

THE MOHONK TRUST  
Mohonk Lake  
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## N A T U R A L   V A L U E S

of

## T H E   M O H O N K   T R U S T   L A N D S

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1. Geology. The total Mohonk property consists of 7500 acres running along the Shawangunk ridge for 9 1/2 miles. The Shawangunks, contiguous with the Kittatinny Mountains of New Jersey, rise to a maximum elevation on Trustland of 1620 feet at Millbrook Mountain, whose summit The Trust shares with Minnewaska State Park. The northeasterly-southwesterly oriented ridge is comprised of a base of Hudson River shale of the Ordovician Age, overlaid with Shawangunk grit, a massive quartzitic conglomerate of the Silurian Age. These sedimentary strata are extensively folded and faulted, and dip 22 degrees northwestward in an undulating manner. These harder rocks retain evidence of glaciation, with polishing, striations, and chatter marks, and through plucking they have contributed to the complex escarpment to the southeast. Mohonk Lake, Lake Awosting, and Lake Minnewaska all appear to be features of the glacial era. Details of the geology of the region may be found in the works of Darton (1893), Holzwasser (1926), Rich (1934), and Fenneman (1938).

The escarpment facing southeast is dramatic and consists of sheer rock faces of conglomerate up to 350 feet in height. Millbrook Mountain reputedly has the highest sheer-faced escarpment east of the Mississippi River. Boulder talus at the foot of the conglomerate exposures is another distinctive feature. The Mohonk geology is related to the Ellenville Fault-Ice Caves area, already registered as a National Natural Landmark.

The soils on the upper slopes are thin, acid, and relatively infertile. Often they are stony, with frequent glacial erratics. These characteristics generally obtain where there is a conglomerate substrate. Downslope, particularly in the coves, above the shale substrate, soils become deeper and richer with pH approaching neutral.

From the crest of the ridge several more geological features can be observed: the floodplain of the Wallkill River to the east; the typically V-shaped, water-carved valleys feeding Rondout Creek; and to the northwest the eroded peneplain which is the Catskill Mountains.

2. Physiographic Province. The Mohonk Trust lands are located at a point where three physiographic provinces are in close proximity: the Piedmont, the Appalachian plateaus, and the New England-Adirondack region. The vegetation of Mohonk falls within Zone B of Bray (1915), but includes cove forests of typically Zone C character. The later classification of Braun (1950) assigns this area to the "Oak-Chestnut Forest Region." Blodgett (1910), Nichols (1923), Lutz (1928, 1930), Hotchkiss (1932), Hough (1936), Raup (1938), Jennings (1939), Egler (1940),

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Gordon (1940), Oosting (1942), Bard (1952), and Niering (1953) further classify this region in its several parts.

The biota is diverse, ranging from the wetland communities associated with swamps and lakeland, to the more xeric ones situated on the wind-swept and soilless prominences. Enclaves of species typical of the Arctic zone persist in the microclimate of fissures in the Shawangunk grit conglomerate, known locally as "ice caves." Typically southerly species occupy the lower and more southerly slopes, providing one of the more diverse biotas of the northeastern United States. A recently published flora of Ulster County (1143 square miles) lists 1678 species of vascular plants (Domville and Dunbar, 1970). The works of Fernald (1950) and Gleason (1963) further attest to the floristic complexity of the region.

The southerly affiliation with the lower Hudson Valley is indicated by the presence of the tulip tree and the Allegheny wood rat. In the northern Shawangunks the chestnut oak is quite near its range boundary, which is a scant 10 miles to the west. Nevertheless, chestnut oak is a dominant species at Mohonk. Its former competitor, the American chestnut, commencing in 1904 was reduced to a near-shrub by the chestnut blight fungus.

The northerly affiliation is shown by such species as the sandwort and the slate-colored junco, a common resident species. The paper birch appears significantly at Mohonk, along with the large-toothed aspen, both species having distinctly more northern ranges, and thus reflecting the influence of the nearby Catskills as a bridge to more northerly elements.

• 3. Climax Communities. The majority of Trust land has been logged or farmed and is now covered by a second-growth forest of oak, hemlock, pine, maple, and birch. However, recently taken increment borer cores have revealed individual specimens of white pine, pitch pine, white oak, and hemlock between 300 and 400 years old. These trees are found on the ridge and, like the bristlecone pines of California's White Mountains, exemplify nature's tenaciousness in an inhospitable environment.

An enclave of probably virgin woods is Rhododendron Swamp, a low and moist sheltered area resting between a sheer conglomerate escarpment to the west, a robust boulder talus of the same material to the east, and shale knolls to the south. The swamp area, at an elevation of 930 feet, is perennially fed by spring waters with a pH of 4.35 at about 42 degrees F. The swamp is about six acres in extent, and depths to a firm substrate are up to fifteen feet. In 1963 two five-meter cores (NYS 12 and 13) were taken for analysis of diatoms (Hellerman, 1965) and pollen (Lewis, unpublished). Some woody material retrieved was estimated to be 3000 years old.

