

Moss Island, Little Falls, New York

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INTRODUCTION

"I consider this Island and its potholes so unique that I have recommended it most highly for inclusion in the registry of Natural Landmarks of the National Park Service. This island should not be touch in any way or the value of the potholes would be diminished" (Morisawa, 1977, p. G-41).

"Moss Island merits protection and preservation as a geological landmark." (Muller, Hawley, and Muskatt, 1977, p. G-8).

In May, 1976, Moss Island was declared a National Natural Landmark. It is one of only four hundred such registered natural treasures in the United States.

Plans for construction of a highway across Moss Island by the N.Y.S. Department of Transportation were initiated in 1968. Opposition to the proposed plan arose in 1973 only after some concerned individuals found out about those plans. In the forefront of that battle were the Mohawk Valley Floodplain Association, a local group concerned with the Mohawk River and the Utica chapter of the Izaak Walton League, a national conservation organization. These two organizations requested assistance from the New York State Geological Association in 1974. Through the efforts of these organizations, among many others, as well as individuals, national landmark status was achieved. Nevertheless, even with the granting of such status the N.Y.S. D.O.T. continued to press for construction over the Island. The D.O.T. stand was taken over the objections of such groups as the N.Y.S. Department of Environmental Conservation, National Park Service, Sierra Club, N.Y.S. Office of Parks and Recreation, and the National Audubon Society. Not until the Secretary of the U.S. Department of the Interior strongly recommended against approval of the application to the Coast Guard did the N.Y.S. D.O.T. "gracefully" back down. Disapproval by the Coast Guard was on environmental grounds.

GENERAL GEOLOGY

Moss Island (Fig. 1) is a 14-acre curved, dumbbell-shaped feature lying between the Barge Canal to the south and the Mohawk River to the north. Generally the eastern part of the island is referred to as Moss Island. It lies on a horst which raised the Precambrian gneiss to its present position. The throw of the fault is considered to be about 850 ft (Cushing, 1905, p. 40). Isachsen and McKendree (1977) indicate a throw of 250 ft.

Bedrock of the island is a quartzose syenite gneiss of Precambrian age. Potholes and related hydraulic abrasion features, prominently displayed on the island, document the torrent of early postglacial drainage from the Great Lakes through the Mohawk Valley. For some 1000 yrs., from

