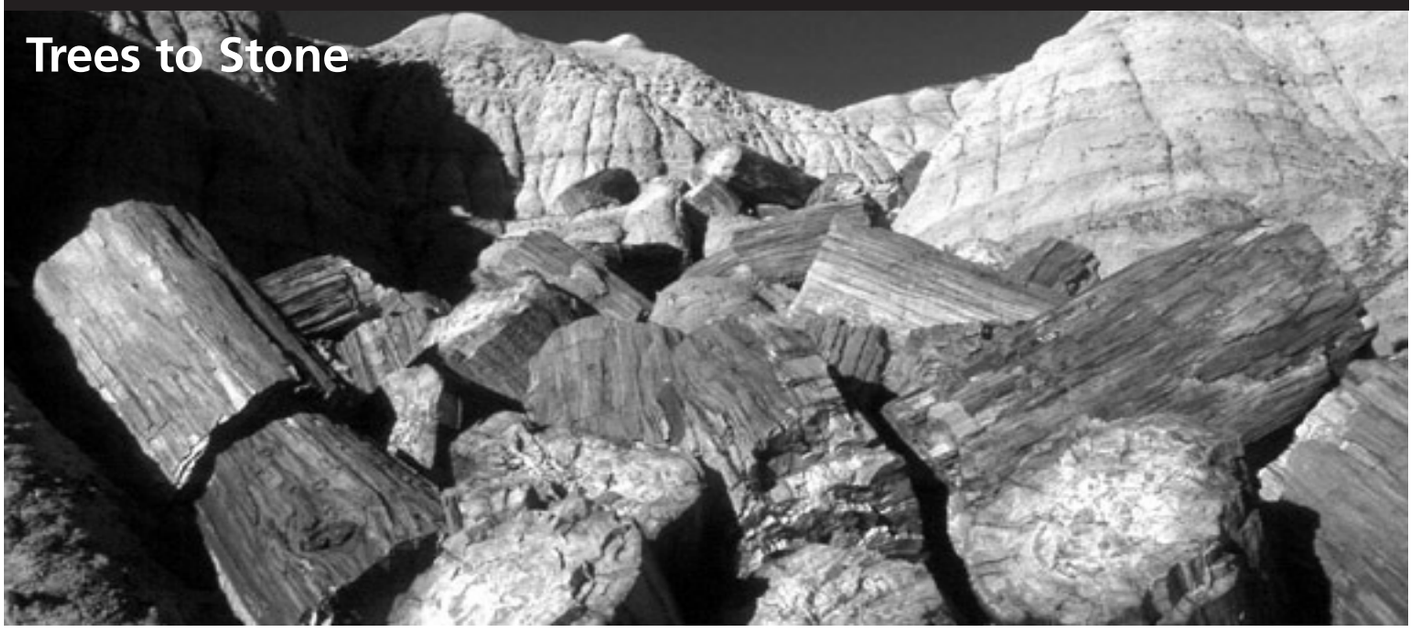
Petrified Forest

National Park Service
U.S. Department of the Interior

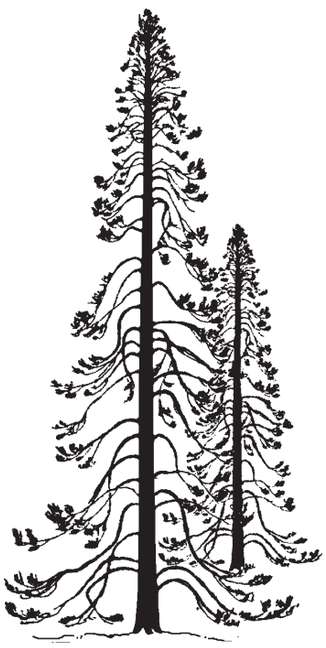
Petrified Forest National Park
Petrified Forest, Arizona

Trees to Stone



"***An enchanted spot…to stand on the glass of a gigantic kaleidoscope, over whose sparkling surface the sun breaks in infinite rainbows.***" ~~Charles F. Lummis, *Some Strange Corners of Our Country – A Forest of Agate*, 1891.

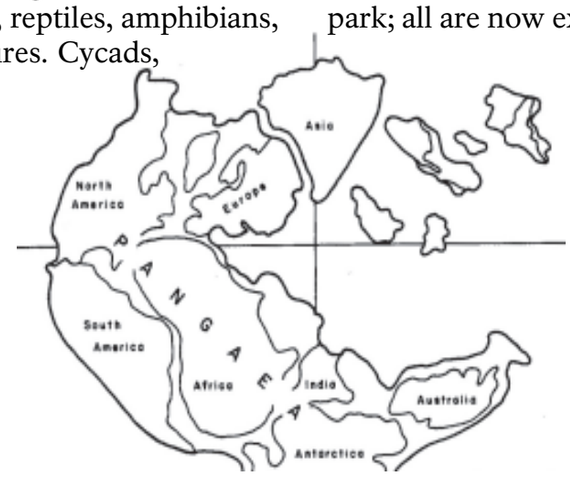
Triassic Environment



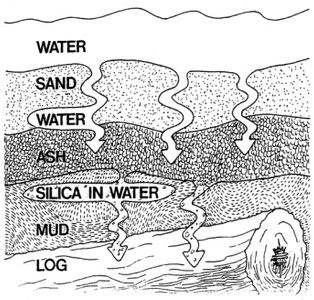
During the Late Triassic, about 225 million years ago, northeastern Arizona was located near the equator. This region was near the southwestern edge of the earth's largest existing landmass, *Pangaea*. The tropical location resulted in a climate and environment very different from today. About this time, the super-continent began to break apart into the modern continents which eventually moved to their present locations. Fossil evidence of this ancient land lies in the sediments called the Chinle Formation which is now so widely exposed in Petrified Forest National Park.

