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Log of field trip for western Dane County

1962

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UNIVERSITY OF WISCONSIN

WISCONSIN GEOLOGICAL AND NATURAL HISTORY SURVEY

G. F. Hanson, State Geologist

LOG OF FIELD TRIP

FOR

WESTERN DANE COUNTY

April 7, 1962

C A U T I O N

ALL FIELD TRIP PARTICIPANTS, WHETHER ON A SUPERVISED TRIP OR MAKING THE TRIP BY THEMSELVES, ARE CAUTIONED TO EXERCISE EXTREME CARE WHILE AT ROCK OUTCROPS OR WHILE IN QUARRIES.

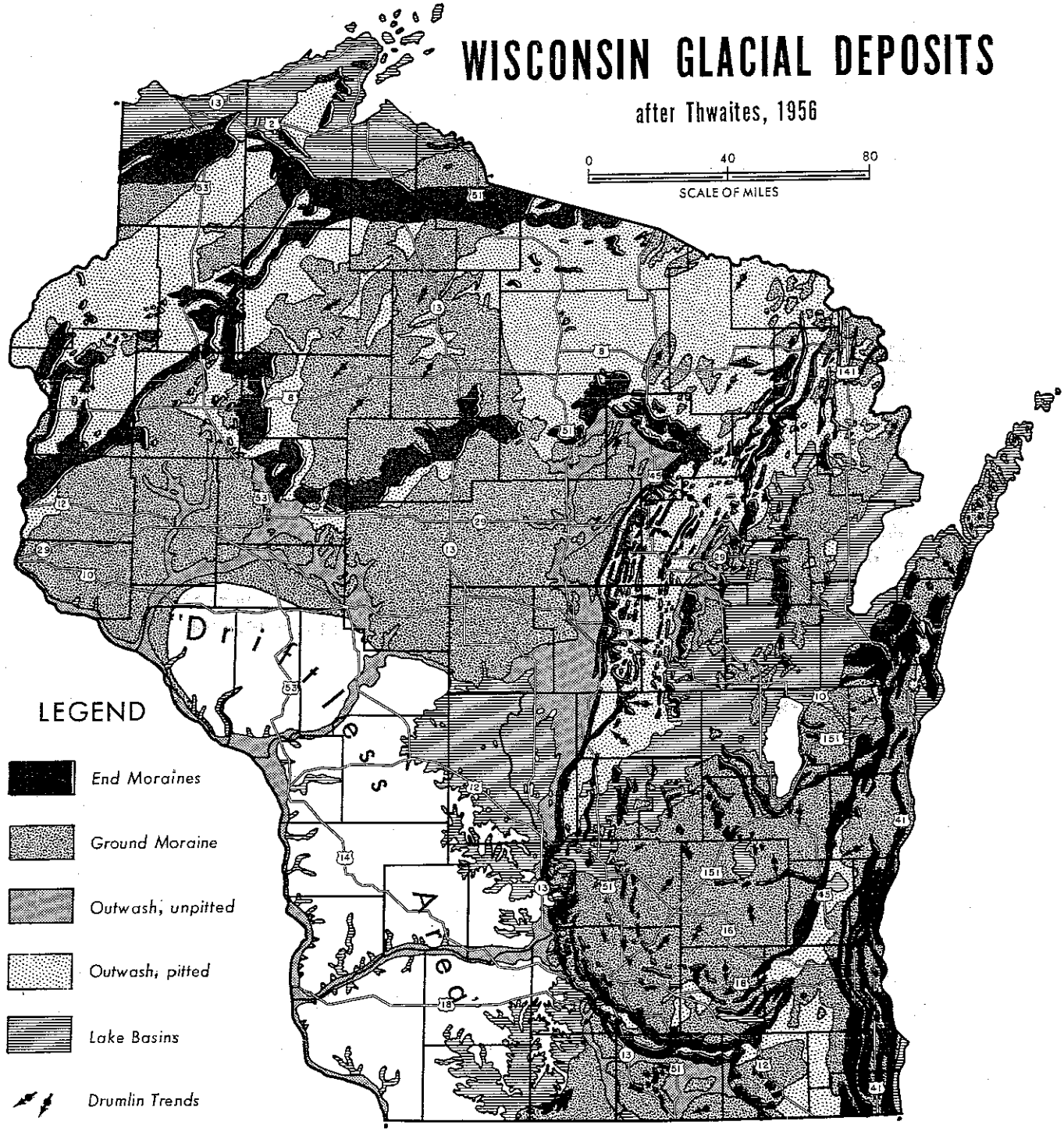
ROCKS CAN AND DO GIVE WAY BOTH UNDERFOOT AND OVERHEAD. EVERYONE SHOULD STAY AWAY FROM HIGH QUARRY FACES AND UNDER NO CIRCUMSTANCES SHOULD THEY GO NEAR TO THE UPPER EDGE OF A QUARRY FACE OR AN OUTCROP. THERE IS NOT ONLY THE DANGER THAT THE WALL WILL GIVE WAY BENEATH YOU BUT, ALSO, THAT BY PRECIPITATING A ROCK FALL OTHERS WILL BE INJURED.