Though well shaded from prevailing winds, Rhododendron Swamp experiences cold air drainage from the extensive boulder talus to the east. Deer yarding has been noticed, but apart from this it is little browsed. Man has played an apparently minor role in the swamp, with no recorded

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lumbering. However, a carriage road and a trail were built along the edges of it more than 75 years ago. Few canopy species occur, and hemlock is the most important in both the canopy and the reproductive categories. Yellow birch, white pine, and red maple are also prominent. For the understory category, rhododendron, hobblebush and Canadian yew are the dominant species. In the ground cover dwarf connell, gold thread, dwarf ginseng, two species of trillium, Massachusetts fern, and a lush stand of shining clubmoss are of note. A rare species of mosquito (harmless to man) spends its larval stage in the cold waters of Rhododendron Swamp spring. In general, this area is noteworthy for its diversity of flora and fauna in a relatively unpertrubed hydrophytic ecosystem.

Although the term "climax community" may first suggest stately woodlands, it should be recognized that the Shawangunk cliffs maintain an extensive ecological community which has not been disturbed since the retreat of the continental icecap. It is believed that this "virgin wilderness" will be of increasing interest to scientists. The lichen study previously mentioned concerns striking changes in this primitive climax community. The reason for the decline is not yet understood, whether drought or pollution or a combination of these.

4. Restoration of Natural Condition. Although the Mohonk Trust lands offer abundant evidence of a lengthy history of human use, they also show a progression of communities toward a restored natural condition. The aboriginal inhabitants were Algonquian Indians who cultivated some of the bottom-land and presumably hunted on the mountain. Arrowheads dated as 6000 years old have been found, campsites discovered, and trails across the ridge are shown on early maps. One of The Trust's trails has been laid out to follow the route of the Indian footpath through the Trapps notch.

The first white settlement was by Huguenots at New Paltz in 1678. The basic land division pattern was long lots running from valley to mountain. These lots were divided and subdivided lengthwise among the children of successive generations, so that each would have some rich bottom-land and some woodlot. This was the French inheritance pattern, as opposed to the primogeniture of British settlers; its mark on the land is easily visible today.

As the valley population increased, some of the long lots were divided into small mountainside farms. These were subsistence operations, with fuel cut on woodlots that were left on the poorest soil sites. During the period when local iron ore was smelted farther south, wood for charcoal was cut and burned in dirt pits. The remnants are still visible on the southeast slope: circular, flattened areas, with different vegetation, and bits of charcoal more indestructible than most modern "litter."

The northwest side of the mountain shows a more varied pattern of land ownership. Here, also, mountain farms were prevalent. At the height of the tanning industry to the north, over 100 years ago, almost all virgin hemlock in the area was cut and stripped of its bark. It is recorded

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that the trunks of these trees were left to rot. In the same region, due to exposed and uniform layers of quartz conglomerate, a millstone cutting industry developed. It is reported that in the previous century a large proportion of the millstones manufactured in the United States were cut in Ulster County. Quarries with abandoned stones in progress are found today on Trust land. Around 1890 the production of natural cement at Rosendale and vicinity created a need for barrels. Hoops were cut on the west slope of the Shawangunks, especially in the Clove Valley, where coppice reproduction allowed successive crops to be harvested; this also has left its mark on the present forest cover.

Both slopes of the mountain were used through the years as a source of logs and cordwood. In the nineteenth century quantities of the latter undoubtedly went to supply heat for curing bricks at some of the numerous brickyards along the Hudson. Hunting, and to a very limited extent, fishing, were considered public rights on these mountain lands. Forest fires were common in the Shawangunks up to about 1865, but in the Trapps area, where blueberry picking was a summer income-producing activity, they continued until about 1920. Hurricanes and tornadoes have had a limited influence on the vegetation and land use. The man-introduced chestnut blight markedly changed the forests in the twentieth century. The gypsy moth has recently proliferated, and in the light of present knowledge may eventually help change the species composition of some of the poor soil sites on rocky ridges toward greater diversity and hence health. The recent five-year drought (1961-1966) killed some forest trees and killed-back mountain laurel.

From the very beginning of Smiley ownership in 1869, land management has been a major consideration, though not always in its present sense. The goal then was not wilderness as we understand it, but the cultivation of beauty and its enjoyment by the hotel guests. Aesthetics and access were the primary consideration. An intricate network of carriage roads was laid out, trails were cleared, muck for a flower garden was hauled in, and trees were cut as needed. Long before "aesthetic forestry" was recognized by the profession, selective cutting was done to keep open the vistas along the roads. In proximity to the hotel these vistas are maintained today.

