

The SENTINEL

ZION NATIONAL PARK

INFORMATION & ACTIVITIES

SPRING / SUMMER 1991

75 Years in Mukuntuweap

HAPPY NEW YEAR!...No, that's not it... **HAPPY BIRTHDAY!**... Hmm, that's close but it's still not right... **HAPPY ANNIVERSARY!** Yes, that's it! **HAPPY 75th ANNIVERSARY!** 75 years?! Who has been around for 75 years? The National Park Service, that's who!

Established in 1916 the United States National Park Service is celebrating 75 years of service to the public. Prior to the establishment of the Park Service, 35 national parks and monuments already existed.

Unfortunately, the administration of these areas was haphazard. August 25, 1916 marked the establishment of the National Park Service in the Department of Interior by Congress.

Mukuntuweap National Monument was one of those already existing areas.

Established in 1909, Mukuntuweap featured a breathtaking 2,000-4,000 foot deep, red and white, sandstone canyon. Located in the far southwest corner of Utah, Mukuntuweap would someday become one of the

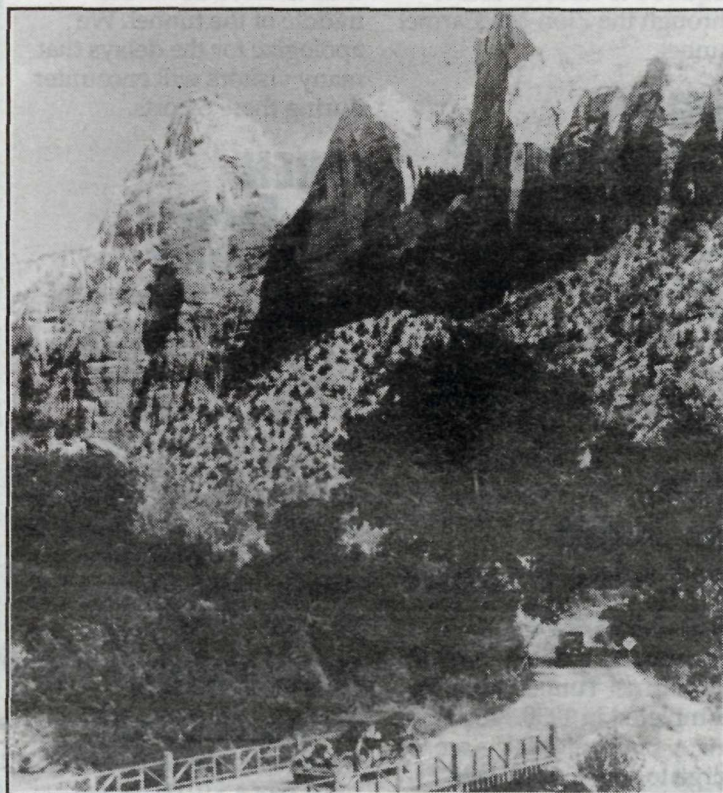
most visited parks in the service. Over the next 75 years Mukuntuweap underwent some changes. Here are just a few: In 1918 Mukuntuweap National Monument was renamed



Zion National Monument, then Zion National Park in 1919. A "passable" road didn't lead to Zion until 1917. The first entrance fee of 50 cents was initiated in 1926. Most of the trails were originally built in the 1920's. The tunnel and east entrance roads took 3 years to construct, 1927-1930, at a total cost of \$2,000,000. The original Zion Lodge was built in 1925. The Kolob section, first designated as Zion National Monument in 1937, was added to the park in

1956. Bears and wolves used to roam the canyons and plateaus and mountain lions still do. After an absence of 30 years, bighorn sheep were reintroduced in the 1970's and a small herd lives in the park today. In the early days, a few brave souls occasionally rode horses into the Zion Narrows. Last year 4,235 visitors hiked through the same canyon. In 1973 one million people visited Zion. That number jumped to 2 million by 1988. A large rockfall off Bridge Mountain occurred in December of 1990, as evidenced by the large, white slide at the base of the mountain. The list is endless.

Sometimes we think national parks are immune to change. But change is inevitable. The Park Service as a whole has changed over the last 75 years, too. Whereas park areas were originally viewed only as "pleasuring grounds", their importance in scientific research, resource management, and education is becoming more evident. They are more than just fun places to visit. They are places to learn about natural



and cultural history. They are among the last refuges for native plant and animal species. They are outdoor laboratories where the global environment is studied.

In this year of the Diamond Anniversary, the National Park Service is rededicating itself to its fundamental mission as stated in the 1916 legislation, "to conserve the scenery and the natural and

historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." Watch for special events and activities at all national park areas across the country during 1991 and wish the NPS a HAPPY 75th!

Message from the Superintendent

Welcome to Zion National Park, a spectacular and fragile place that inspires our sense of wonder. To limit the impact of almost two and a half million visitors a year, we need your help. Please take care of your national park by picking up litter and watching wildlife from a distance without feeding them. Hike and drive safely and with sensitivity for other visitors and for the plants and animals whose home this is.

We hope that Zion's beauty and fragility will inspire you to care for the whole environment of the planet we share with every living thing.

Do you have any concerns or ideas for improving your national park? Let us know what you enjoyed about Zion, too. Please drop a note to: Superintendent, Zion National Park, Springdale, Utah 84767.

Harold L. Grafe,
Superintendent

EMERGENCY?

8:00 A.M. TO 5:00 P.M.
(801) 772-3256

AFTER HOURS
(801) 772-3322
OR (800) 624-9447



TAKE A MOMENT TO INFORM YOURSELF ABOUT:

- Safe hiking
- Precipitous trails
- Loose rock
- Weather conditions
- Exposure to sun and cold
- River safety/flash floods
- Park regulations
- Wildlife

Detailed information: page 3 and visitor centers.

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recycled paper

Restrictions on Large Vehicles in Zion

TUNNEL ESCORTS

Vehicles exceeding 7'10" in width OR 11'4" in height are required to have an escort through the Zion-Mt. Carmel tunnel.

WHERE is the Tunnel?

The Zion-Mt. Carmel tunnel is located on the park road between the East Entrance and Zion Canyon. Zion National Park can be reached via Highway 9 both from the east (off Highway 89) and from the south (off Interstate 15).

WHY do Some Vehicles Require an Escort?

The mile-long Zion-Mt. Carmel Tunnel was completed in 1930. Today many buses and R.V.s are too large to stay in their lane while passing through the tunnel.

While still considering alternative long term solutions, Zion has established a year round escort service.

The tunnel is open throughout the year, but over-sized vehicles must have an escort to ensure their safety and the safety of other motorists.

Please note that you will not be following an escort vehicle through the tunnel. Rangers at each end will convert traffic through the tunnel to one-way, allowing you enough time to drive down the middle of the tunnel. We apologize for the delays that many visitors will encounter during these escorts.

WHEN are Escorts Available?

Rangers are stationed at the tunnel from 8:00 a.m. until 8:00 p.m. daily from March 17 through October 31. Oversized vehicles are prohibited from passing through the tunnel at any other time of day. During the winter season, escorts may be arranged at the entrance stations, visitor center, or by phoning 772-3256.

HOW MUCH Does it Cost?

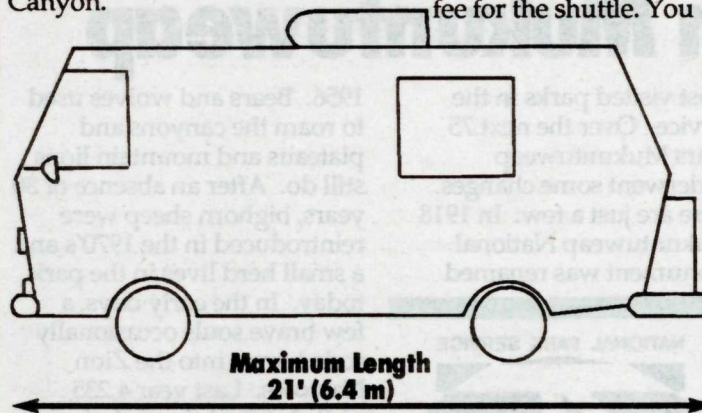
Visitors requiring an escort must pay a \$10.00 fee per vehicle. Pay this fee at either park entrance before proceeding to the tunnel. The fee is good for two trips through the tunnel for the same vehicle during a 7 day period. This fee covers the actual cost of providing escorts, which is not funded in Zion's appropriated budget.

PARKING RESTRICTIONS

Vehicles exceeding 21 feet in length are restricted from parking in two areas in Zion Canyon.

HOW can I visit these two places?

Zion Lodge operates a shuttle in Zion Canyon. There is a fee for the shuttle. You



WHERE are Restrictions in Effect?

Vehicles over 21' are prohibited from entering the Weeping Rock Parking Area. This is due to the small turn-around space. Vehicles over 21' may drive through, but may not park at the Temple of Sinawava parking lot between 9:00 a.m. and 5:00 p.m. This is due to heavy congestion in this area.

Oversized vehicles parked in these areas will be ticketed or towed away.

may purchase tickets at the Lodge.

Oversized vehicles may park in the Lodge's designated area, at the south end of Zion Lodge. Then you and your passengers may ride the shuttle up the canyon.

Another option is to drop passengers at the designated loading/unloading area at the Temple, drive to the Lodge, and park. Then ride the shuttle back to the Temple or wait at the Lodge until ready to pick up passengers.

PROHIBITED VEHICLES

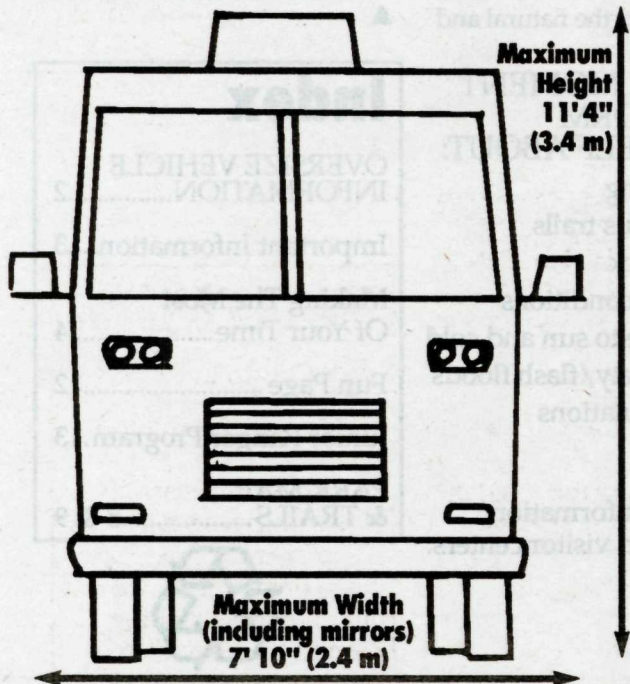
Certain vehicles are prohibited from driving ANYWHERE on the park road between Zion Canyon and the East Entrance.

Prohibited vehicles include:

- any vehicle over 13'1" in height.
- semi trucks.
- vehicles over 50,000lbs combined gross weight
- vehicles over 40' in length for a single vehicle or 50' for a combined vehicle. ▲

DID YOU KNOW...

...the cost of building the tunnel in 1930 was \$503,000?



A Shuttle for Zion Canyon?

Over 2.3 million people visited Zion in 1990, and most of them drove into Zion Canyon. By the year 2000 as many as 4 million people may visit Zion! Where will they all go? Space in the canyon is limited, and crowding is already a significant problem.