UNDER ALL CIRCUMSTANCES THE PERMISSION OF THE PROPERTY OWNER SHOULD BE SECURED BEFORE ENTERING ONTO HIS PROPERTY, BOTH FOR HIS AND FOR YOUR PROTECTION.

REMEMBER -- YOU ARE THE VISITOR!

WISCONSIN GLACIAL DEPOSITS

after Thwaites, 1956



University of Wisconsin

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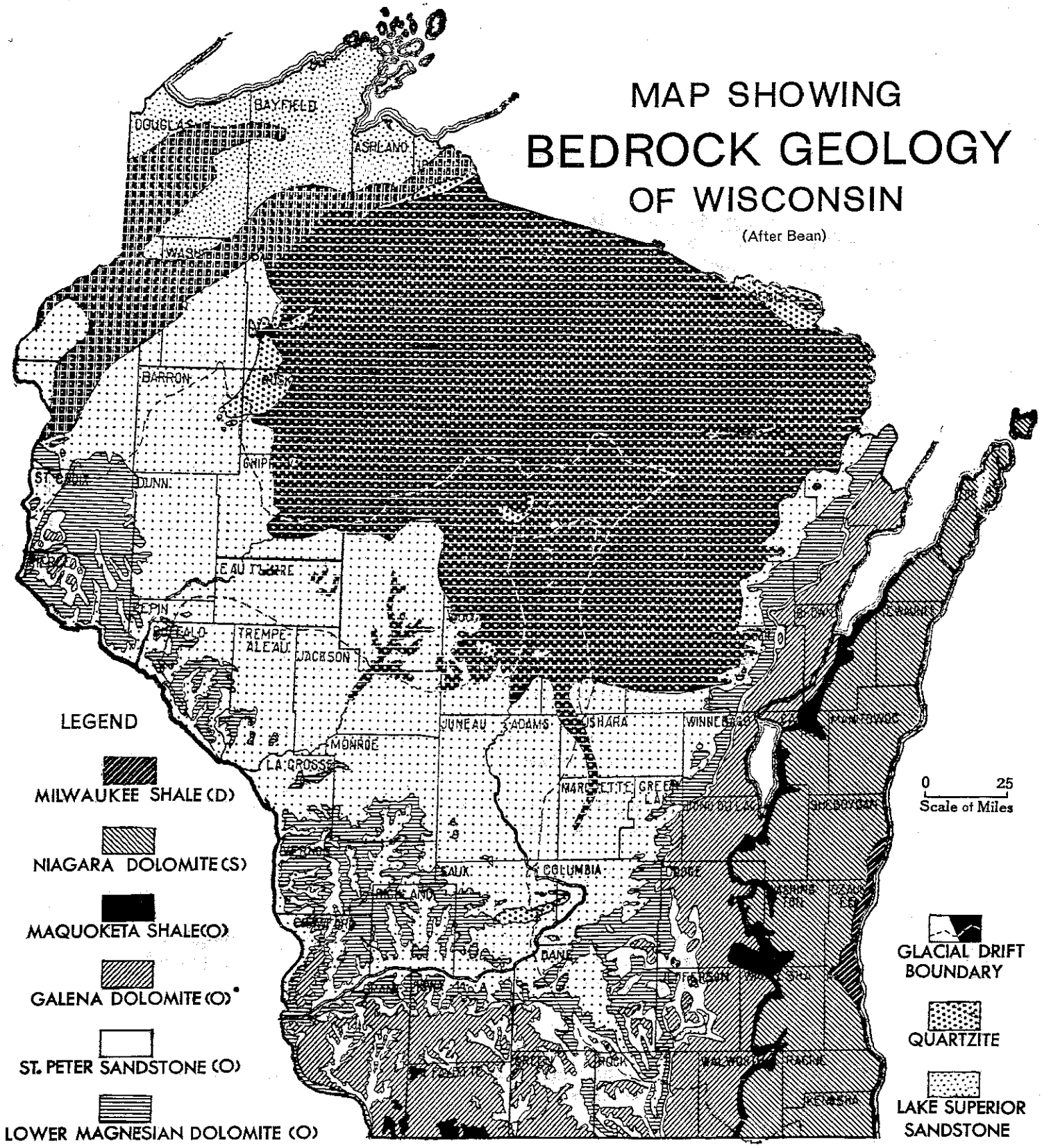
MAP SHOWING
BEDROCK GEOLOGY
OF WISCONSIN

