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Trace Tracker...

for the trails at
Allegheny Portage Railroad
National Historical Site.





INTRODUCTION

Welcome to Allegheny Portage Railroad National Historic Site and these short walking trails. On the Summit of Allegheny Mountain you can discover many elements of our natural and cultural resources. You will see many aspects of the relationship between people and the environment; both past and present.

As our country grew in the early 1800's, Pennsylvania merchants and farmers needed to share their products. Sometimes this meant transporting items east and west for hundreds of miles. Horses, wagons and primitive roads could not meet the demands of moving more freight, faster, at less cost. The transportation answer seemed to be waterways.

Eagerly Pennsylvanians began building a canal system to link the untapped wealth of the west with eastern manufacturing centers. But the mountains posed a problem. How could you pull a barge over the mountains? The canal commission finally decided upon an inclined plane railroad to portage passengers, goods and canal boats over the mountains.

When the Portage Railroad was opened to traffic on March 18, 1834, it was hailed as a great technological feat and an engineering marvel. No other rail system had climbed mountains such as the Alleghenies, overcoming an elevation of 1,400 feet. Technology had arrived at a remarkable level of sophistication, revealing man's capacity to conquer nature, land and the vast wilderness beyond the western slope of the Allegheny Mountains.

For twenty years the Portage Railroad was the vital link in Pennsylvania's mainline westward. Eventually, new advancements in technology; big powerful locomotives and a new railroad route across the mountains rang the death bell for canal systems and the Portage Railroad.

Experience these trails and the historic trace. The features of interest are marked by numbered post corresponding to numbered paragraphs in this guide booklet.

THINK SAFETY — Common sense and caution are foremost for safety. Proper footwear and clothing should be worn due to the varying terrain, vegetation and climate. The trails are not recommended for anyone who has been advised by a doctor to avoid strenuous exercise.

TO
CRESSON, PA.