The need for a transportation system has been identified and documented since the

1970's. A Development Concept Plan completed in 1983 prescribed a voluntary shuttle system. In August of 1988, a five-day experiment was conducted using a voluntary shuttle system. Visitor response to the system was positive and congestion was noticeably reduced.

The National Park Service is working with the Utah Congressional

delegation seeking funding for a permanent shuttle system. The shuttle system will be used during periods of heavy visitation. It is hoped that this system will soon be available to visitors. ▲



Important Information

ACCESSIBILITY



The visitor centers and Zion Lodge are fully accessible to disabled persons. Several campsites in each campground are reserved for people with disabilities and two trails are accessible. For specific details, ask at either of the park visitor centers.

BACKPACKING



Free permits are required for all backcountry camping. Permits and hiking information are available at the Zion Canyon, Kolob Canyons, and Cedar Breaks visitor centers.

BICYCLING



Bicycling is an excellent way to enjoy the magnificent scenery and crystal clear air in Zion. Bicycles are permitted only on established roads. RIDING ON TRAILS OR "CROSS COUNTRY" IS PROHIBITED.

Riding bicycles through the Zion-Mt. Carmel tunnel is prohibited. Bicycles must be transported through the tunnel by a motor vehicle. Contact any entrance station or the visitor center for further information.

Use good cycling sense when riding in the park: wear a helmet and brightly colored clothing, obey traffic laws, carry water, and be aware that automobile drivers may be distracted by the scenery. Traffic is heaviest in Zion Canyon between 9 a.m. and 5 p.m. Ride defensively!

CAMPING



The Watchman and South Campgrounds are available on a first-come, first-served basis. One is open year-round, both are usually open in summer. You may self-register at the campground. The fee is \$6.00/night or \$3.00 for holders of Golden Age/Access cards. Some sites are set aside for disabled persons. Group campsites are available by reservation to educational or youth groups.

FACILITIES INCLUDE:

- restrooms
- water
- picnic tables
- fire grates
- dump stations
- utility sinks

There are no utility hook-ups or showers, but both are available in Springdale. Camping is limited to 14 days and is permitted only in designated sites or in the backcountry. (Permits are required for backcountry use.) Campground regulations are posted conspicuously. Please obey them!

The Lava Point primitive campground is usually open from May to October. There are fire grates, tables, and toilets, but no water. No fee is charged.

There is also a campground at Cedar Breaks National Monument.

CLIFFS



Be mindful of your footing at overlooks and along drop-offs, especially when using binoculars or cameras. Loose sand or pebbles on stone are very slippery. Don't throw or roll rocks; there may be hikers below. Keep an eye on children.

Watch for rockfalls and landslides. Although they rarely do damage, they do occur frequently.

DRIVING



* If you are driving an oversize vehicle, see page 2 for restrictions and procedures.

* Observe posted speed limits. A national park is not a place for speed; enjoy the scenery safely. Slow down at dawn and dusk and watch carefully for animals.

* Wear safety belts - it is required by law in all NPS areas.

* Pull completely off the road when reading maps, observing wildlife, or taking photographs. NEVER stop in the roadway.

* Show courtesy toward cyclists and pedestrians. Treat bicycles as another car, wait for oncoming traffic to clear before passing.

* Drive only on established roadways, and park only in designated areas.

* Watch for rocks or other debris on the roadway.

* Report all accidents to a ranger.

EMERGENCIES



Within Zion National Park, call 772-3256 between 8:00 a.m. and 5:00 p.m. After hours, call 772-3322 or 800-624-9447. The nearest hospitals are in St. George, Cedar City, and Kanab. Springdale Medical Center is open during summer months.

FEES



Entrance fees are \$5.00 per private vehicle and \$2.00 per motorcycle or bus passenger, bicyclist, or pedestrian. Annual passes and passes for senior citizens and disabled persons are available. Ask at the entrance station.

FIRES



Fires are permitted only in campstoves or provided grills. Keep them small and controlled. Collect only dead wood found on the ground. Fires are not permitted in the backcountry.

LOST AND FOUND



* Lost items should be reported to the visitor center.
* Found items must be turned in at the visitor centers. Items not claimed in 60 days may be claimed by finder.

PETS



Pets must be leashed (6 foot maximum) and in your physical control at all times. They are prohibited on all trails, in the backcountry, and in public buildings. Never leave your pet in a closed vehicle. Temperatures can soar to over 120 F (49 C) in minutes. Your pet can quickly die of heatstroke under these conditions. Boarding kennels are available in Kanab, St. George, and Cedar City.

PICNIC AREAS



Picnic areas are located in Zion Canyon (Grotto Picnic Area) and at the end of the Kolob Canyons Road. The Grotto has fire grates, picnic tables, water, and restrooms. The Kolob Canyons site has tables, fire grates, and pit toilets.

SWIMMING AND WADING



If you swim or wade, be alert to the potential dangers of the Virgin River: swift currents, cold water, hidden boulders, submerged logs or other traps, slippery rocks and the possibility of flash floods. Wear shoes while wading to protect your feet.

WILDLIFE



Plants, animals and all other natural features are protected and should not be disturbed. DO NOT FEED WILDLIFE and keep your distance when photographing them. Hunting or the use of firearms is prohibited.

WEATHER



Summer temperatures can reach 110° F (43° C). Guard against becoming overheated. You can lose water rapidly in this dry air, particularly when it's hot as well. Carry plenty of water when hiking and remember to drink it, even when you don't feel thirsty. Thirst occurs after mild dehydration. This is flash flood country. Stay out of narrow canyons and washes when it is raining or threatening. Pay attention to the Narrow Canyon Danger Level posted daily at the visitor centers and the Gateway to the Narrows trailhead.

A walk in the rain can be delightful, but rain can also make roads and trails slick. Be careful! Drive slowly and watch your step. Be alert to the threat of lightning, especially when exploring high rim trails. Storms can arrive quickly and unexpectedly. Be prepared for a variety of weather conditions when exploring the park. Current weather forecasts and safety information are available at the visitor centers.

DID YOU KNOW...

...visitation in 1916 was approximately 3,000 and in 1990 was 2.3 million? That is an increase of 76,600% in 75 years. If a similar increase takes place over the next 75 years there will be 1.8 billion people visiting Zion in the year 2066.

Making the Most of Your Time Weather in Zion

If you have 2-3 hours:

VISIT: Visitor center and museum and view the 12-minute introductory slide program.

DRIVE: Zion Canyon Scenic Drive - 13 mi/20 km round trip.

WALK: Weeping Rock Self-Guiding Nature Trail - easy walk to a spring.

If you have half a day:

VISIT: All of the above plus:

WALK: Gateway to the Narrows Trail - easy walk along the river.

OR: Emerald Pools Trail - moderate walk to a waterfall.

DRIVE: East Entrance Road to Checkerboard Mesa Viewpoint - 11mi/18 km one way from visitor center.

If you have a full day in Zion and wish to walk:

WALK: Trails above, plus Watchman Trail - moderate

walk, good views of lower Zion Canyon (best early or late in the day).

Canyon Overlook Trail - easy, self-guiding trail.

OR: Half day hikes - allow 4-5 hours each:

HIKE: Angels Landing - strenuous, good views of Zion Canyon.

Hidden Canyon - moderately strenuous, side trip from East Rim Trail.

(NOTE: Neither of these trails recommended for anyone fearful of heights.)

If you have a full day in Zion and wish to drive:

DRIVE: Zion Canyon Scenic Drive - 13mi/20km round trip.

East Entrance Road - 11mi/18km from visitor center to Checkerboard Mesa.

Kolob Canyons Section (NW corner of Zion) - 45mi/72km one way from Zion visitor center to Kolob Canyons. 10mi/16km round trip scenic drive.

Although clear skies and warm temperatures are trademarks of the Southwest, visitors should expect the unexpected: a drenching thunderstorm in July, a snow storm in March, a cool evening in May. Whatever the weather, the unique and changing beauty of Zion is guaranteed.

Weather conditions change significantly with elevation. Expect a drop in temperature of about three degrees Fahrenheit per thousand feet of elevation gain.

Zion is open all year. The Zion Canyon Scenic Drive, the Zion-Mt. Carmel Highway, and the Kolob Canyons road are plowed in winter. The Kolob Terrace road (to Lava Point) is closed in winter due to heavier snowfall.

Although snowfall in Zion Canyon is slight, shaded side canyons and higher elevation trails will have snow/ice from winter into spring.

Spring

Spring weather is most difficult to predict. Stormy, wet weather one day, sunshine and warmth the next. Waterfalls cascade down the sheer sandstone cliffs, spring wildflowers add a bright floral bouquet. Blooming begins as early as February and usually

reaches its peak in May.

Summer

Hot (95°-105°F), sunny days generally prevail from late May through mid-September. Potential for afternoon thunderstorms exists from mid-July through mid-September. Waterfalls tumbling over canyon walls are shortlived, but breathtaking. Flash-flooding may occur; always check the forecast before hiking in narrow canyons.

Fall

Striking fall colors against red sandstone walls are the highlight of fall. Colors peak in September in the high country, late October in Zion Canyon. Mild days, cool nights, and little rainfall make for good hiking/travelling conditions.

Winter

Winter contrasts snow-covered slopes with brightly colored cliffs. Snowfall in Zion Canyon is slight, but the plateaus may have enough snow for skiing and snowshoeing. Daytime temperatures often reach the fifties, nights often dip into the twenties. Winter travelers should be prepared for snow storms and icy conditions in the higher elevations.

Visitor Services

Zion Lodge

Lodging, a restaurant, snack bar, gift shop, post office, guided tram tours, and a hiker shuttle service are available here. For details call (801)772-3213. For advance motel reservations call (801) 586-7686. Guided horseback rides are also available March through October. Reservations and information are available at the lodge, or you can call (801) 772-3967.



Nearby Services & Accommodations

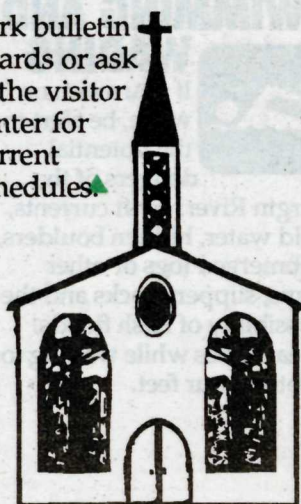
Nearby communities offer a wide variety of services including motels, restaurants, grocery stores, service stations, campgrounds with utility hookups, showers, laundromats, gift shops and galleries, and U.S. Post Offices.



Worship Services

During summer months, a variety of worship services are held in Zion National Park. A Christian Ministry in the National Parks sponsors interdenominational services on weekends at Zion Lodge and the South Amphitheater. The Roman Catholic Church and the Church of Jesus Christ of Latter-Day Saints also offer services in the park. Check

park bulletin boards or ask at the visitor center for current schedules.



Average Temperature(°F) Average Precipitation

	High	Low	Inches
January	39-60	15-37	1.71
February	45-69	21-40	1.72
March	54-72	28-40	1.88
April	62-80	37-59	1.17
May	72-97	45-59	1.05
June	87-100	51-68	.50
July	93-103	64-73	.94
August	93-101	51-72	1.47
September	83-96	53-65	1.18
October	70-88	42-62	.98
November	54-72	27-44	1.11
December	46-61	18-39	1.52
Total Annual Precipitation:			15.23

Beyond Zion Canyon

Kolob Canyons

Whether you're interested in a scenic drive or a pleasant walk, visit the Kolob Canyons in the northwestern part of Zion National Park. These spectacular narrow canyons - cut into the Navajo Sandstone - create towering vertical cliffs whose brightly colored, orange-red walls give the Kolob a striking singularity.