(After Bean)



LEGEND

- MILWAUKEE SHALE (D)
- NIAGARA DOLOMITE (S)
- MAQUOKETA SHALE (O)
- GALENA DOLOMITE (O)*
- ST. PETER SANDSTONE (O)
- LOWER MAGNESIAN DOLOMITE (O)
- UPPER CAMBRIAN SANDSTONE
- GLACIAL DRIFT BOUNDARY
- QUARTZITE
- LAKE SUPERIOR SANDSTONE
- PRE-KEWEENAWAN ROCKS, CHIEFLY IGNEOUS
- KEWEENAWAN IGNEOUS ROCKS

Soils Div., Wisc. Geol. and Nat. Hist. Surv.

*and Platteville.

Note: In legend, left, formations are in order of age, youngest at top.

F.D.H., 1950

INTRODUCTION

Geology is the science that deals with the earth's crust, its origin and history, as disclosed from the study of rocks. Thus, the science of geology goes beyond mere identification of rocks and minerals to the more difficult task of interpreting earth history.

Just as there are specialists in medicine there are also specialists in geology. Interpretation of earth history is based on the findings of scientists engaged in many different fields of geology. The general geologist of fifty years ago is rarer today than is the general practitioner in medicine.

Some of the fields of geology that will be touched upon today are:

1. Glacial geology - the study of glacial deposits and glacial land forms.

2. Geomorphology - the study of the factors that have caused the development of today's landscape.

3. Physical geology - the processes that operate to modify our landscape.

4. Sedimentation - the study of transportation and deposition of sediments.

5. Stratigraphy - the study of the sequence of layered (stratified) sedimentary rocks.

6. Structural geology - the study of the effects of deformations in the earth's crust on rocks.

7. Economic geology of non-metallic minerals (Industrial Minerals) - dolomite and sandstone quarries and gravel pits will be visited.

8. Paleontology - the study of fossils.

9. Mineralogy and Petrology - the study of minerals and rocks, respectively.

GENERALIZED GEOLOGIC UNITS IN DANE COUNTY

Glacial Deposits

Glaciated Area - Deposits consist predominantly of till (unsorted clay, silt, sand, and gravel with some boulders), outwash (sorted and stratified, silt, sand, and gravel), and lake deposits (sorted and varved clay and silt).

Unglaciated (Driftless) Area - Deposits consist of outwash in some valleys and loess, a loam consisting of silt particles deposited by wind.

Paleozoic Rocks (age range from about 450 million years to 370 million years old)

Silurian System - consists of chert found in Dane County only in the top of Blue Mounds State Park.

Ordovician System (360 to 440 million years)

Galena-Platteville Dolomite - predominantly dolomite with some limestone. Fossils abundant in some areas. Bedding regular.

St. Peter Sandstone - composed predominantly of well-rounded quartz sand grains (almost 100%). Deposited on old erosion surface cut in Prairie du Chien dolomite.

Prairie du Chien Dolomite - mostly dolomite, some sand and shale. Contains oolitic chert. Fossil algae common. Bedding generally irregular.

Cambrian System (440 to 460 million years)

Jordan Sandstone - composed predominantly of rounded quartz sand grains.

St. Lawrence Formation - composed of siltstone and dolomite. Fossils rare: trilobites in siltstone, algae in dolomite.

Franconia Sandstone - characterized by "greensand", small sand-grain-sized green pellets. Commonly cross-bedded.

