

Fieldtrip to Tallman Mountain State Park

By Bill Menke, November 12, 2023



Hudson River with the Palisade Diabase forming the ridge to its left, as seen from the North Overlook of Tallman Mountain State Park

Goal: View the Mesozoic rocks along the Hudson River and much more recent glacial features dating from the Ice Age.

Time and Distance: About two miles; roundtrip in two and a half hours.

Starting/Ending Point. Main Parking Lot of Tallman Mountain State Park, Rockland Road, Sparkill, New York. Rockland Road is a side street off of Route 9W. I urge following the directions of Google Maps or a similar navigation app to find the Park.

Parking. The Main Parking Lot is just inside the Park entrance on the right. It is large and can accommodate larger vehicles. A parking fee is sometimes charged.

Bathrooms. There is a bathroom by the soccer field is across the park road from the Main Parking Lot. The route of the fieldtrip passes by three other bathroom buildings. However, there is no guarantee that they are open, especially in the colder months. If you want to be sure, call the Park Office ahead of time.

Conditions: Hiking along relatively well-maintained trails with significant elevation change. Hiking boots are recommended but not required.

Suggestions: Bring a water bottle and a snack and wear a hat. This area is very photogenic, so consider bringing a camera. A compass and a land lens would be handy, too.

Hazards: Tripping on a rock; falling down a steep hillside, dehydration, Lyme disease, Poison Ivy. I recommend against doing this fieldtrip in winter, but bring micro-spikes or other traction devices if there is any chance of ice.

Park Map. I made this Park Map. Have a look! It may help you keep to the directions.

<https://www.ldeo.columbia.edu/users/menke/slides/public/tallmanpark.pdf>

A plea. Don't damage rock outcrops by hammering on them or marking them. Don't collect rock samples, which is illegal in a public park like this. Stay on the trails so not to trample the fragile cliff-side ecosystem. And don't try to scale the cliffs!

Notation. The notation (102,38) means 102 yards from the Main Parking Lot, 38 yards from the last stop.

(0,0) Main Lot. After you've parked in the Main Parking Lot, you might want to use the bathroom by the soccer field, across the park road from the lot, to the right of the stone bleachers. The fieldtrip starts at the far (east) end of the lot (the end furthest away from the Park entrance). Begin by facing away from the Park entrance. This direction is east, towards the Hudson River. The river (which you can't yet see) flows from north (left) to south (right). Walk east along the edge of the Park Road, until you reach an intersection with a road on the right.

(64,64) Intersection with Saw Mill Picnic Area sign. Note the large rock outcrop on the left (north) side of the road. It is composed of diabase, an igneous rock that formed almost exactly 200 million years ago during a period of volcanism. When weathered, its surface is brown (as is this outcrop), but the rock itself is grey in color. Note that the rock breaks into big rectangular blocks. A small stream flows along the right (south) side of the road, and a line of boulders has been set along the edge of the road. It's dangerous to make any inferences from decorative stones that could have been trucked in from far away. But I know from having examined them that most of them are the local diabase. If you can find a fresh surface (don't hammer one!), you will see that the rock is actually grey, with a salt-and-pepper appearance due to two common igneous minerals, light-colored feldspar and dark-colored pyroxene. Use your hand lens (if you have one) to look at these minerals. A few boulders are not diabase, but rather a banded metamorphic rock called gneiss. They are glacial boulders, brought from the Hudson Highland, a group of hills located about 25 miles to the northwest of the Park, by the great glaciers of the Ice Age, about 15 thousand years ago. Can you find them? They are called "erratic boulders" because they do not fit in. In addition to transporting boulders, the ice also tore away the downstream (southeastern) side of hills, forming cliffs. I don't know whether the pile of boulders beneath the rock outcrop was formed that way. It's possible. But it's also possible that the outcrop was broken up by machinery when the Park Road was built. As we shall see, this area has been heavily modified by human activity. Continue along the main Park Road, heading east.

(102,38) Park Directors residence. As you pass the residence, note that it is composed of diabase stones. It's one of the many beautiful stone buildings that the Civilian Conservation Corp built during the 1930's. Continue along the main Park Road, heading east.

(168,67) Turning Circle. Turn left when you reach the circle and head uphill (north). Although there are some big boulders in the circle, at least one of them is non-local, having been brought in on a truck a decade ago as a prop used during the filming of a TV show (and not subsequently removed). Keep left, walking along the edge of the road.

