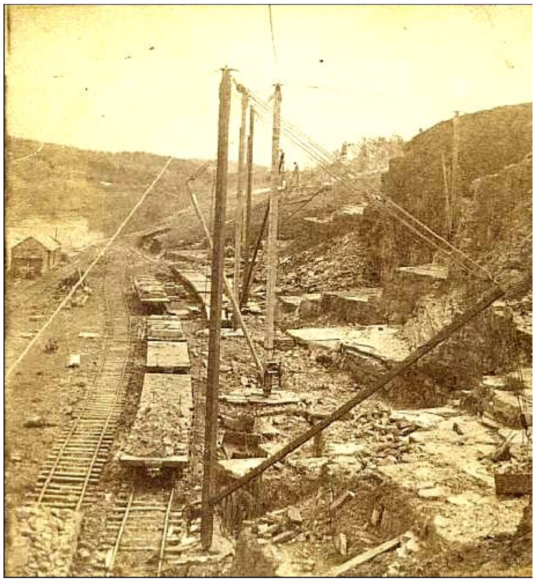
Anamosa State Penitentiary (Fig. 1), located in the Jones County community of Anamosa, is a maximum security penitentiary prison for men. Long known as the Iowa Men's Reformatory, it has recently been renamed the Anamosa State Penitentiary. It is the largest correctional institution in the State of Iowa and is listed in the National Register of Historic Places.

Figure 1. Areal view of the Anamosa State Penitentiary

On April 23, 1872, the Fourteenth General Assembly appointed William Ure, Foster L. Downing and Martin Heisey as Board of Commissioners to locate and provide for the erection of an additional penitentiary for the state of Iowa. The board met on June 4, 1872 at Anamosa, Jones County and selected a site within the corporate limits of the city. Fifteen acres were donated by the citizens of Anamosa to the state of Iowa. Also donated were 61 acres of "good pastureland" close to the area. One reason for this location was three nearby quarries with high quality limestone sufficient for the State's needs to build public buildings.

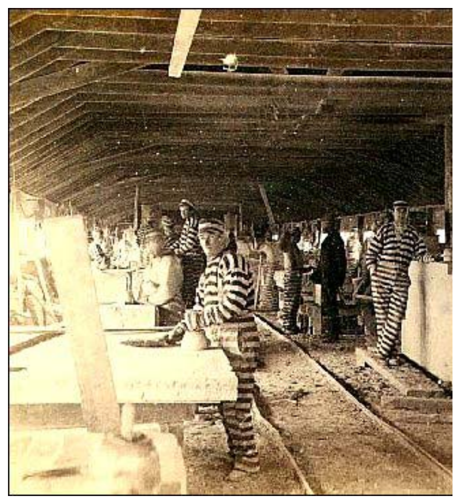
The quarry (Fig. 2a) that produced most of the stone for the Penitentiary was located 1 3/4 miles northwest of the institution and was connected by a spur of the Northwestern Railroad. Prisoners who quarried the stone were conveyed there by a train of handcars (Fig. 2b) accompanied by armed guards. The quarried stone was transported by train into the yard of the prison (Fig. 2c) where it was shaped and carved by the inmates as needed (Fig. 2d). The rock used for the construction was the Anamosa Member of the Silurian Gower Formation, a very evenly-bedded, soft, yellow dolomite. This classic stone fortress has approximately thirteen acres within its walls.



b. inmates returning to the prison from the quarry

a. the Penitentiary quarry operated by inmates.

c. quarried stone being sized in the prison yard



d. inmates in the prison stone shed

Figure 2. Production and shaping of dimension stone for the Anamosa State Reformatory, late 1800s.

As of February 26, 2009, the penitentiary is home to 1,224 inmates with another 175 in segregation. The prison also has 357 staff members. Inmates working in the Iowa Prison Industries produce metal stamping, custom wood, printing, metal furniture, sign, and cleaning products at the penitentiary. The penitentiary also offers educational services for which it has a contract with a community college. Classes are offered for vocational training in welding, automobile repair, horticultural, and janitorial services. Inmates also are able to take courses to earn a high school diploma or a GED, or can take coursework towards an Associate of Arts degree. The prison offers substance abuse treatment programs for those inmates with drug and/or alcohol problems.

For this field trip we will only drive by the Anamosa State Penitentiary on route from Stone City to Wapsipinicon State Park. This will provide an opportunity to see one of the most beautiful examples of construction with Anamosa stone (Fig. 3). If you wish to stop briefly to take a photograph, you can join the caravan at the Park. If you wish to return to the area, the Penitentiary has an interesting museum.

You can obtain museum hours, see many additional photographs, and read a variety of interesting Penitentiary-related stories at the museum's web page: www.asphistory.com/.

a.

b.

Figure 3. Modern views of the Anamosa State Penitentiary, constructed primarily of dolomite of the Anamosa Member, Gower Formation. **a.** western wing of the Penitentiary; **b.** main entrance

SILURIAN BEDROCK GEOLOGY OF WAPSIPINICON STATE PARK

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INTRODUCTION

Picturesque natural exposures of Silurian dolomite bedrock are seen in Wapsipinicon State Park along the valley walls of the Wapsipinicon River and Dutch Creek (Fig. 1). Steep rocky slopes and bold cliffs tower up to 70 feet high in places (Figs. 2). The rock is commonly thick to massively bedded (Fig. 3), and hosts encrustations of mosses and liverworts in places. The bedrock is composed of remarkably pure dolomite (calcium-magnesium carbonate). These strata were not originally deposited as dolomite, but began as calcium carbonate sediments that accumulated in a shallow warm tropical seaway that covered much of North America during the middle part of the Silurian Period (about 425 million years ago). These sediments were chemically transformed to dolomite, probably coincident with the withdrawal of the seaway later in the Silurian. The area that would one day be known as Iowa lay in the southern tropics during the Silurian.

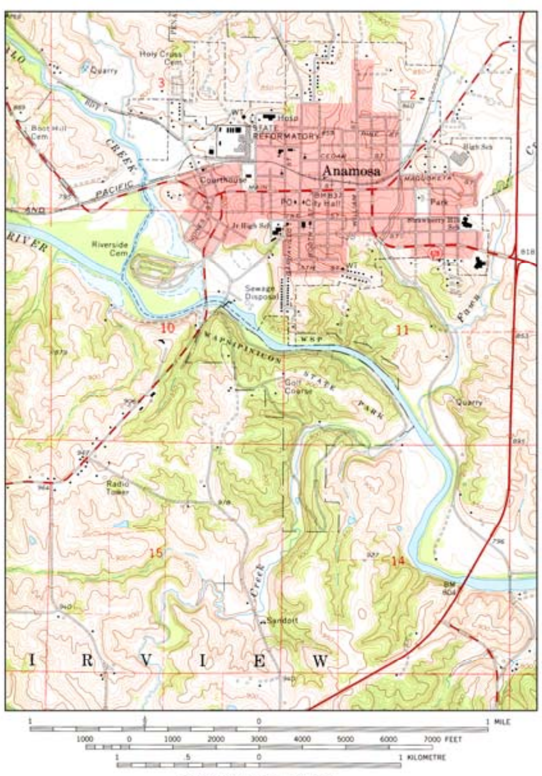

Figure 1. Topographic map of Wapsipinicon State Park and Anamosa area. This map is base map for the one in Figure 5.

The dolomite strata in the park are composed of an amalgamation of very fine dolomite crystals that have replaced the original sediments of lime mud and sand. Crystal sizes vary from a tiny fraction of a millimeter up to several millimeters in diameter – the more coarsely crystalline rocks show a sugary (sucrosic) texture. Because of pervasive recrystallization, fossil shells are often difficult to recognize. Small fossil grains commonly have been dissolved leaving small and often indistinguishable molds in the rock. Many of these molds are cylindrical to disc-shaped and likely were derived from the solution of small fragmented crinoid (sea lily) debris; some coarse dolomite crystals have replaced crinoid grains. Abundant small molds along with tiny inter-crystalline pores collectively make the dolomite strata in the park quite porous with porosities up to about 20% (Fig. 4). As discussed subsequently, solution and weathering of the dolomite bedrock in the park has further enhanced porosities with large porous networks, fissures, and caves. Wapsipinicon State Park and the surrounding area were the focus of two previous geologic field trips (Witzke, 1981a, 1992), and interested readers are encouraged to access those guidebook discussions. Additional information

Figure 2. Wapsipinicon State Park in winter, the Silurian dolomite pictured here is typical of the bedrock exposures at the park. Some of the bedrock outcrops in steep cliffs and bluffs up to 70 feet high.

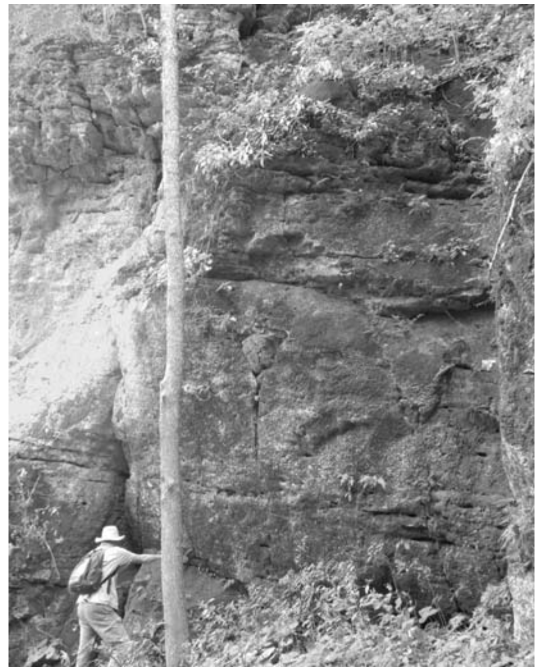

Figure 3. Closer view of cliff face shown in Figure 2. Note slight dip of lower beds and the solutionally-enlarged fracture to the left.

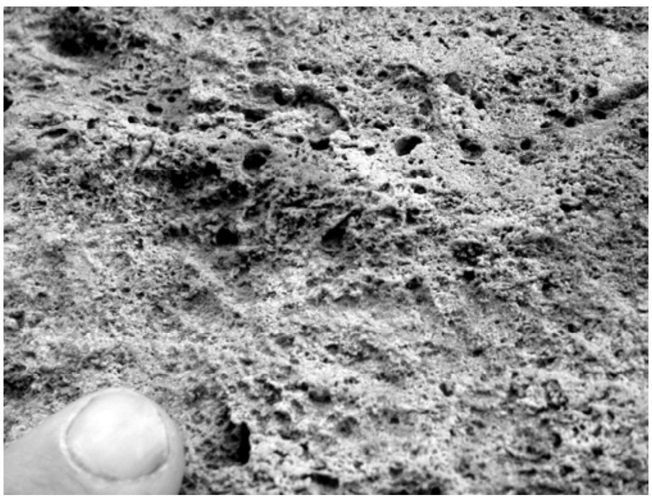

Figure 4. Close-up view of fine-scale porosity in dolomite near Dutch Creek bridge; finger tip for scale. Indeterminate small molds and very fine inter-crystalline porosity are visible.

on the geology and paleontology in the area are also presented by Witzke (1981b), Witzke and Johnson (1999), and Frest, Brett, and Witzke (1999). The geology at Wapsipinicon State Park is remarkably similar the instructive bedrock succession seen to the south at Palisades-Kepler State Park, and the interested reader is encouraged to compare these two areas (Witzke, 1999).

STRATIGRAPHY

All exposed bedrock strata in Wapsipinicon State Park belong to the upper part (50 to 75 feet) of the Scotch Grove Formation. These Silurian strata correlate with the lower Wenlock Stage, a time of exceptionally high sea level worldwide (Witzke, 1992). As seen at Stone City, the Scotch Grove Formation is overlain by the Gower Formation (laminated Anamosa Member). However, no exposure of the Gower Formation has been recognized at Wapsipinicon State Park. The Scotch Grove Formation derives its name from exposures near the town of Scotch Grove, also in Jones County. The upper Scotch Grove Formation contains a complex array of dolomite facies, characterized in places by unusual mounded features assigned to the Palisades-Kepler Member (whose typical locality is at the state park of that name in Linn County). Although most Paleozoic strata in Iowa are relatively flat-lying (horizontally bedded), this member includes complex to dipping beds that form a coalesced mass of mounded (haystack form) to horizontally-bedded strata forming a distinct facies of porous dolomite strata up to 1 to 2 miles in diameter and 75 to 200 feet thick. These complex mounded features have been described as “reefs” by many

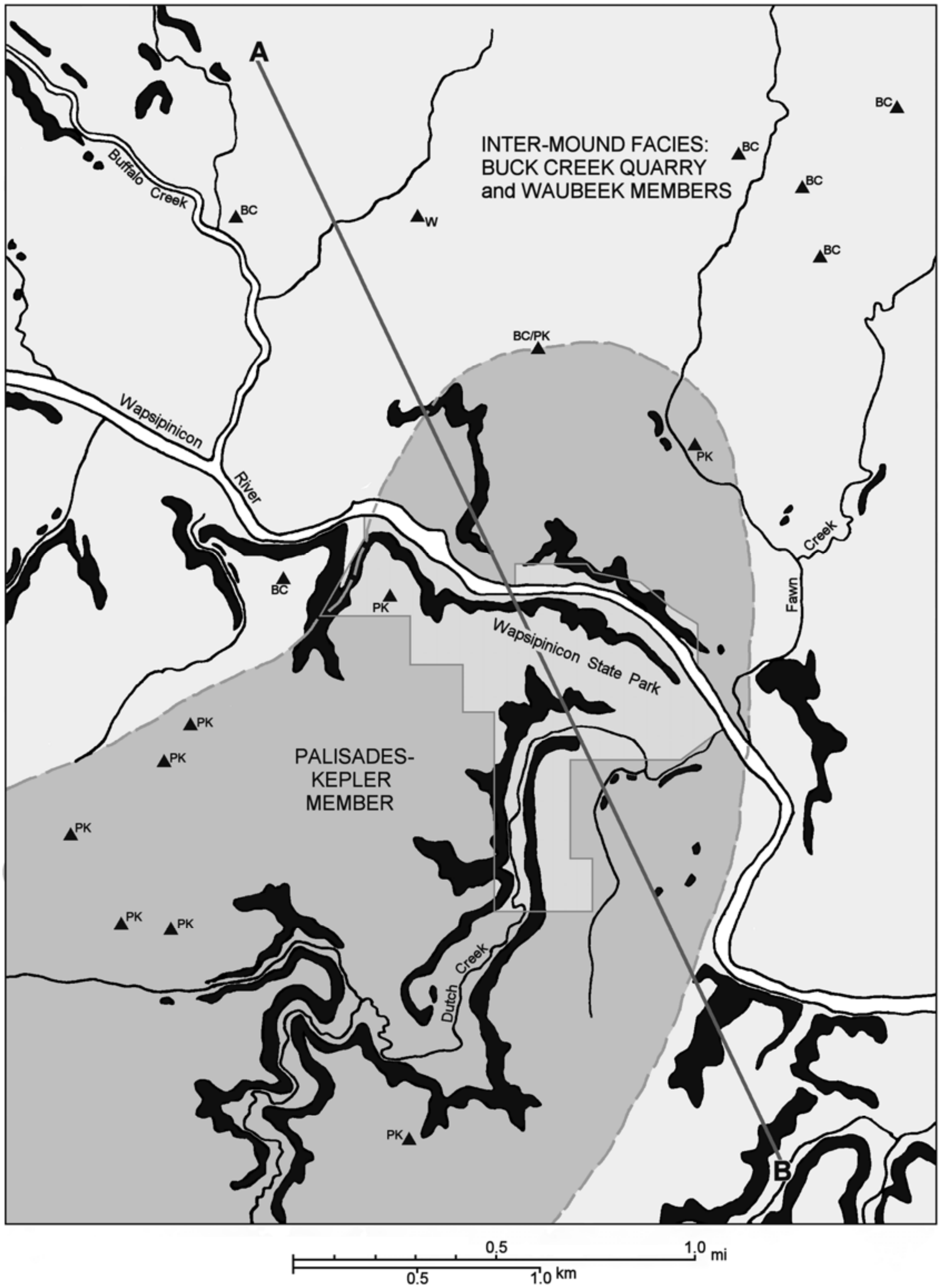

Figure 5. Map showing the general distribution of the mounded Palisades-Kepler Member and correlative inter-mound facies in the area of Wapsipinicon State Park (see Figure 1 for base map). Black areas correspond to regions of bedrock exposure and shallow-to-bedrock soils. Triangles denote areas where subsurface well information is available (upper strata designated PK – Palisades-Kepler Mbr., BC – Buck Creek Quarry Member, W – Waubeek Mbr.). Line A-B is cross-section line for Figure 9.

previous workers, but there are no framework builders or other features that would serve to identify them as true organic "reefs" (see summary by Witzke, 1992).