PICNIC GROUND

22

U.S. RT. 22

SUMMIT
LEVEL
TRAIL

LEMON
HOUSE
VISITOR
CENTER

STONE
QUARRY
TRAIL

TRACE OF OLD RAILROAD

INCLINE
SIX
TRAIL

SKEW
ARCH
BRIDGE

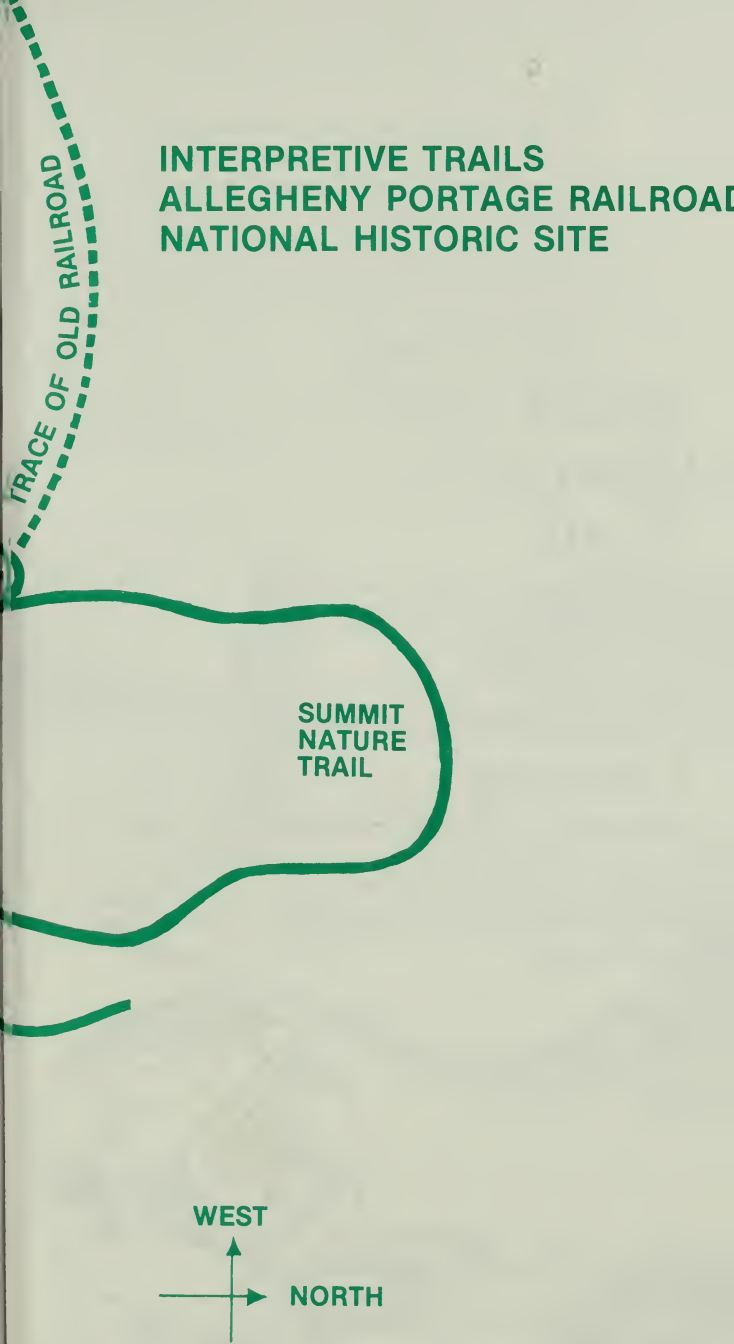
Allegheny

TO
HOLLIDAYSBURG,
PA.

4.



INTERPRETIVE TRAILS
ALLEGHENY PORTAGE RAILROAD
NATIONAL HISTORIC SITE



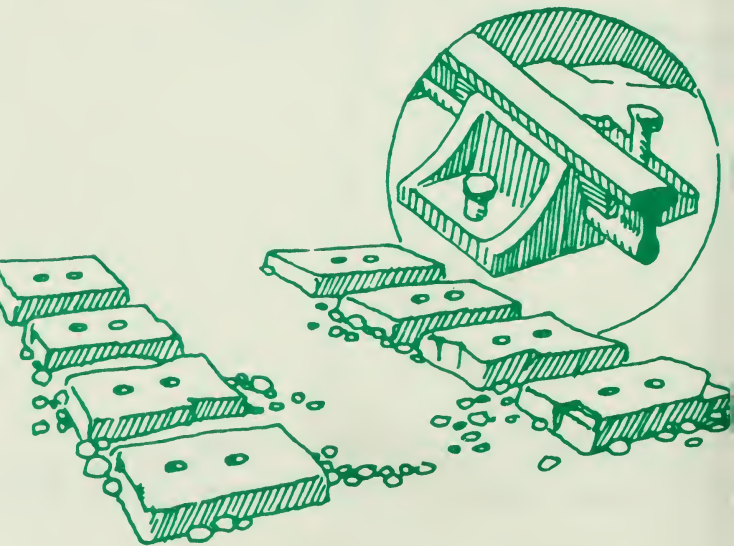
Map showing Interpretive Trails at
Allegheny Portage Railroad National Historic Site

Stone Quarry Trail:

a short, pleasant walk less than one-quarter of a mile in length.

1. Stone Sleepers

Unlike modern railroads with their wooden cross-ties, the Allegheny Portage Railroad used large blocks of cut stone to hold the rails in place. Lying in the ground, these heavy foundation blocks were called sleepers.



Occasionally, a stone cross-tie was used to space the distance between the rails, but usually the sleepers were separate so that each rail was independent of the other. Any shifting of a sleeper would widen or narrow the distance between the rails and would cause the train to jump the track. This often happened. The hard labor of original construction was just a beginning. Every deep frost would move the embedded stones and work crews had to fight continuously against nature's disturbing influence.



2. Sandstone:

Feel the gritty surface, and look for the many colors in this sandstone. The stone masons fashioned this raw material into sleepers. Can you see the lines or layers in the stone? Originally these layers were loose sand laid down on the bottom of a body of water.

Over 300 million years ago a shallow arm of the ocean extended over much of eastern United States. Now these rocks are over 2000 feet above the sea. Man builds railroads, but given time, nature builds mountains!



3. Natural Stonecutting

Which is stronger, wood or rock? Small tree roots slowly grow into the fractures in the rock. As the roots enlarge they wedge apart and eventually, over the years, they cleave the rock in two.

