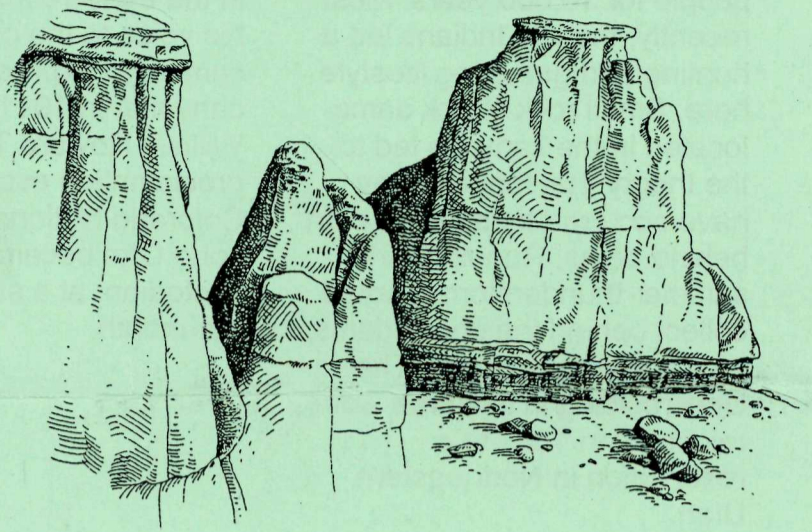




MONUMENT CANYON TRAIL



Monument Canyon holds many wonders for hikers. The trail is approximately 6 miles (11.1 km) long. It descends 600' (183 m) into Monument Canyon and follows the canyon drainage. Parking is available at the lower and upper trailheads. Remember to take water with you--do not drink water found in the canyon! During summer, 1 gallon (4 liters) per person is recommended. Be aware that scorpions and rattlesnakes, although not common, make their home here--be careful where you put your hands and feet. Pets are not allowed on trails within the national monument; nor is collecting anything (rocks, plants, artifacts).

GEOLOGY

The Upper Monument Canyon Trail and Coke Ovens Trail share the same trailhead. As you begin your walk, look ahead to the man-made tunnel below the road. During thunderstorms, this tunnel diverts runoff below the road surface and into the canyon. Why is it so large? In slickrock country during a thunderstorm, a tremendous amount of runoff can occur in a very short amount of time. A large tunnel is needed to accommodate thunderstorm runoff.

As you walk down into the canyon, notice the different layers of rock. Each layer corresponds to a different geologic time and records the events that occurred at the time of its deposition.

The sheets of dark stain you often see on the Wingate Sandstone is called desert varnish--staining caused by iron and manganese oxides, often in association with bacteria. Black streaks are usually the result of algae.

There are several methods of weathering and erosion still at work in Monument Canyon. Runoff during summer thunderstorms scours the canyons and carries sediments away. Alternating hot and cold temperatures cause the rocks to expand and contract and break apart. Ice forms in cracks in the rock and further breaks them apart. Lichens growing on rocks secrete an acid that weakens some of the minerals in the rock and help break it up.

Do you see other forms of weathering and erosion at work?

The dark-colored rock you see at the bottom of the canyons is some of the oldest rock on Earth--Precambrian Age, roughly, 1.7 billion years old. Layers of sediments accumulated in an ancient sea and hardened into sedimentary rocks. Great heat and pressure eventually changed, or metamorphosed, these sediments into rocks called gneiss and schist.

A 1.5 billion year gap in the geologic record separates these Precambrian gneisses and schists from the younger, overlying sedimentary rocks. These sedimentary rocks are composed of clays, silts, sands and gravels deposited by wind and water during the Mesozoic Era (Age of Dinosaurs).

The Coke Ovens monoliths are softly rounded domes of Wingate Sandstone. The sheer cliff walls on the opposite side of the canyon are composed of the same sandstone. Why have the Coke Ovens eroded so much more than the cliff walls? The Coke Ovens were formed when the protective "cap" of the erosion-resistant Kayenta Formation weathered away. These monoliths received their name because of their resemblance to coke ovens used to convert bituminous coal into coke (not the soft drink, but a substance used to refine metals).

HUMAN HISTORY

These canyons were used by people for 10,000 years. Most recently, the Ute Indians led a hunting and gathering lifestyle here. Small rock check dams located in the canyons led to the theory that farming may have occurred by planting corn behind dams. Runoff during summer thunderstorms would collect behind the check dams, thus watering the corn. The Utes residing in this area were relocated in 1881 to a reservation in Northeastern Utah.

The trail you are walking on was originally built by John Otto. John arrived in this area in the early 1900s and added his voice to the community's campaign to preserve these canyons. In 1911, President William Howard Taft signed a proclamation establishing Colorado National Monument. John Otto became the first custodian, at a salary of \$1.00 per month.

Independence Monument was named by John Otto. It seems to be appropriately named, since John (or perhaps his wife of three months, Beatrice) chiseled the last sentence of the Declaration of Independence on a rock near the base of the monolith. John intended to carve the names of the signers of the Declaration as well. He managed to incise a few names (which can still be seen today) but never finished the job. Independence Monument eroded into a shape like the Coke Ovens due to the presence of a "cap" of the protective Kayenta Formation.

PLANTS AND ANIMALS

The juniper tree (*Juniperus osteosperma*), identified by its blue-colored berries, is in the Cypress family. The berries are modified cones and are used to flavor gin. Look for a blue-gray insect gall found in its branches, a result of insect activity. A yellow parasitic mistletoe may also be seen growing on the tree. The Ute Indians used the shreddy bark for bedding and diapers.

Co-existing with the juniper is pinyon pine (*Pinus edulis*). This pine tree has needles bundled in pairs. Look for pine cones both among the upper branches and on the ground.

The juniper tree is more abundant at lower elevations and the pinyon pine dominates at elevations above 6,000 ft. (1829 m). Touch the foliage of both plants. Do you feel the waxy coating? This coating insulates the needles and retards water loss--an important survival aid in a semi-arid climate.

As you meander, watch your step! In undisturbed areas you may see a lumpy, blackish soil crust. This is actually a group of living organisms called cryptobiotic crusts. (In Latin, *crypto* means *hidden* and *biotic* means *life*!) Cryptobiotic crusts are composed of cyanobacteria (blue-green algae), mosses, lichens, and fungi which help stabilize the sand and clay particles. As the crusts develop, nutrients are added to the soils, eventually making the soil more hospitable to other plants. Please don't walk on the crusts because of their important role in this ecosystem.

Most of the animals in the desert do not venture out in the daytime. Temperatures can be scorching during the summer. Animals in canyon country stay cool in burrows or other shelters and emerge at dusk when temperatures drop. During your hike, you may spot lizards, squirrels, chipmunks, desert cottontails, and various insects. Look also for some large, soaring birds. Many wonder if they are watching turkey vultures or golden eagles. Viewed from below, turkey vultures have two-toned wings, with the lower edges lighter in color. Golden eagle wings are solid brown, except for immatures, with mottled white-and-brown wings. 9/00