

A SURVEY OF PRECAMBRIAN TO PLEISTOCENE GENERAL GEOLOGY IN CENTRAL NEW YORK

H. S. Muskatt
Utica College of Syracuse University

and

David E. Jones
The Ecosystems Center, Marine Biology Lab,
Woods Hole, Ma.

The intent of this field trip is to introduce several aspects of geology covered in the New York State earth science syllabus. We shall examine rocks that range in age from Precambrian to Pleistocene. Many rock types from a wide variety of Paleozoic depositional environments will be seen. Opportunities to collect a wide range of fossils and minerals will be provided. The field trip will develop a tectonic framework of deposition as we move higher into the stratigraphic record. Sedimentary structures and erosional features are well represented at these stops. There are several good photo opportunities of faults and potholes in addition to the rocks. We will also be seeing a wide variety of landscape features produced during the last glacial retreat, including lakes, U shaped valleys, kettle ponds, meltwater channels, sinkholes, and drumlins. An excellent general field trip of the Utica area to the west by Tewksbury and Allers (1984) is highly recommended.

REFERENCES

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- Grasso, Tom, and Wolff, M., 1977. in Wilson, P.C. (ed), Field Trip Guidebook, 49th Annual Meeting, N.Y.S.G.A., Oneonta, trip A-3, p. 1-50.
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Tewksbury, B. J. and Allers, R.H., 1984, Geology of the Black River and Mohawk River Valleys. Hamilton College. Clinton, N.Y. 130 pages.

ROAD LOG

- | | | |
|------|------|--|
| 0.0 | 0.0 | Turn left onto West Street. The campus of Hartwick College is on the right. |
| 0.6 | 0.6 | Turn right at the stoplight onto Chestnut Street (Rts. 7 and 23). |
| 2.5 | 3.1 | Turn right onto Rte. 23 N. |
| 0.3 | 3.4 | Junction of Routes 23 and 205. Turn right onto Rte. 205 N. You will be driving up the Otego Creek Valley, a very good example of glacial "U" shaped valley erosion. |
| 21.9 | 25.3 | Intersection of Routes 205 and 80. Turn right onto 80 E. |
| 1.8 | 27.1 | Intersection of routes 80 and 28. Turn left onto Rte. 28N. Canadarago Lake will be to the right. This lake, a <i>fingerlet</i> , was formed at the end of the last ice age by the blockage of glacial meltwaters downstream which formed a natural dam.
<i>Fingerlet</i> : Muskatt's term for a smaller version of a Finger Lake. |
| 11.2 | 38.3 | Intersection of routes 28 and 20. Turn right onto Rte. 20 E. |
| 0.2 | 38.5 | Intersection of Rtes. 20 and 167 at the traffic light in Richfield Springs. Turn left onto 167 N. |
| 9.1 | 47.6 | Intersection of Rtes. 168 and 167. Continue N. on 167. |
| 1.5 | 49.1 | Outcrop of Utica Shale (Ordovician). To the east, a good meltwater channel can be viewed. |
| 1.9 | 51.0 | Junction with Newville Rd. at Wrights Corners. Turn left and continue to follow route 167 N. |
| 1.4 | 52.4 | Cross under the NYS Thruway. An outcrop of Trenton Limestone (Ordovician) containing trilobites is on the east side of the road. |
| 0.8 | 53.2 | Junction with Route 5S. Turn left and then make an immediate right to continue on route 167 N. The rocks outcropping to the east will be stop 2 in this road log. |
| 2.0 | 55.2 | City of Little Falls. Turn right onto Albany St. |