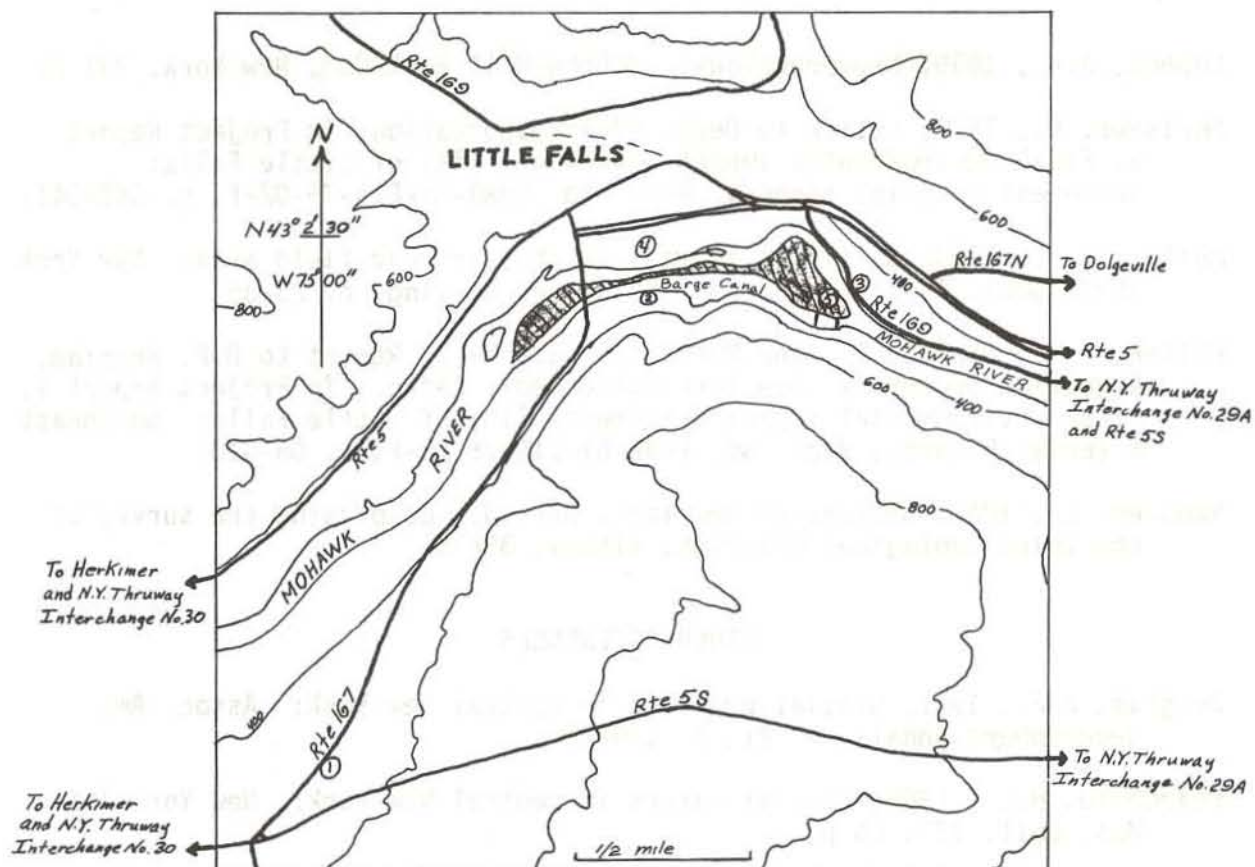


Figure 1. General map showing Moss Island, shaded, and field trip stops.

about 12,000 to 11,000 yrs ago (Lake Iroquois phase), the Mohawk River carried the entire outflow of the Great Lakes while the St. Lawrence valley was blocked by the slowly receding continental ice sheet. The resistant uplifted syenite gneiss here at Little Falls created the preglacial divide between the Hudson and St. Lawrence drainages. As the waters from the Great Lakes poured over this divide the narrow valley at Little Falls was cut. These same rapid swirling waters helped create the spectacular potholes on the island. The potholes were reported first by Vanuxem (1842, p. 209).

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ROAD LOG FOR MOSS ISLAND FIELD TRIP

Start: Colvin St. Parking Lot, Syracuse University, Manley Field House, Syracuse, NY. 8:30 AM. Exit on to Colvin St., turn right (w).

<u>Miles from last point</u>	<u>Cumulative Miles</u>	<u>Route Description</u>
0.0	0.0	Stop light, intersection of Colvin St. and Comstock Ave. Cross intersection, continue along Colvin St. (W).
0.1	0.1	Looking W, straight ahead, view of Onondaga Valley, a N-S glacial trough.
0.5	0.6	Turn right onto Route I81 N, immediately after underpass. Stay in right lane.
1.0	1.6	View of downtown Syracuse on left.
0.6	2.2	Stay right onto Route I690 E. Use center lane if possible. Route I690 follows a glacial melt-water channel, the Erie Canal Channel. The floor of this channel is depositional (Muller, 1964, p. 51).
3.7	5.9	Thruway sign. Stay left.
0.7	6.6	Take Route I481N to N.Y.S. Thruway.
3.6	10.2	N.Y.S. Thruway entrance 34A. Take eastbound direction. Observe 55 mph limit.
		Route cuts through the Lake Iroquois glacial lake plain whose outlet was at Rome, NY. This is part of the Ontario Lowland and is underlain by Middle and Upper Silurian units.
10.3	20.5	View to the right (S), first good view of the northern limit of the Appalachian Plateau. Plateau units here are of Late Silurian age and principally the Vernon Formation and the Syracuse Formation, along the face of the scarp.
1.8	22.3	Low ridges to right (S) and left (N) are ancient glacial lake barrier bars. Additional bars will be seen along route.
2.8	25.1	Another view of Appalachian Plateau front on your right.
13.4	38.5	Outcrop of Middle Silurian Oneida Conglomerate, basal formation of the Clinton Group on your right (S) alongside roadway.