Virtually all bedrock strata exposed at Wapsipinicon State Park belong to a relatively flat-lying portion of one of these coalesced mounded complexes (see area outlined on Fig. 4). However, strata locally dip from 5 to 20° to the west to southwest in the northwestern park of the park (Fig. 6), and from 5 to 13° to the east in the northeastern park of the park (Fig. 7). Strata are more-or-less horizontally bedded along Dutch Creek in the southern part of the part. Dipping

Figure 6. West-dipping strata near intersection of upper and lower roads immediately east of west entrance, Wapsipinicon State Park. Dipping beds are highlighted in white. These beds are cherty dolomites of the Buck Creek Quarry Member which here overlie and are replaced to east (left) by porous non-cherty facies of the Palisades-Kepler Member.

strata are most pronounced across the river just north of the park along the cliff exposures immediately east of the Anamosa Ball Park and City sewage disposal area. That area displays a single large haystack-shaped mounded feature over 1000 feet in diameter with dips of up to 20° (Fig. 8). Unlike exposures in the park, this mounded feature shows scattered but abundant molds of fossil corals and stromatoporoid sponges (4 to 12 inches) as well as coarse dolomitized graded beds and packstones of crinoid debris, brachiopods, and bryozoans. Coral fossils are considerably less common in most of the state park, and coarse crinoid debris and brachiopod fossils are only common near the west entrance to the park. A generalized and schematic cross-section of the Palisades-Kepler Member mound complex seen in and around Wapsipinicon State Park is shown in Figure 9.

The scale and form of the mounded complex at Wapsipinicon State Park is substantially similar to the complex seen at Palisades-Kepler State Park (Witzke, 1999), as summarized here. 1) Both complexes are about 1.5 miles in diameter. 2) Both show steepest dips in the northern and northwestern parts of the complex, with more horizontally bedded strata to the south. 3) The most coral- and stromatoporoid-rich beds are seen in the northern area of both complexes. 4) Coarse crinoid debris and graded beds are seen primarily in the northern areas, whereas finer crinoid and other small fossil debris characterizes the southern areas. 5) Strata of both mounded complexes are observed to interstratify and be laterally replaced by denser partly cherty inter-mound facies. These similarities are further evident when comparing the schematic cross-sections for both areas (Fig. 9, this guidebook; see also Witzke, 1999, p. 7). The general asymmetry of these complexes is interpreted to reflect large-scale storm processes that affected their development and form. Iowa lay in southern tropical latitudes during the Silurian, rotated at a position so that easterly direction would be located to the present-day northeast. Large tropical storms (hurricanes) would be expected to mostly track towards the south and west at those latitudes. As such, tropical storms would directly strike the northern parts of the mound complexes, possibly producing the observed geometric and sedimentary asymmetries.

Figure 7. Two views of east dipping strata exposed along the road immediately south of the river, Wapsipinicon State Park (NE NW SW sec. 11). Evidence for dissolution of dolomite strata is evident by numerous vugs, pits, and small caves.

The mounded complex of the Palisades-Kepler Member at Wapsipinicon State Park is abruptly replaced by notably different strata comprised of horizontally-bedded dense sparsely-fossiliferous cherty dolomite. These dense cherty beds characterize the inter-mound facies of the upper Scotch Grove Formation, the Buck Creek Quarry Member (see discussion in Witzke, 1992). The abrupt change from porous crinoidal dolomite of the mound facies to dense cherty inter-mound dolomite is well displayed in the area surrounding the state park (Fig. 5), especially near the west entrance to the park and to the north of the previously noted Ball Park exposures. There are several exposures near the park entrance that show west-dipping beds of dense cherty dolomite that interstratify and overlie porous dolomites of the mound facies (Fig. 6). These exposures capture a thin transitional zone between mound and inter-mound facies. A short distance to the west, just across the highway (Old Military Rd., E34) from the park entrance, horizontally-bedded cherty dolomite strata of the Buck Creek Quarry Member are well displayed. Similar relations are shown a short distance to the northwest of the Ball Park mound exposures, where cherty inter-mound beds are seen at the Eden Golf Cart shop in Anamosa. In addition, numerous exposures (including quarries and roadcuts) of horizontally bedded inter-mound dolomite strata are seen immediately to the east and southeast of the park (including the area south of the Highway 151 Wapsipinicon River bridge and nearby exposures along road X40; see Fig. 5). The cherty dolomites of the Buck Creek Quarry Member are dense and extremely finely crystalline. Small fossil molds are generally rare and scattered (see subsequent discussion of fossils). The strata are generally well bedded (usually in beds 4 to 12 inches thick). Chert occurs primarily as elongate nodules (2 to 12 inches), but some nodules are seen to coalesce into larger lenses. The chert is commonly white and "chalky" (that is, has a chalky-like texture containing a mixture of dolomite and silica), but some gray nodules are "smooth" chert (that is, pure silica, the kind of chert suitable for making arrowheads). All chert is a chemical (silica) replacement of original carbonate sediment. The source of the silica is not known with certainty, but derivation from biogenic silica (opaline silica) seems likely. A likely source of biogenic silica is from siliceous sponges. Molds of sponge spicules are noted in these beds, lending some credence to this idea.

Figure 8. Mounded strata of Palisades-Kepler Member exposed in bluff face to the east of the Anamosa Ball Park area (SE NE sec. 10) north of Wapsipinicon State Park. This is a tracing of general bedding from a photo-mosaic (no vertical exaggeration). Observed fossils along lower face abbreviated as follows: P – coarse crinoidal packstones (graded bedding in part); S – stromatoporoid sponge molds (hemispherical to globose); T – tabulate coral molds (primarily *Favosites* and *Syringopora*).

In general, the mound complex at Wapsipinicon State Park is seen to be abruptly replaced to the west, north, east, and southeast by cherty dolomite strata of the Buck Creek Quarry Member (Fig. 5; see also Fig. 9 cross-section). However, exposures beginning about 1 mile to the west and northwest of the mound complex margin along Buffalo Creek and the Wapsipinicon River (to Stone City) lack abundant chert, but the dense sparsely-fossiliferous dolomite strata otherwise resemble those of the Buck Creek Quarry Member. These non-cherty inter-mound strata have been termed the Waubeek Member, named after exposures along the Wapsipinicon River in Linn County (see Witzke, 1992). The absence of chert in these rocks suggests the possibility that biogenic silica not as abundant in these inter-mound sediments.

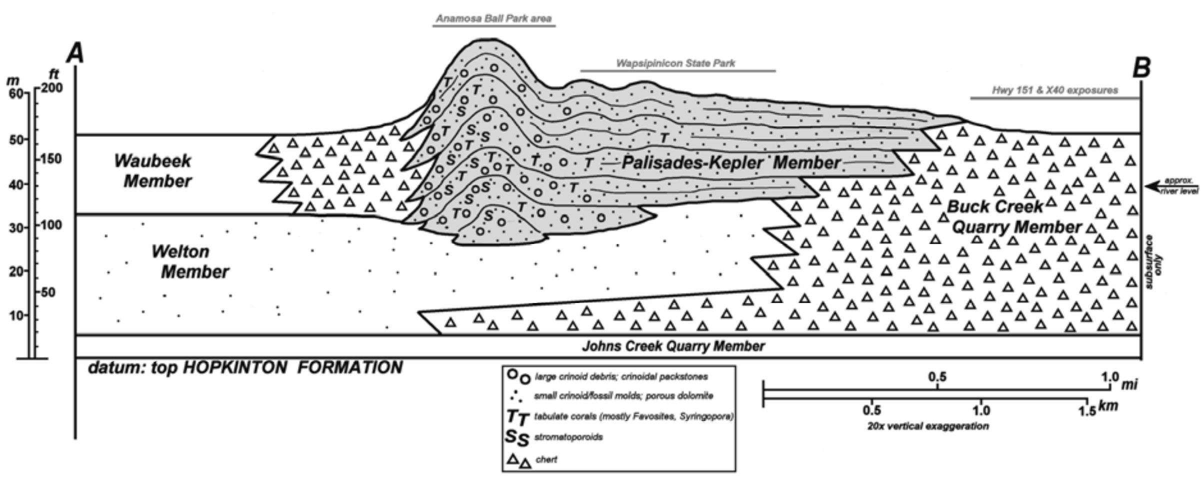

Figure 9. Schematic cross-section of Scotch Grove Formation in the area of Wapsipinicon State Park; see Figure 5 for location of cross-section line A-B. General location of areas of major bedrock exposure are noted along top of figure. Only the upper strata are evident in outcrop in the area (approximate position of river level noted at right); lower strata interpreted from water well penetrations in the area (see Fig. 5). Vertical exaggeration 20:1.

FOSSILS

As noted, small fossil molds are abundantly represented in the dolomite strata of Wapsipinicon State Park, but these are often difficult to identify because of poor preservation. Many cylindrical and disc-shaped molds likely represent dissolved fragments of crinoid stems and plates. In some beds, larger molds and dolomitized fragments more clearly represent the remains of crinoid debris. Overall, crinoid debris seems to be the dominant fossil type represented in the park. The finely crystalline matrix of the rock was originally carbonate mud, and carbonate mud in the modern world is primarily produced by the disaggregation of calcareous green algae and other carbonate-secreting organisms. This likely was the source of carbonate mud in the Silurian, as well. At other places in the park, scattered indistinct molds of shells indicate that brachiopods also lived on the bottom. Finally, molds of massive to hemispherical corals and stromatoporoid sponges are occasionally seen in the park (Fig. 10), but these are surprisingly rare considering their notable abundance at the nearby Ball Park exposure. Colonial tabulate corals (about 2 to 10 inches) are identified in the park, primarily *Favosites* and *Syringopora*.

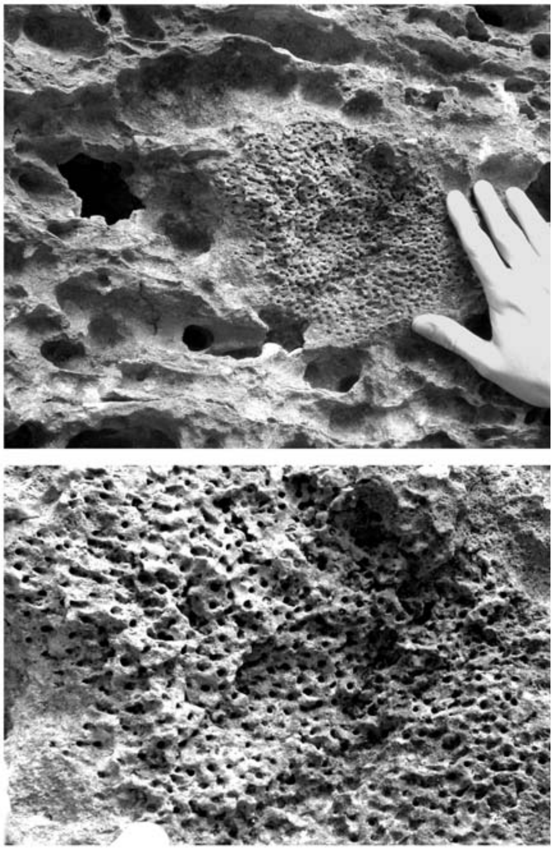

Figure 10. Two views of fossil coral mold (*Syringopora*) seen in vuggy dolomite along Dutch Creek between Ice Cave and Horsethief Cave.

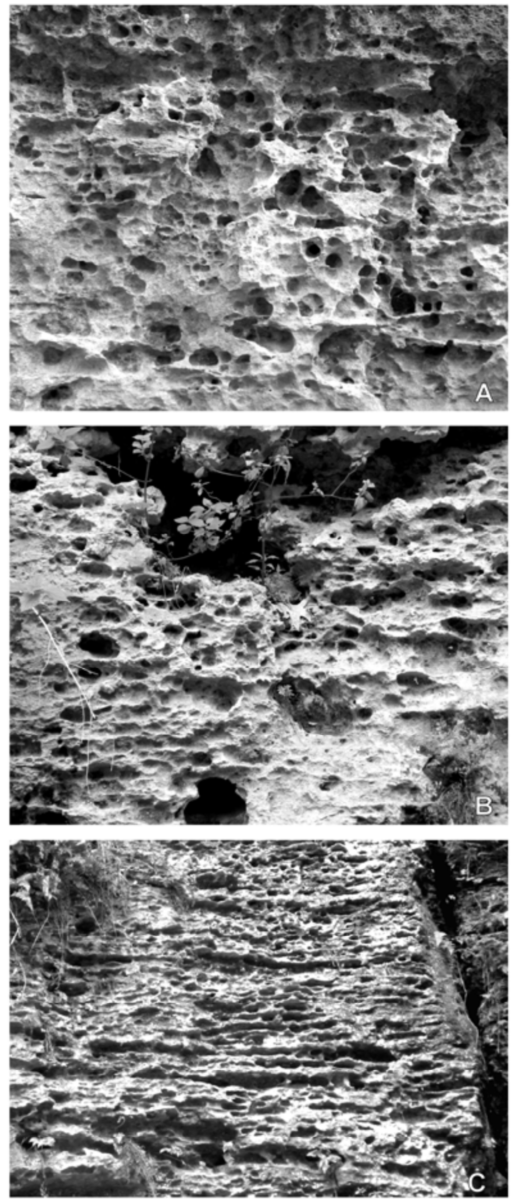

Figure 11. Three views of porous and vuggy dolomite with solutionally-enlarged fractures and cavernous voids seen along Dutch Creek in Wapsipinicon State Park. Vugs in upper photo (A) are 1 to 3 inches in diameter; vegetation provides scale for photos B and C.

In contrast to the dolomite exposures in most of the park, abundant and well preserved fossil molds have been identified along the lower road near the west entrance to the park. These strata occur near the transition into inter-mound strata, and the great abundance of fossils, some in graded beds, suggests a position near the toe of the mound slope. Over 70 types of fossils were identified at this position (see Witzke and Johnson, 1999, p. 822; Frest et al., 1999, p. 696), including numerous brachiopods and echinoderms. In addition, a variety of small tabulate and solitary rugosa corals, bryozoans, gastropods, bivalves, nautiloids, and trilobites were also identified. The brachiopods are dominated by spiriferids (*Hedeina*), atrypids (*Atrypa*, *Plectatrypa*), and gypidulids, but a wealth of other taxa are also present. Disarticulated crinoid debris is abundant, and a number of articulated crinoid cups were also identified (especially *Dimerocrinites*). Rhombiferan cystoids (*Hallicystis*) and Eocrinoids (*Lysocystites*) were also noted. The fossil preservation in extremely finely crystalline dolomite is particularly good at this transitional position, unlike the sugary-textured dolomite found elsewhere in the park. The great diversity of fossils recognized near the park entrance provides a good idea of the types of organisms that inhabited these tropical environments.

The dense cherty dolomite beds of the Buck Creek Quarry Member found near the park entrance and nearby exposures (Fig. 5) are only sparsely fossiliferous, and some beds seem to entirely lack fossil molds. Nevertheless, careful examination of freshly broken dolomite beds reveals a relatively diverse association of small fossils in some beds, primarily characterized by small molds of indeterminate crinoid debris and small button-shaped solitary corals (*Porpites*), with occasional brachiopods (atrypids, resserellids). Other fossils are quite scarce but include small solitary corals (cup corals), branching bryozoans, other brachiopods (including gypidulids), bivalves, gastropods, trilobites, and sponge spicules. The general paucity of fossils in the inter-mound strata suggests that these environments were not as hospitable for the flourishing of bottom life as were the adjoining carbonate mounds (in slightly shallower water).

SOLUTION AND KARST OF DOLOMITE STRATA

Surface exposures of carbonate strata in Wapsipinicon State Park show extensive evidence of solution and weathering. Dolomite slowly but surely dissolves in weak acidic solutions (but not as rapidly as limestone), and the percolation of weakly acidic rain water and humic acids (in the forest soils) progressively dissolves away some of the dolomite. This dissolution is most pronounced where water movement is greatest, primarily along fracture networks and horizontal bedding surfaces. The ongoing process of dissolution of carbonate rock produces *karst* – areas characterized by caves, enlarged crevices, fissures, porous networks, and sinkholes. As crevices progressively enlarge along the valley walls, the massive cliffs of dolomite further weaken and fracture and begin to move downslope producing areas of mechanical karst.