Nearby another natural process is breaking up rock. Look closely. A thin layer of scaly plant material, called lichen, is living on these rocks. Lichens produce weak acids which percolate into small crevices in the rock and slowly dissolve it away. Eventually, the rock crumbles into soil.

4. Stone Quarrying:

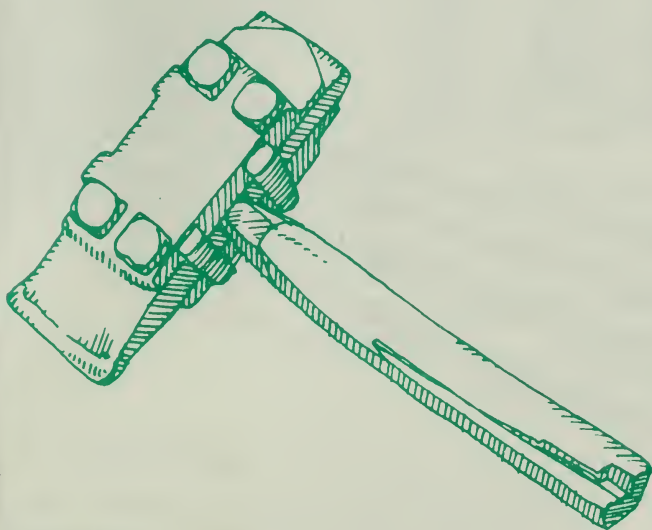
Back in the 1830's cutting sandstone required skill, time and hard work. Power tools were not available. The stone mason outlined the shape of the block with hand drilled holes. He had to have a "feel" for the internal structure of the stones and could split off sections with his axe by striking along the weak planes.

The stone mason often used one of nature's methods in quarrying. During the winter, water was poured into cracks. Upon freezing it expanded, cracking open the rock. He repeated this until a stone block was produced.

5. Stone Moving

Sweating men and straining horses tugged the heavy blocks from the quarry to the railroad bed using simple mechanical aids such as levers and log rollers. No doubt, during the construction of the railroad this quiet grove was a noisy, brawling scene.

The results of all this quarrying, hauling and shaping of the stone, can be seen at the engine house site nearby, the Lemon House and the Skew Arch Bridge at the bottom of Incline 6. Mainly, the blocks were used as stone sleepers along the 32 miles of level railroad track.



Stone Quiz

A numbers game: With the sleepers placed every 3 feet (on centers) along the level sections, how many sleepers had to be cut and set in place on the Allegheny Portage Railroad? Remember that 5,280 feet equals 1 mile.

After you have answered this, try to figure out the next one.

A weighty question: With each sleeper weighing an average of 550 pounds apiece, how many tons of sandstone had to be quarried for the sleepers on the Portage Railroad? Remember that 2,000 pounds equals 1 ton.





6. Engine House:

The foundation stones you see here are all that remains of the engine house for Incline 6. A big building, it measured about 65 by 90 feet. This structure housed two stationary steam engines. These engines, developing about 35 horsepower, raised and lowered the railroad cars on the incline. At first they were fueled with easy to obtain local resources, firewood and water. After 1840 coal came into use.

Samuel Lemon (the builder and owner of the Lemon Inn) sold wood, water, and later coal to the railroad from his lands. From this business he prospered.

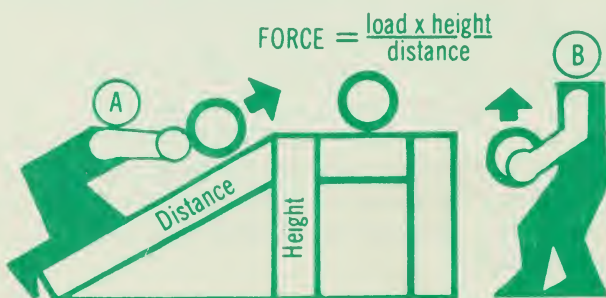
End of the Stone Quarry Trail.