Kolob Canyons Visitor Center is off Interstate 15 (Exit 40), 40 miles from the South Entrance of Zion Canyon. A five mile drive climbs 400 feet from the visitor center along the western edge of the "finger canyons". Water cut these canyons into a high-country plateau called the Kolob Terrace. A picnic area is located at the end of the drive. A guidebook, keyed to the numbered stops along the drive, is available to introduce you to the area's ecology, history and geology.

Several trails offer a closer look at the Kolob's special beauty. The popular Middle

Fork of Taylor Creek trail winds back and forth across the creek for 2.7 miles to the Double Arch Alcove. The cliffs tower 1500 feet above in these narrow confines.

Forests of pine, fir and maple provide welcome relief from the hot summer sun.

The La Verkin Creek trail begins at Lee Pass and leads to the impressive Kolob Arch. Though some hikers do the 14.4 mile round trip in a day, it is perhaps better enjoyed as an overnight trip.

Check the park brochure and interpretive announcements for more details regarding the trails and programs offered. Turn on AM radio 1610 as you approach the area for current information.

Cedar Breaks National Monument

Green, alpine meadows contrast sharply with the gigantic, multi-colored amphitheater of Cedar Breaks. Here, rain, wind, snow and ice have eroded

the limestone into many fantastic shapes and colors.

Cedar Breaks reaches an elevation of 10,350 ft. (3,155 meters). Cool temperatures and alpine forests are a welcome respite from the desert heat of Zion. The road through the monument is open from late-May to October, depending on the weather. At other times, check road conditions before driving to the monument.

The name "Cedar Breaks" is derived from use of the terms "breaks" for badlands and "cedar" for the juniper trees growing near the base of the cliffs.

The famous Cedar Breaks wildflower display begins as soon as the snow melts, and reaches its peak during July and early August. The monument contains majestic stands of pine, fir, spruce, quaking aspen and bristlecone pines.

Bristlecones are among the oldest living things on Earth. Small stands of these ancient, twisted trees tenaciously grow in the limestone soil along the rim of the

amphitheater. Find out more about these elderly trees at the Cedar Breaks Visitor Center. The visitor center has information about plants and animals and the geology of the area. Park rangers are on duty daily to answer your questions and suggest places to see and things to do.

Pipe Spring National Monument

Located off highway 389 in northern Arizona, 65 miles southeast of Zion, Pipe Spring offers visitors an interesting and educational journey back to the "Old West." This small, little-known gem of the park system is rich with Native American, early explorer, and Western pioneer history and lore.

Pipe Spring contains one of the few natural springs on the edge of the dry, but fertile, Kaibab Plateau. Human occupation of the area dates as far back as 500 AD when the Anasazi (a Navajo term for "the ancient ones") created a small settlement. Much later the Southern Paiutes called the area home. In 1776, the first

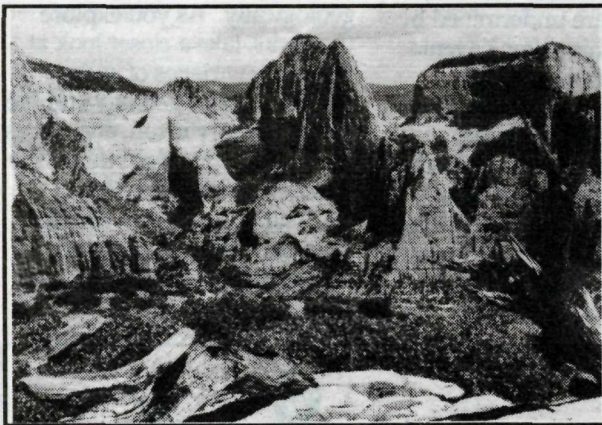
Europeans traveled through northern Arizona.

Eventually beaver trappers, explorers, Mexican slave hunters, and pioneers also discovered the refreshing waters of Pipe Spring. The fort, built in the 1870's by Mormon pioneers, was the first historic structure in the National Park System.

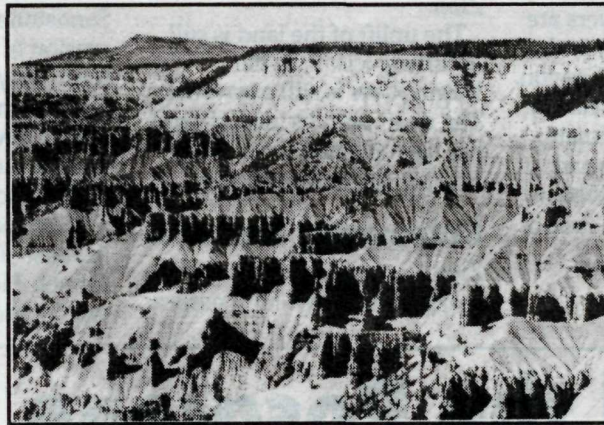
Today Pipe Spring staff dress in Old West style clothing and present living history demonstrations. At the fort one can see pioneer era activities including cultivating crops, caring for livestock, various domestic activities, and an occasional ranching demonstration. Museum exhibits include quilts, Southern Paiute basketry and other handiwork. A "frontier kitchen", adjacent to the monument and operated by Zion Natural History Association, features cuisine of the late 1800's.

Off the "beaten track" and downright peaceful, Pipe Spring National Monument is a fun and fascinating way to learn more about the history of the West. ▲

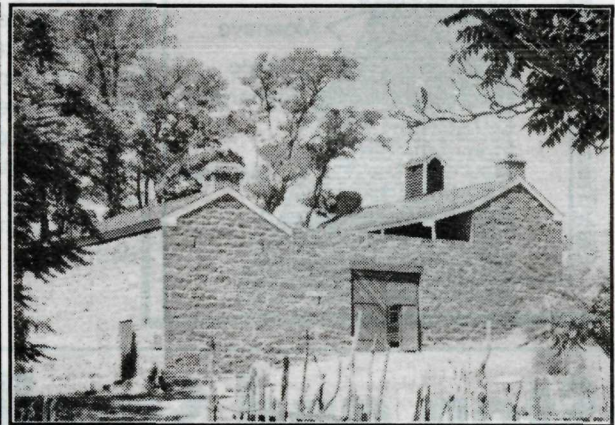
Kolob Canyons



Cedar Breaks National Monument



Pipe Spring National Monument



Naturalist Activities

Park rangers offer a variety of programs to help you learn about Zion. Topics range from the geology of Zion to its plants, animals, history, archeology, and night sky. You can choose from guided walks, hikes, short talks at the visitor center, evening programs at the campground amphitheaters and Zion Lodge, and more. All programs are free. For some you need to make reservations

at the visitor center.

Program schedules vary weekly and are posted at the visitor centers and on bulletin boards throughout the park. Are there other kinds of programs you would like to see offered? Fill out a comment form at the visitor center or write: Superintendent, Zion National Park, Springdale, Utah 84767. ▲



Southern Utah Folklife Festival



The Fifteenth Annual Southern Utah Folklife Festival will take place on

the grounds of the Zion Nature Center, September 5-7, 1991. The Festival celebrates the folk practices of Southern Utah with demonstrations of traditional crafts and customs. From 10 am to 5 pm you can observe traditional arts such as quilting and canning, listen

to live music, and sample such foods as dutch oven potatoes. Zion Natural History Association, the Utah Arts Council, Utah Endowment for the Humanities, and other organizations along with donations from many nearby businesses help make this festival possible. ▲

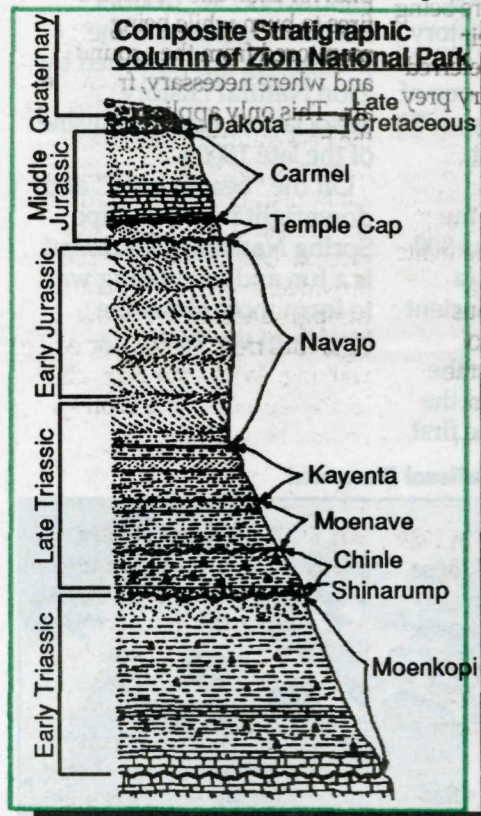
Swamps, Sand Dunes & Seashores The Geology of Zion National Park

Can you imagine Zion without it's deeply carved and beautifully sculpted canyons? First imagine Zion with swamps and streams. Then imagine an enormous, hot desert with sand dunes thousands of feet deep. Finally, picture Zion completely covered by an inland sea. The geologic story of Zion includes all of these scenes. Read on to find out "the rest of the story".

Sedimentation - Deposition

From 240 million years ago to 10 million years ago the Zion

area was a relatively flat basin, located near sea level. Streams carried sand, gravel and mud from surrounding mountains, into the basin and deposited them in horizontal layers. Over millions of years various materials were deposited as environmental conditions changed. The area saw shallow seas, coastal plains, and a desert filled with massive wind blown sand dunes. The weight of each layer of sediment caused the basin to subside (sink) and maintain the surface at an elevation near sea level. This process of deposition, sinking, deposition,.... continued until



10,000 feet of sediment had accumulated. While a shallow sea covered the area, mineral laden waters slowly filtered down through these sediment layers. Minerals such as iron and calcium carbonate were deposited in the spaces between the sand, silt or mud particles. The minerals cemented the particles together, turning them to stone. These rock layers are exposed today in the walls of Zion Canyon. Each layer reveals the geography, climate, and the plants and animals that lived in the area at the time of deposition.

Uplift - Erosion

Geologists believe that ten million years ago Zion was a relatively flat featureless plain. Streams meandered lazily across the surface, dropping their loads of sediment in sand bars and floodplains. Then, in an area extending from Zion to the Rocky Mountains, a massive geologic event began. Forces deep within the earth's mantle started to push up on the surface of the earth. The land in Zion rose from near sea level to as much as 10,000 feet above sea level.

Zion's location on the western edge of this uplift caused streams to tumble off the plateau, flowing rapidly down a steep gradient. Fast moving water carries more sediment and larger boulders than a slow moving stream. These streams began eroding and cutting down into the rock layers, forming deep and narrow canyons. In the 10 million years since the uplift began, the North Fork of the Virgin River has not only carved Zion Canyon, but has also carried away several thousand feet of rock that once lay above the highest rock in Zion.

The uplift of the land is still occurring today, so the Virgin River is still excavating. The river, with its load of sand, has been likened to an ever-moving strip of sandpaper.

