



Paw Paw Tunnel C & O Canal

**National Historical Park
Maryland**

The C & O Canal's Great Tunnel

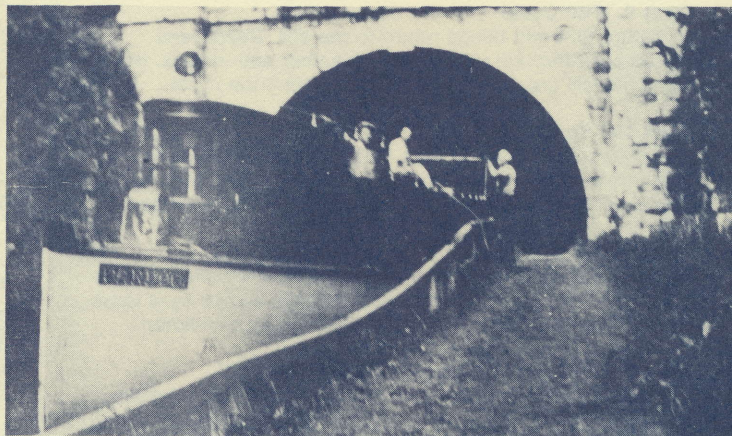
When the Paw Paw Tunnel was in operation, from 1850 to 1924, the muledriver signaled with his lantern to notify boats at the other end that his boat had entered the 3,118-foot, one-way passage. Usually boats headed downstream with cargo had the right of way. Sometimes at this point, 30 miles below Cumberland, vessels lined up for a mile at either end of the tunnel. An oldtimer recalled that when his boat's turn came to enter, he was riding aboard as the mules plodded through. Midway the team balked, the towline snapped, and the mules took off down the towpath. The boat was becalmed in the passage until he caught up with the team two miles downstream. In the canal's heyday the tunnel was a bottleneck even under the best conditions.

On the 20-minute walk through the tunnel, you will hear sounds echo from the brick-lined arch. Muffled footfalls on the towpath and the drip, drip of water penetrate the hush. The sense of being under a mountain grows as the gleam of daylight dwindles to a pinpoint at either end of the tunnel. Consider the toil and hardships endured by workers trying to drive their way through the rocky ridge.

The Project. In the 1830s, when the Chesapeake and Ohio Canal Company's Board of Directors planned the course of the canal, they considered alternatives to a winding, six-mile stretch of the Potomac River known as the Paw Paw Bends. Engineer Charles B. Fisk optimistically pointed out that a tunnel directly through the mountain ridge would cut construction costs, avoid seasonal flooding, and shorten travel time (*see map*). The directors agreed.

Before digging started, surveyors established the center line of the tunnel from portal to portal across the steep ridge. Six marker stones were placed along the line, so positioned that grooves on the beveled face of each stone aligned with the next. As excavation proceeded, an engineer outside the entrance sighted his transit on the markers, then aimed the transit down to check the tunnel direction.

Work began in June 1836 with Methodist minister Lee Montgomery as contractor in charge. The contract called for construction within two years of a 3,118-foot, brick-lined tunnel. An 890-foot-deep cut at the north end and a 200-foot cut to the south were required to gain access to the tunnel excavation areas. Vertical shafts were to be sunk from the ridge down to tunnel level to provide extra working faces in each direction. The cost of the project was estimated at \$33,500.



Pay boat *Candoc* at upstream portal, c. 1910-20.

Years of Hard Labor. Shortly after work began, labor problems surfaced. Montgomery imported Irish laborers and Welsh and British miners. For stonework, he hired Pennsylvania Dutch masons. Although armed guards patrolled canal property, unrest erupted in February 1837. Already the company was behind two months' wages, which were set at \$.91 to \$1.66 per day. Some 250 workmen surrounded the office, threatening robbery and destruction.

