



Landscape Arch

Tom Till

**W**ater and ice, extreme temperatures, and underground salt movement are responsible for the sculptured rock scenery of Arches National Park. On clear days with blue skies, it is hard to imagine such violent forces, or the 100 million years of erosion, that created this land that boasts the greatest density of natural arches in the world. More than 2,000 cataloged arches range in size from a three-foot opening, the minimum considered an arch, to the longest one, Landscape Arch, which measures 306 feet from base to base.

Today, new arches are being formed and old ones are being destroyed. Erosion and weathering are relatively slow but are relentlessly creating dynamic landforms that gradually change through time. Occasionally change occurs more dramatically. In 1991 a slab of rock about 60 feet long, 11 feet wide, and four feet thick fell from the underside of Landscape Arch, leaving behind an even thinner ribbon of rock. Delicate Arch, an isolated remnant of a bygone fin, stands

on the brink of a canyon, with the dramatic La Sal Mountains for a backdrop. Towering spires, pinnacles, and balanced rocks perched atop seemingly inadequate bases vie with the arches as scenic spectacles.

American Indians used the area for thousands of years. Archaic people, and later ancestral Puebloan, Fremont, and Utes searched the arid desert for game animals, wild plant foods, and stone for tools and weapons. They also left evidence of their passing on a few pictograph and petroglyph panels. The first white explorers came looking for wealth in the form of minerals. Ranchers found wealth in the grasses for their cattle and sheep. John Wesley Wolfe, a disabled Civil War veteran, and his son, Fred, settled here in the late 1800s. A weathered log cabin, root cellar, and a corral remain as evidence of the primitive ranch they operated for more than 20 years. A visit to Wolfe Ranch is a walk into the past.



Delicate Arch



Turret Arch

## The Geologic Story



The park lies atop an underground salt bed that is basically responsible for the arches, spires, balanced rocks, sandstone fins, and eroded monoliths that make the area a sightseer's mecca. Thousands of feet thick in places, this salt bed was deposited across the Colorado Plateau some 300 million years ago when a sea flowed into the region and eventually evaporated. Over millions of years, the salt bed was covered with residue from floods, winds, and the oceans that came and went. Much of the debris was compressed into rock. At one time this overlying layer of rock may have been more than a mile thick.

Salt under pressure is unstable, and the salt bed below Arches was no match for the weight of this thick cover of rock. Under pressure, the salt layer shifted, buckled, liquified, and repositioned itself, thrusting the rock layers upward into domes. Whole sections dropped into the cavities.

Faults deep in the Earth contributed to the instability on the surface. The result of one such 2,500-foot displacement, the Moab Fault, is seen from the visitor center. This movement also produced vertical cracks that later contributed to the development of arches. As this sub-

surface movement of salt shaped the Earth, surface erosion stripped away the younger rock layers. Except for isolated remnants, the major formations seen in the park today are the salmon-colored Entrada Sandstone, in which most of the arches form, and the buff-colored Navajo Sandstone. These are visible in layer cake fashion in most of the park. Over time water seeped into the superficial cracks, joints, and folds of these layers. Ice formed in the fissures, expanding and putting pressure on surrounding rock and breaking off bits and pieces.

Wind later cleaned out the loose particles. A series of free-standing fins remained. Wind and water attacked these fins until, in some, the cementing material gave way, and chunks of rock tumbled out. Many damaged fins collapsed. Others, with the right degree of hardness and balance, survived despite their missing sections. These became the famous arches. Pothole arches form by chemical weathering as water collects in natural depressions and eventually cuts through to the layer below. This is the geologic story of Arches—probably. The evidence is largely circumstantial.

## Much More Life Than Meets the Eye

Pinyon and gnarled juniper trees add a splash of green contrast to the red sandstone terrain. When conditions are just right, wildflowers bloom in profusion from April to July. Most species of mammals are nocturnal, but you might see mule deer, kit fox, or more often, jackrabbits and cottontails, kangaroo rats and other rodents, and small reptiles. Flocks of blue pinyon jays chatter in tree tops. Migratory species such as mountain bluebirds and residents such as golden eagles are seen by careful observers.

**Cryptobiotic Crust:** It is alive, so watch your step! But it won't bite you. Once called cryptogamic soil, this dark crust covers much of the untrampled desert. Composed of cyanobacteria as well as lichen, algae, and fungi, this covering protects against erosion, absorbs moisture, and provides nitrogen and other nutrients for plant growth. Avoid crushing these life-giving organisms. Stay on trails. Without these crusts, many larger plants could not survive, and if plants go, so do animals. The desert could lose much of the life that makes it such a magical place.



Greg Harlin

Common Raven



Glenn Van Nimwegen

Collared Lizard

# Exploring Arches



North Window and South Window

Arches National Park is a great family park. Foot trails lead to many park features. You can see much from your car, but to grasp the aura of time and silence and to experience the scale so special here, get out of your car and walk.