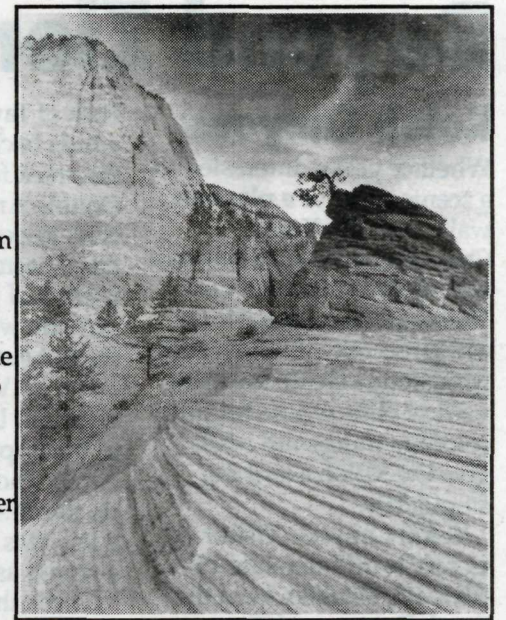
Noteworthy Features

Zion Canyon is famous for its majestic 2000-foot-high vertical

walls of Navajo Sandstone. This formation results from massive sand dunes, present in the area approximately 190 million years ago. The uplift of the Colorado Plateau and subsequent steep gradient of the Virgin River allowed the river to cut through the Navajo in a geologically short time. The cutting of Zion Canyon created a gap in the solid layer of resistant sandstone, and the walls of the canyon relaxed and expanded ever so slightly toward this opening. Since rock is not very elastic, this expansion caused cracks (known as pressure release joints) to form inside the canyon walls. These cracks run completely through the Navajo Formation, parallel to the canyon, and occur every 15-30 feet inside the walls.

The Kayenta Formation, a layer of siltstones and sandstones directly beneath the Navajo, is softer and more easily eroded than the Navajo itself. As the walls of Navajo Sandstone are undermined by erosion of this softer Kayenta layer, they can no longer support themselves. So, they fall off, revealing another vertical face previously hidden as the crack inside the wall.

The slickrock portion of Zion lies east of the Zion Mt-Carmel tunnel. Here the highway winds through the easily



eroded upper layer of the Navajo Sandstone. This upper, white sandstone contains fewer cementing materials (such as iron) than the lower, red sandstone and erodes easily into domes and buttes. Horizontal lines in the rock, called cross-bedding, were formed as the wind blew sand dunes across an enormous desert 190 million years ago. The term "slickrock" is easily understood if you walk on the rocky slopes. The coating of fine sand on the rock acts like tiny ball bearings under your feet.

Most of the national parks of the Southwest are related geologically. As you explore the parks, take a closer look at the many varieties of rocks. Learning about geology and the Earth's history is fun, and not as difficult as you might think. For more information on this fascinating topic, visit the Zion Canyon Visitor Center and Museum or join a ranger-guided geology talk.

Stop and Smell the Rosaceae

What are those trees along the river which the beaver seem to like? What is that large, white, trumpet-shaped flower? What kinds of pines are those on the peaks?

The vegetation types in Zion range from desert to sub-alpine forest. If you are exploring Coalpits Wash or the Petrified Forest trail, you will find desert plants such as mesquite, sagebrush and

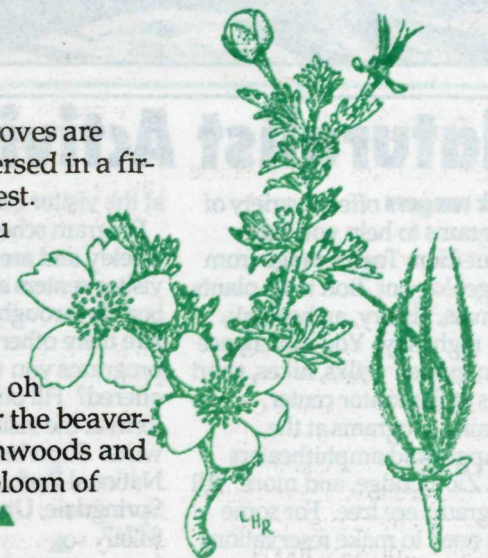
claret-cup cactus. Along riparian (river) areas such as Gateway to the Narrows trail or Emerald Pools you are likely to encounter Fremont cottonwoods, boxelder, bigtooth maple and velvet ash. Canyon grape can be seen vining among the branches of these trees. These trails, and also Weeping Rock, have hanging gardens which display a beautiful

array of colorful flowers including monkeyflower, columbine, and shooting star.

As you hike away from the river, you enter a forest of pinyon and juniper dotted with buffaloberry, prickly pear cactus, and yucca. Moving up in elevation to cooler temperatures, the forest is ponderosa pine with an understory of manzanita. At the highest elevations in

Zion, aspen groves are found interspersed in a fir-ponderosa forest.

So, while you explore Zion, enjoy the fascinating variety of plantlife. And oh yes - watch for the beaver-gnawed cottonwoods and the beautiful bloom of sacred datura.



Natural Resource Management in Zion

One goal of the National Park Service is to preserve park environments in as natural a state as possible. Although it would be best if these environments, or ecosystems, could manage themselves, they are affected by people and encroaching development. Park managers must continuously monitor these ecosystems and sometimes restore areas or help natural processes. Here are some current issues that challenge resource managers in Zion and ways you can help to preserve national parks.

Visitors and Wildlife

Part of the natural wonder and beauty of the national parks is the wildlife. Many people encounter their first wild animals along park roadways and trails. Remember, these are not zoo animals. Although they are all born and mature around people and human activity, they are **not** tame, merely accustomed.

Feeding wildlife, such as deer and chipmunks, is unhealthy for the animal and unwise for you. Wild animals are wild; their behavior is unpredictable and dangerous. Deer may kick and jab with their antlers and chipmunks will bite. Keep away! Photograph them from a distance. That setting is more "natural" anyway.

Serious deer feeding problems have developed in the park in the past few years. Groups of deer have become so used to human handouts they stay near the Zion Canyon Scenic Drive waiting for food, often becoming quite aggressive. Here they fall victim to vehicles. Deer/vehicle accidents not only maim and kill deer but can potentially cause serious harm to the vehicle passengers.

All wild animals are closely attuned to their environment, including their natural foods. Left alone, their instincts guide them to find, eat and store the foods best able to keep them alive and healthy. Their health is damaged by human food, especially processed foods which contain too much sugar

and salt. They also lose their inclination to forage for themselves.

Zion National Park is here to protect the wildness of the wildlife. Respect wild animals by keeping your distance. Otherwise, harm that comes to them could be the result of human selfishness.

Revegetation Projects

With 2.3 million visitors a year, the trails and campgrounds in Zion take quite a beating. Native vegetation is destroyed when people leave established trails in heavily visited areas. Cutting switchbacks and taking short-cuts causes excessive erosion and tramples native plants allowing exotic (non-native) plants to invade. The park is trying to revegetate these damaged areas by installing fences and erosion control matting and by replanting. You will see

these rehabilitated sites at both campgrounds, the Temple of Sinawava, Emerald Pools and other places in the main canyon. Your assistance is necessary for the re-establishment of these areas. Stay on the trails and avoid areas where replanting has occurred.

Backcountry

There is a serious problem in the Zion backcountry, and we need your help. Carelessness and thoughtlessness are resulting in abuse of the land. Litter, off-trail (human-made) paths, and disturbed vegetation are becoming common sights. There are a few golden rules of backpacking that could solve these problems:

1. **Pack out EVERYTHING you pack in.** This includes apple cores, orange peels, gum wrappers, and toilet paper.
2. **Leave everything as you found it.** For example, don't cut saplings for hiking sticks. Don't build fires. They leave ugly scars, sterilize the soil and can start forest fires.
3. **Respect others as you would have them respect you.** Travel quietly so everyone can enjoy the peacefulness of nature.

Wash (preferably without soap) away from water to keep backcountry water sources fresh. Camp out of sight and sound of the trail and other campers.

Although fewer people enter the backcountry than the main canyon, the overuse of the land is obvious in both. This natural wonder belongs to all of us. Help keep it a pristine natural area. Zion needs you!

Cultural Resources

What are cultural resources? A simple answer is "our heritage", or any prehistoric or historic object. Zion's cultural heritage ranges from evidence of thousand year old Anasazi activity to late 1800's cabin sites to 1930's CCC built structures. All of these are protected by the Archeological Resource Protection Act and the Antiquities Act. Thus, anyone picking up, collecting, or disturbing sites or ancient objects can be arrested, steeply fined and/or jailed.

Seemingly innocent activities can cause great damage to ancient sites. Merely touching images pecked into or painted on stone (rock art) accelerates their deterioration due to oils on one's hands. Also, in picking up and brushing off a pottery shard, one removes it from its context, from its time table that can be read in the dust layers that have accumulated over centuries. (Context means the object's exact location in reference to the vertical and horizontal planes.) Context is extremely important because most past human behavior is reflected not only by the material objects themselves, but by how they are situated in relation to each other.

Due to continued vandalism at Anasazi sites, the Park Service restricts information on site locations. If you find a cultural site, please leave it undisturbed and report it to a park ranger.

Endangered and Endemic Species

What does it mean when a species is said to be endangered or endemic? Endangered means it is threatened with extinction, and endemic means it is native to a particular region.

So, who cares if a few plants and animals become extinct? Every species is an integral part of the natural system in which it lives. When it is gone, a void remains, setting the entire ecosystem askew. Depending on the species lost, the change may be subtle or devastating. Either way, the system is diminished. To protect the diversity of species still found on the earth, resource managers are continually involved in projects dealing with endangered and endemic species.

Here are some of the ongoing projects involving endangered and endemic species in Zion.

Mexican spotted owls are being studied to determine their habitat requirements, preferred territory size, and primary prey species.

Peregrine falcons are being surveyed this summer. Teams of climbers and biologists will be collecting eggshell fragments at the end of the breeding season throughout various western national parks to determine if thinning of the eggshell is still a problem.

Bighorn sheep population remains small since their reintroduction in 1977.

Plant survey completed in 1989 revealed 899 species. Of those, 798 are native; many are endemic, and 18 are very rare.

Hanging gardens survey was completed in 1989. These areas are delicate and particularly sensitive to impact.

Non-native plant eradication involves removal of tamarisk and thistle species. This allows native species to revegetate their original range. Visitors can expect to see the initial results of these projects in certain areas.

What can you do to help? Report sightings of any animals you consider unusual. Lists of local birds, mammals, reptiles, and plants are available at the visitor center. We are especially interested in falcons, eagles, owls, bighorn sheep, mountain lions, bobcats, ringtail cats, and bears. Be prepared to report the sighting accurately and specifically. Note: time of day and weather conditions at the sighting, the animal's behavior

and appearance, and its location. Be aware of your physical impact on Zion. Please don't pick flowers and refrain from touching plants in hanging gardens.

Fire Policy

Since the large fires in Yellowstone in 1988, controlling forest fires on public land has been a hot topic. The fires also sparked much interest in studying the necessity of fire to natural ecosystems. Natural fires, those caused by lightning strikes, create the dynamics that occur in various habitats. Pinyon-juniper woodlands and ponderosa pine forests need fire to burn off dead wood, return nutrients to the soil and to allow sunlight to reach young plants.