(239,71) Halfway up hill. About halfway up the hill, you will pass a diabase outcrop on the right (east). This is a "roadcut", meaning that rock was removed to make way for the road. You can get a good sense of the way that the rock is cracked (or "jointed" in geology-lingo). These cracks formed when the hot rock cooled and are responsible for the rectangular shape of boulders that fall from the outcrop. You will also note a deep valley that is just beyond the left-hand (west) side of the road. Its size and steepness is

rather unexpected, because no stream flows through it, and little land is available uphill of it to provide a watershed. I suspect that it's a "beheaded valley", formed at the end of the Ice Age, when it was the pathway of a torrent of meltwater coming off the retreating glaciers. Continue walking uphill along the road.

(310,71) Road turns right (east). Follow the road as it turns right (east) and note the land falls off very quickly north of the road. You are at the south edge of a major valley that runs east-west.

(347,37) Intersection with road on right. Continue straight on the left (east) road as you pass an intersection.

(447,100) North Overlook. Leave the road and walk to North Overlook, a north-facing viewpoint at the edge of a deep valley. You will see the Hudson River, spanned by the Mario M Cuome Bridge. On the river's left (west) bank are the villages of Piermont (in the foreground) and Nyack (by the bridge). Clausland Mountain is above Piermont and Hook Mountain is just beyond Nyack. Both hills are composed of the same diabase as occurs in Tallman Mountain State Park. It forms a more-or-less continuous ridge (except for a few gaps like the one you're looking at) that runs from just north of Staten Island to just south of Haverstraw. Much of the eastern side of the ridge has steep cliffs, called the Hudson Palisade. An important geological question is whether the rock beneath the river is diabase, or whatever material makes up the Westchester hills, or something else. Note that the Clausland Mountain is a little to the left (west) of Tallman Mountain and separated from it by a valley. Westchester, on the right (east) bank of the Hudson, has hills, too. Another important geological question why there is a valley between Tallman Mountain (where you're standing) and Clausland Mountain. Return to the road when you're finished admiring the view. Note that one of the big boulders on the roadside is a big piece of Highland gneiss. It's probably an erratic that was moved only a few yards when the Picnic Area was built, but we cannot know for sure. A bathroom building on across the Park Road and a little to the west of the overlook. It is made of diabase stones. Return to road and continue on it as turns right (south).

(476,29) East Overlook. Leave the road and walk to East Overlook. It's a bit overgrown, so you may have to search around for a good view. Piermont Marsh is right below. It is cut by a big meandering creek called the Spar Kill, and by several smaller ones. ("Kill" is the Dutch word for "creek"). The marsh was formed soon after the retreat of the glaciers, but Piermont Pier, on its left (north) edge, was built in the Nineteenth Century. Return to the road when you're finished admiring the view. You are now heading south.

(601,125) Long Path (LP) intersection. Just before you arrive at another Bathroom Building, a hiking trail called the Long Path (LP, blazed in blue) crosses the road. Take it left, into the woods and downhill until you reach the Turning Circle.

(609,8) Turning Circle. Go left by the Turning Circle and take the main road downhill (north).

(640,31) Rock outcrops. More diabase outcrops along the left (west) side of the road. Continue downhill (north).

(682,50) Old Quarry face. Look left and up left as you head down the road. The cliff above you is not natural; it is part of a now-defunct "traprock quarry". Back in the late 19th and early 20th Century, the diabase from Tallman Mountain and many other nearby places was extensively mined for "trap" (crushed rock used tin construction). Had these hills not been acquired as parkland, they would now be gone. Looking right, you will have a good view east across Piermont Marsh. Continue downhill (north).

(740,58) Turning Circle. Go left when you reach the turning circle at the bottom of hill and continue north along the Bicycle Path. You are walking on a narrow strip of land between the ridge of diabase above you and Piermont Marsh, full of tall Phragmites reed (an invasive variety). The proliferation of the reed is fairly recent; a generation ago the marsh vegetation was completely different.

(982,242) Ferdon Avenue Gate. Continue along Bicycle Path as it curves to the west. You will come to a gate with a town road, Ferdon Avenue.

(990,8) Spar Kill. Exit the Park, turn right, and walk along the sidewalk until you stand on a bridge that crosses the Spar Kill, to get a downstream (east) view of the stream, then cross the road and walk to an old drawbridge with benches to get an upstream (west) view. The Spar Kill drains the lowlands west of Tallman and Clausland Mountains and flows out through this narrow valley (“water gap”) between them. However, flowing water did not carve the valley on its own. A geologic fault runs through the valley. Fault motion offset Clausland Mountain west of Tallman Mountain. The faulting crushed the rock, making it easier for water action to wear it away. When you are done admiring the Spar Kill, reverse direction, walk back into the Park and retrace your way (south) along the Bicycle Path.