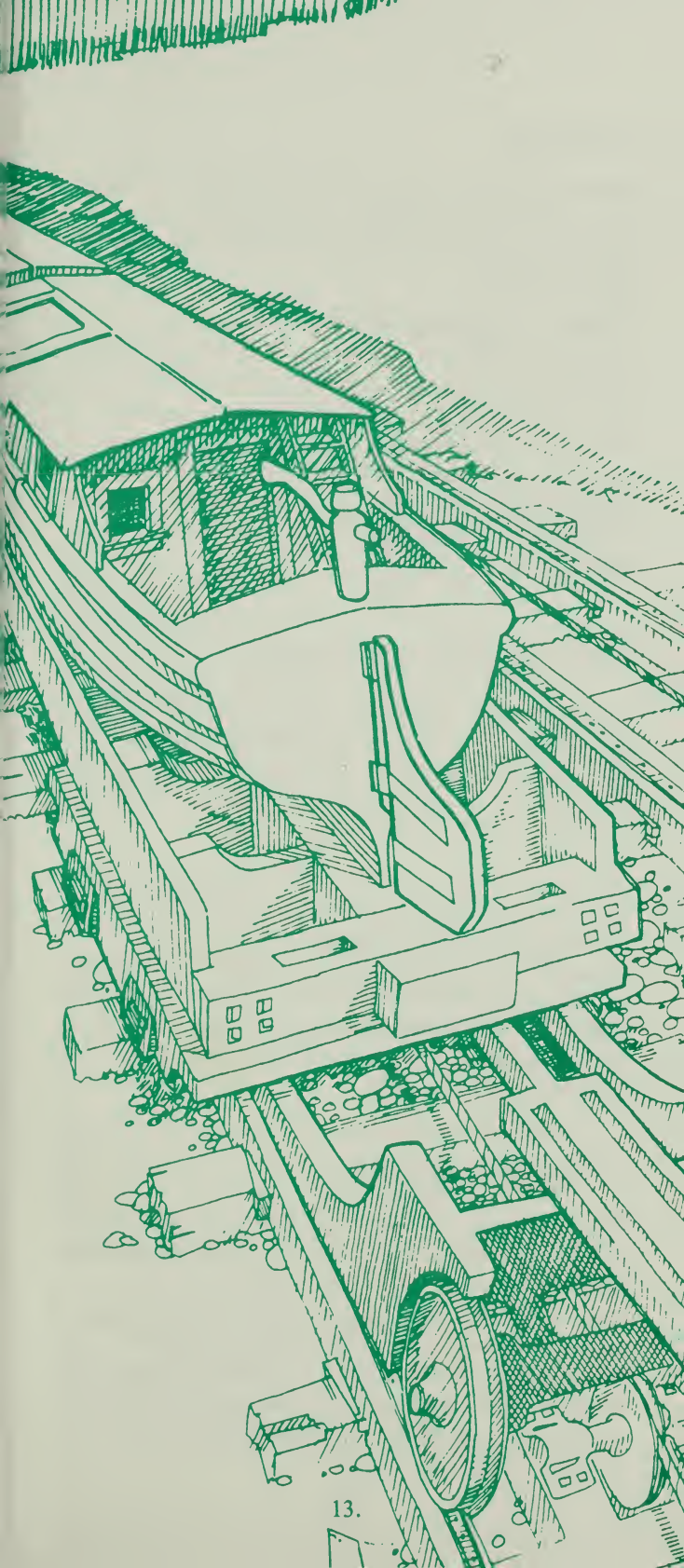
Incline 6 Trail:

a steep walk about one-half mile long. Going down is easy but you might find it a bit of a strain climbing back up. Since this trail intersects U. S. Highway 22, one of your party could drive down to pick up the others thereby avoiding the climb back .

The inclined plane made by a ramp makes it easier to roll a barrel onto a platform than to lift it.



It is a simple machine used to raise heavy loads with relatively small forces. For example, when person A pushes a load up a slanted ramp onto a platform, less force is used than person B uses in lifting the same load onto the platform.



1. Incline 6:

Inclines were not unique to the Allegheny Portage Railroad. In the 1830's they were one of the better ways to move loads up and down the sides of mountains.

The heavy stone sleepers were not used on the inclines because over the years gravity would have caused them to creep down the slope. Instead, wooden ties similar to those of modern railroads were used. Long wooden stringers were set into the ties. Iron strips, called plate rails, were then spiked to the inside top edge of the stringers. Walk over and look at this reconstructed sample of incline track.

2. Dangers Riding The Inclines

Picture yourself sitting in a railroad car inching up this incline. The car is being pulled by only one rope. Worn or damaged ropes are not uncommon. If the rope breaks, you and the freight will end up on the rocky embankments or worse!