Since about the turn of the century, the upper slopes of the mountain have been reverting to second-growth woods. On the lower slopes, however, where there are several small streams and natural and artificial ponds, farming and grazing have been Mohonk industries since 1890. This activity continues today under the direction of the Mountain House, though in this region of limited fertility farming is becoming less feasible economically. At present some unused fields are just beginning the chain of natural succession to woodland. It is expected that The Trust will acquire this former farm land and manage it to preserve some open fields, some second-growth forest, and the steps in between.

Nature is also taking its restorative course with wildlife. The porcupine, for example, had been exterminated in the northern Shawangunks

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in the previous century, but returned to Mohonk in 1930, probably via a route across the Rondout Valley, where the Catskill Mountains approach the Shawangunks.

Over the years the preservationist ethic has grown increasingly important in the United States, no doubt reflecting the discovery and acceptance of conservation as a national goal. At Mohonk, preservation is tempered with ecosystem understanding as it is gained. On those portions of Trust land which are already forest, maintenance is minimal, essentially limited to keeping trails and fire roads clear. Cutting, spraying, and the introduction of exotic species, both flora and fauna, have not been permitted; this extends to not allowing the release of foreign predators and parasites of the gypsy moth. This policy of non-interference is not simply "natural," but rather another step in a long history of land management, just as the existence of The Trust itself reflects changing concepts of man's relationship to nature.

5. Rare or Restricted Species. The following rare or restricted habitat plants are found at Mohonk: *Cetraria jahlunensis* (Swedish shield lichen), *Asplenium montanum* (mountain spleenwort), *Thelypteris simulata* (Massachusetts fern), *Selaginella rupestris* (rock spikemoss), and *Isotria verticillata* (whorled pogonia).

6. Seasonal and Migratory Animals. Mohonk is the recorded home of 49 species of mammals, 37 herptiles, and 170 birds. Part of the land is open to hunting. Since 1920 there has been a game refuge surrounding the Mountain House. Actually, this refuge functions more as a people refuge during the hunting season, although there has not been a shooting accident on Mohonk land in the fifty years of operation of the present system. The deer use well established tracks connecting the mountain refuge with the fields and orchards of the valley below. These movements and their food preferences among native and garden plants have been observed for many years.

Because the thermal currents of the Shawangunk ridge form a natural flight corridor, certain Mohonk cliffs are a popular vantage point for observing seasonal migrations, with the advantage that the observer on the mountain is often near the flying altitude of the birds. Canada geese frequently fly low along the ridge, and one escarpment on Trust land has earned the name "hawk mountain" because of the reliable opportunity to see migrating hawks.

7. Illustration of Scientific Discoveries. Mohonk is the type locality for the two species of parasitic wasps named after Daniel Smiley. In the area of gypsy moth studies, the U.S.D.A. currently reports that Mohonk had the highest rate of parasitism of their study areas in four states; this is believed to reflect the fact that the Mohonk forests have the longest history, outside of New England, of not being sprayed. It thus appears that Mohonk can

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play a significant role in man's increasing understanding of natural controls of the gypsy moth. Although the previously mentioned study of foliose lichens is just beginning, it holds the potential to make an important contribution to the understanding of air-borne pollution. Finally, the greatest potential value of The Trust's baseline studies also lies in the future, when repetitions of the studies will surely disclose significant changes in the Shawangunk ecosystem.

8. Scenic Grandeur. The scenic appeal of the Shawangunk Mountains is demonstrated by their century-long record of attracting visitors. If anything, that appeal is growing stronger. In 1972 The Trust was host to over 25,000 visitors. The Shawangunk wildlands have been recognized on the State, regional, and national levels as a unique national natural resource. The following passages are taken from the Minnewaska State Park master plan (1971), prepared for the Palisades Interstate Park Commission by the National Park Service:

A wild and fragile area, astride the Shawangunk Mountains in Ulster County, New York, lies in the heart of the greatest concentration of population in the United States—the Atlantic urban region, stretching from Boston to Washington.

Ninety miles away from the park—less than 2 1/2 hours by auto, and a little more by bus, is the heart of New York City. Nowhere else within a day's reach of the City is there any comparable natural area.

A 22,000 acre portion of the Shawangunk Mountain Range is comprised of lands owned by the State of New York, the Town of Ellenville, Minnewaska Mountain Houses, Inc., and the Mohonk Trust and Lake Mohonk Resort. The Master Plan Team decided, following its research, that the whole Shawangunk Range is more important as a resource than any of its individual parts. (Emphasis added.)

In the spirit of this wholistic approach, The Mohonk Trust, in cooperation with its neighboring private and public agencies, is working to preserve and protect this natural area in perpetuity.

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