Many of the dolomite exposures seen in Wapsipinicon State Park are pock-marked with solutionally-enlarged pits, voids, vugs, and small caves, in places producing networks resembling Swiss cheese (Fig. 11; see also Fig. 10). Horizontal bedding is accentuated in some areas by networks of solutional pits (Fig. 11C), likely reflecting bedding-parallel variations in crystal size and porosity in the original dolomite. As the sugary-textured dolomite is subjected to dissolution, the microscopic inter-crystalline pores enlarge, weakening the rock and making it more susceptible to weathering by flowing water and freeze-thaw processes. Such processes produce dolomite disaggregation into fine dolomite “sand”; in places the sugary dolomite crystals will crumble on outcrop at the touch of a finger. Some crevices and fissures are filled with loess-derived sediment, indicating a relatively long period of karst development in the area. Of note, Holocene crevice fills in the Anamosa Ball Park area north of the state park have produced abundant subfossil bones, most notably rattlesnake vertebrae. No rattlesnakes are currently living in the area.

Many fissures and crevices have been significantly enlarged by dissolution of the dolomite, and small caves are developed in places, especially in the valley of Dutch Creek. Two of the larger caves along Dutch Creek are easily accessible and have been given names: Ice Cave (Fig. 12) and Horse Thief Cave (Figs. 13, 14). Neither of these cave systems are particularly large, with only modest measured passageways big enough for human travel (60-92 feet, respectively). However, the flow of cool air from the mouth of the caves suggests that a much larger inter-connected karst network may be present, much of it at a scale too small for human entry.

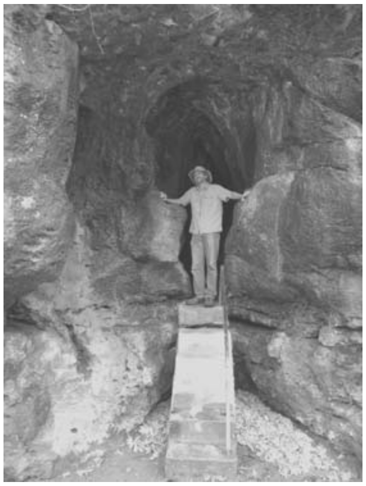

Figure 12. Entrance to Ice Cave; geologist Tom Marshall provides scale.

Figure 13. Large rock shelter at entrance to Horsethief Cave.

Figure 14. Looking out from Horsethief Cave.

FIELD TRIP STOPS

We will plan two field trip stops to examine the bedrock geology in Wapsipinicon State Park, but the extensive exposures of Silurian dolomite in the park afford many additional opportunities for further examination. The first stop will begin at the parking area along the river about 1000 feet from the park entrance. Dolomite cliffs rise dramatically along the valley at this point (see Figs. 2, 3), and we will first examine the thick beds of porous dolomite (Palisades-Kepler Member) in this area. A stairway leads to the top of the cliff where a fine view of the Wapsipinicon Valley is available. The cliff faces are encrusted in places with mosses and liverworts, and ferns grow out of some pores and crevices. The bedding here approximates horizontal, but a closer look will show that bedding undulates slightly, with dips up to 7° noted (west to southwest). We will proceed northwest from these cliffs to look at exposures adjacent to the roadway closer to the park entrance. **Please be extremely cautious of traffic** in this area, as there is a blind curve at one point (view blocked by a dolomite exposure). The beds show a slight westward dip as we proceed along the road. Although fossil collecting is not permitted in the state park, the rocks in this area contain a great abundance of well-preserved fossil molds that are visible in some of the broken blocks along the road. Molds of crinoid stems and columnals are the most common fossil, and in some beds molds of crinoid cups are quite common (primarily *Dimerocrinites*). A great variety of other fossils are also noted in these beds, including a diverse assemblage of brachiopods (see previous discussion). These strata occur very close to the northwestern margin of the carbonate mound complex (Palisades-Kepler Member).

We will next visit the bedrock exposures seen in the ditch and slopes along the upper (campground) road near its intersection with the lower (river) road. Strata here also dip to the west, locally as much as 20° (see Fig. 6). At this point we are very close to the northwestern-most margin of the mound complex where it interstratifies and overlain by dense cherty dolomite strata of the Buck Creek Quarry Member. The porous and crinoidal beds of the Palisades-Kepler Member are replaced westward by dense cherty beds in this area, especially upward in the stratigraphic succession. An abundance of white chert debris and dense dolomite colluvium is seen littering the forested slopes above these exposures. The cherty dolomites are only sparingly fossiliferous, most notably small crinoid debris molds and the small button-coral *Porpites*. The best exposure of this upward transition between Palisades-Kepler and Buck Creek Quarry facies is seen in the bluff facing the highway a short distance south of the park entrance (but difficult to access), and a measured section there portrays this transition (Fig. 15). Immediately across the highway from this point is a very nice exposure (about 30 feet thick) of horizontally-bedded cherty dolomite of the Buck Creek Quarry Member (this is on private land). The area in and around the park entrance is particularly instructive in that is clearly portrays the pronounced and abrupt facies transition between porous mound facies and dense cherty inter-mound strata.

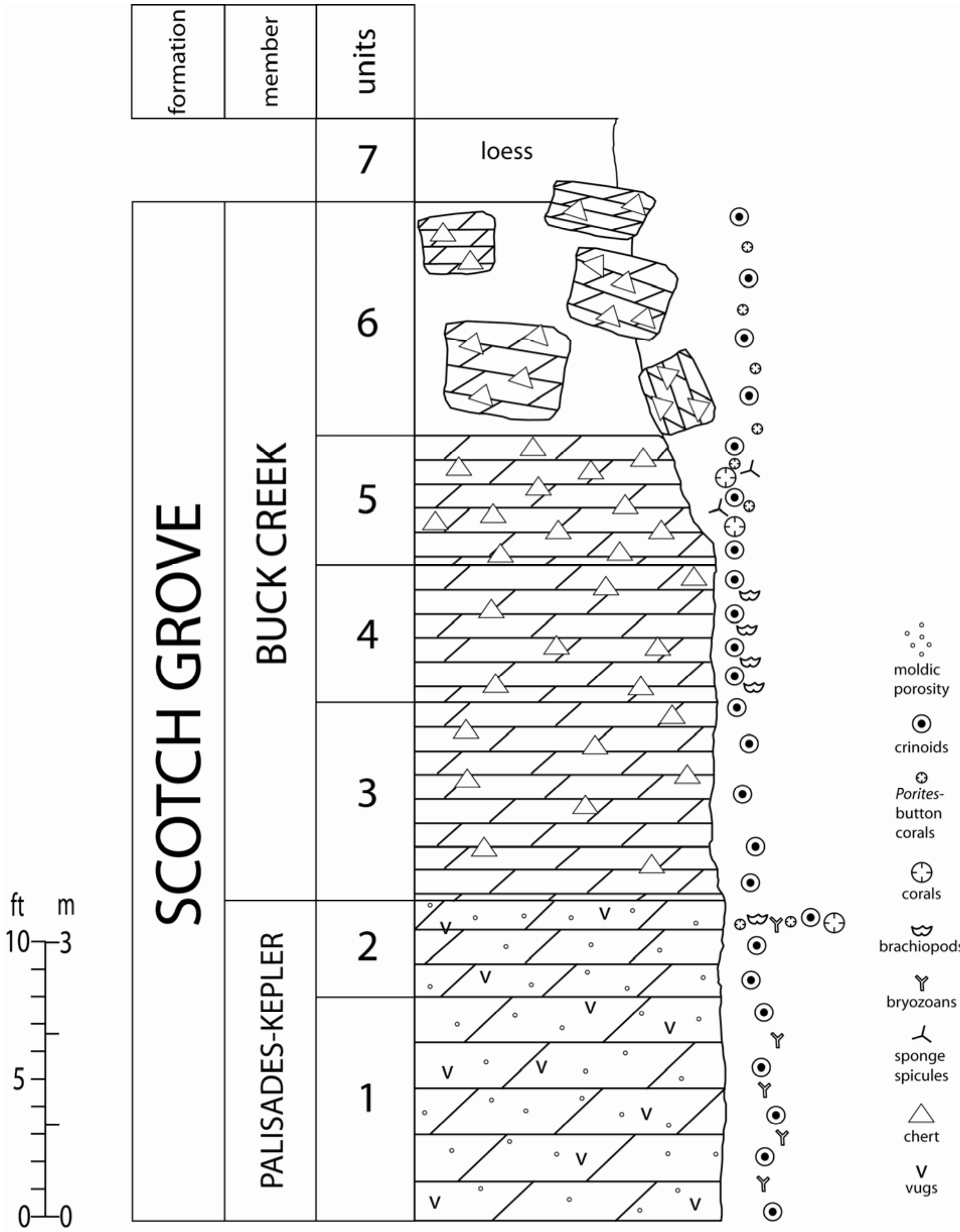

Figure 15. Graphic stratigraphic section of transition between porous dolomites of the Palisades-Kepler Member and cherty inter-mound facies of the Buck Creek Quarry Member exposed near the west entrance to Wapsipinicon State Park (SW SW SW NE sec. 10). See text for written description of units.

The second field trip stop will examine bedrock exposures in the park in the valley of Dutch Creek. We will park cars near the bridge over Dutch Creek about mid-point between Ice Cave and Horsethief Cave. The dolomite bedrock in this area is extremely pitted and weathered, and numerous small to large scale karst features are evident. Overall, the bedrock is approximately horizontally bedded (certainly more so than in the previously visited area), but minor undulations are observed. We will first walk along the short trail to Horsethief Cave. The entrance area to this cave forms a very large rock shelter (see Fig. 13). The cave quickly constricts to the west, and its entrance is flanked by two short cave segments (Fig. 16). We will return along the trail to the parking area and proceed north along the road to the entrance to Ice Cave. Along the way, note the extreme pitting and pock-marked weathering of the dolomite exposures and the numerous enlarged fissures and fractures in the bedrock. Ice Cave has a narrower entrance than Horsethief Cave (see Fig. 12). It has a narrow but relatively tall passageway (Fig. 17). We will return to the parking area, and for those participants that wish to see a fossil coral in situ (Fig. 10), we will cross the bridge and look at the exposures on the other side of Dutch Creek.

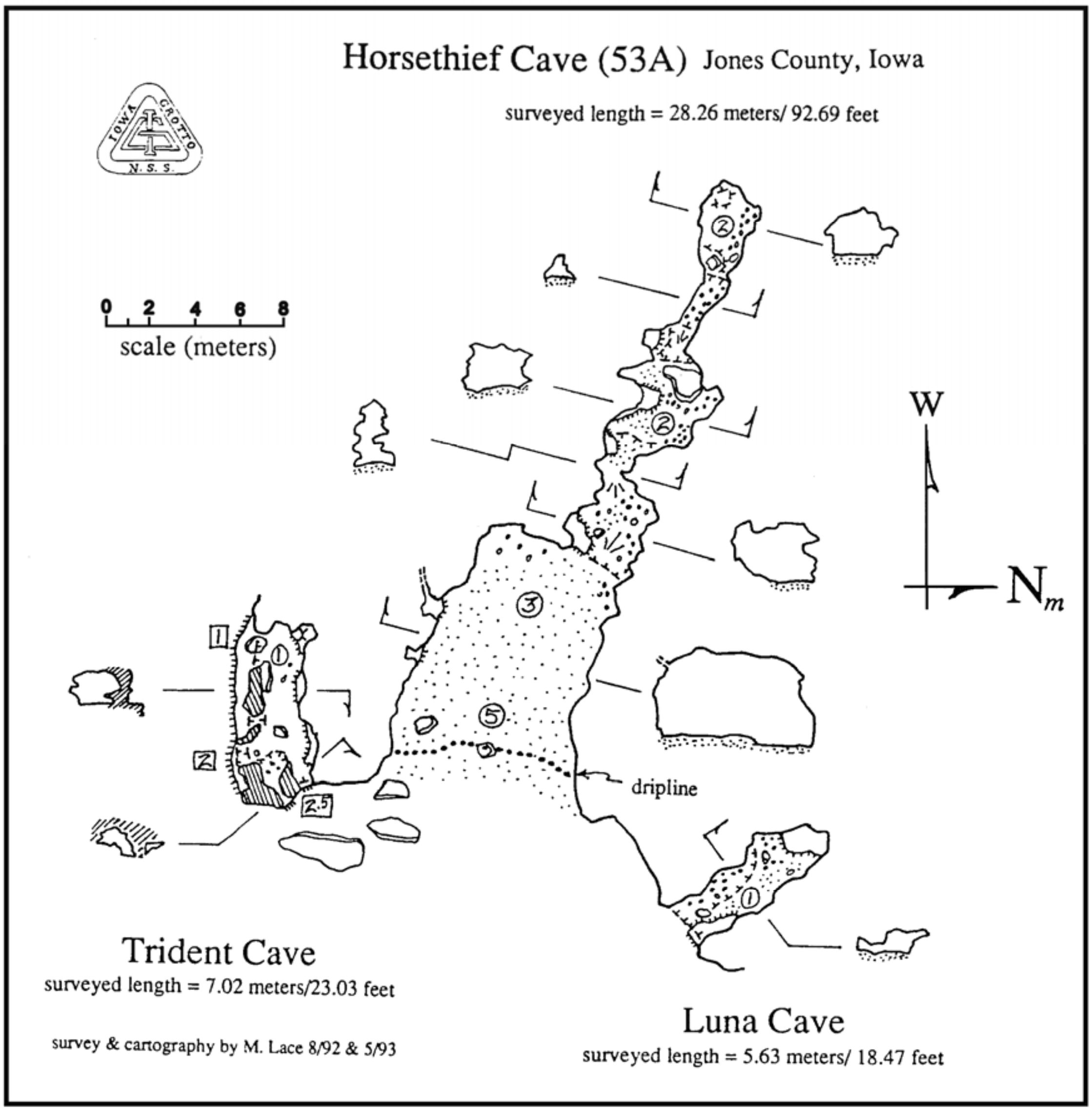

Figure 16. Cave map of Horsethief Cave, Wapsipinicon State Park, by M. Lace (from Iowa Grotto Cave Map Book v. 2, National Speleological Society).

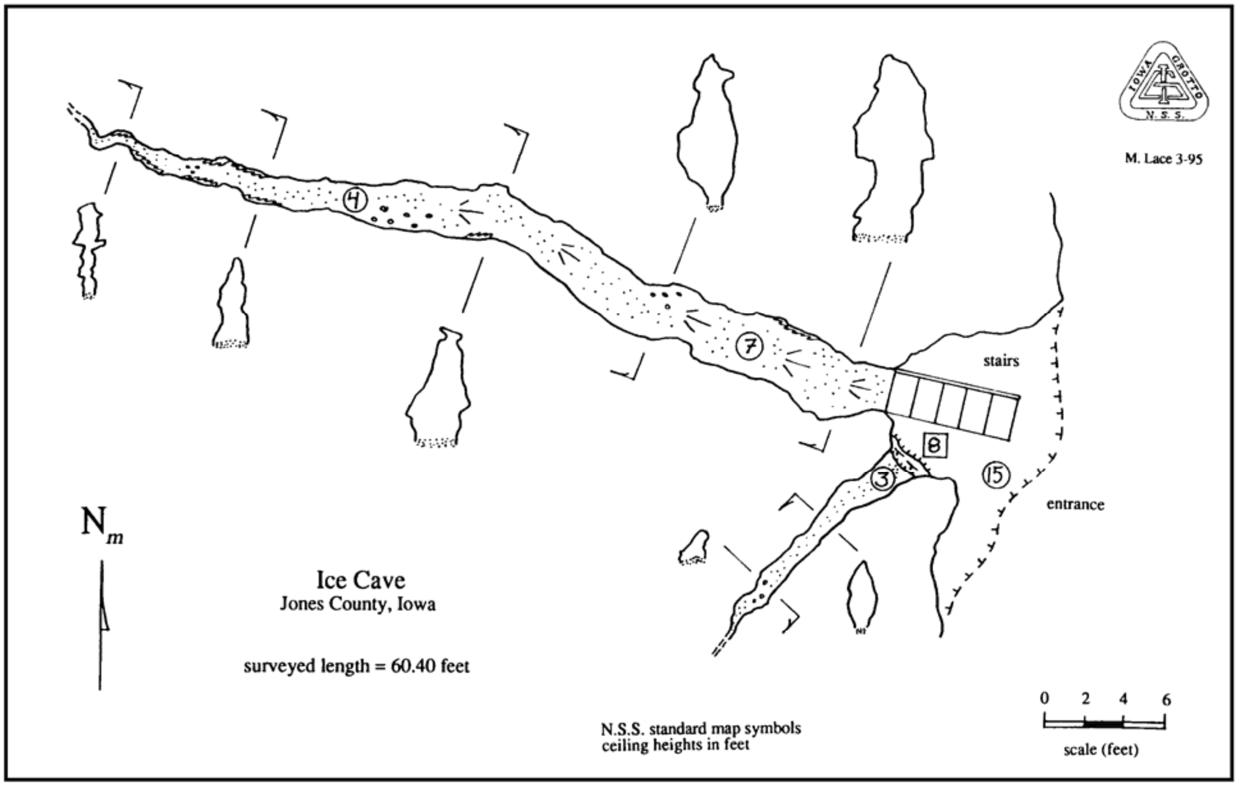

Figure 17. Cave map of Ice Cave, Wapsipinicon State Park, by M. Lace (from Iowa Grotto Cave Map Book v. 2, National Speleological Society).