Frequent claims for damages were filed for destruction and loss of goods being shipped over the mountains. After several years of costly experience a safety device, the buck, was developed. If a rope broke, this small two-wheeled brake apparatus slowed the cars as they rolled downhill. In 1842 engineers began replacing fiber ropes with wire ropes (cable).

3. Witness To History:

This fine white oak, estimated to be 220 years old, escaped the fate of its neighbors. The other trees were cut down for firewood or for construction lumber. Perhaps the workmen left this tree out of aesthetic appreciation, and it silently witnessed the operation of the Allegheny Portage Railroad between 1834 and 1855. If it could speak of the events that took place on this mountain, what stories it might tell us!



4. Hickory Handles:

In the handtool days, you couldn't just go to the hardware store to buy a replacement for broken handles. Workmen often had to improvise with what they had. Replacement handles were cut and fitted on the spot from the tough, durable hickory trees like this one.

5. Black Locust

How do you fasten an iron rail to a stone sleeper? First you need thousands of wooden pegs. You then plug these pegs into holes drilled in the sandstone sleepers. Then metal brackets called "chairs" can be nailed into the wood. The "chairs" hold the rails.

Usually, the plugs were made from black locust trees which were common in these mountains. Because of its strength and resistance to decay when in the soil, locust made good posts, fence rails, and wooden pegs for old stone sleeper.

6. Old Paths — New Paths

The old gives way to the new. In the 1830's horses were used on the level sections of the railroad, but were soon replaced with locomotives.



Then the old Allegheny Portage Railroad with its complex of inclines and flat sections became obsolete also. In 1855 it gave way to the New Portage Railroad which was eventually superseded by the mainline of the Pennsylvania Railroad. Today trucks, automobiles and airplanes have taken much of the railroad business. Compare the highway noise with the railroad of the past century.

As you continue, be alert to highway traffic coming from your left.

7. Skew Arch Bridge

While skewed bridges were relatively common a hundred years ago, there are not many left today. This bridge had to be skewed, or twisted, in order to carry the Northern Turnpike at an angle over



the railroad. A normal, unskewed arch can be seen 2 miles east down the hill where the New Portage Railroad crossed U.S. 22.

Notice that the legs of the arch are offset and not directly across from each other. To picture how the bridge is built this way, imagine a normal arch bridge. Then, without tilting the top, move one leg forward and the other leg backward. The arch will be distorted or skewed throughout and the stone masonry will have to be laid at an angle to the horizontal.

After reading the plaque on the monument, look at the sandstone blocks of which it is made. You will find they are stone sleepers taken from a section of the railroad.

End of the Incline 6 Trail

Reflections On Returning:

As you puff and pant back up the trail, pause to rest and to reflect on the story of the old incline. Imagine the effort it took to pull the heavy cars full of people or freight to the top. Think of the excitement of settlers on their way to new homes out west. Picture the anticipation of travelers looking forward to eating, drinking and resting when they reached the "top" — Mr. Lemon's tavern. Consider too, the hard work and the engineering accomplishments that made this travel possible.

CAUTION:

Be Alert To The Highway Traffic.

Summit Level Trail:

an easy level trail about one-half mile long. A trail to the picnic ground connects with it a short distance from here.

1. Transportation Barrier:

It is easy to see how the Allegheny Mountains formed a barrier to transportation. To reach this height a canal barge had to be lifted 1,380 feet above the canal basin at Hollidaysburg. From here they would have to be lowered 1,140 feet down to the canal basin at Johnstown.

Such a change in elevation was far too great to overcome with a system of locks to lift the barges by water over the mountain. What to do? One fanciful scheme proposed digging a 4 mile tunnel through the mountain and floating the barge through the mountain underground. Finally the planners decided that the only practicable way to get the barges to the other side was to haul them over on a railroad.

2. Divide:

This is not the Continental Divide, however, this mountain separates two watersheds. You are standing about 2,300 feet above sea level atop the Allegheny Front. Here, rainfall flows east to the Atlantic Ocean. Not far away, near incline 5, the water runs off to the Gulf of Mexico.