The current fire management plan for Zion allows natural fires to burn while being monitored from the ground, and where necessary, from the air. This only applies to fires in the backcountry away from human activity and structures. All human-caused fires require suppression. So, please be careful. Use only the fire pits provided in picnic areas and campgrounds. Don't throw cigarettes from vehicles or while walking. With your help, all can safely experience Zion's natural beauty.

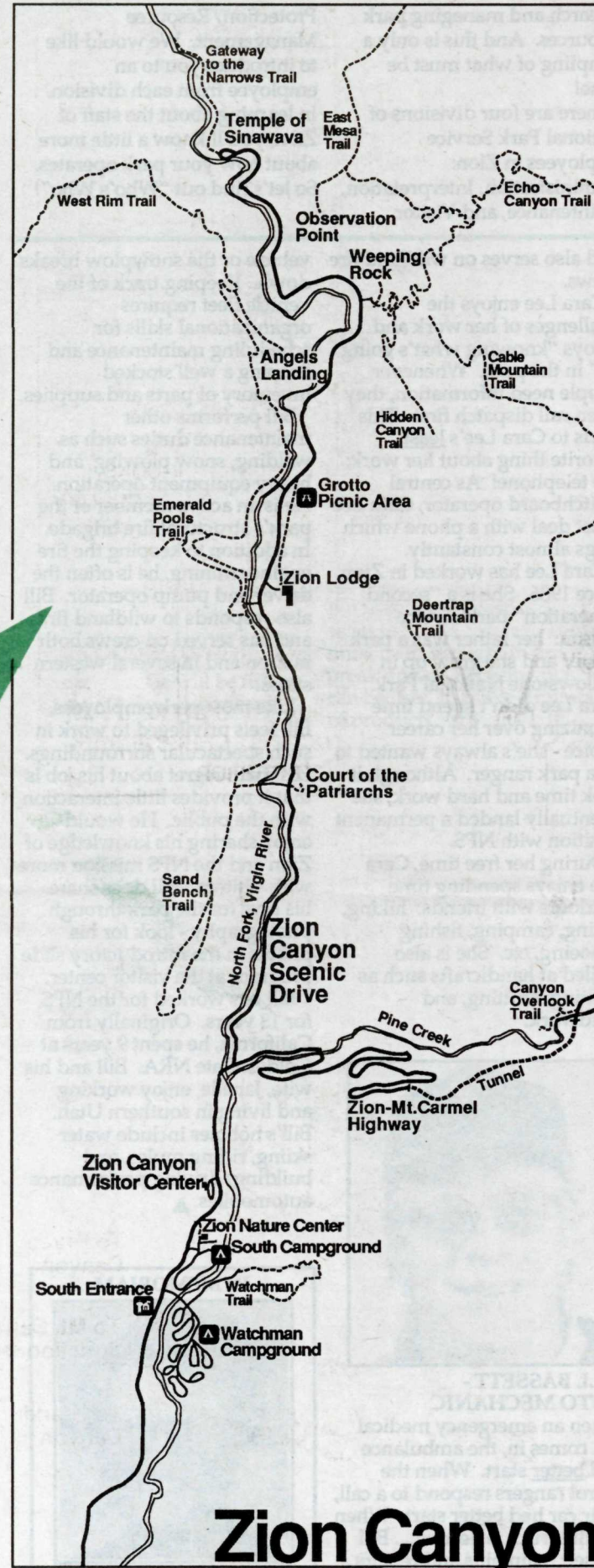
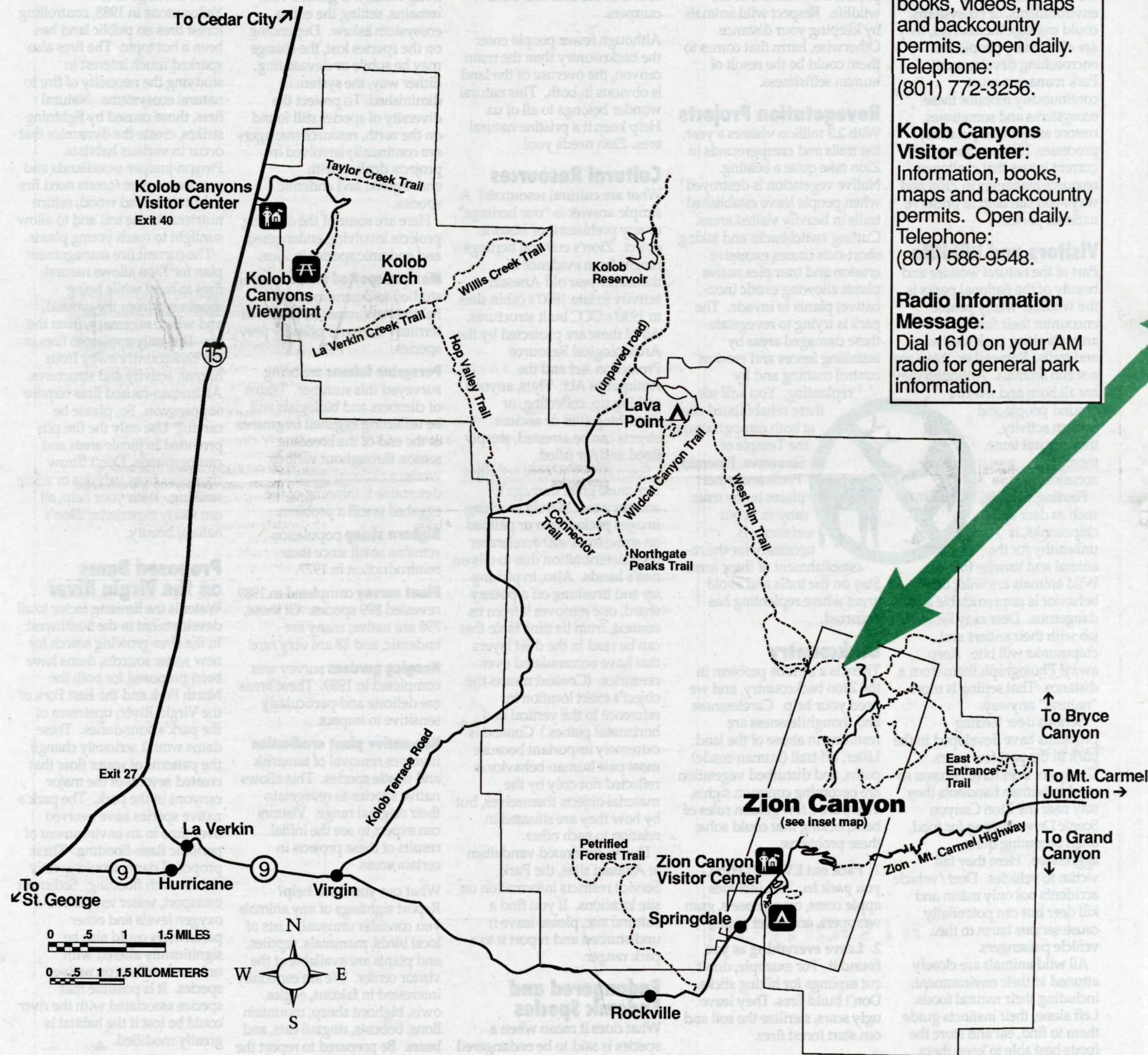
Proposed Dams on the Virgin River

Water is the limiting factor to all development in the Southwest. In the ever-growing search for new water sources, dams have been proposed for both the North Fork and the East Fork of the Virgin River, upstream of the park's boundaries. These dams would seriously change the patterns of water flow that created several of the major canyons in the park. The park's native species have evolved over time in an environment of periodic flash-flooding. These proposed dams would greatly reduce such flooding. Sediment transport, water temperature, oxygen levels and other parameters could also be significantly altered with unknown effects on native species. It is possible that species associated with the river could be lost if the habitat is greatly modified. ▲



Zion National Park

National Park Service
U.S. Department of Interior



Park Trails

Maintained trails in Zion are rated from **easy** to **strenuous** in the amount of energy they require. Most trails have dropoffs where you must be extra careful to watch your footing. Always stay back from the edges. Each trail description below indicates how strenuous the walk is and the severity of the dropoffs along the way. These descriptions apply only to the trails themselves, not to nearby areas. People uncertain about heights should turn around if they come to dropoffs that bother them.

Trail	Trailhead	Round Trip (mi/km)	(ave. time)	Ascent (ft/m)	Description
Weeping Rock	Zion Canyon Scenic Drive-Weeping Rock parking lot.	0.5/0.8	1/2 hour	98/30	Easy. Minor dropoffs. Self guiding trail. Ends at Weeping Rock, a rock alcove with dripping springs. Hanging gardens of wildflowers decorate the walls in spring and summer.
Canyon Overlook	Zion-Mt. Carmel Highway-just east of long tunnel.	1.0/1.6	1 hour	163/50	Easy. Long dropoffs. Mostly fenced. Self guiding trail. Guidebooks available at visitor center and trailhead. Ends at spectacular view of lower Zion Canyon and Pine Creek Canyon.
Emerald Pools	Zion Canyon Scenic Drive-opposite Zion Lodge	1.2/1.9	1 hour	69/21	Easy to moderately strenuous. Long dropoffs on upper route. Lower route ends at lower pool and 3 waterfalls. Accessible to disabled people with assistance. To reach Upper Pool, hike another 1.6 km (1 mile); this is more strenuous. Upper Pool is larger, sits at base of high cliffs.
Gateway to the Narrows*	Zion Canyon Scenic Drive-Temple of Sinawava	2.0/3.2	1-1/2 hrs	57/17	Easy. Minor dropoffs. Watch for construction equipment; trail being rebuilt. Follows Virgin River upstream to Zion Canyon Narrows, where paved trail ends. Hanging gardens of wildflowers in spring and summer. Trailside exhibits. Accessible to disabled people with some assistance.
Watchman	Service road-east of Watchman Campground Registration Station	2.0/3.2	2 hours	368/112	Moderately strenuous. Mostly minor dropoffs. Recommended for early and late in the day. Ends at viewpoint of lower Zion Canyon, Oak Creek Canyon and town of Springdale.
Hidden Canyon	Zion Canyon Scenic Drive-Weeping Rock parking lot	2.0/3.2	3 hours	850/259	Moderately strenuous. Long dropoffs. Not for anyone fearful of heights. Leads to narrow side canyon carved in joint of rock. Trail ends at canyon mouth; can hike beyond end of trail for another 1 km (0.6 mile) to natural arch.
Taylor Creek	Kolob Canyons Road-2 miles from visitor center	5.0/8.6	4 hours	450/137 Descent	Moderately strenuous. No dropoffs. Follows the Middle Fork of Taylor Creek past two old homestead cabins to Double Arch Alcove. Footwear may get wet fording the creek.
Angels Landing	Zion Canyon Scenic Drive-Grotto Picnic Area	5.0/8.6	4 hours	1488/453	Strenuous. Long dropoffs and narrow trail. Not for anyone fearful of heights. Ends at summit high above Zion Canyon floor. Last 0.8 km (0.5 mile) follows a steep, narrow ridge; chains have been added for safety.
East Rim	Zion Canyon Scenic Drive-Weeping Rock parking lot	8.0/12.0	7 hours	2148/655	Strenuous. Long dropoffs. Climbs to Observation Point high above Zion Canyon floor. Excellent views of the canyon. Trail gives access to other East Rim plateau trails: Cable Mountain and Deertrap Mountain.
Kolob Arch	Kolob Canyons Lee Pass	14.0/22.0	8 hours	699/213 Descent	Strenuous. No dropoffs. Too hot for summer day hikes. Follows Timber and LaVerkin Creeks and ends at Kolob Arch, possibly the world's largest freestanding arch. This red rock span is 94 meters (310 feet) long.
West Rim	Zion Canyon Scenic Drive-Grotto Picnic Area	26.6/42.6	20 hours	3593/1095	Strenuous. Long dropoffs. Climbs to high country viewpoint of Right Fork of North Creek canyon (12.8mi/20.4 km), and continues to Lava Point, an alternate starting point. Trip to Lava Point should not be attempted as a one-day hike.