This will mark the end of the geologic tour of Wapsipinicon State Park. For those that wish to see some additional sites in the area, there will be informal visits to the mound exposed along the cliff face east of the Anamosa Ball Park (Fig. 8) and/or cherty inter-mound facies in roadcuts along county road X40 near its intersection with Highway 151 immediately south of the Wapsipinicon River bridge.

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QUATERNARY GEOLOGY IN THE VICINITY OF WAPSIPINICON STATE PARK

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INTRODUCTION

The area examined for this trip lies near the border between the Iowan Surface and the East-Central Iowa Drift Plain (ECIDP) landform regions (Fig. 1). The boundary near Wapsipinicon State Park in Jones County is irregular and follows an interfingered northwest to southeast trend with a relatively even split between areas of the regions. East-central Iowa has a rich and complex geologic history punctuated by at least seven periods of glaciation between 2.2 million and 500,000 years ago. Subsequent erosion and ensuing drainage development have created a landscape of the steeply rolling topography that is characteristic of the ECIDP landform region. In this area, these Pre-Illinoian Episode glacial deposits are mantled by Pre-Wisconsin age colluvium (pedisediment) and Wisconsin age eolian materials (loess). The ECIDP is similar to the Southern Iowa Drift Plain, except that it has more shallow rock and outcrop. During the Wisconsin Episode glacial advance a period of intense cold resulted in massive erosion in the northeastern part of Iowa forming the landform region known as the Iowan 'Erosion' Surface.

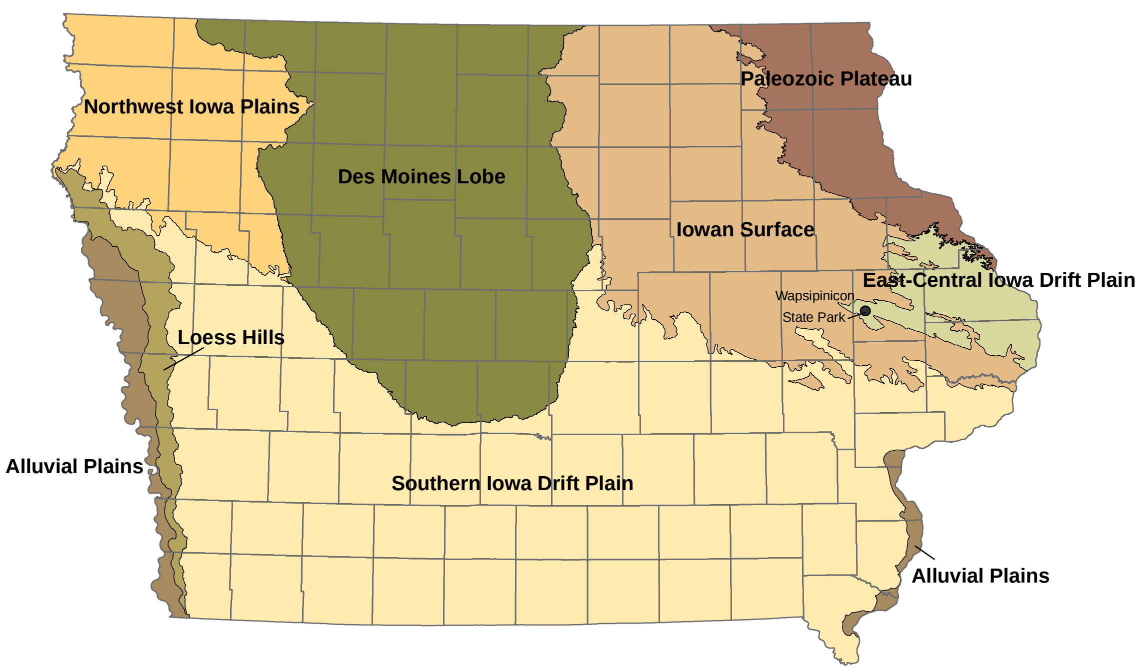

Figure 1: Landform regions of Iowa (Prior and Kohrt, 2006) showing the location of Wapsipinicon State Park near the boundary of the East Central Iowa Drift Plain and the Iowan Surface.

The Iowan Surface includes approximately half of Jones County and nearly all of the nearby counties to the northwest. The Iowan Surface is characterized by landscapes forming a complex mosaic of broadly stepped Wisconsin erosional surfaces cut into Pre-Illinoian Quaternary sequences, Wisconsin and Holocene alluvial surfaces, Wisconsin and Holocene eolian landforms, and intermittent areas of Paleozoic bedrock exposure. The stepped erosional surfaces were formed by stream action, slope wash and wind deflation during a period of intense freeze and thaw activity (periglacial) that occurred between 21,000 and 16,500 years ago during the coldest part of the Wisconsin Episode. While driving to and from the field trip, participants will likely traverse both landform regions and observe landscape features associated with the Iowan Surface.

Figure 2 shows LIDAR imagery for the area surrounding Wapsipinicon State Park. The change in topography between the well developed drainage divides of the ECIDP and the level Iowan Surface is highly visible. This boundary is also apparent when looking at the soils map of the area (Fig. 4). The ECIDP is dominated by loess with thin alluvium in drainages. The Iowan Surface is a mix of loamy sediments over till, eolian sand, loess, and sand and gravel. The variability represents the reworking of the original till materials during the formation of the Iowan Surface.

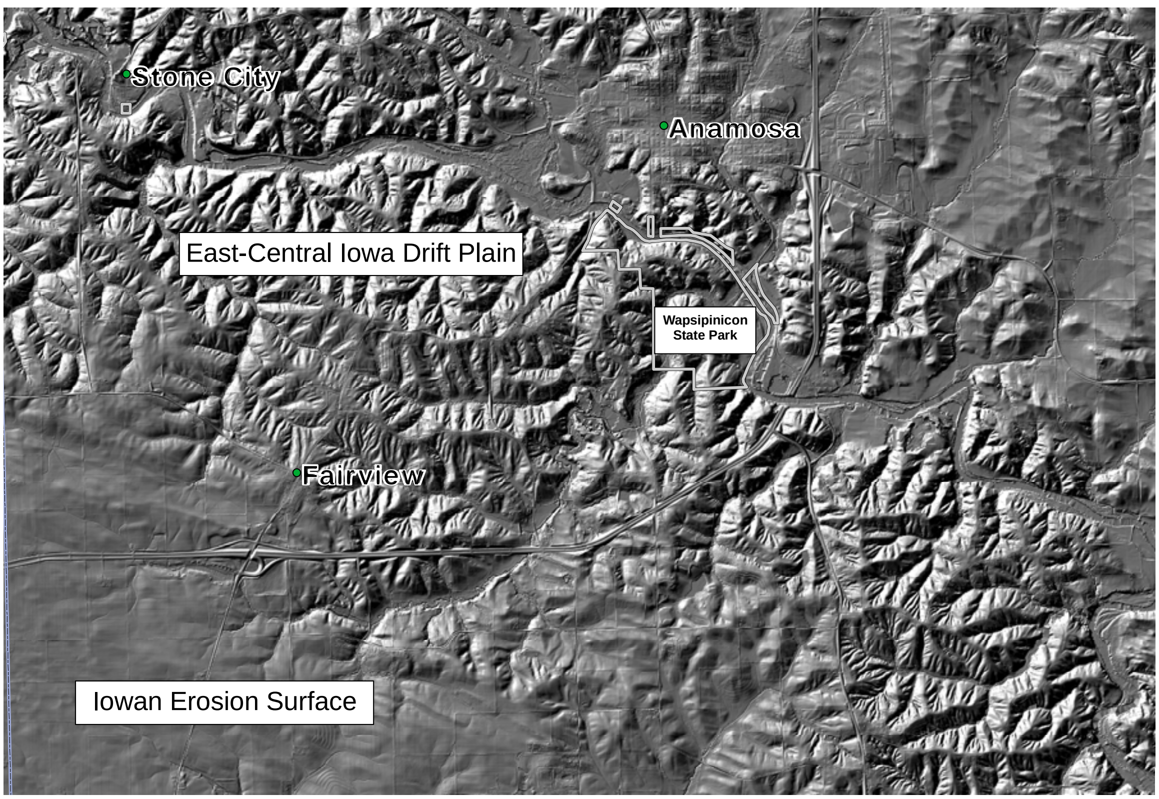

Figure 2. LIDAR imagery of the Stone City and Anamosa area. Note the distinct topographic boundary between the ECIDP (thicker loess, highly dissected landscape) and the Iowan Erosion Surface (thin loess overlying loamy sediments, gentle slopes).

REGIONAL STRATIGRAPHIC UNITS

The stratigraphic framework of east-central Iowa consists of materials from the Pre-Illinoian, Illinoian, Wisconsin and Hudson episodes. Pre-Illinoian materials are composed of glacial tills of the Wolf Creek and Alburnett formations as well as the intervening paleosols and unnamed sand and gravel units (Hallberg, 1980). The Wolf Creek Formation is subdivided into the Winthrop, Aurora and Hickory Hills till members (oldest to youngest). The Alburnett Formation till members are 'undifferentiated'. Although multiple till members may all be present in one area, laboratory analyses are necessary for differentiation. It is difficult to determine which till member is present from field descriptions alone, especially in areas where only one till is present. Generally speaking, the till units are all massive, uniform, loam textured basal tills.

East-central Iowa is mantled by two Wisconsin Episode loess deposits, the Peoria and Pisgah formations. These materials may overlie glacial till, Wisconsin age alluvium or unnamed Erosion Surface sediments. The Peoria Formation includes wind-blown materials and two facies are recognized: a silt facies (loess) and a sand facies (eolian sand). Materials are well-sorted, may be interbedded and range in texture from silt to medium sand. The Peoria Formation is time-transgressive, with deposition occurring between approximately 23,000 and 11,000 radiocarbon years before present (RCYBP) (Bettis, 1989). Loess deposition was most rapid from about 21,000 to 16,000 years ago during the period of intense cold associated with development of the Iowan Surface.

The Pisgah Formation originated as eolian silt and was altered by a combination of colluvial hillslope processes, pedogenic and periglacial processes. The Pisgah ranges in texture from silt loam (loess) to loamy sand and includes loess, colluvium, slope deposits and mixing zone materials. The Pisgah Formation was previously referred to as the 'basal Wisconsin loess' (Ruhe, 1969) or the 'basal Wisconsin sediment' and is the stratigraphic equivalent of the Roxanna Silt of Illinois and the Gilman Canyon Formation of Nebraska, although the lithologic properties vary (Bettis, 1990). Pedogenic alteration at its base has resulted in its incorporation with the underlying Sangamon Geosol. The Pisgah Formation is typically much thinner than the Peoria Formation and has the Farmdale Geosol developed on its surface. The Pisgah Formation was deposited between approximately 30,000 and 24,000 RCYBP (Bettis, 1989).

The Farmdale Geosol is an interstadial soil that represents a brief period of landscape stability during the Wisconsin glacial. It is expressed as a thin, dark grayish brown buried soil, and commonly contains charcoal. Periglacial activity has often altered the contact resulting in a discontinuous or mixed horizon. The Farmdale is widespread throughout the Midwest and is commonly identified in Illinois and Indiana (Hall and Anderson, 2000). Dates for the Farmdale Geosol range from 28,000 to 16,500 RCYBP (Bettis, 1989).

Quaternary materials within Wapsipinicon State Park generally consist of Peoria Loess mantling bedrock. Exposures are limited to thin loess and some colluvium over bedrock in drainages and on slopes. There may be isolated areas where Pre-Illinoian till is preserved on the bedrock surface below the loess, but no exposures have been identified. The loess may be relatively thick on the upland areas. The well log for the park shows 35 feet of loess overlying Silurian dolomite. Within a few miles of the park, striplogs indicate as much as 40 feet of loess, with an average thickness of 25 to 30 feet. Several of these logs also show a thin package of glacial till, up to 30 feet in thickness.

LANDFORM REGIONS OF EAST-CENTRAL IOWA

Iowa is divided into seven distinct landform regions: the Des Moines Lobe, Loess Hills, Southern Iowa Drift Plain, Iowan Surface, Northwest Iowa Plains, Paleozoic Plateau, and Alluvial Plains (Prior, 1991). The boundary between the Southern Iowa Drift Plain to the south and the Iowan Surface to the north occurs in east-central Iowa. The map unit classifications are based on a combination of landscape features, geologic materials, and slope elements. Each landscape region is associated with a series of depositional or erosional events and contains materials characteristic of those genetic processes. Prior's 1991 map has since been revised (Prior and Kohrt, 2006). On a large scale, the basic regions are the same; however, better imagery and data allowed for more detailed delineation of the boundaries and better identification of additional surface features such as paha and parabolic dunes.

East-Central Iowa Drift Plain

The ECIDP is an extension of the Southern Iowa Drift Plain. The two are separated by an area of Iowan Surface in Clinton County, southern Jones County and northern Cedar County. The primary difference is the shallow bedrock and presence of outcrop in the ECIDP landform region. Together, these areas make up the largest of Iowa's landform regions and comprise the southern portion of the state. Both landform regions are characterized by steeply rolling landscapes and well-developed drainage divides. Iowa has been glaciated at least seven times between approximately 2.2 million and 500,000 years ago (Boellstorff, 1978a,b; Hallberg, 1980, 1986) and has undergone alternating periods of landscape stability and erosion since that time. The great amount of time since the last glacial advance in this area has allowed for the development of an integrated drainage network and resulted in the destruction of the features typically associated with glacial landscapes. Pre-Illinoian age tills in eastern Iowa are typically uniform, massive, loam to light clay loam textured, basal tills with associated fluvial deposits and intervening paleosols. The glacial till is overlain by various thicknesses of loess deposits ranging from a few feet to greater than 50 feet near local sources.

Iowan Surface

In contrast to the ECIDP, the Iowan Surface to the northwest was the result of a period of intense cold from 21,000 to 16,500 years ago during the Wisconsin full glacial (Bettis, 1989). The Iowan Surface is the predominant landform region in northeastern Iowa and level rolling topography and limited exposures are typical of this landform region.

Description and Materials

Following many years of debate, it is now understood that the Iowan Surface is the result of extensive erosion during the Wisconsin Episode (Ruhe, et al., 1968; Hallberg, et al., 1978). A period of intense cold from 21,000 and 16,500 years ago and ensuing upland erosion led to the development of the distinctive landform recognized as the Iowan Surface (Prior, 1991). A periglacial environment prevailed during this period with intensive freeze-thaw action, solifluction, strong winds and a host of other periglacial processes. The result was that surface soils were removed from the Iowan Surface and the Pre-Illinoian till surface was significantly eroded.

Unlike the Pre-Illinoian tills of the Southern Iowa Drift Plain, those on the Iowan Surface were subjected to a combination of weathering and colluvial processes that created a package of much less consolidated materials at the surface. Iowan Surface materials are commonly loamy and sandy sediments, massive to weakly stratified, poorly consolidated, and may contain significant interbedded gravelly or pebbly loam units. There may be up to 20 feet of these materials, and they are commonly thicker on slopes and near stream valleys as part of solifluction lobes related to this time period. Some areas are also overlain by a thin increment (less than 5 feet) of Peoria Formation silt.

Geomorphic Features

Characteristic surficial features on the Iowan Surface include a stone line, glacial erratics, ice wedge polygons, and paha (Fig. 3). Extensive erosion of the upland stripped material from the surface resulting in the development of a regional colluvial lag deposit, or 'stone line'. Glacial erratics, boulders that have been transported by glaciers from their original depositional position, are commonly seen in this part of the state and are also a remnant deposit. Ice-wedge polygons formed in frozen sediments (permafrost) during this period of intense cold, and subsequently filled with material.

