

12 The juniper's companion in much of the canyon country "pygmy forest" is the PINYON PINE. Though you might think of pines as growing best on snow-capped mountains, many species--especially the pinyon group--are well-adapted to lower, drier areas. All leaves have pores through which plants breathe, but in pine needles these are sunk in deep pits (which you can see as fine whitish stripes on the needles). Along with the needles' waxy coating, this helps to reduce the amount of moisture lost through evaporation. Also, in many pines a type of root fungus helps draw water from the soil, since the fine strands of the fungus can penetrate into more nooks and crannies than the relatively coarse roots.

Perhaps you've seen--or better yet, tasted--the "pine nuts" often sold around the Southwest. These are the seeds of the pinyon, borne in small cones which ripen in the fall. It's certainly easier to find them in a store than on the trees, for the chipmunks and ground squirrels always seem to get there first.



13 Water, as everyone knows, doesn't run uphill. Why, then, does the Green River, calmly flowing along through Browns Park, suddenly turn southward and cut directly across the Uinta Mountains, which in this area rise some 3,000 feet above the valley floor? No one knows for sure, but one theory suggests that a few million years ago, the river did more logically flow eastward, away from the mountains. When that route was blocked by uplifting along the present Continental Divide, drainage in this area stagnated and Browns Park was gradually filled to the brim with sediments. Meandering along on top of that fill, the Green River eventually spilled over the buried crest of the mountains and down their southern slope. This gave it the energy to begin downcutting once more, and as it washed out most of the recent sediments, it also rasped its way into the older rocks to carve the CANYON OF LODORE.

14 Today, the rugged walls of Lodore are a favored haunt of the BIGHORN SHEEP. These sure-footed climbers must have been abundant here in the past for drawings of them appear often in the thousand-year-old rock art of the Fremont Indians. In this century, though, the bighorn began to die out from a combination of disease, parasites, and competition from domestic livestock, and the last native one seen in Dinosaur National Monument was reported in 1944. In 1952 a new herd of 32 animals from elsewhere in Colorado was transplanted into the area. Their population has since varied from about 50 to 150 individuals, and once again hikers and river-runners have the chance for a rare but thrilling glimpse of the handsome bighorn in its natural settings.

15 "At noon the sun shines in splendor on vermilion [sic] walls . . . and the canyon opens, like a beautiful portal, to a region of glory. This evening, as I write, the sun is going down and the shadows are settling in the canyon . . . and now it is a dark portal to a region of gloom--the gateway through which we are to enter on our voyage of exploration tomorrow. What shall we find?"

The words of JOHN WESLEY POWELL, camped near here on June 7, 1869, express the combination of excitement and fear which he and his companions often felt as they made the first full-length expedition down the Green River. Since most of the canyon country was then literally a blank spot on the map, Powell and his men had the opportunity to fill in the blanks with new names. Andy Hall, the youngster of the group, suggested the name for this canyon after recalling "The Cataract of Lodore" by the English poet Robert Southey:

"All at once and all o'er, with a mighty uproar--
And this way the water comes down at Lodore."

These lines soon proved to be appropriate, for the first large rapid below here wrecked one of the party's four wooden boats and earned itself the name Disaster Falls. However, the men salvaged what they could, approached later rapids more cautiously, and ultimately floated all the way down the Green and Colorado Rivers through the Grand Canyon.

16 What Powell had called "THE GREAT UNKNOWN" is now explored by thousands of people every year in inflatable rafts, fiberglass dories, and even kayaks. In fact, river-running has become so popular that most such areas, including Dinosaur National Monument, have established river-use permit and quota systems, both for boaters' safety and to reduce the impact of so many people concentrated in the narrow canyons. To some, the imposition of such regulations is contradictory to the freedom of wilderness travel; to others, some control seems necessary in order to preserve the wilderness itself.

Unlimited-versus-controlled boating on the Green River might never have become an issue, if not for a greater debate over a proposed dam a few decades ago. The Echo Park Dam would have flooded the entire Canyon of Lodore and also that of the Yampa River, the Green's major tributary. Protestors pointed out that Dinosaur National Monument had been enlarged to protect these canyons in their natural state, not as artificial reservoirs, and finally the Flaming Gorge Dam site was chosen instead.