*Please note: you may continue hiking beyond the end of the Gateway Trail. This route through the Virgin River - referred to as the "Narrows Day Hike" - involves walking in up to 4 feet of water and climbing over rocks. Wear ankle supporting shoes. Avoid carrying items in your hands and protect cameras in plastic bags. Check Narrows Danger Level before starting.

Gateway Trail Reconstruction

The National Park Service is reconstructing the Gateway to the Narrows Trail, the most popular in Zion. While the work is underway, you may be delayed or rerouted while walking this trail. Please be alert for construction activity. The project will be finished in 1993. The Gateway Trail was first given a hard surface in 1929. Now, over 400,000 people walk it each year. The trail would turn into a deep, sandy trench were it not paved. Pavement also allows people in wheelchairs and strollers to use the trail.

Who's Who in Zion



SHARON HUBER - PERSONNEL ASSISTANT

Sharon Huber keeps track of about 150 full time and seasonal park employees. When a supervisor in Zion, Pipe Spring or Cedar Breaks hires an employee, Sharon must process the paperwork, make sure that they get paid, help them order uniforms, inform them about employee benefits, and provide various other assistance. She also prepares and distributes job opportunity announcements and counsels seasonal employees on how to gain full time employment.

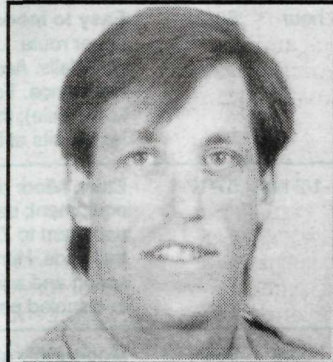
With this type of workload, Sharon must be organized and be able to juggle and shift priorities frequently. Good communication skills and coping with stress are also crucial. When people turn to Sharon for help, she cheerfully assists.

In addition to working with current park employees, Sharon also communicates with hundreds of other people who would like to be employed in Zion. When a position opens, Sharon actively recruits to fill it, but must work within strict federal employment guidelines. There are far more applicants than jobs, so competition is keen.

Sharon grew up in Gardiner, Montana, just outside of Yellowstone National Park. It was here that she developed a love for the parks and a belief in the mission of the NPS. Sharon has worked in the park system for 15 years, and enjoys "working with interesting, talented, dedicated people". She says that she feels fortunate to raise her 8 year old daughter, Kelsey, in the "NPS family". On days off, Sharon and Kelsey enjoy hiking or going out for picnics.

A hearty "hello" from the staff of Zion National Park! When most visitors think of park employees, they think of "rangers" - the people who patrol roads and trails, conduct guided walks and talks, and assist visitors in a variety of ways. However, rangers are

When asked about the rewards of living and working in Zion, Sharon says "When the pressures of everyday life get to me, all I have to do is walk out my front door ... to see and feel the beauty and tranquility, and be at peace again with myself."



MARK WARD - INTERPRETER

Mark Ward has lived in some interesting places these past few years. Nepal, New York City, and now, Zion National Park. After spending two years in the Peace Corps in Nepal, Mark studied chemical physics at Columbia University in New York City. Now he is working his second season at Zion as a naturalist.

Mark staffs the visitor center, leads walks and hikes, and presents evening programs and other talks. He also "roves" the trails and campgrounds, answering visitors questions and providing other assistance. Mark feels that good interpersonal skills, a working knowledge of natural sciences, and the ability to speak effectively to an audience are crucial skills for his job.

For Mark, both the best and worst part of his job is working with park visitors. He loves the feeling of knowing that he's sparked someone's curiosity and inspired them to seek more knowledge about Zion and the world around them. At the same time, he says that working with people continuously can be exhausting. When people are tired or frustrated, they can be cranky. "You know - the kind who wouldn't be pleased even if you stood on your head and spit nickels!"

On his days off, Mark spends time hiking and travelling in and around Zion. He also likes to play chess and guitar, and is

only part of the staff. It takes many people to keep a national park operating smoothly. Park employees have a wide variety of responsibilities including maintaining roads, trails, buildings and equipment; handling personnel, budget, and procurement; conducting

taking German lessons.

Mark's extensive science background, great sense of humor, and easy, "can-do" attitude make him a valuable member of the park staff.



CARA LEE NUSS - DISPATCHER

Cara Lee is the primary "voice of the airwaves" in Zion National Park. She is the lead radio dispatcher and telephone switchboard operator. Like any law enforcement dispatcher, Cara Lee provides vital communication for rangers in the field. Some of the work is routine: relaying information such as messages, road and weather conditions, or tunnel escort information, and verifying vehicle registration/driver's license information. However, if an emergency situation develops, it is the dispatcher who holds things together.

Cara Lee has dispatched the radio during a variety of events: law enforcement incidents, medical emergencies, fires, rescues, floods, and other similar events. During these emergencies, she must coordinate all radio traffic, often transmitting between a number of park personnel. At the same time, she may be telephoning the hospital, sheriff's office, on-call park rangers, or other needed assistance. She is also required to keep a written log of each transmission and call. Sometimes Cara Lee could use 12 hands, 3 mouths, and 8 ears!

In addition to dispatching the radio, Cara Lee takes care of lost & found items, group camping reservations, backcountry use data, weather forecasts and data, and submits payroll for the ranger division. She is an active member of the park's structural fire brigade

research and managing park resources. And this is only a sampling of what must be done!

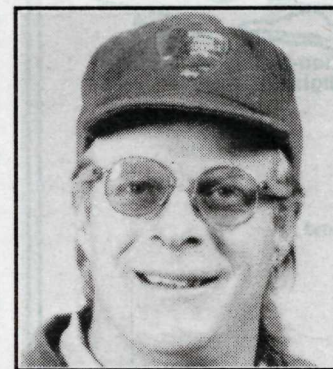
There are four divisions of National Park Service employees in Zion: Administration, Interpretation, Maintenance, and Visitor

and also serves on wildland fire crews.

Cara Lee enjoys the challenges of her work and enjoys "knowing what's going on" in the park. Whenever people need information, they often call dispatch first. This leads to Cara Lee's least favorite thing about her work: the telephone! As central switchboard operator, Cara Lee must deal with a phone which rings almost constantly.

Cara Lee has worked in Zion since 1986. She is a "second generation" park service person: her father was a park ranger and she grew up in Yellowstone National Park. Cara Lee didn't spend time agonizing over her career choice - she's always wanted to be a park ranger. Although it took time and hard work, she eventually landed a permanent position with NPS.

During her free time, Cara Lee enjoys spending time outdoors with friends: hiking, biking, camping, fishing, canoeing, etc. She is also skilled at handicrafts such as quilting, knitting, and beadwork.



BILL BASSETT - AUTO MECHANIC

When an emergency medical call comes in, the ambulance had better start. When the patrol rangers respond to a call, their car had better start. When the fire truck is needed.... Bill Bassett maintains and repairs a fleet of over 65 park vehicles, including cars, trucks, emergency vehicles and heavy maintenance equipment. He performs day to day maintenance on park vehicles, including everything from tune-ups and oil changes to major engine overhauls. At the same time, he must quickly make repairs if an emergency

Protection/Resource Management. We would like to introduce you to an employee from each division. In learning about the staff of Zion, you'll know a little more about how your park operates. So let's find out "Who's Who"!

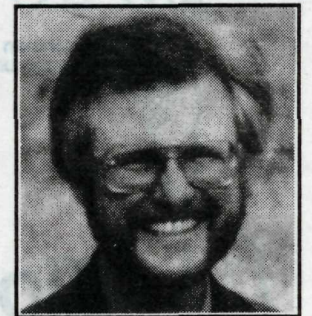
vehicle or the snowplow breaks down. Keeping track of the vehicle fleet requires organizational skills for scheduling maintenance and keeping a well stocked inventory of parts and supplies.

Bill performs other maintenance duties such as welding, snow plowing, and heavy equipment operation. He is an active member of the park's structural fire brigade. In addition to keeping the fire engine running, he is often the driver and pump operator. Bill also responds to wildland fires, and has served on crews both in Zion and in several western states.

Like most park employees, Bill feels privileged to work in such spectacular surroundings. His main regret about his job is that it provides little interaction with the public. He would enjoy sharing his knowledge of Zion and the NPS mission more with visitors. Bill does share his love for the park through photography - look for his photos in the introductory slide program at the visitor center.

Bill has worked for the NPS for 13 years. Originally from California, he spent 9 years at Golden Gate NRA. Bill and his wife, Janelle, enjoy working and living in southern Utah. Bill's hobbies include water skiing, riding mules, and building/driving performance automobiles. ▲

IN MEMORIAM



John P. Ethridge, 1950-1990
John spent much of the last twelve years of his life working in Zion National Park, protecting, exploring, and interpreting it to visitors. He knew Zion as few have. The reverence, curiosity, and sense of adventure which John brought to his life in Zion set a standard for us all.

Zion Needs You!!! 4 things YOU can do to help!

We have all seen the lists, "5,973 ways you can SAVE THE WORLD!" After the first couple of hundred suggestions they all begin to look the same. Simply try to remember the 4 R's: RECYCLE glass, metals, paper, plastic and motor oil; REDUCE waste and hazardous materials; REUSE items, like paper bags, clothing and plastic containers; REJECT overpackaging, disposable items and nonbiodegradable items. Let's take a closer look at the why's, what's and how's of each 'R'.

RECYCLE: glass, metals, paper, plastic and motor oil.

WHY? "Throw it away." Have you ever thought about where "away" is? The statistics are staggering. Two-thirds of the nations landfills have been closed since the late 1970's. 1/3 of the remaining will be full in the next 5 years. Americans toss 160 million tons of garbage per year. That's enough to fill over 1000 football fields, each 30 stories high, or enough to fill a bumper to bumper convoy of garbage trucks half way to the moon! We are simply running out of room. Today only 11% of our waste is recycled. 50% is recyclable.

WHAT and HOW? Don't throw everything "away". Once you have a system set up in your home (ie. a separate box for each material to be recycled) it should only take 10-15 minutes each week to separate your trash.

Glass: 32% less energy is required to make new glass from old. The energy saved from recycling one glass bottle will light a 100-watt bulb for four hours. All glass bottles and jars can be recycled. The bottle you throw away today may still be littering the landscape 1,000 years from now. RECYCLE IT! Sort glass according to color, remove any metal strips and caps.

Metals: 70% of all metal is used just once, then discarded. Recycling aluminum uses 90% less energy than making aluminum from scratch. Tin cans ARE recyclable, too. We throw away enough iron and steel each year to continuously supply all American auto makers. RECYCLE IT! Rinse metal cans, remove paper labels and flatten.