<u>Miles from last point</u>	<u>Cumulative Miles</u>	<u>Route Description</u>
5.7	44.2	Another view of Appalachian front on right.
3.7	47.9	Recent Oneida Lake plain to left (N) with view of the foothills of the Adirondacks in distance. Oneida Lake is a remnant of glacial Lake Iroquois.
1.1	49.0	View of the foothills of the Adirondacks ahead.
2.4	51.4	Riverside Airport on right (S).
2.8	54.2	UTICA on right. My residence and the location of UTICA COLLEGE of Syracuse University.
15.1	69.3	Traveling along a higher floodplain level of ancient Mohawk River.
1.3	70.6	We are located in the Mohawk subprovince. View to the right is again the northern limit of the Appalachian Plateau. The horizontal benches seen in the upper half of the scarp are of Middle Silurian sandstones and conglomerates of the Clinton Group. The Clinton Group disconformably overlies the mudstones and siltstones of the Frankfort Formation of lower Late Ordovician age which occur in the lower portion of the scarp.
1.3	71.9	View of the Adirondack foothills on the left (N).
5.9	77.8	Traveling on an old terrrace of the Mohawk River. Present Mohawk River floodplain seen on right (S).
0.7	78.5	View on left (N), terraces cut into Middle Ordovician Utica Formation to control slumping of slope. Every several years the shaly mudstone slumps, thereby blocking the highway for a day or two. Because of the regional dip, 50-80 ft/mi to the south (right), the Utica Formation is not exposed across the valley to the right (S). The overlying unit, the Frankfort Formation does crop out.
0.6	79.1	View on left (N), another exposure of terraced Utica shale. Remington Arms plant on your right (S), in valley.

<u>Miles from last point</u>	<u>Cumulative Miles</u>	<u>Route Description</u>
0.9	80.0	View across valley to right (S) of knobby hills representing the terminal moraine of the Ontarian lobe which moved from the west. This is the easternmost limit of the last glacial advance in this region (Dunn, 1960, p. D9).
0.4	80.4	View on the left (N). A large gravel pit of glaciofluvial origin. The foreset beds are clearly shown. Being the top elevation of the deltaic deposit is about 520 ft, Fairchild (1912, p. 39) would assign it to post-glacial Lake Amsterdam.
0.9	81.3	EXIT 30, Herkimer Exit, Route 28. <u>GET OFF</u> N.Y.S. Thruway.
0.4	81.7	Toll booth - Pay toll!
0.1	81.8	Route NY28 S, TURN LEFT. Cross bridge and Mohawk River.
0.2	82.0	Turn left (E), proceed along Route NY5S. Mohawk River on left (N).
0.5	82.5	Block of tillite on right (S).
1.7	84.2	Old stone Fort Herkimer Church on left (N) completed in 1767. Listed on National Register of Historic Buildings in 1972.
0.3	84.5	Cross N.Y.S. Thruway below overpass.
2.4	86.9	Glacial till on right.
0.2	87.1	Cross N.Y.S. Thruway below overpass. Look quickly down on right. View of Middle Ordovician Dolgeville Formation.
1.6	88.7	Intersection of Route NY167 N and Route NY5 S. Turn left (N) onto Route NY167 N.
0.1	88.8	STOP 1: (30 min) Outcrop of Late Cambrian Little Falls Dolostone. This unit directly underlies the Black River Group in this area. It nonconformably overlies a Precambrian syenite gneiss. The nonconformable contact will be seen at stop 2. The gneiss may be examined on Moss Island in Little Falls, stop 5. The Little Falls Dolostone is a sandy, medium-grained dolostone with some sandstones occurring near the base of the unit. Except for the

<u>Miles from last point</u>	<u>Cumulative Miles</u>	<u>Route Description</u>
		abundant colonial algae <u>Cryptzoon</u> , the unit seems to be barren in this area.
1.6	90.4	Cliffs of Little Falls Dolostone on the right (E).
0.2	90.6	On bridge to Little Falls and over the Mohawk River. Moss Island below. (See Figures 1 and 2.
0.1	90.7	STOP SIGN ON BRIDGE. TURN RIGHT.
0.1	90.8	"T" intersection, turn right onto S. Ann St. For purposes of expediency we will leave some cars here and regroup. Cars will be picked up in about one hour when we go to the potholes of Moss Island. We will make three quick photograph stops before picking up cars.
0.1	90.9	Cross bridge over Mohawk River to Moss Island.
0.05	90.95	Stay left at end of bridge toward <u>ONE LANE</u> bridge. <u>CAREFUL</u> . Cross bridge over canal. See Figure 2.
0.1	91.05	Intersection of bridge with E. Jefferson St. Turn left (E).
0.05	91.1	STOP 2: (15 min - picture stop). Parking lot on left. Walk down hill (W) and cross road to empty lot on west side of church. Walk to fence in back center of lot. Across abandoned railroad right-of-way observe nonconformable contact of Little Falls Dolostone overlying Precambrian syenite gneiss. Dolostone is overlain by classic manmade limestone wall. Return to cars and one lane bridge over canal.
0.05	91.15	Intersection of bridge with E. Jefferson St. Turn right (N) over bridge.
0.1	91.25	End of one lane bridge over canal. Stay right.
0.05	91.3	Cross bridge over Mohawk River. Continue on S. Ann St.
0.1	91.4	"T" intersection, turn left (W) toward bridge.
0.1	91.5	Intersection with bridge (Route NY167). Turn right (N).