System	Series	Group or Formation		Description	Average thickness in feet		Stops
PLEISTOCENE				Glacial Drift (present only in glaciated area). Includes till, outwash, and lake deposits. Outwash deposits also present for short distance west of glacial front.			
Ordovician	Middle	Galena Dolomite		Dolomite, yellowish-brown, thick-bedded. Fossils of Receptaculites in middle.	80	225	
				Dolomite, drab to buff; cherty; Receptaculites near base.	105		10, 13
		Decorah F.		Dolomite, limestone, and shale, green and brown. Contains fossils of Prasopora.	35-40		
		Platteville Formation		Limestone and dolomite, brown and gray; green sandy shale at base.	55-75		12 9
		St. Peter Sandstone		Sandstone, almost 100% quartz, grains rounded.	40+	280-320	
	Lower	Prairie du Chien Group		Dolomite, light buff; cherty; sandy near base and in upper part; shaly in upper part.	0-240		2 3, 6
Cambrian	Upper	Jordan Sandstone		Sandstone, yellowish-gray, greenish shale and little dolomite in upper part.	120-150		5
		St. Lawrence Formation		Siltstone, very dolomitic, contains trilobites (Dikelocephalus), and Dolomite, somewhat silty, contains algal fossils			

Generalized geologic column for field trip in Western Dane County. Portion of column which will be seen at various stops is indicated in column at right.

ROAD LOG

ASSEMBLY - University Parking Lot 60, University Bay Area, Madison

STOP 1.

We are standing on what was once the bottom of Lake Mendota. The lake as we see it today is a very transitory geologic feature being steadily destroyed by the deposition of sediment from incoming streams and the encroachment of vegetation. The Willows Drive is a sandbar which was formed by wave action in shallow water and which cut off part of the University Bay. Behind the bar a marsh developed which gradually became filled with vegetation. The marsh was drained, and today it is a cornfield.

The lake is the result of glaciation. Prior to this event (say some 40,000 years ago) the view would have been much like standing on the bluffs of the upper Mississippi. A river valley would lie some 250 feet below us bounded by craggy cliffs.

With the advent of glaciation the hillcrests were smoothed off, the valleys partially filled and the rivers dammed or diverted from their course. Within the glaciated portion of the State some hills may be predominantly bedrock. These are called rock-cored hills. Such are the Shorewood Hills seen to the west. In many cases the hills are no more than mounds of "till" deposited by the glaciers. "Till" consists of an unassorted mixture of boulders, gravel, sand, silt and clay. Throughout the whole of the glaciated area, till is plastered over the surface of the bedrock in varying thicknesses.

"Ground moraine" is the term used to denote the till that was deposited under the ice. "Terminal moraine" is the till deposited at the margin of the ice front.

We will be traveling over ground moraine until we are almost at the fourth stop when we will pass over the terminal moraine of the Cary stage of Wisconsin glaciation.

Look carefully and note the rolling topography, subdued hills, "closed" depressions (i.e. pockets) in the landscape, some of which may contain ponds.

(Note: This is the result of continental glaciation when the ice covered even the highest hills and attained a thickness of some 10,000 feet. It is not to be confused with "alpine" glaciation, as seen in the Rockies, where the ice confined itself to the flanks of mountains and a completely different and very rugged landform resulted. Many books, as the Scout Manual, illustrate only alpine glaciation.

Total Mileage

00.0		Proceed west on University Bay Drive.
	00.7	
00.7		Bedrock hill to right mantled with glacial till. Old lake bed of Lake Mendota to left.
	00.2	
00.9		Oxford Road through Shorewood Hills. Hill to right is composed of Prairie du Chien dolomite.
	00.2	
01.1		Stop sign. Turn left on Bowdoin Road.
	00.1	
01.2		Stop sign. Keep left on Shorewood Blvd. Flat valley typical of valleys filled with glacial debris.
	00.2	
01.4		Stop sign. Turn right on Topping Road.
	00.2	
01.6		Topping Road and Oak Way. Turn left. Prairie du Chien Dolomite exposed in cuts on right.
	00.1	
01.7		Turn left down hill.
	00.05	
01.75		STOP 2. (15 minutes) Shorewood Quarry. Prairie du Chien dolomite. This dolomite is the major hill-forming rock in the Madison area. The rock in this quarry was originally laid down in marine waters on a layer of sand bordering the then existent land areas. The rock is about 400,000,000 years old. It is composed of fossil debris and chemically precipitated carbonates. Some sandstone, chert, and shale are also present. Stone taken from this quarry was used for building purposes. Ordinarily this stone would not be used because of high chert content and because exposure to weathering causes disintegration and break down of sandy and shaly layers. However, because it was located close to a market haulage costs were low and the stone could be sold at a lower price than better quality materials that were imported from outside the area. Where this stone is quarried in other areas it is used chiefly for road aggregate (road gravel) and for agricultural limestone.