Poor living conditions, sickness, and liquor led to more turmoil. The Irish contingent fought newcomers and each other. A cholera epidemic isolated the makeshift camps. Episodes of violence increased, reaching a climax on August 11, 1839, when an Irish mob vandalized the English and Dutch camp, shooting and wounding 14 men before the Cumberland militia arrived to restore order. The Canal Company joined with the B & O Railroad to establish a black list of 130 undesirables and troublemakers.

When work on the tunnel could continue, men slogged with pick and shovel, star-bit drills, and sledge hammers. First they set charges of black powder to blast out sections of rock; then the rubble was hauled out by horse carts and deposited in huge spoil banks. It was brutal, crushing work, plagued by accidents. Even working three shifts a day with 250 laborers, the men advanced the tunnel only 10 to 12 feet a week.

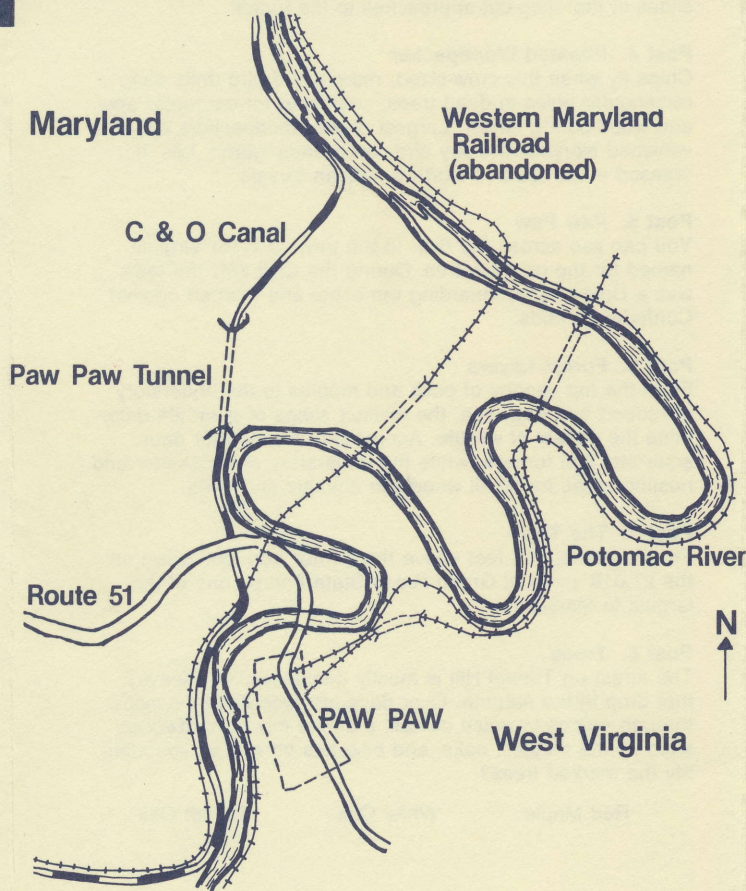
Company Collapse. In 1841 most work on the canal ground to a halt. Inept leadership, poor planning, corruption, and financial exhaustion took their toll. The tunnel effort became

sporadic and slow. Four years later, new contractors with a fresh supply of funds sublet the project to the firm of McCulloch and Day.

For two and a half years workers pressed on. On October 10, 1850, 12 years behind schedule and at a cost of \$850,000, the tunnel opened for traffic. With this final link finished, the entire canal from Cumberland to Georgetown was complete.

PAW PAW TUNNEL

built to eliminate six-mile set of bends in Potomac River



Paw Paw Tunnel is located at Mile 155 from Georgetown. From Interstate 70 at Hancock, Md., take the exit for Route 522 south to Berkeley Springs, West Virginia. Turn right on Route 9 and drive for 28 miles to Paw Paw. Cross the Potomac River bridge into Maryland and follow signs for tunnel on right.

From Interstate 48 at Cumberland, Md., take Exit 43B to Route 51 south for 28 miles to the towpath.

Facilities. Parking, canoe-camp. Portable toilets and drinking water, May-October.