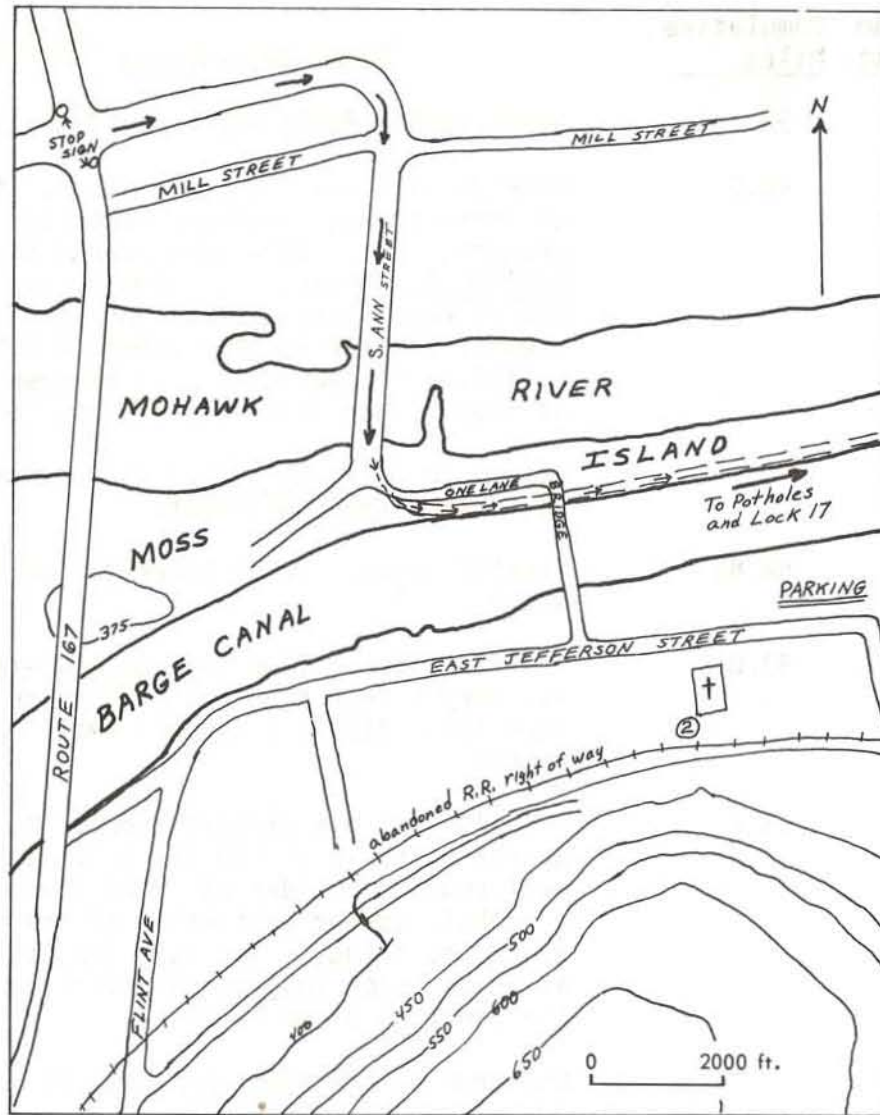


Figure 2. Detail of entrance to Moss Island, Little Falls, N.Y. (arrows) and location of STOP 2 and parking area.

<u>Miles from last point</u>	<u>Cumulative Miles</u>	<u>Route Description</u>
0.05	91.55	Stop sign, turn right, continue on Route NY167 N.
0.05	91.6	Stop sign, turn right, continue on Route NY167 N.
0.1	91.7	Stop light, turn left, continue on Route NY167 N and Route NY5E. Moss Island is on the right (S) across Mohawk River.