Today the water that passes through the Gates of Lodore is not quite the wild and unknown torrent that Powell saw, but it is still a flowing river. The current still gnaws inch by inch into the ancient rocks; beaver still burrow and feed along the banks; bighorn still find footholds on the canyon walls. And the modern explorers who thrill to these sights, and to the roar of a rapid and the song of a canyon wren, attest that this flowing river is as rare and valuable a resource as the fossils which first inspired the creation of Dinosaur National Monument.

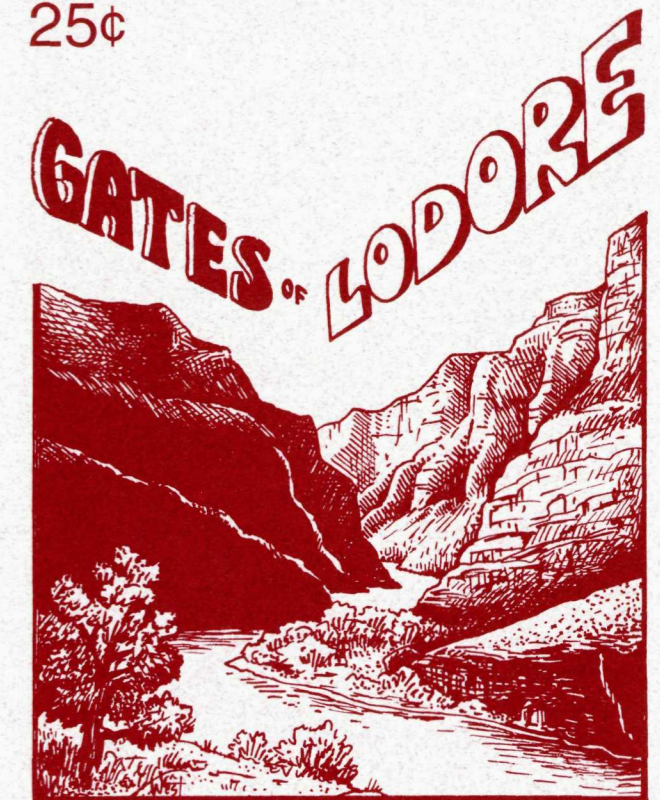
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NATURE TRAIL

Many canyons can be seen only distantly from their rims, or entered only by long and strenuous hikes. Here at the Gates of Lodore, a fairly easy walk--about 1½ mile round trip--takes you over the threshold of Dinosaur National Monument's canyon country for a close-up look at the Canyon of Lodore and its history and ecosystem.

This trail is not rugged, but you should wear good walking shoes and, in warm weather, a hat. The best way to beat the heat is to hike early in the morning or late in the afternoon--the air is cooler and the shadows on the canyon walls may also be more dramatic. It's also a good idea to carry a small canteen of water.

Please help the next visitors to enjoy the trail too: stay on the trail, carry out all trash, and do not collect or disturb any rocks, plants or animals.

1 For much of its length, the Green River rushes and roars through steep-walled canyons, but for some 30 miles upstream from here, it has wandered more placidly through an open valley. Mountain men of the 1800's called such areas "parks," and this one took its name from such a man. Baptiste Brown, a French-Canadian trapper, found that this valley was a comfortable, mild-wintered place to settle as well as a fine source of beaver pelts, and soon the area was known as **BROWNS PARK**.

Cattlemen later discovered the value of the valley's grasslands, and on their heels came a few men who had a free hand with the branding iron, and some who found the valley's isolation a handy refuge from the law. Rustling and outlawry are no longer major professions here, but Matt Warner, Butch Cassidy, Tom Horn, and others are well-remembered in Browns Park, both by the ranchers who still live here and by others who come to camp, fish, or float the river. Perhaps for many of today's visitors, this valley is still a sanctuary--not from mountain snows or sheriff's posses, but from the noisier, faster-paced world "outside."