Inside the Tunnel.

CAUTION: Towpath surface is uneven: Use the guardrail as a guide. You may want a flashlight.

Look for:

Rock steps outside, leading to top of entrance for clearing drainage shaft (**dangerous, do not try these**).

Weep holes — spaces in the tunnel lining to allow drainage from behind the almost six million bricks.

Rope burns — grooves worn in the railing by the towlines.

Rub rails — planks fastened to sides of canal to keep boats from bumping and scraping the lining.

Other Points of Interest. The section house, one-half mile upstream from the tunnel, served as home and office for the section superintendent of the canal.

Purslane Cemetery is located upstream at Mile 157.4. Cholera ravaged the workers camps in 1833 and 1836, killing a number of Irish laborers. The Canal Company hired doctors and set up a hospital to counter the loss of its workforce. Local communities, fearing the epidemic would spread, refused to allow burials in town, so those who died were buried at this cemetery.

Downstream from the tunnel, a set of locks leads down toward the river. At the carpenter shop near Lock 66 workmen built and repaired the lock gates. Timbers were soaked for 10 days in a solution of water and mercuric chloride, a toxic chemical that helped to preserve wood for up to nine years. In the 1870s the company found that cheaper creosote extended the life of treated timber up to 23 years. Locks in this area were constructed of rough-cut stone and sheathed with wood. Lock 65 was eliminated to save construction costs, resulting in the peculiar numbering of Locks 63 $\frac{1}{3}$ and 64 $\frac{2}{3}$.