<u>Miles from last point</u>	<u>Cumulative Miles</u>	<u>Route Description</u>
0.4	92.1	Stop light. Route NY169 S. Turn right (E).
0.4	92.5	STOP 3: (15 min - picture stop). Park in clearing across the road, north side. <u>CAUTION</u> crossing road. Walk back across the road <u>CAREFULLY</u> . Observe potholes on northeastern end of Moss Island across Mohawk River. This view is similar to that shown in Lobeck (1939, p. 194). The potholes will be seen close up at Stop 5, our last stop on this trip. Return to cars <u>CAREFULLY</u> and reverse direction on Route NY169, <u>northwest</u> .
0.35	92.85	Traffic light. Cross intersection with Route NY167.
0.15	93.0	Traffic light. Turn left onto Alexander St. St. Mary's Church on left. Park on right, before turn, displays several small roches moutonees.
0.2	93.2	STOP 4: (15 min picture stop). In front of apartment house at 550 Alexander St. Large well-rounded boulder on front lawn was found in a pothole during excavation of the foundation of the building. This is a typical boulder used as an abrasion tool by the swirling waters for the creation of potholes. Continue on Alexander St. and take curve to:
0.1	93.3	Stop sign; cross intersection.
0.1	93.4	Traffic light. Intersection with E. Main St. <u>TURN LEFT</u> , continue on E. Main St.
0.15	93.55	<u>SHARP LEFT</u> to Route NY5.
0.05	93.6	ROUTE 167S. Proceed along Route NY167S partway across bridge.
0.1	93.7	STOP SIGN on bridge. <u>TURN LEFT</u> . See Figure 2.
0.1	93.8	"T" intersection, turn right onto S. Ann St. <u>PICK UP CARS</u> .
0.1	93.9	Cross bridge over Mohawk River.
0.05	93.95	Stay left at end of bridge toward <u>ONE LANE</u> bridge. Just <u>BEFORE</u> bridge entrance take <u>RIGHT</u>

Miles from last point Cumulative Miles

Route Description

FORK onto dirt road. Sign reads "This is not a public highway. Dept. Pub. Wks." THIS IS OUR ROUTE. See Figure 2. Road parallels barge canal.

0.05 94.0 Mohawk River on left (N), barge canal on right (S). Precambrian syenite gneiss across canal on right. Late Cambrian Little Falls Dolostone forms cliffs on the right (S). Proceed East along road toward Lock 17.

0.6 94.6 Parking area at Lock 17, Moss Island. STOP 5: End of trip. See Figure 3. Lock 17 is one of the highest lift locks in the world, 40.5 ft. The lower level is 322.5 ft above sea-level and the upper level is 363.0 ft above sea-level. For those who are interested, after we have examined the potholes, you can visit the old Erie Canal lock constructed about 1825. This old lock is located southeast of the existing Lock 17. It may be reached by walking across the catwalk in front of the eastern end of the lock and then down the stairs. The old Erie Canal lock is just a short walk to the east.

Part of the proposal involving construction of the bridge over Moss Island included covering the old lock. As stated by one local supporter of the bridge, "burying the old Erie Canal lock thus preserves this historic site for posterity".

Several potholes are located west of the parking area, along the south facing cliff adjacent to the road.

Walk north from parking area several yards along path to clearing, an old picnic area. Note iron rings in the gneiss. These rings are said by some to have been used as pole support tiedowns for: (1) telephone poles, (2) "A" frames as part of the lock construction, (3) eyelets for hawsers for hauling barges. Perhaps, on the other hand, they may have been used by Rip Van Winkle's friends as croquet wickets when they tired of bowling in the Catskills.

Walk NNW about 200 yds across the island and then turn N, downhill to potholes. STAY ON PATH and WATCH OUT for WIDE JOINT OPENINGS which require a slight jump. Paint marks represent bridge positioning.