Paper: Making new paper from old paper uses 30% to 55% less energy. It takes an entire forest, over 500,000 trees, to supply Americans with their

Sunday newspapers every week. Recycled paper could easily be substituted for virgin paper in many products without any loss of quality. RECYCLE IT! Newspapers are easy to recycle but other paper can be recycled as well: notebook, computer and typing paper, xerox copies, white index cards and envelopes. Keep these separate from newspaper, colored paper and cardboard. There are even new technologies to make recycling glossy paper (magazines) easier.

Plastics: In the U.S. we throw away 2.5 billion plastic bottles every HOUR. The world's shipping industry dumps over 450,000 plastic containers into the sea every day. Biodegradable plastics don't seem to be the answer. They must be in sunlight in order to break down. Recycled plastics can be used to make a number of products, such as plastic lumber and fiberfill for sleeping bag insulation. Twenty-six recycled plastic soda bottles can make one polyester suit! RECYCLE IT!

Motor oil: When motor oil is poured into the ground, it can seep into the ground water and contaminate drinking water supplies. A single quart of motor oil can pollute 250,000 gallons of drinking water. New technology exists that can turn a gallon of used motor oil into 2.5 quarts of new. (It takes 42 gallons of virgin oil to make the same 2.5 quarts.) RECYCLE IT!

REDUCE: waste and hazardous materials

WHY: The United States has come to be known as the throw-away society. How much garbage will you generate in your lifetime? Statistics say about 600 times your adult weight. An estimated 14 billion pounds of trash are dumped into the sea every year. Not only are we covering our world with a layer of trash - much of this trash is highly toxic. Detergents, aerosols, solvents, plastics, oil, industrial wastes, fertilizers, pesticides, the list is endless. Hazardous waste seeps into the ground or runs off into streams and lakes, contaminating our already small usable water supply.

WHAT and HOW? **Excess waste:** The solid waste generated in the U.S. in one year could pave a highway 24 lanes wide and 1 foot deep that would stretch from Boston to

Los Angeles. Twenty-eight million tons of grass clippings, leaves and other yard waste adds up to almost 20% of all landfill trash. REDUCE IT! One way to get rid of excess waste is to RECYCLE! Compost grass clippings. When shopping, if you don't need a bag to carry your purchase, don't take one.

Pesticides and herbicides: Homeowners use about 10 times more toxic chemicals per acre than farmers. These chemicals endanger songbirds and pollute ground water. REDUCE IT! Pull weeds! Use mulch (from your compost pile) to keep weeds down. For pests, use non-toxic alternatives. Non-toxic soap sprays will kill some insects. Boric acid dust will kill cockroaches.

Detergents: Many contain phosphates. These chemicals, upon reaching water supplies (lakes and streams), promote algal growth. This depletes the oxygen supply in the water thereby killing aquatic organisms. REDUCE IT! Check your labels and buy detergents with low or no phosphates.

Paint: Americans use enough paint each year to fill a lake 20 feet deep, 4 miles long and 1 mile wide. Paint and paint products such as solvents, thinners, stains and finishes can account for up to 60% of the hazardous waste dumped by individuals. Pigment in oil-based paints contain heavy metals which are highly toxic. REDUCE IT! Use latex paint instead of oil-based paints.

Household toxins: Most chemical cleaners (window, drain, oven, toilet, ammonia) contain harmful chemicals which can burn the skin or give off harmful gases. Mothballs are really nasty - 100% paradichlorobenzene - which can harm your liver and kidneys. Even things like permanent ink pens, markers and permanent press clothes contain toxic chemicals. REDUCE IT! Buy or make alternative products. Baking soda and a fine steel wool pad works on tough spots. Herbal mixtures and natural scents are good fresheners. Cedar chips smell nice and keep the moths away too.

REUSE: items like paper bags, plastic containers and clothing.

WHY: REUSE is similar to RECYCLE - only cheaper! If products are reused you won't

need to buy as much. REUSING also REDUCES waste.

WHAT and HOW?

Shopping bags: Paper or plastic? Plastic may be more convenient but it is not biodegradable and the ink used on the bags contains toxic heavy metals. Paper bags are biodegradable but require the destruction of millions of trees to be produced. However BOTH can be REUSED. Keep a supply in your car. If you forget them when you go into the store, make yourself go back and get them - you will remember next time. Try canvas or string bags. REUSE IT!

Washables: Disposable items may be easier for us to use but we need to start considering what will be easier on the environment. Plastic containers make good storage containers. Put leftovers in a margarine tub instead of foil or plastic wrap. Use washables such as rags (instead of paper towels), mugs (instead of paper cups and plates (instead of paper or foam). THINK before you throw it away. REUSE IT!

REJECT: overpackaging, disposable, and nonbiodegradables.

WHY? Have you ever tried to remove something from it's packaging quickly? It can't be done. First take off the plastic from around the entire package. Next break the seal on the package. Then open the package and remove the contents. Now remove the plastic from around the product. If you're lucky you may have reached the product at this point. If not, keep opening! Sounds like typical packaging, doesn't it? 50% of the paper produced in the U.S. is used solely for packaging, as is 75% of the glass, 30% of the plastic and 8% of the steel. \$1 out of every \$11 spent on food goes into packaging. Convenient and disposable have become the American way of life. By REJECTING overpackaged and disposable items the demand for them goes down and the energy required to produce them goes down.

WHAT and HOW?

Styrofoam: America produces enough styrofoam cups each year to circle the earth 436 times. Chlorofluorocarbons (CFC's, which destroy the ozone layer) are used in the

production of styrofoam. Because of the big uproar over the destruction of the ozone layer some companies are using other chemicals to make CFC-free styrofoam. Although less damaging, these chemicals still threaten the ozone and contribute to smog. Styrofoam is NON-biodegradable. It will not go away. None of it is safe. REJECT IT.

Disposable diapers: The U.S. uses 18 billion disposable diapers each year, enough to reach back and forth to the moon seven times. Over one billion trees are cut each year to make disposable diapers. REJECT IT. Buy and use cloth diapers; they're cheaper.

Other disposable items: Disposable bottles consume three times as much energy as reusable, returnable containers. Avoid disposable, one-use items such as disposable razors, flashlights, cameras and batteries. REJECT IT! Think about what you buy - "Can this be recycled? Can I reuse this container?" If not, consider rejecting it.

Excess packaging: The garbage of the average American is 1/3 packaging that is tossed out immediately. Approximately 1/2 of the plastic we throw away each year is solely packaging. REJECT IT! Buy in bulk, especially non-perishable items (it's cheaper!)

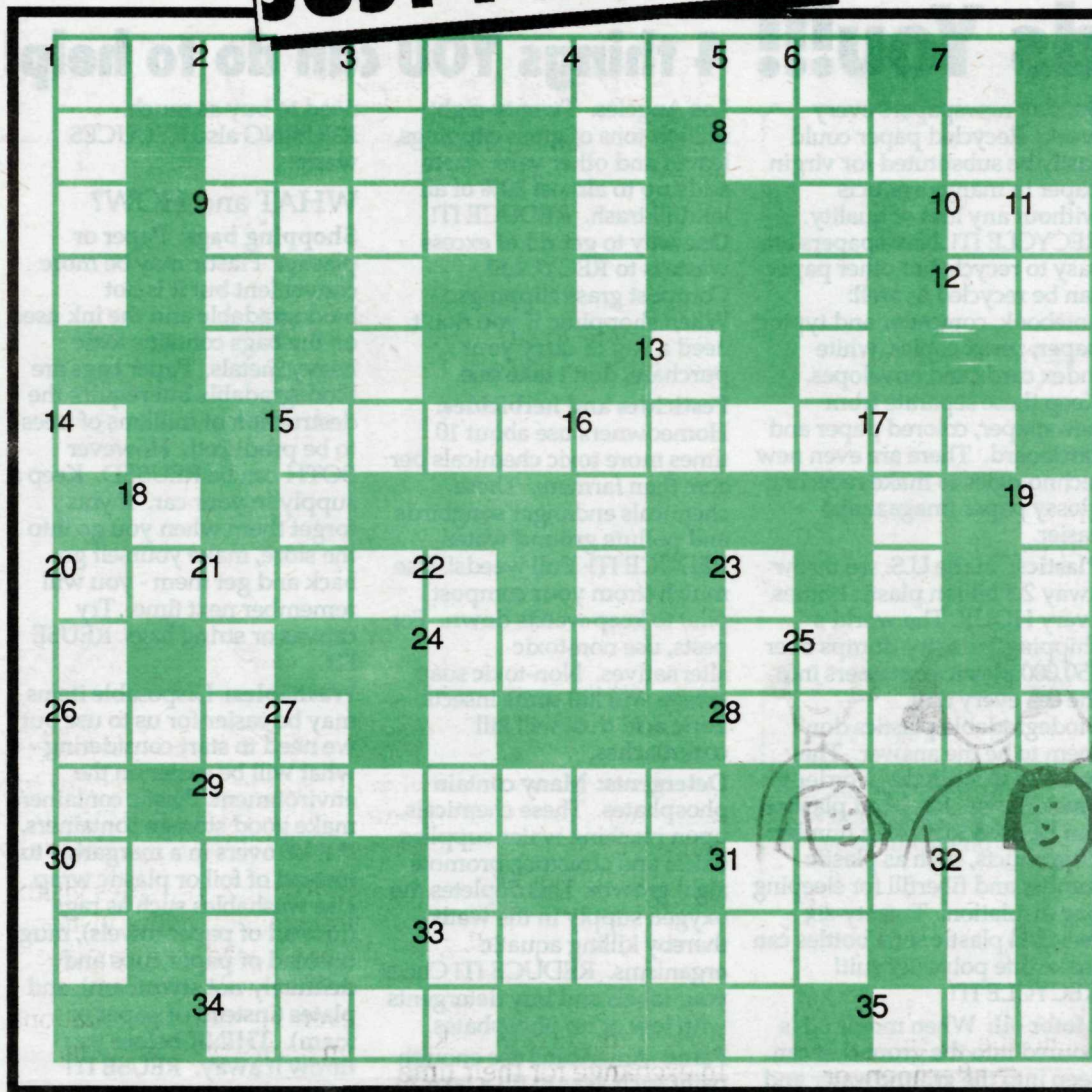
What this all boils down to is consuming LESS, demanding LESS energy from the earth. This will require MORE energy from you, us, humans. Humans generally don't like to put out more energy than is absolutely needed to get the job done. If there is a shorter, more convenient way to do something, we will find it - and, up until now, no matter what the consequences. Well, now the consequences are catching up to us and we MUST act. It's a tall order and will require work - on everyone's part. Hopefully the suggestions above will reduce some of the work and make it more "convenient" by simply remembering The 4 R's: RECYCLE, REDUCE, REUSE, and REJECT. Here's to a healthy home!



JUST FOR FUN

ACROSS:

1. Paiute name for Zion Canyon
8. Cougar = mountain ____
9. Volcanic ooze
10. Either/ ____
12. Us
14. Letter that does not belong after Zion
15. Highest peak in Zion N.P.: ____ Mountain (8926 ft., 2660 m)
20. Buzzworm = ____ snake
24. First director of N.P.S.
26. Amount of litter allowed on trails
28. Hiker's companion
29. Most popular hike in Zion
30. Female bighorn sheep
31. Plant whose virtues have yet to be discovered
33. Symbiotic rock colonizer
34. Small quartz particle
35. Emergency Medical Technician (abbr.)