3. Hemlock Water Pipes:

These beautiful evergreen trees grow throughout these mountains. Early records say more hemlocks than other kinds of trees were cleared along the railroad right-of-way. Pipes made of hemlock logs carried water from wells and cisterns to the engine houses and other railroad buildings. Logs were cut to the desired length, peeled of bark, and hollowed out. When laid in the ground, their natural resins kept out the rot for many years.



4. Stone Culvert:

Construction crews had to build over 150 drainage structures along the Allegheny Portage Railroad. This old masonry culvert was fitted by hand and no mortar was used. Look through to see that it extends all the way under the railroad embankment. Still functioning after 150 years it proves the durability and strength of keystone arches.



5. Natural Recycling:

A rotting stump is home to many small creatures who in turn hasten the process of decay.

Decomposers such as earthworms feed on dead organic matter and break down the debris into substances re-usable by new plants. Nature's efficient and economical processes continuously recycle important nutrients and are self-sustaining. On the other hand, man-made operations (such as this railroad) need continuous maintenance and a steady input of energy.



6. Right-of-Way:

Original construction started in 1831 and contracts called for grubbing a 120 feet wide clearing through the wilderness. Level sections like this one were created by digging out the high ground and filling in low sections. The men toiled for long hours with hand tools. One track was ready on March 18, 1834; full service on both tracks began in 1835.



The railroad was abandoned and sold in 1857. During the intervening century forest grew up in the right-of-way. Now it has been recleared by the National Park Service. You are welcome to walk along the trace another ½ mile to the park boundary. Don't worry about train traffic.

7. Competition for Survival:

As you pause here, notice the dense vegetation. Seemingly peaceful, these trees, shrubs, herbs and ferns are struggling to live. They are competing with each other for nutrients in the soil; for sunlight, for water, even for room to grow. In this tough plant-world only a few individuals out of the millions of seeds cast each season survive.

Over the long haul these few survivors are the best adapted for their function.

The Allegheny Portage Railroad didn't survive for long but it did contain the ideas for new growth and it gave competition needed to strengthen the railroad industry.

End of the Summit Level Trail

Reflections On Returning:

As you return to the Lemon House, listen to today's sound of traffic on the highway. Then, "listen" to the sounds of the past — the noises of the engine house, the railroad cars grinding and rattling up the incline, the locomotive chugging along the level, and excited talk of people making their first trip west. Traveler's



journals tell of 100 Conestoga Wagons and teams hitched outside the Lemon House at night. It may well have been noisier than now!

Remember how this canal and railroad system was considered one of the greatest man-made marvels of the world. Today, trees invade the right-of-way; leaf mold and moss bury the stone sleepers. Will grass someday grow in the lanes of our modern superhighways?

What does it mean?

The old Allegheny Portage Railroad failed to pay for itself. It never captured a flourishing trade, but it did affect the people and the land. Its cheap transportation helped many immigrant families on their way to the West. The Railroad provided jobs and encouraged the growth of towns. Industries appeared along its route. An American experiment, it tested various modes of transportation.

An outstanding technological feat for its day, the Allegheny Portage Railroad was a preview of America's transportation network of railroads, roads, waterways and airways.

Summit Nature Trail:

a pleasant walk 1.3 mile long with moderate grades. This trail winds through many of the park's varied habitats.

1. The park lies along what is locally known as "Cresson Ridge," the front range of the Allegheny Mountains. The Alleghenies stretch from southern New York, across western Pennsylvania, to West Virginia. They are a part of the extensive Appalachian Mountain Range which runs from the Gaspe' Peninsula in Quebec, Canada to northern Georgia. Though not as rugged as the Adirondacks of New York or the Great Smokies of North Carolina and Tennessee, the Alleghenies consist of beautiful rolling hills and forests teeming with a large variety of wildlife and vegetation.

2. Coal is found in these mountains. One of the first coal mines in this area was in the vicinity of this numbered post. While digging a well to supply water for the boilers at the engine house, the well digger surprised Mr. Lemon with the information that he had dug through a four foot vein of coal, which to this day is known as the Lemon Vein. Samuel Lemon, the Lemon House Tavern owner, became one of the wealthiest men in Cambria County, and much of his financial success was due to this accidentally discovered coal vein.