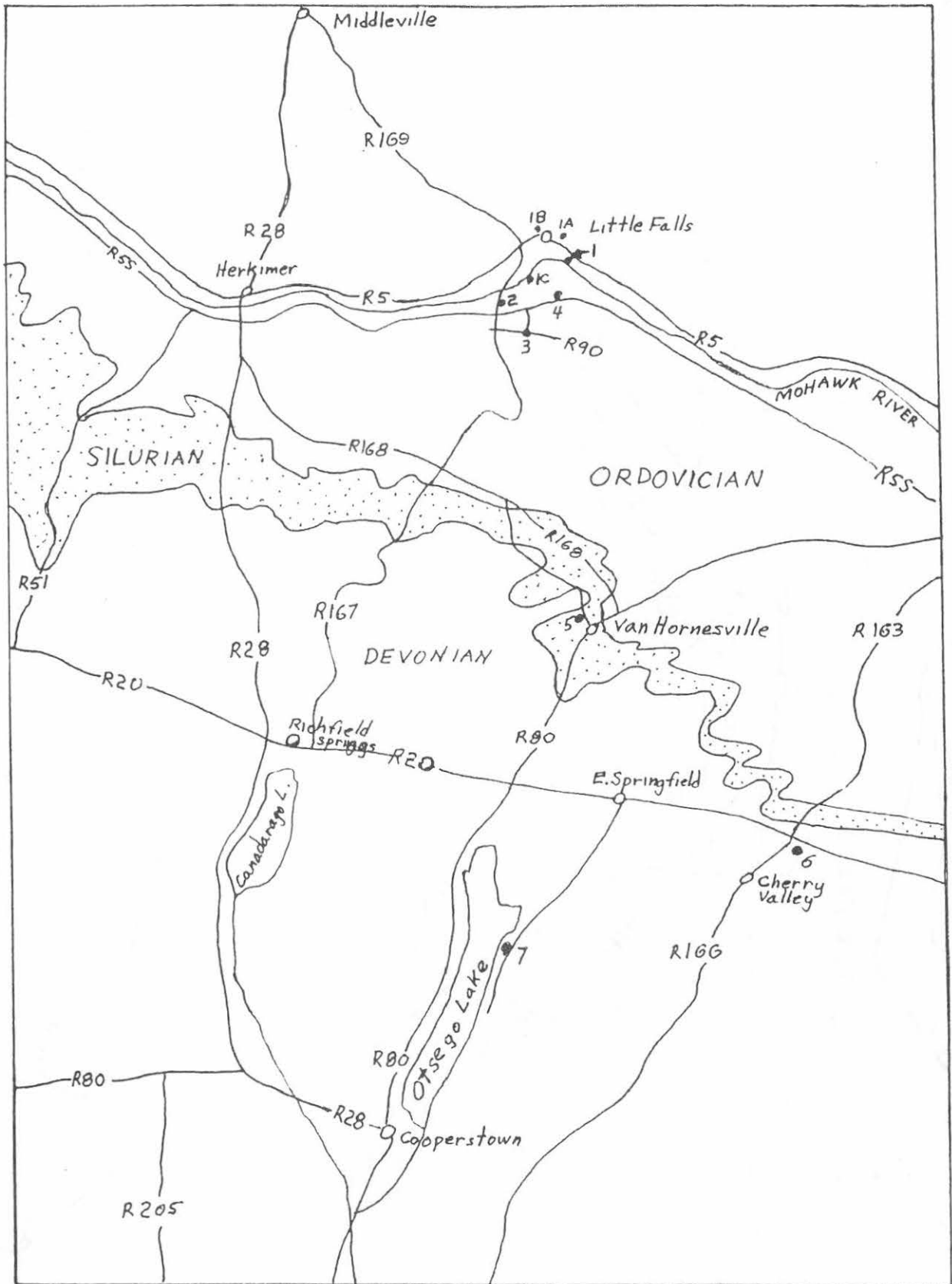


Figure 1. General Map of Field Area

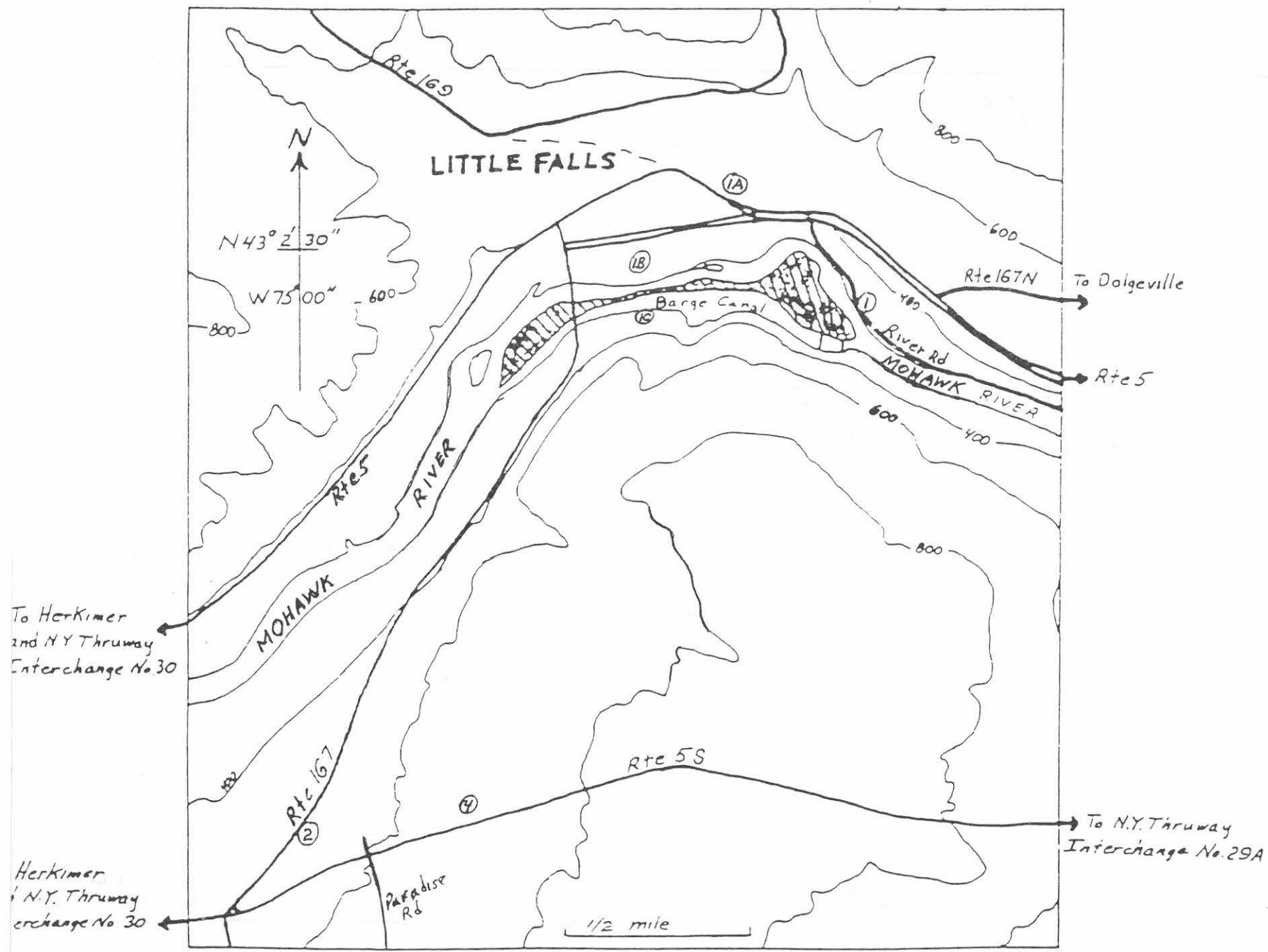


Figure 2. General Map showing Moss Island, shaded, and field trip stops

- 0.3 55.5 Turn right onto South Ann. St., then left onto 167 N./5 E. combination.
- 0.2 55.7 Turn right at the traffic light onto River Road. Precambrian basement material can be seen in an outcrop on route 5 to the east and up the hill.
- 0.5 56.2 Little Falls Sewage Treatment Plant.

STOP #1 - A very good outcrop of Precambrian material can be seen on the NE. side of the road just before reaching the plant. This rock is a quartzose syenite gneiss of Precambrian age. Multiple veins of quartz that have filled fractures in this material attest to a history of deformation in these rocks. Please do not use rock hammers at this outcrop, as the use of them would mar the large pothole, a very unusual erosional feature that is visible here. For some periods of the Pleistocene ice blocked the flow of water through the St. Lawrence River creating Lake Iroquois. This greatly increased the flow of water through the Mohawk R., for some 1000 yrs., from about 12,000 to 11,000 yrs ago, which carved this pothole and those across the river. Across the river is Moss Island. In May, 1976, Moss Is. was declared a National Landmark. It is one of only 400 such registered natural treasures in the U.S. The shoreline of Moss Is. displays several of these potholes, some more than 30 feet deep and about 20 feet in diameter, and makes an excellent photo opportunity. Lock 17, which is the highest lift lock on the barge canal system (40.5 ft.), can also be seen.