The stone was quarried by first drilling holes downward from the surface. These holes were packed with dynamite which was then exploded. Some of the old drill holes can be seen on the quarry face. The blast rubble, in sizes from sand to 2 or 3 feet in diameter was then sized by hand for individual jobs. In modern quarries similar material is run through a crusher to reduce it to the desired size, generally less than 4 inches. The crushed material was separated into different size fractions using screens with different sized openings. The sizes produced at a quarry are dependent upon what the users desire.

Dolomite is a mixture of calcium and magnesium carbonate. Although the material was initially deposited as calcium carbonate, replacement of some of the calcium by magnesium through a process, only poorly known, has resulted in its present composition. Dolomite is one of a large group of what are called industrial minerals (non-metallic minerals) which are generally low-cost products. For this reason it is economically bad business to have to haul the stone any great distance. The numerous quarries scattered throughout southern and southwestern Wisconsin attest to this fact.

Rocks which can be collected from this quarry include dolomite, sandstone, chert, and possibly shale. Mineral specimens are rare and generally small, but include dolomite, calcite, and pyrite. At some horizons, notably the small bench in the floor below the upper face, small "BB" type structures can be seen in chert. These are called oolites and are formed by chemical precipitation of calcium carbonate from sea water onto small sand grains or fossil fragments in areas where wave agitation can roll the particles around. Through a process of replacement of carbonate by silica the oolites attained other present composition (SiO_2).

Algae are the most abundant fossils. Other forms including brachiopods and gastropods are rare. A zone of algal formation can be seen approximately 5 feet above the base of the upper level on its west face.

Dolomite is particularly dense, with few if any, openings. Such openings occur as vertical joints or as cavities along bedding planes. For this reason dolomite is not considered to be a good water-producing rock (aquifer). In the west face of the upper bench of the quarry water can be seen coming from openings in the rock. As the water moves through openings in such rocks, that is dolomite or limestone, it dissolves the rock thus enlarging the cavity. Under the right conditions this solution produces large cavities which, when drained of their water, become caves. Small caves occur at many places in southwestern Wisconsin.

01.75		Leave quarry, turn right (west).
	00.05	
01.8		Stop. Turn left on Tally Ho Lane and then right on Highbury Rd.
	00.1	
01.9		Cross railroad tracks going south past Coca-Cola Bottling plant.
	00.1	
02.0		Stop. University Avenue, turn right (west).
	00.1	

02.1		Stop light. Intersection University Avenue and Midvale Blvd. Proceed W. on University Avenue.
	00.5	
02.6		Note poor drainage. Bedrock controls the topography, but filling with glacial drift has resulted in uneven landscape with closed or undrained depressions. Such poor drainage is typical of glaciated areas. Drift here consists predominantly of poorly sorted sand, gravel, silt, and clay.
	03.3	
05.9		Stop sign in Middleton. Proceed west on Highway 14.
	06.6	
12.5		Note that land surface is rising gradually. To the left and back can be seen a quarry in the Prairie du Chien Dolomite, the same dolomite as is exposed in the Shorewood Quarry.
	01.0	
13.5		STOP 3. (5 minutes) Bus will park in drive at east end of rock bluff on right. Passengers are advised to stay away from the road. At this stop can be seen the contact of the Prairie du Chien Dolomite with the underlying Jordan Sandstone. The contact is located about 10 feet above road level. Note the irregular contact surface and the zone of transition from sandstone at the base, through mixed sandstone and dolomite, to dolomite at top. Rocks which can be collected at this exposure include sandstone, dolomite, chert, and shale (the green zone between sandstone and dolomite). Note that in the area of this outcrop the Prairie du Chien Dolomite caps all of the hills and the valleys are cut into the softer Jordan Sandstone. The difference in resistance to weathering of the two rock types can be seen at the exposure.
	00.1	
13.6		Note we are still in an area of poor drainage and unsorted glacial materials.
	00.8	
14.4		This is the western edge of the glaciated area. We are at the crest of the terminal moraine. To the west the ancient valleys that drained from the glaciated area contain outwash.
	00.6	