3. This burrow is the home of *Marmota monax*, commonly called woodchuck or groundhog. This animal has thrived with the presence of man and the subsequent clearing

of the forests. As meadows, field, and pastures replaced the deep woods, these mammals have multiplied rapidly. Burrows, such as this, also provide homes and escape

refuges for rabbits, skunks, opossums and other small animals from their predators - enemies. Watch



carefully as you walk the trail and you may glimpse this robust animal which excels at digging holes.

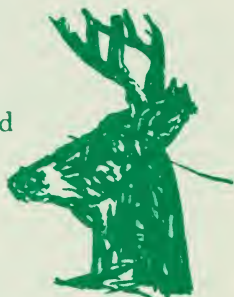
4. Although many different types of birds may be viewed all along the trail, this section is especially good for seeing a variety of birds that are characteristic of Pennsylvania's forests and fields. This blueberry sprinkled mountain meadow, with scattered small trees, bushes and shrubs, is perfect habitat for birds such as sparrows, warbles, grosbeaks, buntings, finches and wrens. Besides being pleasing to watch, birds are very beneficial to man. Birds are the natural enemies of insects and also help in controlling vegetation-destroying insects.

5. When a farm is abandoned, nature immediately begins to reclaim the land and the land goes through various stages of plant succession. If the land has not been completely denuded of its topsoil, "weeds" and other plants will almost immediately start growing from seeds that are blown or carried to the waiting soil. These small plants slow down erosion and cool and keep the ground moist by shading it. Soil conditions are then more desirable for trees such as the black locust and hawthorn - - the second step in plant succession. These pioneer species, in turn, give way to a "Northern Hardwood" forest which is composed primarily of birch, beech and maple trees. This "Northern Hardwood" forest will eventually change into a "Climax forest" which is a stable community where little change occurs.

A "Climax forest" composed primarily of hemlock, covered this vicinity before and during the time of the Allegheny Portage Railroad. Logging operations, since the Portage Railroad days have caused this area to begin the various stages of plant succession.



6. The Allegheny Mountains are prime habitat for the whitetail deer. This symbol of wilderness heritage sustained and supported early pioneers and Indians for many years. With the coming of civilization and the cutting of the forests, the whitetail faced hard times. However, the whitetail has adapted extremely well to man's encroachment and is very much with us today. If you walk quietly and look and listen you may encounter some of the many white-tails that inhabit the park.



7. Although this tree is dead it will not go to waste. Through nature's great recycling system, all of the material and energy that is stored in this tree trunk is gradually being returned to life. Fungi, bacteria, insects and other small decomposers consume the material, or break it down into another form that can be consumed by other animals and plants.

8. Why not stop here for a short rest before continuing your walk? The nearby pipeline right-of-way and open forest offer an excellent vista for observing the many faces of nature. Relax and listen to the many sounds of nature which are around you. We humans subconsciously ignore many sounds. We prefer to rely on our sight to tell us what we need to know. Take time now to use some of your other senses; - - listen, touch, and smell as well as *Look*. Suprisingly, you will increase your awareness of the world around you.

9. The greenish blue growths covering these stones are lichens. A lichen is not one organism but two, an alga and fungus living and depending on one another for survival. The fungus encases the alga and provides it a "home," thereby allowing it to remain alive under the harshest living conditions. The alga, in return, manufactures food and provides nourishment for the fungus.

10. The piece of barbed-wire in the tree, behind the post, is striking evidence of human presence and also of nature's ability to adapt and regenerate.



At one time, an old fence row ran parallel to this stretch of trail and possibly kept a farmer's livestock from wandering. The farm was abandoned and nature has been reclaiming the land. Notice the wire and how it extends through the tree, creating the impression that it was originally inserted through the tree. In truth, as the tree matured, it grew around and completely encircled the wire.

11. The concentric rings in this tree stump tell the life story of this former tree. Can you determine the age of this tree at the time it was cut by counting the rings? Wide rings indicate years of large growth, narrow rings indicate years of little or no growth. Notice that as the tree grew older it grew more slowly. Growth varies with both developmental stage of the tree and annual differences in weather.

How old was this tree when it was cut?

12. The stream bank may seem peaceful and harmonious, but a silent, and often overlooked, battle is taking place very close to you. Erosion is constantly removing the rocks and soil from along the stream bank. Trees and shrubs are constantly struggling for a foot-hold. The plants help stabilize the stream bank temporarily, but the stream will be the eventual winner.