Other common features of this region are isolated and uneroded topographic highs of loess mantled Pre-Illinoian till, known as paha. These elongated hills are oriented northwest to southeast and are most abundant near the boundary between the Iowan Surface to the north and the Southern Iowa Drift Plain to the south. The stratigraphic units present within a paha are the same as what is typical on the Southern Iowa Drift Plain (oldest to youngest): Pre-Illinoian till, Sangamon Geosol, Pisgah Formation materials, Farmdale Geosol and Peoria Formation. Surrounding landscapes have had the upper materials eroded and only have Pre-Illinoian materials overlain by weathered or colluviated materials. Good exposures showing the internal stratigraphy of paha are rare, but intensive studies have been completed using drill core.

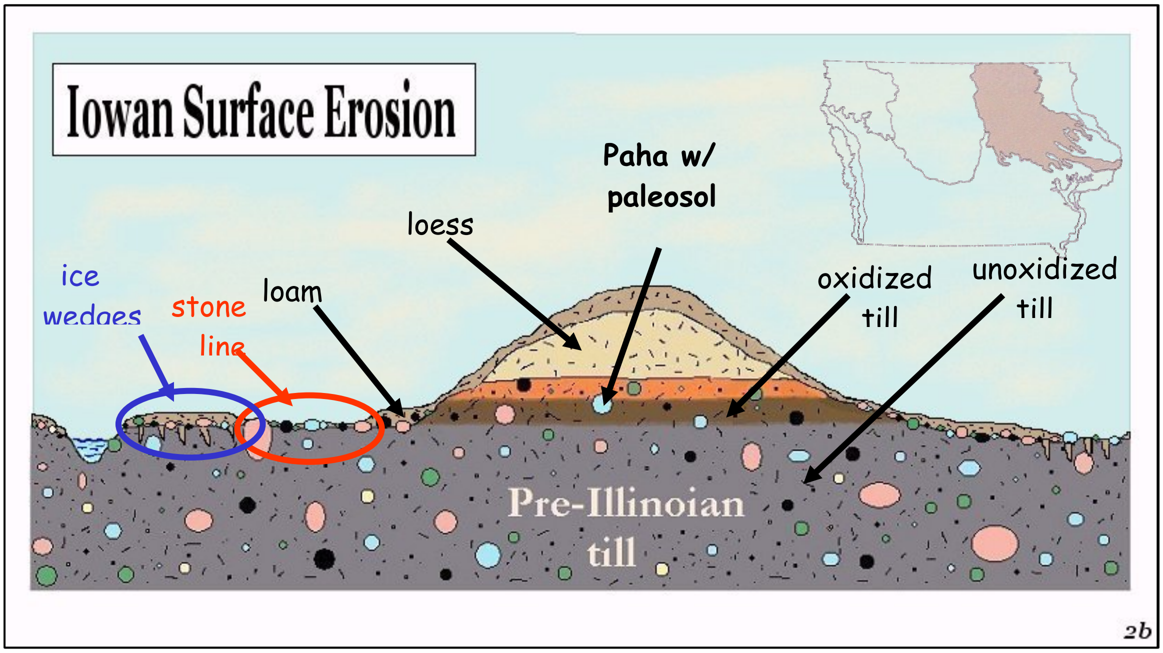

Figure 3. An idealized cross section of the Iowan Surface which illustrates the resulting landscape and sediment package formed during mass wastage of the landscape during an intense period of cold from 21,000 to 16,500 years ago.

Soils of the Stone City and Anamosa Area

The block diagram in Figure 4 illustrates the pattern of soils and parent materials that compose the landscape of the Stone City and Anamosa areas. The limestone bedrock represents the underlying Silurian-age carbonate rocks which are overlain by Pre-Illinoian age tills with a thin veneer of periglacially altered loamy sediments. This sediment package is blanketed by variable thicknesses of Peoria Formation loess. The Fayette soil is formed in loess and forms the narrow ridges and steep sideslopes. These soils developed in forested conditions. The Nordness soils are residual soils developed in the underlying carbonate bedrock and formed on very steep slopes adjacent to stream valleys, ie. the Wapsipinicon and it's numerous tributaries. Figure 5 provides a larger overview of soils in relationsip to the local topography. Sand stringers and dunes are common near the transition from Iowan Surface to the ECIDP as well as north of Anamosa where wind aligned features are visible on the LIDAR imagery (Fig. 2).

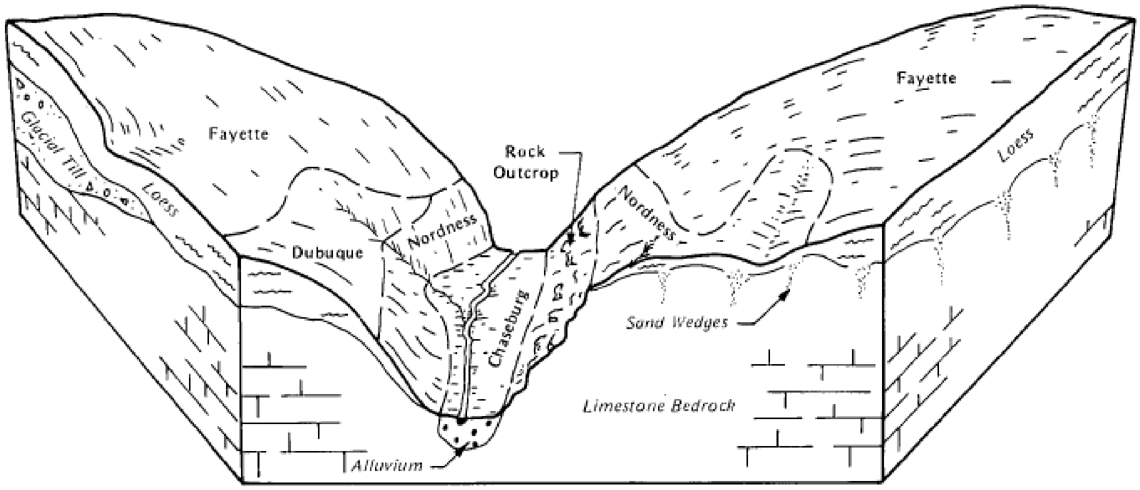

Figure 4. The typical pattern of soils and parent materials associated with Fayette-Nordness-Rock Outcrop Association in the Stone City and Anamosa area (Soils Survey, Jones County, Iowa, 1991).

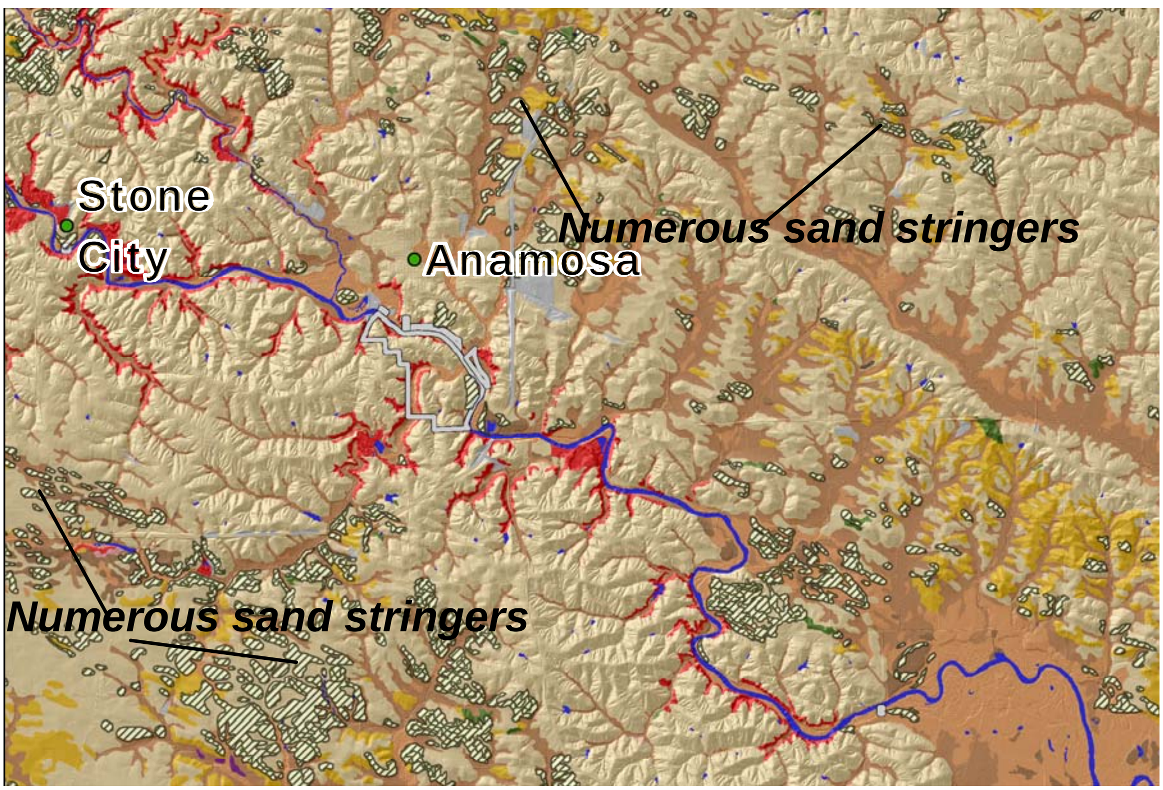

Figure 5. Digitized soils overlain on LIDAR imagery of the Stone City and Anamosa area. Note numerous sand stringers and dunes (hatchure pattern) present on the Iowan Erosion Surface (lower left hand corner). Dark areas along the Wapsipinicon Valley and associated tributaries are areas of bedrock outcrop (Nordness soil series). Narrow ridgetops and steep sidelopes are composed of the Fayette soil series. Other darker areas in the figure are mapped as alluvium and loamy sediments.

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VEGETATION OF WAPSIPINICON STATE PARK

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INTRODUCTION

Wapsipinicon State Park is located on the north- and east-facing slopes flanking the Wapsipinicon River as it traverses Jones County in a northwest to southeast direction. Approximately 400 acres in size, the park contains a variety of vegetation including mature forest, old fields in both grassy and woody stages of succession, an old pine plantation, a cropfield managed as a wildlife food plot, and the manicured turf of a golf course. Comparison of aerial photographs from the 1930s and 2008 provides insights into the history of vegetation changes that have occurred in the park.

VEGETATION TYPES

Six major vegetation types are recognized in the park (Fig. 1). The following sections will briefly describe each of these types.

Old forest. Examination of 1930s-era aerial photographs shows approximately 150 acres of forest along the west and north sides of the park associated with steep topography and rock outcrops where farming was impractical. Forest area within the park had increased to 250 acres by 2008, consisting of the original 150 plus an additional 100 that had developed on former grassland. The original 150 acres today is occupied by a mature forest dominated by large trees of white oak (*Quercus alba*), red oak (*Quercus borealis*), basswood (*Tilia americana*), and sugar maple (*Acer saccharum*), a composition typical of natural upland forests in eastern Iowa. White oak and red oak tend to be more abundant on ridges and upper slopes while sugar maple and basswood are more abundant on lower slopes. Saplings of sugar maple are very numerous in the understory of all parts of the old forest and appear destined to become the dominant trees in the overstory as the present canopy trees die and are replaced. Ironwood (*Ostrya virginiana*) is also common as a small tree in the understory. Herbaceous plants occupying the forest floor include graminoids such as Pennsylvania sedge (*Carex pennsylvanica*), white bear sedge (*Carex albursina*), nodding fescue (*Festuca obtusa*) and bottlebrush grass (*Hystrix patula*); ferns such as lady fern (*Athyrium felix-femina*), interrupted fern (*Osmunda claytoniana*), and maidenhair fern (*Adiantum pedatum*); and wildflowers including Mayapple (*Podophyllum peltatum*), wild ginger (*Asarum canadense*), wild geranium (*Geranium maculatum*), blue cohosh (*Caulophyllum thalictroides*), and yellow bellwort (*Uvularia grandiflora*). This vegetation type is mapped as "old forest" in Figure 1.

Within the old forest section of the park, rock outcrops occur on the steepest blufflands bordering the Wapsipinicon River and Dutch Creek. Many cliffs and small openings on these blufftops are characterized by bare rock, thin soils, and greater exposure to sunlight. They support an interesting array of vascular plants, lichens, mosses, and liverworts not found in the heavily shaded, deep soil habitats that prevail throughout most of the old forest. Examples of vascular plants of this nature include yellow touch-me-not (*Impatiens pallida*), bulblet bladder fern (*Cystopteris bulbifera*), liverleaf (*Hepatica nobilis*), columbine (*Aquilegia canadensis*), and ebony sedge (*Carex eburea*). Although occurring on high branches throughout much of the old forest, many foliose lichens become more abundant

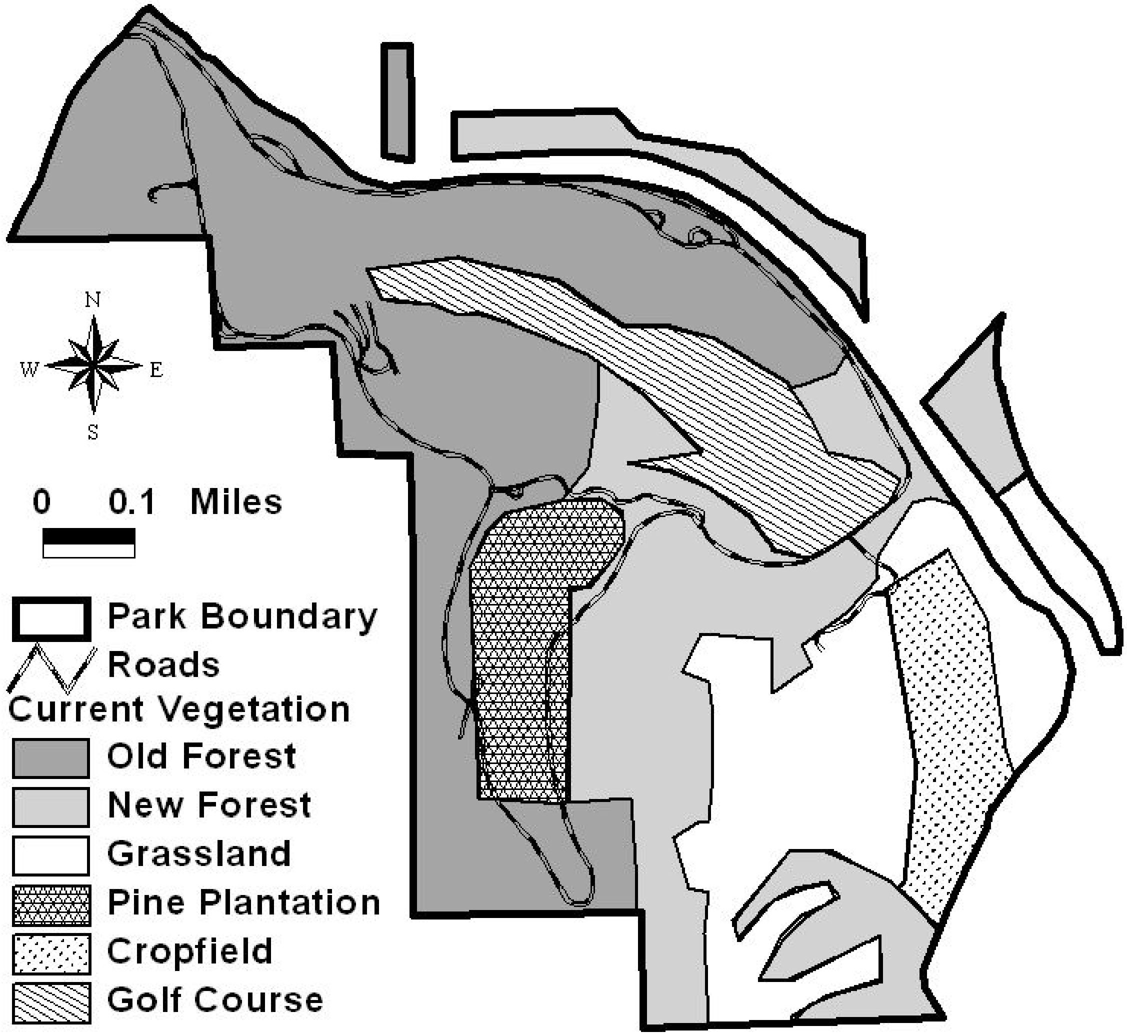

Figure 1. Map of current vegetation types in Wapsipinicon State Park.

closer to the ground on tree trunks in and near these exposed habitats, including speckled shield lichen (*Punctelia rudecta*), common greenshield (*Flavoparmelia caperata*), and bottlebrush frost lichen (*Physconia leucolyptes*). On highly exposed sites such as the dolomite cliffs along Dutch Creek near the "Ice Cave", colorful, crustose lichens such as mealy firedot (*Caloplaca citrina*) and sulphur firedot lichen (*Caloplaca flavovirescens*) occur in close association with smooth cliffbrake fern (*Pellaea glabella*).