15.0		STOP 4. (5 minutes) Gravel and sand pit in glacial outwash materials. This stop is intended to show sorted character of deposit in reference to unsorted deposits which occur east of the terminal moraine. Materials here are coarse because of nearness to front of glacier. Westward the size of outwash material decreases. This difference is due to steeper gradient of the glacier face, large flow of water near glacier, and short transport distance. Although the gravel in this pit provides a wide variety of different kinds of rocks better collecting can be had at the Verona Sand and Gravel Pit where we will have the opportunity to see the equipment used for processing.
	00.3	
15.3		Note gravel pit on left in glacial outwash materials.
	00.5	
15.8		STOP 5. Bus will stop at west end of outcrop on right. This outcrop shows the contact of the Jordan Sandstone, seen below the Prairie du Chien Dolomite at Stop 3, with the underlying St. Lawrence Formation. The St. Lawrence Formation commonly has a very dolomitic siltstone in its top and a dolomite in its base. Rocks which can be collected at this stop include siltstone and sandstone. Fossils, mainly trilobites, are found in the St. Lawrence. Note difference in bedding between the massive bedded sandstone and thinly bedded siltstone.
	00.2	
16.0		Note the hills are still capped with Prairie du Chien dolomite and valleys are cut in Jordan Sandstone. Large slump-blocks of Prairie du Chien have fallen because of weathering, erosion, and removal of underlying and supporting Jordan Sandstone. Note also that we are now in an area of more open, or connected, drainage.
	00.8	
16.8		Enter Cross Plains.
	00.2	
17.0		Turn left (south) on County Trunk Highway "P".
	00.3	
17.3		Siltstone of St. Lawrence Formation crops out on right.
	00.5	
17.8		Jordan Sandstone crops out in roadcut on right.
	00.4	
18.2		Siltstone of St. Lawrence Formation crops out on left. From this point we begin to rise in the geologic section.
	00.1	
18.3		Jordan Sandstone crops out on right.
	00.1	

18.4		STOP 6. Bus will stop on right. In middle of valley directly east of this stop a conical hill can be seen standing alone in the middle of the valley. Capping this hill is only the remnant of Prairie du Chien Dolomite, most of which has disintegrated to rubble seen on the upper hillside. This hill form is typical of those developed on sandstone where the dolomite cap has been removed. The erosive action of streams, one flowing on either side of the hill, cut the valleys but left this hill behind as a remnant. As we continue up the hill and proceed south we will pass upward in the geologic section of rocks through the Prairie du Chien Dolomite, which does not outcrop along the road, through the St. Peter Sandstone and the lower part of the Platteville Dolomite which can be seen in road cuts. Note that we have now entered an area in which Platteville Dolomite caps the hills and St. Peter Sandstone has been eroded from the valleys.
	1.0	
19.4		Note dendritic (resembles shape of hand with fingers representing stream tributaries) drainage in stream to right (west). This type of drainage is typical of the Driftless Area.
	1.3	
20.7		Enter Pine Bluff.
	00.1	
20.8		Turn left on County Trunk Highway "S". Note, straight ahead, the change in topographic expression. We are crossing a flat valley underlain by St. Peter Sandstone. The rolling topography here is typical of landscapes developed on sandstone. The hills in front are capped by Platteville Dolomite which is in turn overlain by terminal moraine to the east. The glacier moved up to near the crest of the bedrock high as it moved westward and stopped.
	01.0	
21.8		Outcrop of St. Peter Sandstone on left.
	01.5	
23.3		Front of glaciated area.
	00.1	
23.4		Note difference in drainage. We are now in an area of undrained depressions or unconnected drainage as can be seen from lake on left (north) side of road. Eastward from the terminal moraine the former stream channels in the bedrock surface, such as that seen at Stop 6, are filled with unsorted glacial drift materials.
	00.2	

23.6 STOP 7. Bus turn left and stop on right side of road. Passengers dismount. Bus turn around as we will retrace our path. The ridge we are on is the topographic divide. On the east side streams flow to Yahara River whereas on the west side streams flow to the Sugar Creek. At the north side of County Trunk Highway "S", in the road cut through the ridge, glacial drift materials can be seen. Note the unsorted character of these deposits, especially the large boulder.

Bus turn west, toward Pine Bluff.

00.3

23.9 STOP 8. Bus will stop at crest of hill where we will dismount. Assemble on left (south) side of road. We will rejoin bus at foot of hill.

We are standing just outside of the limits of glaciation. The Cary terminal moraine forms the hill over which we passed to the east. The "Driftless Area" is seen to the west and south. (Drift is an old term for till hence lack of drift indicates no glaciation). This area encompasses the southwestern quarter of Wisconsin and extends into Iowa and Illinois. It is unique in that it is surrounded by drift on all sides but escaped glaciation itself.