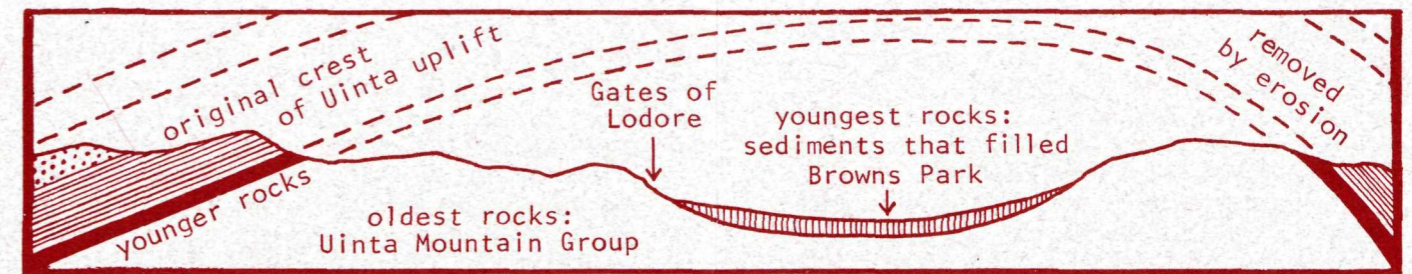
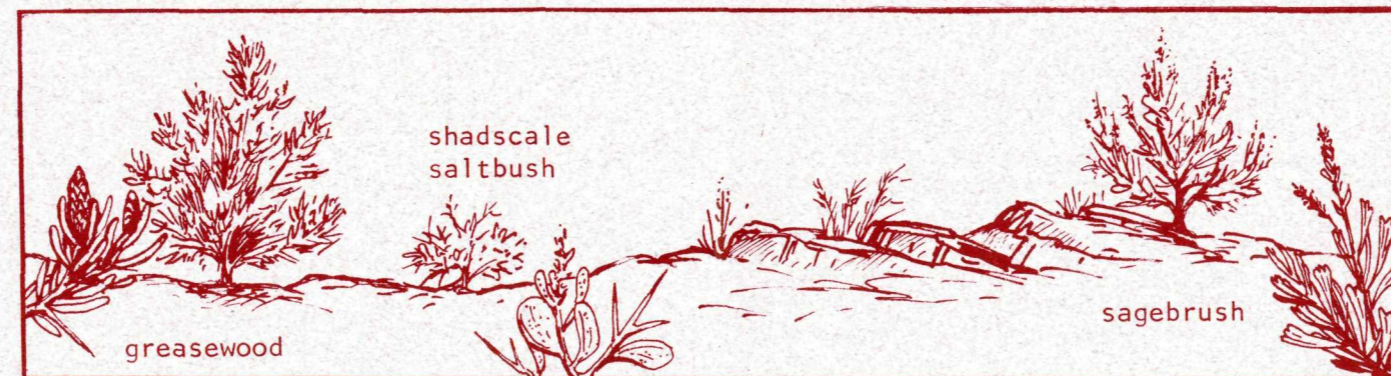
2 The great cattle herds shaped the lifestyle of the West for many years, and also, more subtly, reshaped the land itself. Many native grasses were grazed off faster than they could reproduce, and new plants such as this **CHEAT GRASS** took their place. Native to the Mediterranean, cheat grass traveled to North America in grain shipments and spread like wildfire across the range. Not only are its seeds too spiny for most animals to eat, but they continue to hitchhike to new places by catching in hair or fur--or perhaps your socks.

3 In contrast to cheat grass, **LICHENS** have been here a long time. The colorful patches on the rocks at your feet are living plants: fungi whose filaments can cling to smooth rock and secrete acids that release minerals, and algae which take shelter in the fungi and manufacture food for them both. By breaking down rock into soil, lichens help create new habitat for other plants; they can also be the first indicators of a habitat's decline, as they are very sensitive to air pollution. Remote as it is, Browns Park shares the same skies as the fast-growing region around it, and someday these lichens may reflect the changes taking place many miles away.