New forest. As mentioned in the previous section, approximately 100 acres of "new forest" developed on former grasslands in the park between the 1930s and 2008, now occupying a broad band in the central part of the park, located on moderately sloping, former pasture between old forest and grassland vegetation types (Fig. 1). Today it consists of a diverse mixture of pioneering tree species such as elms (*Ulmus americana* and *U. rubra*), green ash (*Fraxinus pennsylvanicus*), and northern pin oak (*Quercus ellipsoidalis*) and shrubs such as wild plum (*Prunus americana*), black raspberry (*Rubus occidentalis*), smooth sumac (*Rhus glabra*), and rough-leaved dogwood (*Cornus drummondii*). Tree species typically dominating the old forest (white oak, red oak, sugar maple, and basswood) are rare or absent. The present boundary between new forest and grassland represents the edges of cropfields that existed in the pre-park landscape as late as 1990, when the 140-acre hunting area in the southeast corner of the present park was acquired.

Pine plantation. A 23-acre plantation of pines, primarily white pine (*Pinus strobus*) was established on former agricultural land in the 1920s about the time that the park was established. By the 1950s, this plantation, located on a ridge and west-facing slope above Dutch Creek traversed by the park road, contained a vigorous, dense stand of young pines (Fig. 2). Today it is dominated by tall, 80 year old trees up to two feet in girth (Fig. 3). Native deciduous trees - particularly black walnut (*Juglans nigra*) – have become established beneath the pines and will become the new canopy species when the pines eventually die. Herbaceous plants in the undergrowth of the plantation are a mixture of species found in disturbed woods such as hog peanut (*Amphicarpaea bracteata*), cleavers (*Galium aparine*), honewort (*Cryptotaenia canadensis*), rattlesnake fern (*Botrychium virginianum*), Jack-in-the-pulpit (*Arisaema triphyllum*), and clearweed (*Pilea pumila*) and species found in mature, relatively undisturbed woods such as wild ginger (*Asarum canadense*), spikenard (*Aralia racemosa*), wild sarsaparilla (*Aralia nudicaulis*), and blue cohosh (*Caulophyllum thalictroides*).

Figure 2. Photograph from 1950s of the pine plantation.

Figure 3. White Pines as seen in the park's Pine Plantation today.

Grassland. A large, mostly treeless area of rolling grassland occupies the most of the southeastern part of the park. Except for a 20-acre wildlife food plot, cultivation and cropping of this 90-acre area ceased in 1990 when this it was acquired and added to the park as a hunting area. Seeded with native grass species and prairie forbs, this grassland is now dominated by a mixture of Indiangrass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii*), Canada goldenrod (*Solidago canadensis*), and common milkweed (*Asclepias syriaca*). Annual cultivation of this area in its pre-park phase prevented trees from establishing. The present boundary of the new forest-grassland contact represents the former extent of the former cropfields.

Cropfield. As mentioned in the grassland section, this 20-acre area is presently used as a wildlife food plot, planted with annual seed-producing crops favored by many wildlife species. It is the sole cropfield remaining from an era of extensive cultivation that existed in what is now the southeastern part of the park while a private farm.

Golf course. A nine-hole golf course has occupied the center of the park since its dedication in 1923. Consisting of fairways and greens planted with introduced grasses and maintained by frequent mowing and cultural treatments, it is a popular recreational feature of the park. Comparison of aerial photos from the 1930s and 2008 indicates that the course has not changed considerably in size or shape during that time, although forest now occupies more of its perimeter now than in the past.

FAUNA OF WAPSIPINICON STATE PARK

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Wapsipinicon State Park is located along the Wapsipinicon River just south of Anamosa. The park has mature upland and riparian forest, a golf course, a campground, and picnic areas. The 140 acre recreation area on the south side of the park is grassland and forest.

BIRDS

Sixty-one species of birds were listed as probable or confirmed breeders (Table 1) in the nine section breeding bird atlas block that included both units of Wapsipinicon State Park (Jackson et al., 1996). The number of birds listed is similar to other forested parks like Lacey-Keosauqua and Dolliver, which list 69 and 68 species respectively. The diversity of breeding bird species for Wapsipinicon is slightly lower because the areas of mature forest are smaller and more scattered. Lacey-Keosauqua and Dolliver both have larger areas of mature forest with a well developed understory. Many forest-interior birds require high quality understory for food, cover and nest sites. The golf course and other open areas around the lodge fragments or breaks up the forest into small blocks. However, these open areas do provide habitat for species such as the eastern meadowlark, dickcissel and eastern kingbird.

Table 1. List of confirmed and probable breeding birds for Wapsipinicon State Park Breeding Bird Atlas Block (Jackson et al., 1996).

Canada Goose	Wood Duck	Mallard
Turkey Vulture	Red-tailed Hawk	Ring-necked Pheasant
Wild Turkey	Killdeer	Rock Dove
Mourning Dove	Barred Owl	Common Nighthawk
Chimney Swift	Ruby-throated Hummingbird	Belted Kingfisher
Red-headed Woodpecker	Red-bellied Woodpecker	Downy Woodpecker
Hairy Woodpecker	Northern Flicker	Pileated Woodpecker
Eastern Wood-Pewee	Eastern Phoebe	Eastern Kingbird
Purple Martin	Northern Rough-winged Swallow	Bank Swallow
Barn Swallow	Blue Jay	American Crow
Black-capped Chickadee	Tufted Titmouse	White-breasted Nuthatch
House Wren	Blue-gray Gnatcatcher	Eastern Bluebird
American Robin	Cedar Waxwing	European Starling
Yellow-throated Vireo	Warbling Vireo	Red-eyed Vireo
American Redstart	Ovenbird	Common Yellowthroat
Northern Cardinal	Rose-breasted Grosbeak	Indigo Bunting
Dickcissel	Chipping Sparrow	Savanna Sparrow
Song Sparrow	Red-winged Blackbird	Eastern Meadowlark
Common Grackle	Brown-headed Cowbird	Baltimore Oriole
Pine Siskin	American Goldfinch	House Sparrow
House Finch		

Figure 1. Bluebird
Photograph by Jim Durbin

Figure 2. Wood duck
Photograph by Jim Durbin

MAMMALS

Mammals that are commonly seen in the park are white-tailed deer, raccoon, opossum, wood chuck, fox squirrel, eastern chipmunk, and cottontail rabbit. River otters have occasionally been seen in the river and at the mouth of Dutch Creek. Small mammals that are rarely seen but occur or are likely to occur in the park are eastern mole, short-tailed shrew, masked shrew, white-footed mouse, meadow vole, meadow jumping mouse, and southern flying squirrel. A list of the mammals observed or that potentially occurring in the park are listed in Table 2.

Figure 3. Big brown bats
Photograph by Russ Benedict

Five species of bats were recorded during an on-night mist net and acoustical survey in August of 2009. Big brown (Fig. 3), long-eared, red and little brown bats were captured in mist nets set over Dutch Creek and an adjacent trail. The acoustical survey equipment also identified silver haired bat as occurring in the area of the mist net survey. The mature forest in the park provides habitat for these species.

Table 2. List of Mammals Observed or Potentially Occurring in Wapsipinicon State Park.

Virginia Opossum	Masked Shrew	Short-tailed Shrew
Eastern Mole	Northern Myotis	Little Brown Bat
Eastern Pipistrelle	Big Brown Bat	Red Bat
Hoary Bat	Silver Haired Bat	Eastern Cottontail
Eastern Chipmunk	Woodchuck	Fox Squirrel
Southern Flying Squirrel	Beaver	Western Harvest Mouse
White-footed Mouse	Deer Mouse	Meadow Vole
Woodland Vole	Meadow Jumping Mouse	Muskrat
Coyote	Red Fox	Raccoon
Mink	River Otter	White-tailed Deer

AMPHIBIANS AND REPTILES

No survey of the park has been completed for amphibians and reptiles but a list of species that potentially occur in the park is provided in Table 3.

Table 3. List of Amphibians and Reptiles that Potentially Occur in Wapsipinicon State Park.

Tiger Salamander	Northern Leopard Frog	Green Frog
Gray Treefrog	Cope’s Gray Treefrog	Western Chorus Frog
Cricket Frog	American Toad	Painted Turtle
Snapping Turtle	Spiny Softshell Turtle	Northern Water Snake
Brown Snake	Eastern Garter Snake	Plains Garter Snake
Prairie Ringneck Snake	Blue Racer	Milk Snake
Bullsnake	Fox Snake	Black Rat Snake

FRESHWATER MUSSELS

Surveys of the Wapsipinicon River above and below the park in 2005 and 2006 and at the park in 2008 found 16 live species and dead shells of two additional species. Two state endangered species (Higgins’ eye and pistolgrip) and two state threatened species (creeper and ellipse) were found live during the surveys. The full list of species found is presented in Table 4.

Beginning in 2001 the DNR, in cooperation with the U. S. Fish and Wildlife Service, began a program to reintroduce Higgins’ eye mussel (Fig. 4), a federal and state endangered species, into interior rivers in Iowa. The mussels were reintroduced by releasing host fish, usually walleye or largemouth bass fingerlings that were carrying the larval stage (glochidia) of the mussels on their gills. The period of attachment varies greatly, from 1 to 25 weeks, depending on the host, mussel species, water temperature, and the attachment location on the host. While attached to the host, the glochidia change form and begin to look like the adult mussels. Once the glochidia have completed metamorphosis, the young mussels drop to the bottom of the river or stream. After several years the mussels become sexually mature. Mussels can be long-lived with most species living more than 10 years and a few to possibly 100 years.

Figure 4. Higgins’ eye mussel
Photograph by Scott Gritter

The presence of Higgins’ eye mussels in the Wapsipinicon River several years after the reintroduction provides positive evidence that our efforts to establish a population of this endangered species in one of Iowa’s interior rivers may be successful. Because the survival rate of juvenile mussels is very low and mussels are not uniformly distributed in the river it is quite surprising that we were able to find these juvenile Higgins’ eye mussels. We will know that the reintroduction is successful if juvenile mussels produced by the reintroduced individuals are found in a few more years.

Table 4. List of Freshwater Mussels Observed in the Wapsipinicon River.

Elktoe	Threeridge (dead shell only)	Plain Pocketbook
Higgins' eye	Fat Mucket	White Heelsplitter
Fluted Shell (dead shell only)	Fragile Papershell	Black Sandshell
Hickorynut	Pink Papershell	Giant Floater
Pimpleback	Creeper	Lilliput
Pistolgrip	Deertoe	Ellipse

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NOTES ON THE ARCHAEOLOGY OF WAPSIPINICON STATE PARK

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INTRODUCTION

What follows is a brief summary of archaeological investigations in Wapsipinicon State Park. It was compiled from records and reports on file at the University of Iowa State Archaeologist (UI-OSA). Additional investigations may have taken place, and the author apologizes for these omissions.

Several archaeological surveys have been conducted over the years within Wapsipinicon State Park. Eleven archaeological sites are recorded by UI-OSA within the park boundaries. These were occupied by precontact Native Americans, as long ago as the Late Paleoindian and Early Archaic periods (10,500 to 5,500 B.C.). Two of these sites have been partially excavated: Horse Thief Cave (13JN8) and 13JN258.

Horse Thief Cave was excavated in 1922 by A. C. (Gus) Corcoran, an avocational archaeologist from Anamosa. The circumstances leading to this work would, fortunately, be unimaginable today: As part of the earliest improvements made to the park, the State Conservation Commission had approved the removal of the upper four feet of the cave's natural fill for use in building steps to improve access to the cave. Although the floor of the cave was littered with cultural material, there was originally no intent for an archaeological excavation. Corcoran fought and won a bitter battle with Mayor Frank Johnson and others in the community to be allowed to spend what turned out to be four days of excavation.

The results of his work are quoted below from Morrow (1997).

> "Corcoran (1928a:3) estimated that more than 200 yards of sediment was removed from the cave…. There was a large amount of refuse, apparently showing no clear stratigraphy, in front of the cave…. Corcoran (1928a:3) indicated that the bones and shells from this area were badly decayed and that "a few flint chips, arrow heads, and teeth were about all that was saved." In the interior of the cave, Corcoran noted four distinct strata. The upper 12 inches (31 cm) consisted of ashes, underlain by five inches (13 cm) of clay and roof fall. Beneath this was about 23 inches (58 cm) of ashes underlain by a thin continuous strip of light brown ash (Corcoran 1928a:3).
>
> Corcoran's account indicates that relatively few artifacts were found in the top layer and nothing in the underlying clay. He indicated that he found "scarcely a half dozen arrow heads and one grooved axe, polished, but very rude and coated with lime" (Corcoran 1928a:3). Beneath the clay layer in the underlying ash, Corcoran (1928a:3–4) stated that he recovered "about a dozen arrow heads mostly triangular and laurel leaf forms, some of them nicely finished but very small. Two spear heads – one twenty-six inches from the surface – oblong rude. One four feet from the surface, slightly barbed, pointed shaft, fairly well finished, heavily coated with stalagmite."
>
> In addition to these artifacts, Corcoran (1928a:4) indicated that "Four bone awls very rude – a few stones used for breaking bones and cracking nuts, and a considerable number of pieces of pottery" were found but does not specify the layers from which these were derived. He also states that "there were no ornaments of any kind." Corcoran (1928a:4) noted large numbers of mussel shells throughout the cave deposits and he saved "nearly five bushels of animal bones."

> Of these faunal remains, Corcoran wrote: "They represent about every specie (sic) of animal, bird or reptile common to the Mississippi Valley and several now extinct, notably the mastodon and a small ungulate left over from the early Pleistocene."
>
> Corcoran encountered nine human skeletons in his excavation of Horse Thief Cave. All of them were reportedly buried in a seated position facing the cave entrance. Corcoran's (1928a:4) descriptions of the burials and their provenience is incomplete but he does indicate that there were "five with full set of milk teeth – one infant – one with wisdom teeth just even with jaw." One "large skeleton" near the center of the cave was mostly burned and was found under a mound of charcoal. He also noted one "large male near the north side of the entrance, fairly well preserved, teeth much worn and entirely devoid of nerve cavities" (Corcoran 1928a:4). There was also "one child thirty inches, buried with some animal not surely identified."
>
> A letter from A. D. Corcoran to Charles R. Keyes [of Cornell College, Mount Vernon, who was for all intents and purposes Iowa's first state archaeologist) dated 9 April 1928 describes artifacts and other objects that were washed out of the "midden" below the cave about 20 August 1926 (Corcoran 1928b). These items are also mentioned in Corcoran's manuscript (1928a:2). Corcoran indicated that the four or five foot deep hole cut by the creek "threw out a large number of elk and deer horns, broken bones, mussel shells, a piece of mastodon tusk 18 inches in length, several pieces of pottery, one unpolished axe of black basalt, one flesher made of hematite unpolished, several broken arrow and spear heads, several buffalo teeth, all more or less petrified." (Corcoran 1928a:2). Corcoran's letter to Keyes (Corcoran 1928b) also mentions that he found a human femur here the week before he wrote the letter."

Today, materials from Corcoran's invaluable efforts are curated at the Office of the State Archaeologist, and faunal materials are in collections of the University of Iowa Geosciences Department. Morrow (1997) examined these collections. Time-diagnostic artifacts that he identified are primarily ceramics and projectile points from the Woodland and Late Prehistoric periods, but a few projectile points of the Late Paleoindian and Early through Late Archaic periods are present. No "mastodon tusk" is present in the collections, and the whereabouts of human remains from the site is also not known.

Peterson and Krieg (1997) examined six archaeological sites on stream terraces of the Wapsipinicon River in the southeast part of the park. Four of these were prehistoric artifact scatters of undetermined cultural affiliation. Artifacts were found only in the plowzone. Another site yielded evidence of Late Archaic through Early Woodland occupations, but was outside their project area and not further investigated. Excavations at a sixth site, 13JN258) encountered Woodland-period materials that extended up to 80-100 cm below surface. Most materials were found in the upper part of the sandy soil profile, and decline in frequency with depth, and were interpreted as having been mixed into the soil by burrowing animals and other soil processes.

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THE HISTORY OF WAPSIPINICON STATE PARK

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INTRODUCTION

Wapsipinicon State park encompasses 398 acres of land along the Wapsipinicon State Park just south of Anamosa in Jones County, Iowa. Most of the park area is rolling upland, wooded area with very steep limestone bluffs bordering the flood plain of the Wapsipinicon River. The initial parcels that form the park were acquired by the State of Iowa in 1921 and 1922, with additional parcels added as recently as 2005. The park area and surrounding regions has a rich and colorful history, much of which has been documented by several past park rangers.