- 0.5 56.7 Intersection of River Rd. with 167/5 combination. Go straight at this light onto East Main St. (Rte. 169 N.) One block later, you will see the Board of Education building on the NE corner. Park here.

STOP #1A. In the town park ahead is a good exposure of bedrock that displays roche moutonnee glacial alteration. Turn left out of the Board of Education parking lot onto E. John St., cross E. Main St., and continue.

- 0.3 57.0 555 E. John St. Boulder on display in front of the Rockton Plaza was removed from a pothole during excavation.

STOP #1B. Photo opportunity of a well scoured boulder, an abrasion tool used by the swirling waters for the creation of potholes. This road bends to the right. At the next traffic light, turn left.

- 0.3 57.3 In front of the McDonalds store, turn left onto the turnoff for Rte. 5 and then left onto route 5. Turn right immediately to be on Route 167 S. You will be on a bridge crossing the Mohawk River. Moss Island can be viewed on the left (East).
- 1.0 58.3 Turn left onto Casler Road. Make an immediate left onto Flint Rd. and continue.

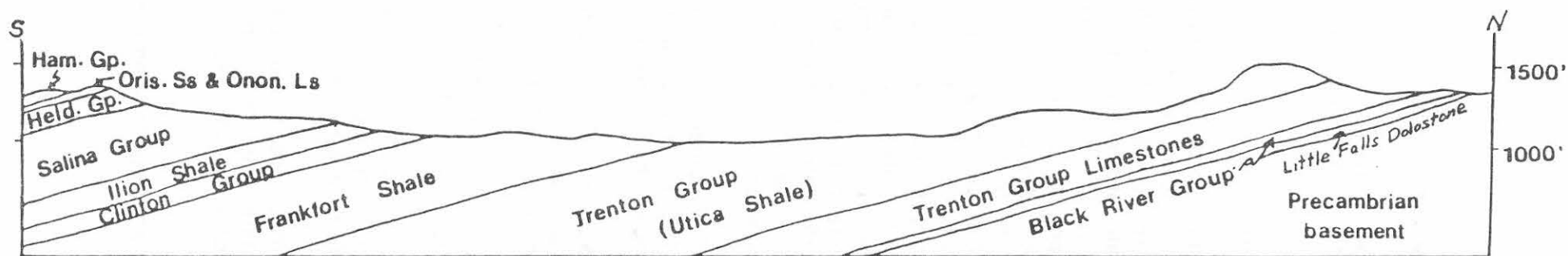


Figure 3. Schematic geologic cross section of central New York State. Average general dip is less than 1° to the South

- 0.3 58.6 STOP #1C Parking Lot for church on right, W. of the church. Walk to fence in the back center of lot. Across abandoned railroad right of way observe nonconformal contact of Little Falls Dolostone (Cambrian) overlying Precambrian syenite gneiss. Dolostone is overlain by classic manmade limestone wall. Return to Rte. 167.
- 0.3 58.9 Turn left and continue on Route 167 S.
- 1.8 60.7 STOP #2 Outcrop of Late Cambrian Little Falls Dolostone. This unit directly underlies the Black River Group (Ordovician) in this area. It nonconformably overlies a Precambrian syenite gneiss. The Little Falls Dolostone is a sandy, medium-grained dolostone with some sandstones occurring near the base of the unit. Except for the abundant colonial algae Cryptozoan, not seen at this site, the unit seems to be barren in this area. Quartz crystals from this site are locally known as Little Falls, Herkimer, or Middleville Diamonds. Anthraxolite is a black, lustrous, carbonaceous mineral often found in association with the quartz. Calcite, dolomite, pyrite, marcasite, galena, sphalerite, chalcopyrite, hematite, and glauconite have also been reported.
- 0.1 60.8 Intersection of Rtes. 167 and 5S. Turn left, and follow route 5S to the east.
- 0.4 61.2 Turn right onto Paradise Rd.
- 0.8 62.0 STOP #3 Paradise Road bridge over Thruway. Park at S end. Ordovician Dolgeville Facies, a mixture of calcisiltites and black shales, overlain by the Ordovician Utica Shale can be seen in rock cuts on both sides of the Thruway. It is a deeper water facies of the Trenton limestones. The contortions seen in the Dolgeville are considered to be due to a submarine slide when the unit was in a soft sediment phase. Graptolites and trilobites from the Utica Shale exposed in the ditch at the SW corner of the bridge have been found. WARNING: Do not climb down the cliff faces. It is illegal and dangerous to go rock collecting there. Looking at the NE. wall a very visible fault can be seen. It the first of many major faults that cross the Thruway further to the East. (This stop is a good camera opportunity).
- 0.8 62.8 Return to Route 5S. Turn right, and continue east.
- 0.4 63.2 STOP #4 (LUNCH)
North of the road is an abandoned quarry. This is now part of a private home, so please do not do damage to these rocks. 2-1/2 feet of Gull River Limestone underlie 18 feet of Kings Falls Limestone. These rocks are very fossiliferous, shelly and nonshelly calcarenites from the Ordovician Trenton Group. See stop #2, Cameron (1972) for more detail.