Imagine a large basin with numerous rivers and streams flowing through the lowland. A lush landscape with coniferous trees up to nine feet in diameter and towering almost two-hundred feet into the sky surround you. Galleries of trees, ferns, and giant horsetails grow abundantly along the waterway, providing food and shelter for many insects, reptiles, amphibians, and other creatures. Cycads, bennettitaleans, ginkgoes, and coniferous trees grew in the slightly dryer areas a short distance from the water.

Over time, trees fell into the waterways, knocked down by wind, undercut by water, or killed by insects. Rivers and streams carried the trees downstream, breaking off branches and roots along the way. Many tree trunks came to rest on the banks of the rivers while others were buried in the stream channels. Most of the trees decomposed and disappeared, but some of the trees were petrified, becoming the beautiful fossilized logs we see today. Many of the fossilized logs are from a tree called *Araucarioxylon arizonicum*. Two others, *Woodworthia arizonica* and *Schilderia adamanica,* occur in small quantities in the northern part of the park. At least nine species of fossil trees have been identified from the park; all are now extinct.



Petrification



Distant volcanoes to the west spewed tons of ash into the atmosphere, carried by the wind into this area where it was incorporated into the river sediments. Some logs were buried by sediment before they could decompose. Ground water dissolved silica from the volcanic ash and carried it into the logs. This solution formed quartz crystals which filled hollows, cracks, even the interior of the cells, and sometimes replaced the cell walls. The process could be so exact the resulting fossils show many details of the logs' original surfaces and, occasionally, the internal cell structures. Traces of iron and other minerals combined with quartz during the petrification process, creating the brilliant rainbow of colors. Within the larger cracks and hollows the growth of quartz crystals was not limited in size and larger crystals of clear and milky quartz, purple amethyst, and yellow citrine formed.

Uplift and Erosion

This area has endured many changes. As time passed, a thick sequence of younger rock buried the Chinle Formation. Over millions of years, the region was uplifted as part of the massive Colorado Plateau. Wind and water eroded the land, removing the younger layers of rock and exposing parts of the Chinle Formation. Now fossilized logs that were once embedded in the Chinle Formation lie strewn across the clay hills and are exposed in cliff faces. You might notice that most of the logs are broken into segments. Who cut the logs? This is one of the park's most common questions! People did not cut the logs. Because the sections are still in order, we know that the logs fractured after they were buried and the petrification process was complete. Composed of quartz, petrified logs are hard and brittle, breaking easily when subjected to stress. Softer sedimentary layers surround the hard logs. As the sedimentary layers shifted and settled, stress on the rigid logs caused fractures. Some researchers believe that such stress may have been produced by earthquakes or the gradual uplifting of the Colorado Plateau.

Erosion continues today. Rain and wind wear away the land, uncovering additional logs, while freezing and thawing break down the logs exposed on the surface. With the infinite patience of time, the layers of sediment will continue to erode, exposing more pages of this ancient history book.

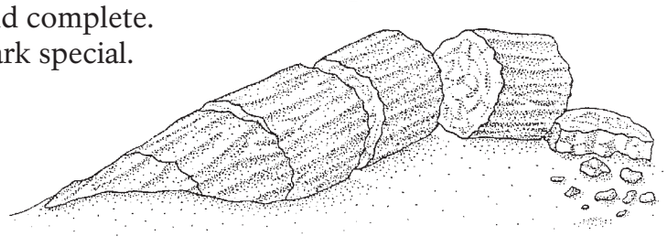
More than Trees

While the park is best known for its petrified trees, the Chinle Formation is full of different kinds of fossils and is considered one of the richest Upper Triassic fossil plant deposits in the world. Over 200 fossil plant taxa are known from the Chinle Formation, including silicified wood, compressed leaves, stems, cones, pollen, spores, and amber. Plant groups represented in the park include lycopods, ferns, cycads, conifers, ginkgoes, bennettitaleans, and several forms that are currently unclassified.

Your National Park

Petrified wood is found in every state and in many countries, so why was this place made into a national park? It was originally established to protect some of the largest and most beautifully preserved concentrations of petrified wood in United States. We now know, however, that few places in the world have a fossil record of the Triassic Period that is so diverse and complete. These things make **your** park special.

All natural and cultural resources, such as petrified wood, rocks, fossils, artifacts and plants must not be removed from the park. Unfortunately, thoughtless people continue to steal tons of petrified wood from the park every year. Petrified wood sold in local shops comes from private lands outside the park boundaries.



Everyone is responsible for protecting the national parks. Do not allow thoughtlessness to damage your irreplaceable heritage. Please report wood theft by using the emergency phones at Blue Mesa, Puerco Pueblo, and Crystal Forest or speaking with a park employee.