(1032,42) Diabase outcrops. You will pass rock outcrops very close to road level. Continue along the Bicycle Path (south).

(1046,14) Erratic boulder. You will pass an erratic boulder of gneiss on the right (west). Continue along the Bicycle Path (south)

(1229,183) Turning Circle. At the Turning Circle, continue straight, staying at river level, and walk south through the Pool Parking Lot.

(1280,51) Pedestrian Path. Pass a pedestrian path heading uphill on the right. Continue walking south through the parking lot.

(1330,50) Pool Entrance. Pass the entrance to the Pool on the right (west). Continue walking south.

(1372,42) Sedimentary Rocks. Just past the pool, stop to inspect rocks outcropping below an old stone wall on the right. These rocks are not diabase, but rather sedimentary rocks that are a little older than it (in the 230-210 million year range). Dinosaur footprints have been found in these sediments (but not here in Tallman Mountain State Park). The ones below the wall are mostly beige-colored sandstones, but you can also find red siltstones and red shale (lithified mud) in the area. Try to verify that the layering (stratification in geology-lingo) of the sediments is more-or-less horizontal. Use your hand lens (if you have one) to inspect the sediment grains. Continue south along the path.

(1393,21) Hiking Trail on Right. Just before making a right-hand turn up the hiking trail, note the rock pavement (which I think is natural) of red siltstone is exposed in the roadbed. Then head uphill on the trail as it heads uphill (northwest).

(1403,11) More Sediments. More sedimentary rocks (mostly sandstones) outcrop on the right. Some fragments of siltstone protrude from the trail bed (but I don’t know whether or not people have moved them there). Continue uphill (northwest) along trail.

(1412,8) Old Quarry. Note (but don’t enter) an old quarry to the left of the trail. The rock on the quarry wall has the characteristic jointing of the diabase. Why do you think that horizontal floor of the quarry is where it is? Why didn’t the workers delve deeper? Continue uphill (northwest) along the trail.

(1453,41) Pedestrian Path. The trail intersects a paved pedestrian path. Go left (west) and uphill on the pedestrian path, which follows a narrow valley with a stream.

(1463,11) Stone Staircase. Pass, but don't climb, a stone staircase, continuing uphill along valley.

(1472,8) Old Dam. Note that a ten-foot high dam made of rock interrupts that stream, but that the lake (impoundment in geology-lingo) upstream of the dam is completely "silted up" (meaning full of sediments, not water). It gives you a sense of the amount of material that even a small stream can move during the brief time that it is in flood after a heavy rain. The dam is probably not more than a hundred years old and already it is useless. This is the fate of all dams. Reverse direction and head downhill (east).

(1480,8) Stone Staircase. Take stone staircase, marked with a blue LP blaze, uphill (south).

(1501,21) Picnic Tables. Stay on the LP heading south as you pass picnic tables

(1522,21) Diabase Outcrops. Note the diabase outcrop on left (east) side of trail

(1541,19) Trail on the Right. Stay on the LP heading south as you pass a trail on the right (west). This area has lots of small glacial erratic boulders.

(1571,30) Bathroom Building. Pass a Bathroom Building. Continue south along the LP.

(1604,33) Park Road on right. Pass a wide path that leads to a park road on the right (west). Continue south along the LP.

(1711,107) Orange-Blazed Trail. Pass an intersection with an orange-blazed trail. Continue south along the LP.

(1750,39) Cross a little stream. We will cross several small streams today. Note that the vegetation around the streams is always more luxurious than elsewhere in the woods. It is reminded of the importance of water to the ecosystem. Also note that the types of bushes are different. Continue south along the LP.

(1813,63) Rock-Paved Road. The LP follows an old rock-paved road with a rock wall on its right. The Park has many such rock walls. They are a reminder of a time when the land was farmed (for farmers collected rocks that were obstructing their fields and built them into walls). Although tall, most of the trees in Tallman Mountain State Park are 20th Century in origin. The pre-Colonial forests are all gone. Some of the flat rocks exposed along the roadway have poorly-preserved glacial groves (glacial striae in geology-lingo). They are faint gauges, a finger with or so wide and several feet long, that glaciers carved into the rock pavement. Oriented north-northwest – south-southeast, they give a sense of the direction of motion of the glacial flow. Continue south along the LP.