The level hill tops are due to a resistant cap of limestone of the Platteville Formation. When streams cut below this level they encounter the St. Peter Sandstone which is soft hence wide valleys develop. The Platteville is therefore termed a "ridge maker" and the St. Peter is a valley maker. In the Driftless Area the nature of the bedrock is reflected in the topography. Gentle slopes develop on soft formations and steep slopes or cliffs on more resistant rocks.

Note the change in drainage pattern from that seen in the glaciated country. Here it is dendritic i.e. like the veins on a maple leaf. Every gully leads to a creek which leads to a stream which leads to a bigger stream thence to the Mississippi. There are no closed depressions or lakes. This is a classical example of the "mature" stage of the cycle of erosion.

02.5

26.4 Stop sign. Pine Bluff, turn left on County Trunk Highway "P".

00.6

27.0 Note that we are now in an area where bedrock is the dominant control on topography. Ancient valleys are only slightly filled in by glacial materials.

00.6

27.6 Intersection with CTH "J". Note St. Peter Sandstone exposed at southwest corner of intersection while underlying Prairie du Chien Dolomite occurs at an elevation some 40 feet higher in the quarry which can be seen in the hilltop to the east. Whereas we have concerned ourselves thus far with erosion of the bedrock surface prior to deposition of glacial materials, we are looking here at an erosion surface developed almost 400,000,000 years ago in the top of the Prairie du Chien Dolomite. Rivers of that time cut into the Prairie du Chien and into the underlying softer Jordan Sandstone. Later, all of these valleys were filled and hills were covered by sand deposited during St. Peter time. Recent erosion has exhumed these deposits.

00.1

27.7 St. Peter Sandstone exposed in roadcut on right. Note in left distance a quarry in St. Peter Sandstone. Note especially the lack of bedding in the lower part (St. Peter) and the obvious bedding in the uppermost part (Platteville).

01.0

28.7 Turn left. Continue on County Trunk Highway "P".

00.5

29.2 Turn left on blacktop road toward sandstone quarry.

00.7

29.9 STOP 9. Bus back into quarry road on right and park. We will proceed west at the end of this stop. Group assemble at sandstone exposure on north side of road. The quarry here is owned by Mr. Pendergast and is known as the Klevenville quarry. Because of the dangers of slides in such quarries, and because we can see the stone to good advantage at the exposure where we now stand, there is no reason to enter the quarry. The processing plant is very similar to that which will be seen at our stop in Verona. This is the St. Peter Sandstone. It consists of almost 100% quartz (silica) sand grains. Note the bedding and the way slightly harder (i.e. better cemented) beds stand out. Note how rapidly it is breaking down to sand again in spite of the fact it is some 400 million years old. Hence "age" does not make a rock "solid". Rocks are held together by "cement" or by recrystallization of the compact minerals. Lime, silica, and iron oxide are the more common cements. This sand is only loosely cemented. Note the regular terrace below the outcrop. This terrace is constructed of sand grains that have weathered off of the outcrop.

Silica sand is quarried here by blasting and crushing. It is then washed and screened to yield the desired range in particle size. Sand from this quarry is used as foundry sand. Its iron content is too high to merit use where sand of higher purity is required. The uses of silica sand depend upon its purity and size. The purest sands are used in the manufacture of glass. The bulk of silica sand is used as abrasives and in manufacture of pottery, porcelain, and tile. Other industries which use large amounts of silica sand include the foundry and steel molding industries and the enamel industry.

Return to CTH "P" (westward).

00.6

30.5 Stop. Turn left on CTH "P".

01.3

31.8 Drainage seen here is similar to that which existed in Madison area before deposition of glacial materials.

00.8

32.6 Stop sign. Turn left (east) on Highway 151. We are now on Military Ridge, so named because it was the main route of military travel during the Indian War, the drainage divide separating streams which flow northward to the Wisconsin from those flowing southward to the Mississippi. Military Ridge is formed on an east-west trending crest of Platteville and Galena Dolomites. The dolomites dip inperceptibly beneath the earth's surface to the south. North of the ridge the dolomites have been eroded and cut through so that they do not occur north of Cross Plains.

02.1

35.0 Turn right on secondary road.

00.2

35.2 STOP 10. Turn left into quarry. Bus turn around. This is one of the many quarries owned by the Wingra Stone Company. In this quarry we see the Galena Dolomite for the first time. The contact of the Galena with the underlying Ion Member of the Decorah Formation can be seen about 8 ft. above the base of the quarry along its east and northeast face.