13. Although they are present year-round, insects are more likely to be encountered during the warmer months of the year. Insects occur almost everywhere and make up more than half of all the living things on this planet. Although some insects are very destructive, many are beneficial. For instance, trees and flowers are pollinated by bees and other similar insects. Some of the wildlife living in the forest depend on many kinds of insects for their food source. The rotting stump in front of you is being decomposed and turned back into soil through the help of beetles, termites, ants and other wood decomposing insects.

14. This evergreen tree is an Eastern hemlock (*Tsuga canadensis*), the official state tree of Pennsylvania. Common in wet areas or climates,

Eastern hemlock usually grows along streams such as this one. It is the expected and usual coniferous tree type of the "Northern Hardwood" forest. Eastern hemlock can be identified by its flattened needles which are arranged in two rows, and are striped underneath.

The Eastern hemlock was a dominant tree in this area before and at the time of the Allegheny Portage Railroad. Pipes made of hemlock logs carried water from wells and cisterns to the engine houses and other railroad buildings. Logs were cut to the desired length, peeled of bark, and hollowed out. With the elimination of logging in the park and barring major fires, the hemlock will gradually spread through the forest and again become the dominate tree.



15. In the spring and summer, plants and leaves are green due to the green pigment chlorophyll. Plant cells containing chlorophyll convert the sun's energy into usable energy by manufacturing and storing carbohydrates through a process known as photosynthesis. In the fall, when photosynthesis stops and chlorophyll is no longer present, other plant pigments become visible thus giving a variety of color to the forest. Man and other animals do not have the ability to directly use the sun's energy and are totally dependent upon plants and the process of photosynthesis to supply energy in a usable form.

16. Bark serves a tree just as our skin serves us; they both keep out undesirable organisms, and when cut, they both "bleed." Sap, like blood, washes harmful organisms out of the wound. When the wound heals, both bark and skin are left with a visible scar. You can help to protect trees by not climbing, cutting, or placing nails on their surface.



17. If you are here in the late spring, summer, or early fall, you will be in the middle of a "fern forest". Lady fern (*Athyrium Filix-femina*) is a common fern that often grows in large colonies. They have long light stalks with lacy, fronds or leaves. Many fronds develop from one

underground root system to create the miniature forest you see. The rootstocks and roots are often deep in the ground. This protects them from extreme wet, cold, drought and heat. Due to their tendency to grow wildly, lady fern is often considered the weed of the fern family.

18. The underlying rocks on the summit are sedimentary sandstone.

In spite of the hardness and durability of these rocks, they are slowly

being converted into soil

by natural processes. The expanding action of freezing water tends to widen cracks in the rocks. The lichens growing on them secrete acids that slowly dissolve the minerals. In time, soil is formed from minute quantities of decomposed rock, decomposed plant remains and decayed leaves from the surrounding forest. As the soil accumulates, it supports larger and more complex plants which in turn aids in the process of soil formation. Sandstone was a major building material used along the Allegheny Portage Railroad. The stone culvert ahead, built approximately in 1832, is evidence of human use of this natural material.



This is the last stop on the Summit Nature Trail. We hope you have enjoyed learning about the environment and its importance in our daily lives. The park staff will be happy to answer any of your questions. Please return booklet if you do not wish to keep it so someone else can use it. The Lemon House Visitor Center may be reached by turning left at the wood-chipped Summit Level Trail.

NOTES



Allegheny Portage Railroad National Historic Site was created by an act of Congress in 1964, and is administered by the National Park Service, a bureau of the United States Department of the Interior. The Purpose of the Allegheny Portage Railroad National Historic Site is to **preserve** the remains of the first railroad crossing of the Allegheny Mountains for future generations to enjoy; **interpret** the significance of the flow of social, economic, and technological advancement, created by the Allegheny Portage Railroad, which opened the era of western expansion; **communicate** to visitors an understanding of Allegheny Portage Railroad's contribution to the shaping of our nation; **manage** the park and its facilities for maximum visitor enjoyment consistent with its character and unique value; **cooperate** in the historic preservation movement with state and local governments, private organizations and individuals.



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