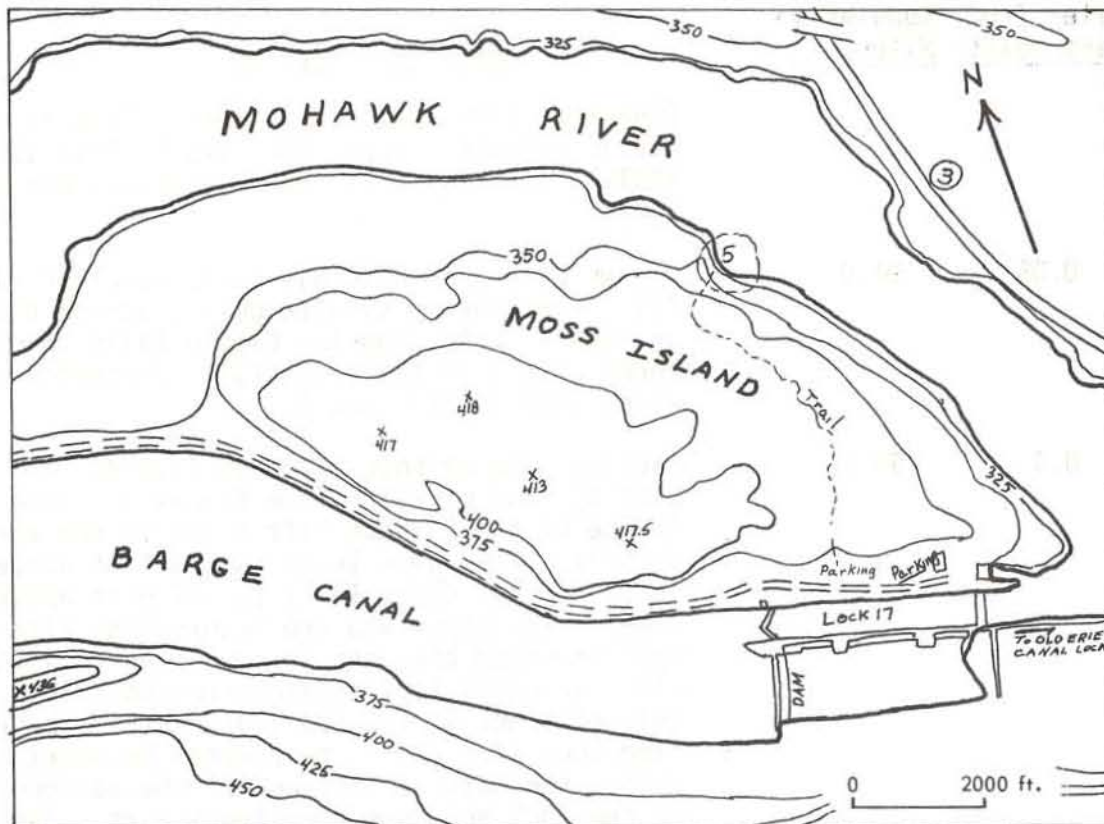


Figure 3. Moss Island, Little Falls, NY and location of STOP 3 and 5 (pothole concentration).

Miles from last point Cumulative Miles

Route Description

The ecological balance here is critical, the soil cover is thin. DO NOT pick flowers or destroy foliage. Most of the low-lying bushes are blueberry bushes. You may eat in season. Most of the plant species seen here are characteristic of Adirondack flora.

Along most of the northeastern margin of Moss Island, facing the Mohawk River, numerous potholes occur. Although several hundred potholes are reputed to be scattered about the island the trip will observe only the area of greatest concentration. The deepest hole measured to the river silt-sand fill is 30 ft. The maximum diameter measured is about 20 ft.

USE EXTREME CAUTION while moving about. Please do not sit on THE THRONE.

The bedrock here is a quartzose syenite gneiss of Precambrian age. A number of quartz-rich

Miles from Cumulative
last point Miles

Route Description

dikelets cut across the relatively horizontal foliation of the gneiss. The dikelets generally strike east-west and dip 45°N. According to Cushing (1905), p. 15), the gneiss consists "mainly of feldspar, always show some quartz, usually from 5% to 15% of the rock in quantity, and usually have only a small content of dark minerals, magnetite, hornblende, pyroxene and black mica." The gneiss on the north side of the island is relatively fine-grained whereas on the south side, near the barge canal, it is more coarse-grained and in places seems to be porphyroblastic, occasionally showing augen structure. Several faults also are present.

Return to Route NY167 and HOME. See Figure 1. For the N.Y.S. Thruway take Route 167N to intersection with Route NY5S. To head WEST turn right and intersection with Route NY28, turn right to Thruway entrance. To head EAST turn left onto Route NY5S and proceed to Thruway entrance. The large cut just before the Thruway, after the tollbooth, is in Utica shale, the same unit that has tendency to weather readily and subject to slides as seen previously at mileage 78.5 and 79.1.