ACQUISITION OF WAPSIPINICON STATE PARK

Much of the following section includes material modified from an article originally prepared in 1981 by Mike Brewer, Wapsipinicon Park Ranger, and Bert Finn, Anamosa Area Historian and published in the Iowa Conservationist Magazine

The initial planning and interest in a park in the Anamosa area started at a meeting in the old courthouse, no longer standing, in February of 1921. The initial meeting was to see if there was enough interest to purchase approximately 180 acres being farmed by Asa W. Smith who raised horses purchased in the west. Afterwards, it would be donated to what was then called the Iowa State Board of Conservation. The scenic land under discussion included areas that were heavily forested, and officials at the Men's Reformatory at Anamosa had made an agreement with Mr. Smith to harvest the timber in return for ½ of the wood for use at the reformatory. The committee and the citizens quickly pledged enough money that night to purchase an option on the Smith property and save the timber. Over the next few weeks, $22,936 was raised for the purchase price and the 183.49 acre tract was acquired. The Iowa State Board of Conservation also acted quickly in accepting the unusual grant, one of the first parks given to the State as a gift. The following day, the State Executive Council formally approved the site and the State Board of Control passed a resolution pledging labor from the reformatory prisoners to develop the park. The deed to the property was presented to the State in April, 1921 (Fig. 1).

During the summer of 1921, crews of inmates began constructing facilities at this brand new park, Wapsipinicon State Park. One of the first projects was the building of roads and bridges throughout the park, necessitating the dynamiting of limestone bluffs to build the entrance into the park. The superintendent of Anamosa Schools asked to be notified when the blasting was to begin in order to dismiss school so that the students could watch. Blasting was necessary at many intervals along the river and interior park roads due to the large bluffs. The rest of the construction work was accomplished by hand using picks, shovels, malls and any wheelbarrows. The construction of the roads and bridge project took nearly 5 years to complete.

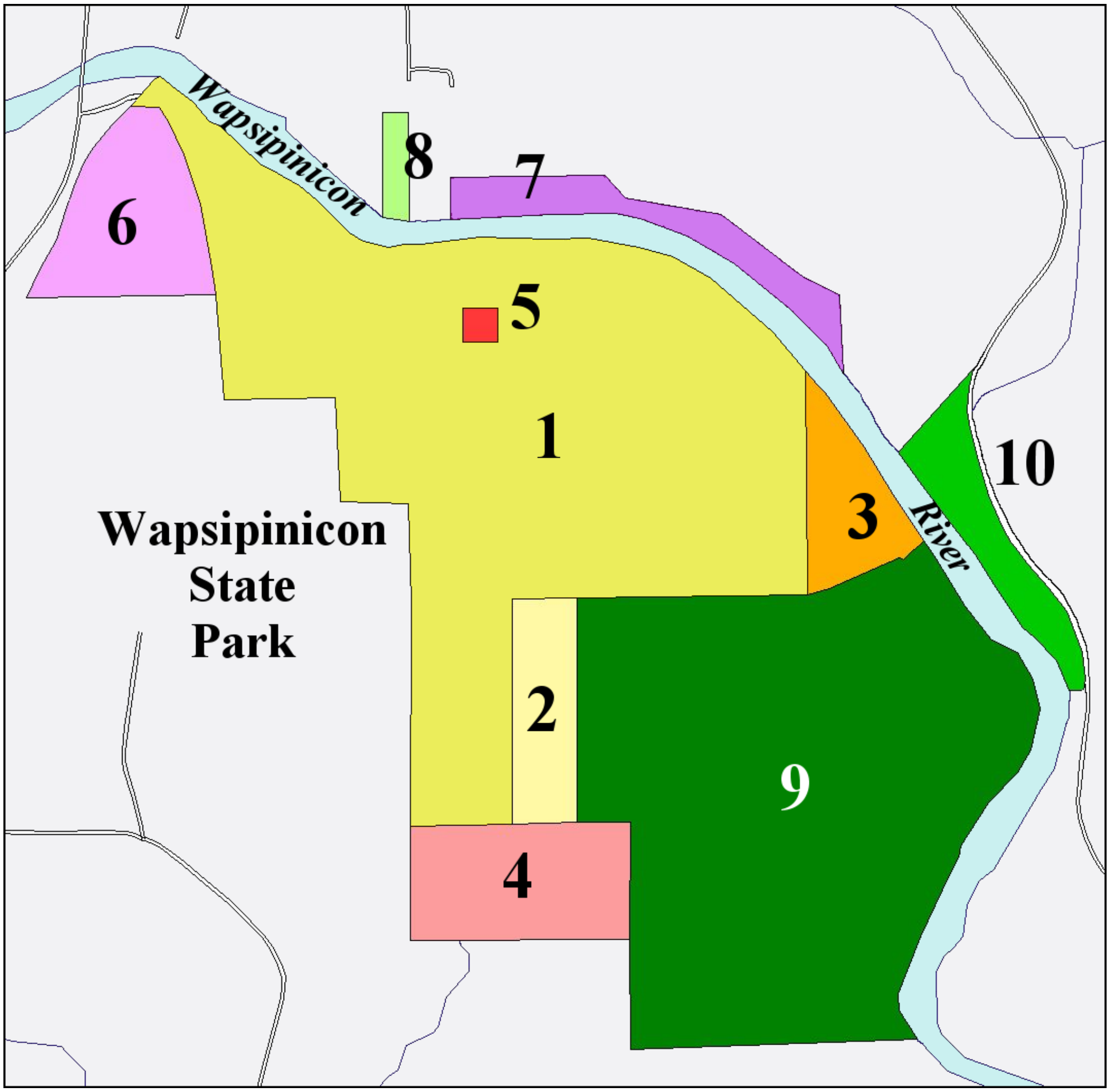

Figure 1. Parcels of land acquired to create Wapsipinicon State Parks. Numbers indicate the order in which the parcels were acquired. See Table 1 for details of parcels.

Table 1. Parcels of land acquired to create Wapsipinicon State Parks. Parcel numbers relate to areas in Figure 1.

parcel	date acquired	acres	previous owner
1	04-07-1921	169	C.L. Niles and others
2	11-02-1922	12	C.L. Niles and other
3	11-20-1922	12	Clyde B. Smith
4	03-03-1923	21	P.B. & Lena Daly
5	02-16-1928	1	C.L. Niles and other
6	10-21-1940	19	Jessie L. Smith
7	09-16-1947	12	C.L. Niles
8	03-30-1976	2	Jane Niles Etvir Zeleznak
9	10-19-1990	138	Dallas F. & Patricia A. Oler
10	06-14-2005	12	Olga & Cletis McNamara

In November 1922, 12 acres of land was acquired just east of Dutch Creek on the south edge of the park. Later that November, an additional 12 acres was purchased by a local committee headed by Asa Smith for part of a 9-hole golf course. Shortly after the purchase, the local committee signed up 118 charter club members. They also made plans for the construction of the golf course and clubhouse, and a board of directors was formed calling itself the Wapsipinicon Country Club. The clubhouse and golf course were also built with prison labor taking 3 years to complete. Rock for the footings and fireplaces and white oak logs for the walls and ceiling rafters were hauled in during the winter from nearby timber along Buffalo Creek using horse-drawn bobsleds. The clubhouse was formally dedicated in June, 1924. The clubhouse, which still stands today (see Fig. 2), is in fairly good shape and is still used daily. The golf course is open to the public and is still run by the Wapsipinicon Country Club board of directors. No tax dollars are spent on the operation of the golf course or clubhouse as they are supported by the club membership and green fees.

Figure 2. Clubhouse for the Wapsipinicon Golf Club at Wapsipinicon State Park, constructed in 1924.

Wapsipinicon State Park added an acre of land in the center of the original parcel early in 1928, and, later, the State purchased a 19-acre parcel on the northwest edge of the park from Jessie Smith in 1940. In 1947, Wapsipinicon State Park acquired the first of three parcels on the east bank of the Wapsipinicon River, a 12-acre parcel gift from C.L. Niles. This was followed by a 2-acre parcel just north of the park, donated by Jane Niles Etvir Zeleznak in 1976.

In October 1990, the DNR took possession of 138 acres of land adjoining the southeast edge of Wapsipinicon State Park. This was the largest addition of land since the donation of the original park in 1921. The land, a farm purchased by the state from Dennis and Patricia Oler, included several hills, grassy slopes, brushy valleys, two ponds, and roughly 50 acres of cropland with buildings and also added more than a mile of riverfront to the park. Funds for the purchase of this land were provided by the Iowa State Department of Natural Resources Resource Enhancement and Protection program (REAP).

The final addition of land into Wapsipinicon State Park was in June 2005 when 12 acres on the east bank of the Wapsipinicon River was purchased from Olga and Cletis McNamara. Funding for this purchase also came from the REAP program.

INMATE CONCERTS AT WAPSIPINICON PARK

One of the popular attractions of the park in its early years was the bandstand constructed by Anamosa Reformatory inmates (Fig. 3a) hosting free reformatory band and vocal performances normally held on Sunday afternoons or holidays. However, this drew the wrath of Local Union 137-Cedar Rapids Musicians who wanted to halt the performances; despite the opposition, the concerts continued on until the Second World War. The bandstand also hosted other functions such as a 1924 Ku Klux Klan rally (Fig. 3b).

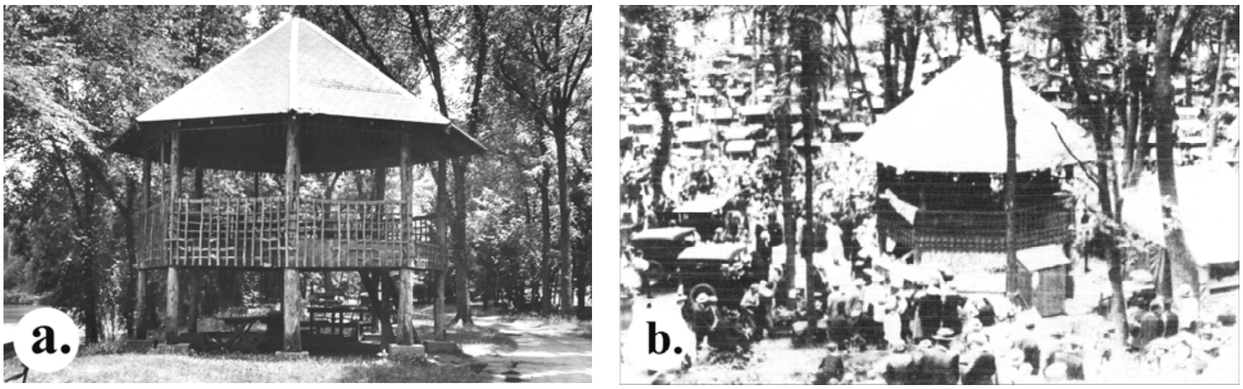

Figure 3. Bandstand at Wapsipinicon State Park (**a.**) was used for a variety of functions, including a 1924 K.K.K. rally in 1924 (**b.**).

WAPSIPINICON STATE PARK SWIMMING POOL

During the early part of the park's history, officials announced plans to construct one of the largest and finest outdoor swimming pools in the country. Construction was started in the fall of 1926 with a dam, named Indian Dam (Fig. 4), on Dutch (Duchess) Creek in front of Horse Thief Cave. After many errors and disappointments, the pool was officially opened in June 1928. The pool (Fig. 5) was 264 feet long, 108 feet wide, and 1 inch to 8 feet deep. The sides of the pool were made of cut stone and cement, but efforts to cement the bottom proved unsuccessful. The pool was fed through a gate on Indian Dam that could be opened and closed to take water from the pool above on Dutch Creek. During the drought of 1931-1932, low water levels forced the closing of the pool. Attempts to drill a well to furnish water to the pool failed, and it was finally closed in 1934. There are a number of local residents who remember using the pool daily in hot weather during the time it was open. Indian Dam still remains on Dutch Creek but serves only as a reminder of good ol' swimming from days gone by.

Figure 4. Swimming pool dam on Duchess Creek

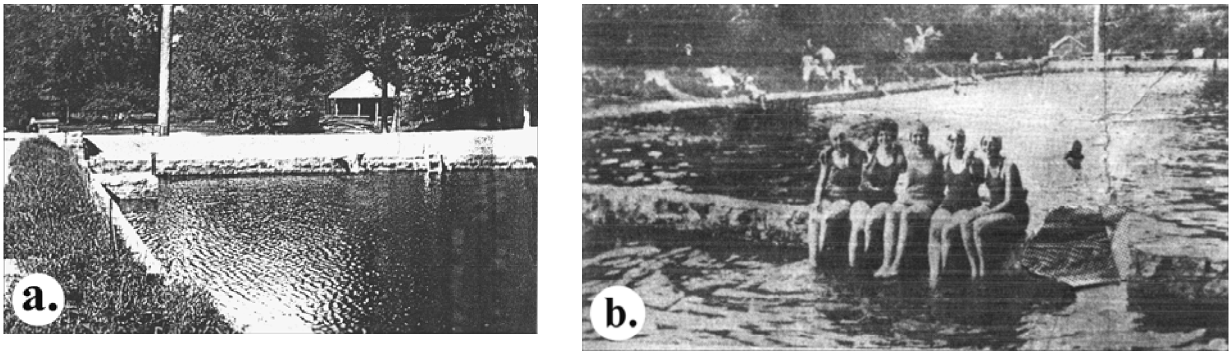

Figure 5. Large swimming pool at Wapsipinicon State Park (**a.**) was very popular in the late 1920s and early 1930s (**b.**).

HORSE THIEF CAVE

One of the most popular features at Wapsipinicon State Park is Horse Thief Cave (Fig. 6). The cave is located along Dutch Creek, on a trail a few hundred yards upstream from the stone bridge. The cave opening is about 15feet high and 30 feet wide and it currently extends about 100 feet into the bluff, narrowing to a thin slot that is difficult to pass. The cave's walls are ornamented with large crystal-filled vugs. Horse Thief Cave has been the subject of many stories, myths, legends, and even proven historical facts! Not surprisingly, the cave received its name because it was claimed to be a hideout for a band of horse thieves. As the story goes, it wasn't all that unusual during the mid-to late-1800s for horse thieves in these parts to disappear among the forest and bluffs of the Wapsipinicon River Valley in what is now Wapsipinicon State Park. Apparently, several caves in the area were natural hideouts for these felons and the horses they stole, and this cave was a particular favorite. In fact, it was rumored that Horse Thief Cave once provided a direct underground connection all the way to Kenwood, a settlement about midway between Cedar Rapids and Marion, resulting in an underground tunnel at least 20 miles long but highly geologically improbable. Still, the tunnel must have proved a good hiding place for these villains and their plunder. Today, the cave only extends a few tens of feet into the dolomite cliffs. Further has been blocked by fallen rocks, perhaps intentionally blasted to prevent visitors from exploring too deeply.