4 The **GREEN RIVER**, too, shows the influence of distant places and events. What color is it today? During spring runoff or after local rains, the water may be brown, gray, or red with silt and mud from tributaries such as Red Creek and Vermillion Creek. In drier weather, the river sometimes lives up to its name, flowing cold and green all the way from Flaming Gorge Dam, which traps most of its sediments.

The dam's greatest effect, though, is not on the Green's color but on its flow (formerly measured at the river gauge just below you). The great spring floods of former years are also trapped at Flaming Gorge. Gradual releases throughout the summer keep the river's flow more constant, although it rises and falls somewhat each day, due to varying power demands at the dam's generators. However, the controlled river has lost much of its ability to scour out its channel and banks--the most noticeable result being the unnatural growth of dense thickets of willow, tamarisk, and other streamside plants in the years since the dam was built.

5 Across the river you can see some of the oldest rocks in Dinosaur National Monument--far more ancient than the fossils which gave the park its name. Perhaps as much as a billion years ago, this area lay near sea level and was being slowly buried in pebbles, sand, and mud washed down from mountains to the northeast. Partly due to the weight of these sediments, the land gradually sank and the sediments continued to pile up, reaching a thickness of 24,000 feet or more. Partly, again, from their own weight and partly from the cementing action of dissolved minerals, the sediments solidified to form the conglomerates, sandstones, and shales you see today, called the **UINTA MOUNTAIN GROUP**.



6 "Well," you may ask, "if these rocks are called the Uinta Mountain Group, then where are the mountains?" Actually, you're standing on them. The **UINTAS**, a spur of the Rocky Mountains, were formed by compression in the Earth's crust which buckled these once-level rock layers upward into a broad arch, highest in north-central Utah and gradually flattening out east of here. This uplifting probably began about the same time as the dinosaurs became extinct, and most likely continued a little at a time over millions of years, rather than happening all at once. Thus, even as the land rose, it was being worn down by erosion, and many younger rock layers have been stripped off to reveal these ancient rocks that were once at the very core of the mountains.

7 Travelers from moister climes may not think of this area as forested, but this tree, the **UTAH JUNIPER**, manages to cover a good deal of the arid canyon country. What it lacks in stature the juniper makes up for in toughness, longevity, the fragrance of its wood, and the beauty of its often gnarled, twisted trunks. Also, from a more utilitarian viewpoint, it has fueled many a campfire since prehistoric times, supported miles of fences, and perhaps right now is providing you with a bit of welcome shade.

8 You might expect to see more **CACTI** in this semi-desert area, but unless they're in bloom, you may have to look closely to find them. Dinosaur National Monument is a "cold" desert, where temperatures can top 100°F in summer but may plunge well below zero in winter. Since cacti survive by storing water in their fleshy stems, they are quite vulnerable to subfreezing temperatures, and only a few low-growing varieties--likely to be insulated by a blanket of snow during the coldest weather--live here. In spring they show off bright yellow, pink, and red blossoms, but in other seasons, watch your step or you might feel one before you see it!

9 Like cacti, most of the plants here must be water-conservers in order to survive. Feel the leaves of this **BLACK GREASEWOOD**: their waxy surface helps to hold in moisture, just as waxed paper keeps food fresh. Greasewood is a valuable browse plant for livestock when other forage is unavailable, but it can also be harmful if overeaten.

10 Another useful adaptation among desert plants is the ability to grow in alkaline, salty soil. Both greasewood and its smaller cousin **SHADSCALE SALTBUUSH** can absorb and store quantities of salt that would kill many other plants. In saltbush this capacity is so well-developed that the leaves can be used as a seasoning (but please don't pick them--many animals depend on them for food as well as flavor).

11 Rounding out the "big three" of common shrubs here is the one that is probably best known, **SAGEBRUSH**. Its grayish color readily distinguishes it from the greener greasewood, and its spicy aroma clinches its identity. Although it is less tolerant of alkaline soils than are saltbush and greasewood, sagebrush covers vast areas of the intermountain West and is a staple food of wildlife such as pronghorn antelope and sage grouse.