Stop at the visitor center and ask advice on the best use of your time in the park and in nearby areas—whether you have an hour or a week. Watch a color slide orientation program, see the geology and history exhibits, and browse for publications and maps. A self-guiding booklet and an audio tour for the drive along the park road are available, as is a guide to the trails of the park. In season, naturalists lead Fiery Furnace walks—make reservations

and pay fees at the visitor center. Ask about other ranger-guided programs or privately operated tours. There are no food or lodging facilities in the park; nearby Moab provides all types of visitor services.

Devils Garden Campground has 52 tent and trailer sites; all are first-come, first-served (no reservations). Fees are charged year-round. Two walk-in group sites are limited to tents (no RVs) and may be reserved for 11 or more people. Flush toilets and water are available year-round. Campfire programs are offered in season at the amphitheater.

| Trail                                                                                                    | Length        | Description                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Trail distances are round-trip, unless otherwise noted. Trails are listed from south to north (see map). |               |                                                                                                                                                            |
| Park Avenue (one way)                                                                                    | 1.0 mi/1.6 km | Moderately easy; short hill leads to smooth rock canyon bottom; tall walls, balanced rocks.                                                                |
| Balanced Rock (loop)                                                                                     | 0.3 mi/0.5 km | Easy walk around the base of Balanced Rock.                                                                                                                |
| Windows (loop)                                                                                           | 1.0 mi/1.6 km | Easy to North and South Windows and Turret Arch; 0.7 mile/1.1 km. Complete loop, for view of both windows, is more strenuous.                              |
| Double Arch                                                                                              | 0.8 mi/1.2 km | Easy trail through some loose sand; spectacular arch.                                                                                                      |
| Delicate Arch                                                                                            | 3.0 mi/4.8 km | Elevation gain of 480 feet/146 meters; no shade—take at least one quart of water per person! Open slickrock with some exposure to heights. Best at sunset. |
| Delicate Arch Viewpoint                                                                                  | 100yds/91m    | Surfaced trail, distant view of arch; reach base of arch only on Delicate Arch trail.                                                                      |
| Sand Dune Arch                                                                                           | 0.3 mi/0.5 km | Easy trail that is great for kids!                                                                                                                         |
| Broken Arch                                                                                              | 1.3 mi/2.1 km | Easy trail across open grassland.                                                                                                                          |
| Skyline Arch                                                                                             | 0.4 mi/0.6 km | Moderate walk over rocks to closer view of arch.                                                                                                           |
| Devils Garden Area: Landscape Arch                                                                       | 1.6 mi/2.6 km | Moderately easy with some elevation gain; gravel surface. Short side trips to Tunnel and Pine Tree arches.                                                 |
| Double O Arch                                                                                            | 4.2 mi/6.8 km | Difficult with many short elevation changes, rocky footing, some exposure to heights. Short side trips to Navajo and Partition Arches.                     |
| Primitive loop from Double O Arch to Landscape Arch                                                      | 2.2 mi/3.5 km | Difficult low route through fins; short section of smooth slickrock; slippery when wet. Side trip to Private Arch.                                         |
| Tower Arch                                                                                               | 3.4 mi/5.5 km | Moderately difficult in remote section of Klondike Bluffs. Some sand and elevation changes.                                                                |

**For Your Safety** The climate and landscape at Arches pose special problems for your safety and convenience. Summer daytime temperatures can reach 110°F (43°C). Carry at least one gallon (four liters) of water per person per day. Heat and dehydration can be fatal.

**Drivers:** The scenery can leave you awe-struck! Save sightseeing for viewpoints.

Sandstone is dangerous—it crumbles and breaks easily. It is easier to climb up than down; don't get rimrocked. Technical rescues are expensive and dangerous. Rock climbing is permitted in the park, but it is prohibited on most features named on USGS maps. Ask for details.

**Accessibility** The visitor center and its restrooms are accessible for visitors with wheelchairs. Ask about accessibility on trails, at other restrooms, and in the campground.

**Regulations** It is your responsibility to know and obey park rules and regulations. All federal and state laws are strictly enforced in the park.

All features are protected by federal law; leave them for future visitors.

Parking is restricted to designated areas; return at a later time if a parking lot is filled. Vehicles must remain on designated roads.

No hunting or firearms are permitted.

**Wood gathering** is prohibited. Bring fuel for the grills provided, or bring a stove. Carry out all trash, even cigarette butts.

**Mountain bikes** are allowed on established roads only; do not take them on trails or in the backcountry.

**Pets** Pets are allowed only on park roads, in parking lots, or in your campsite. They must be physically restrained at all times in these locations. Pets are not permitted on or off trails, in the backcountry, or in buildings. Pets left unattended in vehicles during the heat of the day can quickly die from heat exhaustion.

**Backcountry Use** Backcountry overnight hikers must get a permit at the visitor center. There are no designated backcountry trails or campsites. Low-impact camping techniques are essential. You must carry all your water. No fires are allowed.

**Group campsite reservations**, write: Reservation Office, Southeast Utah Group, National Park Service, 2282 S. West Resource Boulevard, Moab, UT 84532 or FAX to 435-259-4285.

**More Park Information** Arches National Park P.O. Box 907 Moab, UT 84532-0907 435-719-2299 (voice) 435-719-2319 (TTY) [www.nps.gov/arch](http://www.nps.gov/arch)