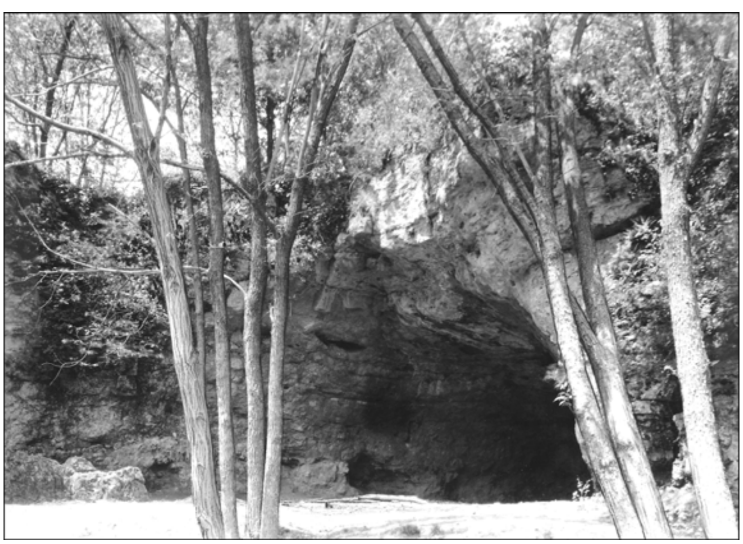

Figure 6. Horse Thief Cave as it appeared in 1929

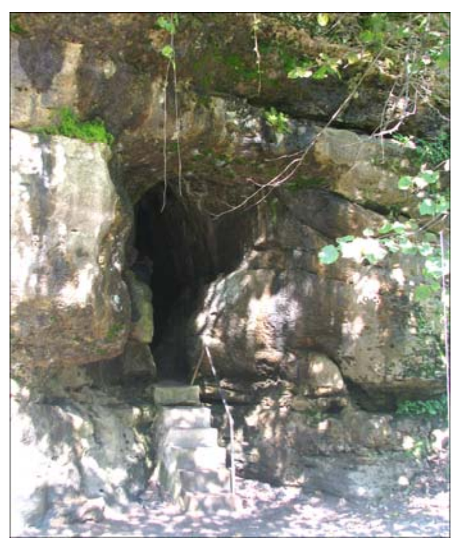

Figure 7. Ice Cave

Amazingly, we have definite proof that Horse Thief Cave was large enough to serve as a home! In March 1922, a crew of workers began improvements on the cave entrance to make it more accessible for the many anticipated tourists. Following the blasting of one particularly large boulder at the entrance, a quantity of broken bones and ashes were discovered, ultimately drawing nationwide attention. A. D. "Gus" Corcoran of Anamosa, a student of anthropology, was called in by the State to study the discovery. Based upon his findings forwarded to the State Historical Society 50 years ago, Corcoran reported 9 human skeletons: five buried in a sitting position near the north wall, another three on the south wall, and one uncovered in the center. Most of the skeletons were of children. All faced the cave's entrance, as if they were keeping watch. He also reported much evidence of cannibalism in the cave area in addition to a considerable amount of pottery and animal bones. Several bone tools, pottery shards, arrowheads, spearheads, flint chips, buffalo teeth, and a large mastodon tusk were found. He also removed 3,000 bushels of ashes from the cave, probably remnants of campfires. Corcoran proposed that the skeletons were from the Archaic period and that the site was occupied as early as 4000 years ago. While most of the items were stolen shortly after the excavation, a box of them has turned up at the Office of the State Archaeologist at the University of Iowa in Iowa City. The archaeology of the cave area was reinvestigated in 1997 by the Iowa Office of the State Archaeologist when new steps were constructed up to the cave (Morrow, 1997). More details on the archaeological history of Wapsipinicon State Park and Horse Thief Cave can be found in the archaeology section, prepared by Joe Artz, of this guidebook.

ICE CAVE

Ice cave (Fig. 7), a smaller cave also on Dutch Creek, is much different from Horse Thief Cave. Accessed by a short flight of concrete steps, Ice Cave is a narrow, keyhole shaped opening that extends about 72 feet into the limestone bluff. Sun shining through the narrow opening creates interesting lighting effects in the cave, and where the passage narrows the walls are ribbed with flowstone ledges.

OTHER FEATURESOF THE PARK'S EARLY DAYS

In its early years Wapsipinicon State Park served as a tree nursery for other state parks. Around 100,000 trees were planted there and nurtured for two years before their removal and replanting. Besides trees, Wapsipinicon also played a role in the nurturing of young men. Reverend James Kearne of the St. Patrick Church, Cedar Rapids ran a Boy Scout camp for two groups of 30 boys over a two-week period during the summer of 1921, promoting a character-building regiment of work, swimming, exercise, and play. A large Boy Scout cabin was built near the country club in 1927, and it served thousands of Boy Scout and Camp Fire groups until its demolition in 1950. During the summer of 1923, two Alaskan inmates at the Reformatory carved a totem pole which stood on the first lower flat of the park.

Wapsipinicon State Park nearly added a zoo to its features. A.D. Sheean, a state senator from Anamosa, brought in a crocodile from Florida in the hopes of starting a zoo at the park. When Dubuque firemen captured a wolf running loose in their city, they sent it to Wapsipinicon Park to be the second zoo resident. Assorted reptiles and other wildlife were also brought in. Unfortunately, the zoo idea soon lost favor and was abandoned. Little is known of the fates of the Florida crocodile, Dubuque wolf, and the other assorted wildlife.

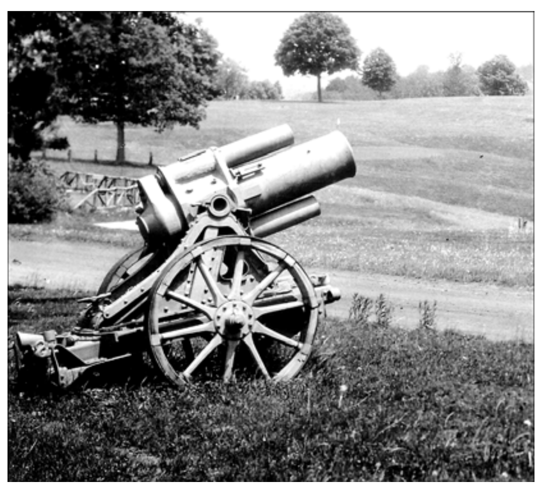

Figure 8. WWI cannon that once stood near the golf course.

Rather bombastic one-time residents of the park included a group of captured World War I German cannons (Fig. 8) brought to Wapsipinicon in 1926, a donation of the United States War Department. The purpose of these canons was war memorials to the Iowans who gave their lives in service to their country. Unlike the zoo animals, the fates of these canons are known as they were melted down during the scrap metal drives of World War II.

Old Mill, Dam, and Bridge

Near the entrance to Wapsipinicon State Park an old bridge crosses the Wapsipinicon River (Fig. 9). This bridge is known as the Military Bridge or Dillon's Bridge because it was along the route of a road authorized by President Martin Van Buren in 1839 to provide for the movement of troops between Iowa City and Dubuque. A Dubuque merchant, Lyman Dillon, surveyed the route and marked it with a plowed furrow, hence the route was originally called Dillon's Furrow. Efforts are underway to get the bridge listed in the National Register of Historic places. Most of the old military road became today's Highway 1, with most of the major deviations from the original route, the result of straightening.

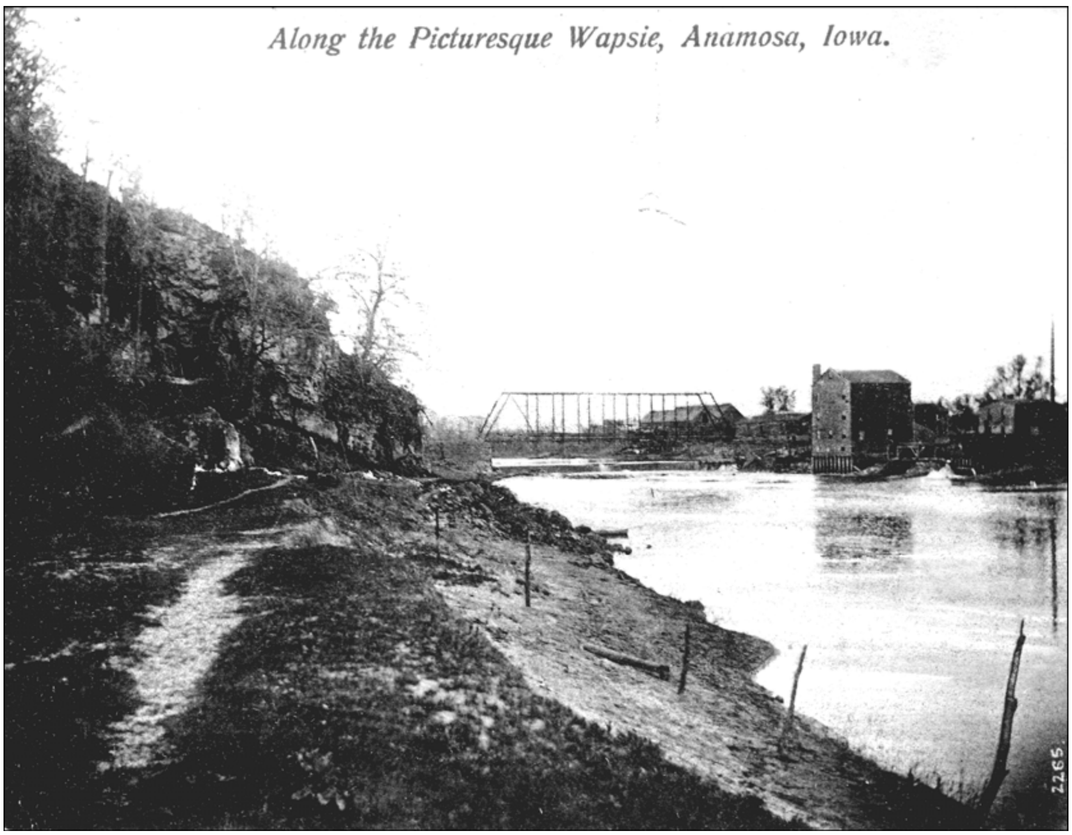

Figure 9. Dillon's Bridge and the old mill on the north bank of the Wapsipinicon River. This late 1800s view (looking west) also shows the rock bluffs in what is now Wapsipinicon State Park from a location very near field trip stop 8.

An old grist mill was constructed just down stream from Dillon's Bridge (Fig. 10.). The Wapsipinicon River was dammed to power the mill. By 1915 the mill had been converted to a hydroelectric plant, the remains of which can be seen today.

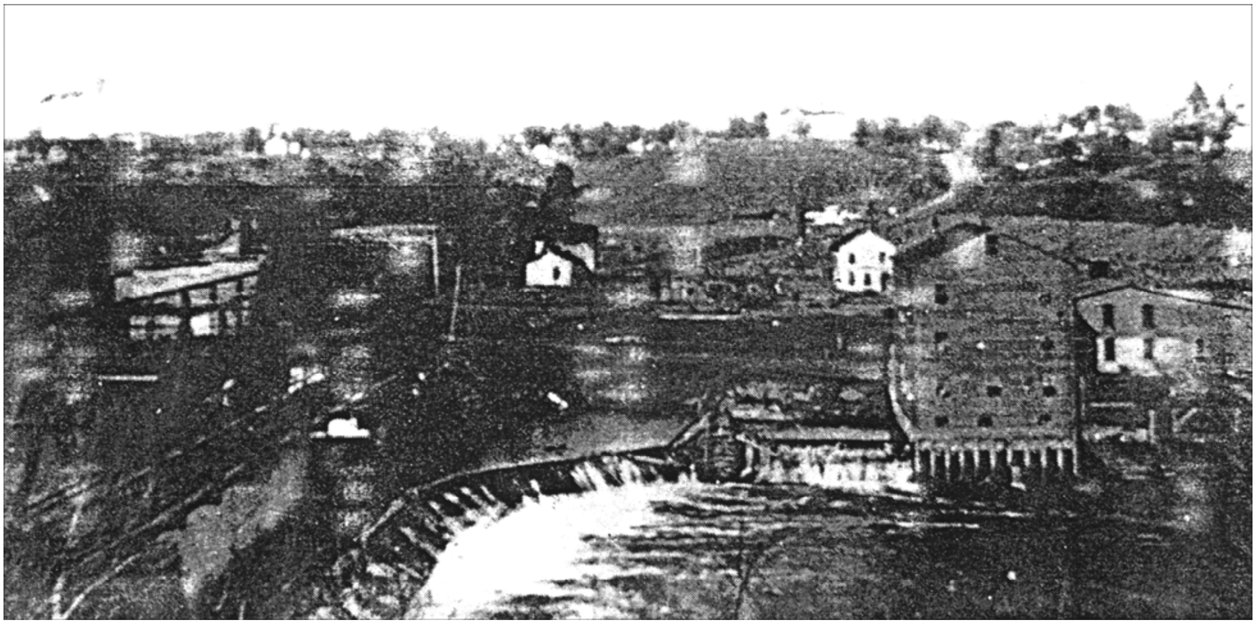

Figure 10. A view of Dillon's Bridge (left) and the old mill and dam on the north bank of the Wapsipinicon River. This late 1800s view (looking north from the rock bluffs in what is now Wapsipinicon State Park from a location very near field trip stop 8.

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Morrow, Toby A., 1997, Archaeological Monitoring of Step Reconstruction at Horse Thief Cave (13JN8), Wapsipinicon State Park, Jones County, Iowa. Contract Completion Report 565, Office of the State Archaeologist, Iowa City, Iowa, 40 p.

Brewer, Mike, and Finn, Bert, 1981, Early History of Wapsipinicon State Park. Iowa Conservationist Magazine, v. 40, no. 4, April 1981, p. 12-13.

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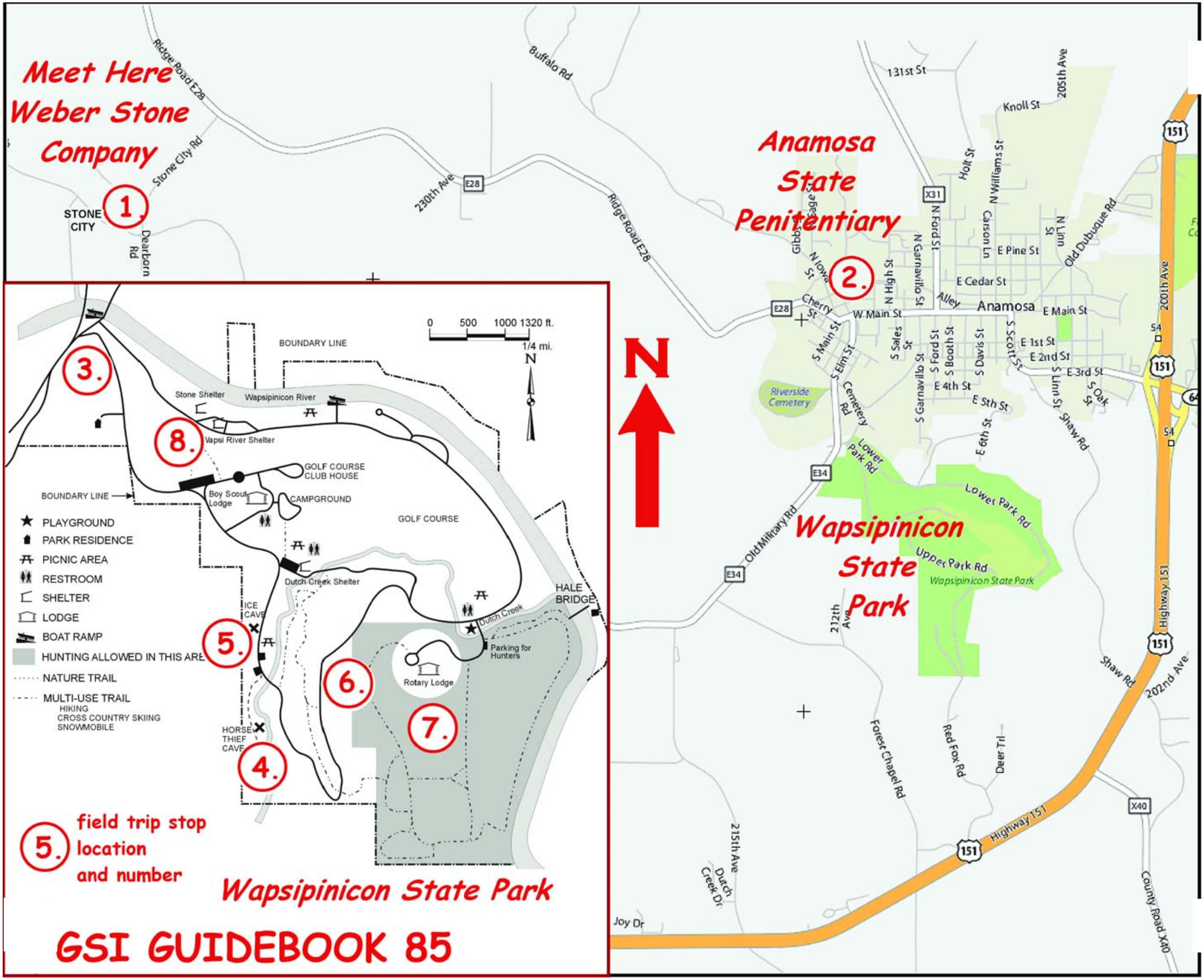

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BOUNDARY LINE
PLAYGROUND
PARK RESIDENCE
PICNIC AREA
RESTROOM
SHELTER
LODGE
BOAT RAMP
HUNTING ALLOWED IN THIS ARE
NATURE TRAIL
MULTI-USE TRAIL
HIKING
CROSS COUNTRY SKIING
SNOWMOBILE
GOLF COURSE
GOLF COURSE CLUB HOUSE
CAMPGROUND
Boy Scout Lodge
Stone Shelter
Vapsi River Shelter
Wapsipinicon River
Dutch Creek Shelter
ICE CAVE
HORSE THIEF CAVE
Rotary Lodge
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Wapsipinicon State Park
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