Turn around and follow Route 5S west.

- 0.8 64.0 Intersection of Rtes. 5S and 167. Turn left and follow 167 S.
- 2.6 66.6 Intersection of Rtes. 167 and 168. Turn left and follow 168 E.
- 1.5 68.1 Intersection of Rte. 168 and Upper Deck Rd. Turn right and continue on Deck Rd.
- 1.3 69.4 Intersection of Upper Deck Road and Travis Rd. Turn right on Travis Road and continue south.
- 4.4 74.3 STOP #5 Outcrop of Silurian Otsquago Sandstone, a formation of the Clinton Group. Coarse red sands, cross bedding well displayed. Interbedded green shales represent the Sauquoit Formation seen further to the west. A deltaic distributary channel environment of deposition is postulated for these rocks.
- 0.2 74.5 Intersection of Travis Rd. and Rte. 80
Turn right and follow Rte. 80 S.
- 5.8 80.3 Intersection of Rtes. 80 and 20. Turn left and follow Rte. 20 E.
- 8.2 88.5 STOP #6
Intersection of routes 20 and 166. Drive under the Route 166 bridge and park along the outcrop on Route 20. Kalkberg Limestone, Oriskany Sandstone, Esopus shale, Carlisle Center and Onondaga Formations. A 1-3 cm (Tioga) bentonite (volcanic ash) layer is found in the Kalkberg. It has been dated as being about 395 million years old. Several rock types are visible at this outcrop that represent a wide variety of Devonian depositional environments. See Fisher (1979), stop #6 for more details. Turn around, and travel W. on Rte. 20.
- 4.5 93.0 Junction of Route 20 and Dugway Road (County #31). Turn left and follow Dugway Road South.
- 4.0 97.0 Glimmerglass State Park on right.
- 2.4 99.4 STOP #7 Road Cut in Dugway Rd.
Otsego shales (Middle Devonian). Epifaunal filter feeders were very common in this deltaic environment. The rise of highlands in the east (due to tectonic uplift) have altered the environment of deposition to something quite different from those seen at Cherry Valley. For more information, see Grasso (1977).
- 4.2 103.6 Junction of Dugway Rd. and River Street (Just after crossing a bridge over the Susquehanna). Turn right onto River Street. A small park at the

junction with Lake Street marks the start of the Susquehanna River. Here the waters of Otsego Lake flow over a Quaternary moraine that dams the lake. Turn left onto Lake Street.

- 0.7 104.3 Intersection of Lake Street with Rte. 80. Turn left. Continue straight on Rte. 28 S.
- 9.8 114.1 Intersection of Routes 28 and 7. Turn Right, taking Rte. 7 E.
- 6.8 120.9 Stoplight. Intersection of Main and Chestnut Streets in Oneonta. Turn right.
- 0.3 121.2 Stoplight. Intersection of Chestnut St. and West Ave. Turn right.
- 0.6 122.0 S.U.N.Y. Oneonta Campus Entrance on right. **END.**