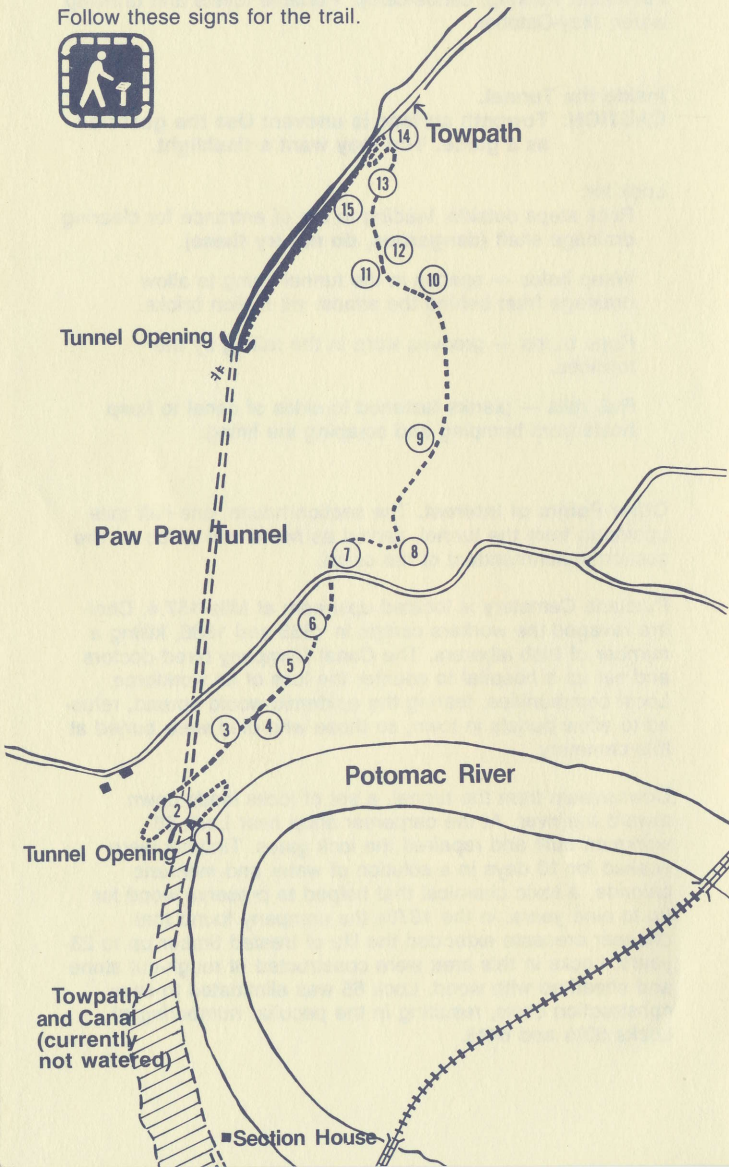
Tunnel Hill Trail

A series of posts numbered 1-15 leads along the trail up and over the ridge above the tunnel. Hikers and bikers will find the two-mile pathway strenuous, requiring one hour.

BE CAREFUL

Please protect your National Parks by preserving the plants and animals that live there.

Follow these signs for the trail.



Post 1. Potomac River

George Washington saw the river as an avenue for pioneers and trade to unify the new nation. His venture, the Patowmack Company, founded in 1785 to make the river navigable, was the forerunner of the C & O Canal Company.

Post 2. Fire

Fires of years ago are discernible in the charcoal tree trunks. Ash from fires releases nutrients to soil, encouraging new growth for animal browse and shelter. Because trees spring up in variety, a single disease or pest will not wipe out an entire stand.

Post 3. Rocks

Tunnel Hill is composed of Brallier shale, a sedimentary rock that caused special difficulties for the miners. The freezing and thawing action of water crumbled the rock, causing huge slides in the deep-cut approaches to the tunnel.

Post 4. Pileated Woodpecker

Chips fly when this crow-sized, red-crested bird drills deep rectangular holes in dead trees, searching for carpenter ants and wood-boring larvae. Largest of the woodpeckers after the vanished Ivorybill, the shy bird, once endangered, has increased in numbers in North American forests.

Post 5. Paw Paw

You can see across the river to the town in West Virginia named for the pawpaw tree. During the Civil War the town was a Union depot, guarding the canal and railroad against Confederate raids.

Post 6. Forest Layers

From the top canopy of oaks and maples to the understory of redbud and dogwood, the distinct zones of plant life determine the variety of wildlife. Acorns provide food for deer, squirrels, and turkeys, while the understory offers shelter and nesting areas for small woodland animals and birds.

Post 7. The Top

From trail top, 362 feet above the tunnel, you look down on the 27,018 acres of Green Ridge State Forest, one of the largest in Maryland.

Post 8. Trees

The forest on Tunnel Hill is mostly deciduous, with leaves that drop in the autumn. Over decades, woodland develops through stages to reach climax, a stable mix of hardwoods such as the maples, oaks, and beeches here. Can you identify the marked trees?

Red Maple

White Oak

Scarlet Oak

Post 9. The Cycle

In nature all living things return to the soil. Dead trees decompose through the action of weather and insects. New plant life will grow from the old, completing the cycle.

Post 10. Spoil

Excavated rock, or spoil, was hauled from the tunnel to fill the hollow before you. More than 218,000 cubic yards of shale were removed from the tunnel and its approaches.

Post 11. Schoolhouse

Sulphur Spring School, also known as Tunnel Hollow, began here in 1840. The one-room brick building, owned by a local family, brought the three R's to canal and local children.

Post 12. The Dual Organism

The gray-green stains spreading across trees and boulders are living plants called lichens. Often confused with mosses, lichens are actually two plants working together: algae producing nutrient and fungi providing the root system.

Post 13. Conifers

The predominant cone-bearing tree here is the Virginia pine, identified by needles growing in pairs. White pine has five needles in a bundle. Pines thrive on the spoil bank because they have shallow roots that do well in rocky soil.

Post 14. Return

Now you have come back to the towpath. On the right are the ruins of the carpenter shop; on the left are Post 15 and the tunnel.

Post 15. Spring House

Just uphill, a spring percolates through the spoil bank. A stairway once led from the canal to a stone hut sheltering the spring. Canalers replenished their water supplies here.

The Paw Paw Tunnel is part of
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