(1871,58) Low Hill. The LP crosses a little hill of diabase with some poorly-preserved glacial striae. Continue south along the LP.

(1886,15) Stream. The LP crosses another stream, a little bigger than the previous one. Note the more luxurious vegetation; dense bushes on the uphill (west) side of the trail and more luxurious fern on the cliff side. An impressive ice-fall forms on the cliff during the winter. Continue south along the LP.

(1894,8) More Striae. Note more poorly-preserved glacial striae on rock on and near the trail bed. Continue south along the LP.

(1962,68) Trail Intersection. Pass the intersection with the unblazed Cliff Edge Trail on the left. Stay on the LP as it turns right (westward).

(1970,8) Two boulders. Note two medium size boulder, just to the right of the trail, one diabase, one erratic. Their color contrast makes the erratic boulders easy to spot.

(2007,37) Bicycle Path. Cross the Bicycle Path when you come to it and staying on the LP as it follows the top of an old levee, heading west. These levees date from the 1920's, when oil tank farm was planned for the area (the purpose of the levees was to contain spilled oil). Fortunately, the tanks were never installed. Even though a century old and traversed by many hikers, the levee has not yet worn away. That's because the soil in the park is rich in clay, a weathering product of the diabase. Clay has high cohesion and resists being washed away. Continue westward on the LP, atop the levee.

(2094,88) Low Rise. A trail intersects the LP at the top of a low rise. Take the trail to the left (south), which follows the crest of this low ridge. Note that the right (west) side of the ridge has been dug away – I suppose to provide material for the levees. The presence of this “sand pit” suggests that the ridge is natural, and not something built in preparation for the oil tank farm.

(2140,46) Visit Sand Pit. When you are just past the sand pit, leave the trail and walk right (west) on gently sloping land (not down face of the pit) and then circle into quarry from its west side. You will find several erratic boulders on the quarry floor (presumably material the workers didn't want). Walk over to one of the steeper section of wall and inspect the material. It's all loose material, a mix of sand, gravel and larger stones, not any sort of rock. The ridge that's been quarried stretches about a half-mile through the woods, and has a roughly north-south orientation. I believe that it is glacial in origin; possibly a lateral moraine or an esker. (A moraine is a pile of sediment deposited along the side or at the end of a glacier; an esker is sediment deposited by a sub-glacial river). As you leave the pit and head back to the trail, note that the area just west of the pit is very marshy, but that a patch of drier land has been created by terracing using a stone wall. The woods of southern New York are full of stonework of one sort or another. The builders and their purposes have mostly been forgotten. Then backtrack, returning to trail and retracing your route back north along it.

(2171,31) Erratic Boulder. Pass a large dark-colored erratic boulder of sandstone on the right (east) of the trail.

(2200,29) Levee. Turn right (south) onto the LP, retracing your path along the top of the levee.

(2289,89) Bicycle Path. Turn left (north) onto the Bicycle Path.

(2353,63) Bench. Pass a bench on the right. Continue north along the Bicycle Path

(2375,23) Stream. Cross a small stream, one of the same ones you crossed previously when you were on the LP. Continue north along the Bicycle Path.

(2468,93) Larger Stream. Cross a somewhat larger stream, another of the several you crossed on the LP. Continue north along the Bicycle Path.

(2497,28) Boulder. Note a large squat boulder to the left of the Bicycle Path. If you look at the side of facing away from the road, you will see some banding and a large embedded fragment of some other kind of rock. I'm not sure what kind of rock it is. The overall rounded shape is suggestive of an erratic boulder. Furthermore, the front side has a long scratch that might be glacial in origin (but could also be from road-building machinery). What do you think?

(2568,71) Trail Intersection. Pass a trail intersection on the right. Continue north along the Bicycle Path.

(2576,8) Orange-Blazed Trail. Intersection with the orange-blazed trail. Take the orange-blazed trail left (west).

(2644,68) Stream. Cross a large stream via a footbridge. The dam is along this stream, a quarter mile downstream (east) from this point. Continue on the orange-blazed trail.

(2654,10) Flagstones. The sandstone paving stones (flagstones in geology-lingo) were trucked in and are not from the Park. Continue on the orange-blazed trail.

(2754,100) Main Parking Lot. This fieldtrip ends as you reach the Main Parking Lot.