This quarry illustrates the use of fossils, as well as other criteria, for subdividing an otherwise continuous section of dolomite. The Galena Dolomite in this quarry contains abundant chert in thin and horizontal beds. Fossils which can be found in the Galena, and which serve to distinguish it from the Decorah and underlying formations include Receptaculites, and Ischcadites. The Ion member of the Decoran Formation is distinguished here on the basis of green shale content and the fossil Prasopora.

Note the contrast between dolomite in this quarry with the Prairie du Chien Dolomite seen at previous stops. Here the dolomite is thin and medium-bedded as well as even-bedded. The Prairie du Chien is noted for massive-bedding and irregular-bedding. Chert in the Prairie du Chien is commonly oolitic. Here the chert is without oolites. Fossils in the Prairie du Chien are predominantly the remains of algal with occasional molds. Fossils here are fairly common and generally well preserved with no algae.

00.2

35.4 Return to Highway 151. Stop sign. Turn right (east).

03.6

39.0 Enter area of glacial drift once more. In this area it is believed that the younger Cary Ice did not extend westward as far as the Rockian Ice of an earlier glacial stage. Thus, we are driving over older Rockian till covered by Cary outwash. As we proceed eastward we enter the area of Cary Drift. Note the rise from west to east and the change in topographic expression and drainage.

01.0

40.0 Area of Cary outwash and poor drainage.

00.6

40.6 Enter Verona.

00.5

41.1 Turn right on Highway 69. Stay on 69.

01.0

42.1 STOP 11. Turn left. Bus proceed due east about 1 mile to gravel pit. We will resume mileage at this intersection on our return. We are the guests of Verona Sand and Gravel Company. The sands and gravels in this pit are Cary outwash, outwash from the last glacial ice to enter Dane County. Note the sorting of the material and the wide variety of different rock types. This is an excellent site from which to collect rock specimens.

On the west side of the highway is the processing plant. Sand and gravel is shovelled into trucks which in turn dump it into a crusher. After passing through the crusher the material is passed over screens and sorted into different sizes for a wide variety of uses. Some of the different rock types which can be collected here are granite, gneiss, schist, basalt, gabbro, dolomite, and chert.

01.0

43.1 Return to intersection with Highway 151 in Verona and turn right (east).

02.9

46.0		Note quarries on right. Upper level of quarry is in Platteville Dolomite. The lower quarry level on the south side is in Prairie du Chien Dolomite. No St. Peter Sandstone can be seen between them. At the north end of the quarry Platteville rests on St. Peter. Here no Prairie du Chien can be seen. The St. Peter Sandstone fills in an old valley cut into the surface of the Prairie du Chien.
	00.9	
46.9		Turn left on black top road. Quarry on right is in Platteville at its upper level and in St. Peter in its lower level.
	00.5	
47.4		STOP 12. Wingra Stone Company, # 1 quarry. This is an especially dangerous quarry and all trip members are advised to stay back from the quarry faces. All of the rock seen here is of the Platteville Formation. Best fossil collecting can be had at the top of the road along the south quarry face. Once again - stay back from the quarry faces, below as well as on top, for this rock has been blasted and is extremely loose. Many different fossils can be collected from rock in this quarry. Some of the different types are brachiopods, gastropods, crinoids, bryozoans, and corals.
	00.5	
47.9		Return to route 151 and turn left (east). (Mileage hereafter estimated from topographic maps.)
	02.0	
49.9		Turn right, before reaching overpass, on Highway 12 and 14. Continue on Highway 12 to intersection with Highway 51.
	08.0	
57.9		Turn right, before reaching overpass, on Highway 51
	00.3	
58.2		Bear to right on secondary road.
	01.2	
59.4		Turn left, proceed eastward passing beneath overpass.
	01.8	
61.2		Continue eastward on gravel road.
	01.0	
62.2		Turn left (north) on gravel road.
	00.3	
62.5		STOP 13. Abandoned quarry in Decorah and Platteville Formation on right hand side of road. Excellent locality for collecting fossils. Fossils available for collecting include brachiopads, gastropods, bryozoans, crinoids, and corals.
	12.6	

75.1		Stop sign. Return to intersection of route 151 with 12 and 14 at west of Nakoma. Turn right on Monroe Street.
	00.1	
75.2		Turn left on Midvale Blvd.
	2.5	
77.7		Turn right on University Avenue at second stop light.
	0.9	
78.6		Turn left on University Bay Drive at second stop light. Follow to Lot 60.
	1.7	
80.3		Turn right into Lot 60.

This concludes the field trip.