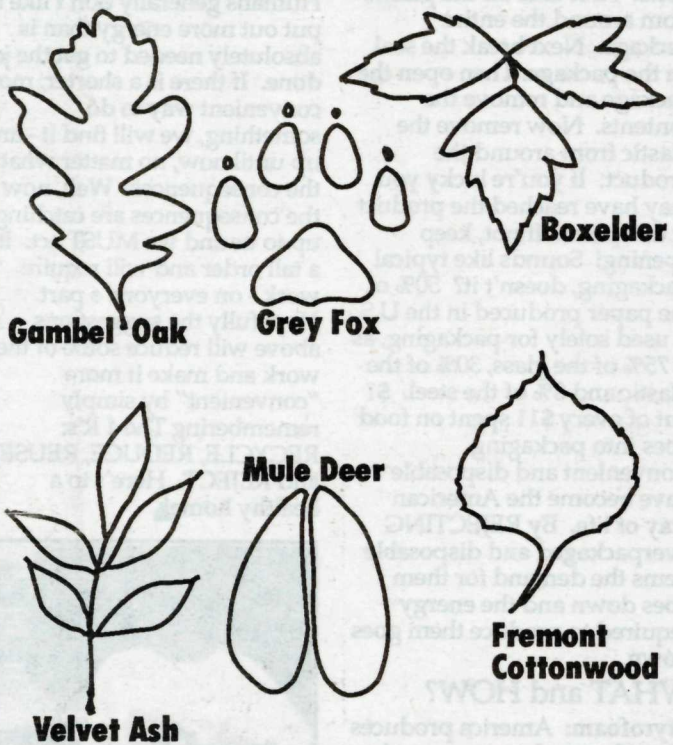
DOWN:

1. Larger than a butte, smaller than a plateau
2. Largest free standing arch in the world: ____ Arch
3. Native American; rock layer in Zion
4. ____ Temple, opposite 16 Down
5. Named for someone saying: "Only an angel could land on it" (abbr.)
6. Juniper's partner
7. Substance not seen in Zion in July
11. Rock color
13. Kid with badge in Zion, ____ Ranger (abbr.)
15. Adjective for summer in Zion
16. Opposite 4 Down
17. Civilian Conservation Corps (abbr.)
18. Mineral in lime (chemical symbol)
19. Mule name but not mule relative
20. Park employee
21. Built at cost of about \$503,000
22. Green Pools?
23. Morning dampness
25. Big black bird
27. Environmental Assessment (abbr.)
31. What you will get in 29 Across
32. Profane water barricade

Solution on next page.

Color Corner

Color the leaves and tracks of some common Zion plants and animals.



I love to eat insects and sometimes other small animals. I have two black stripes around my neck.

I am small, striped and very cute, but even if I beg, please don't feed me. It's hard for me to tell food from fingers and besides, "people" food isn't good for me.

Like my close relative the raccoon, I am nocturnal (active at night). Watch for me along the roadside- you just might see my bright eyes and bushy black tail!

Here in Zion, the water in the Virgin River flows so fast that I can't build a dam and lodge like others of my kind. So instead I build my home in the bank of the river.

WILDLIFE WATCH!

Can you match each animal with its description?

- CHIPMUNK
- RINGTAIL CAT
- COLLARED LIZARD
- BEAVER
- PORCUPINE
- MULE DEER
- CANYON TREE FROG
- PEREGRINE FALCON
- TARANTULA

Many people are afraid of me but there is really no need. I am not poisonous and I only want to eat insects for lunch - not humans, yech!

I like to hang out at the pools in the summer and I'm known to be quite the singer.

I eat birds, like swifts and swallows which can fly 170 mph. But I can catch them because I can fly over 200 mph.

I have very large ears that help me keep cool during the summer. People love to take pictures of me. I don't mind, but please don't feed me or my babies- it's harmful to us and gives us bad habits.

Keep your eyes open for these plants and animals of Zion!

JUST FOR KIDS!

We want YOU to become a JUNIOR RANGER!

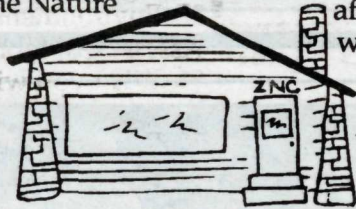


WEAR: Many of our activities are outdoors. Dress comfortably and wear sturdy, closed-toe shoes (no sandals!). Hats are good on hot, sunny days and bring raingear if the weather looks stormy.

WHO: Children 6-12 years old. Programs are specifically designed for this age range. Children below age 6 are too young.



WHERE: Zion Nature Center. The Nature Center is just north of- and within walking distance to- the South Campground. Watch for the Nature Center sign between the South Entrance Station and the Visitor Center.



WHY: Because it's FUN to spend the morning, afternoon, or whole day learning about Zion and our world. By attending a combination of

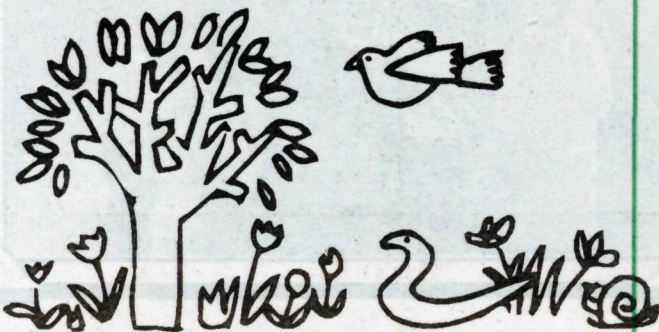
JUNIOR RANGER programs and other ranger-led activities, you too may become a full-fledged JUNIOR RANGER for Zion National Park.

A one time \$1.00 fee helps offset the cost of the badges and patches.

WHEN: May 25-September 1, 1991. Tuesday-Saturday.



Two daily sessions from 9:00-11:30 a.m. and 1:30-4:00 p.m. with registration prior to each session at 8:15-9:00 and 1:00-1:30. **Children must be with their parents between sessions (11:30-1:00). Please be prompt when bringing and picking up children.**



Volunteers in the Park

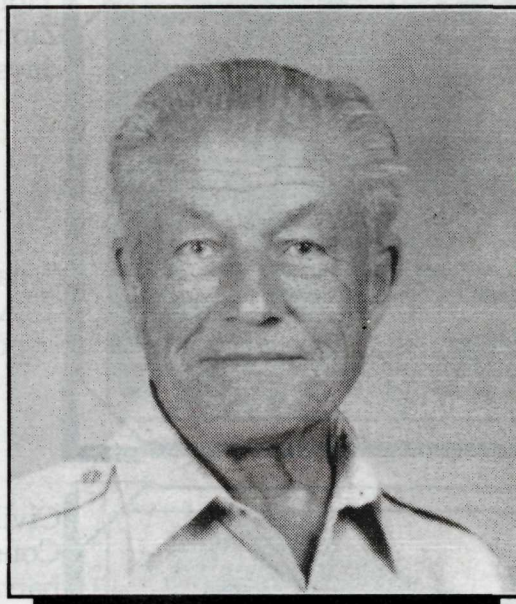
Like most national parks, Zion has long counted on the spirit of volunteerism to enhance the enjoyment of park visitors and to stretch our ability to protect the park's resources for future generations. Two ways exist to give one's time and skill to a park.

Some volunteer through the Student Conservation Association (SCA). This non-profit organization assists our national parks and other conservation agencies by fielding dedicated volunteers (high school students, college students, and other adults) to help with important park management tasks. In exchange for their time and energy, these volunteers gain educational field experience while living and working in a park, and having most expenses covered.

The other way is to join the Volunteer In Park (VIP) program. VIPs work alongside National Park service employees, performing a variety of tasks. Although most expenses are not paid, parks can occasionally reimburse volunteers for some costs and provide housing. (Unfortunately, Zion can rarely provide housing for volunteers.)

Here is a sample of the work that has been done by the volunteers at Zion:

Margaret Malm has been giving her time and skills to Zion since 1974. She takes innumerable slides and organizes the slide file, assists in a botanical survey for the park, gathers and prepares specimens for the park



Marcel Rodriguez volunteers his time in the park library, takes pictures for the park slide files and does roving interpretation.

herbarium, provides visitor information at the Visitor Center, leads interpretive nature walks, and gives evening slide presentations on a variety of subjects.

Harmon and Nelda King have served as campground hosts in South Campground since the summer of 1990. They provide information, help visitors register and find campsites, provide emergency assistance, and help the park staff by reporting resource damage and facility problems.

Dan Kim and James Younk were SCA Resource Assistants in the summer of 1990. They assisted the natural resource managers with a study of peregrine falcons in the park. This project required long hours of patient observation, accurate note taking, and good physical condition to cover the necessary terrain.

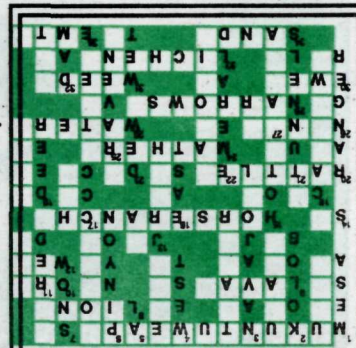
Dory Ruderfer was a SCA Resource Assistant in the summer of 1990 at the Kolob Canyons area of Zion. He worked at the Visitor Center information desk and patrolled the Kolob trails to ensure

proper maintenance and use.

Other projects have included:

- ✓ Writing and designing visitor brochures.
- ✓ Maintaining trails and building fences.
- ✓ Taking photographs and working in the dark room.
- ✓ Answering mail requests.
- ✓ Maintaining the park library.
- ✓ Patrolling trails, giving visitor assistance, and controlling traffic in busy parking lots.
- ✓ Picking up litter along roads and trails.
- ✓ Assisting resource managers and researchers by making wildlife counts, planting trees, and taking part in other projects.

The list is endless. What do you have to contribute? If you would like to help ensure that your national parks will still be enjoyed by future generations, consider becoming a VIP or SCA; if not at Zion, then a park near you. As a volunteer, you can make a difference in your life, in the lives of others, and in the way the national parks are managed and protected.



Crossword solution.

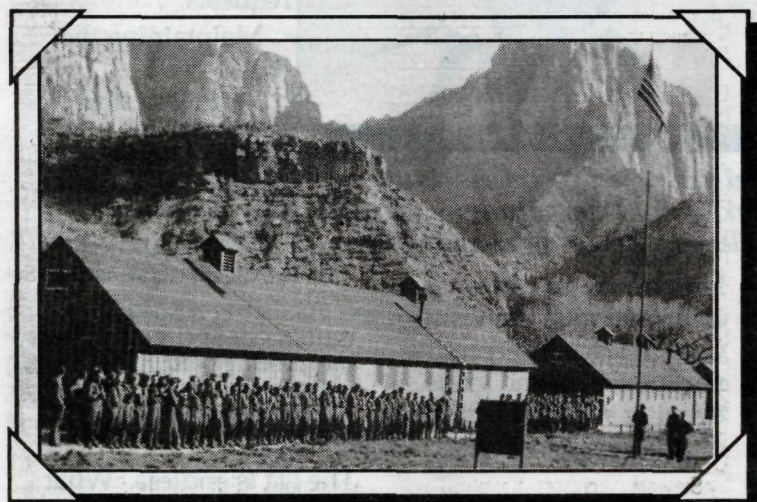
Zion Scrapbook



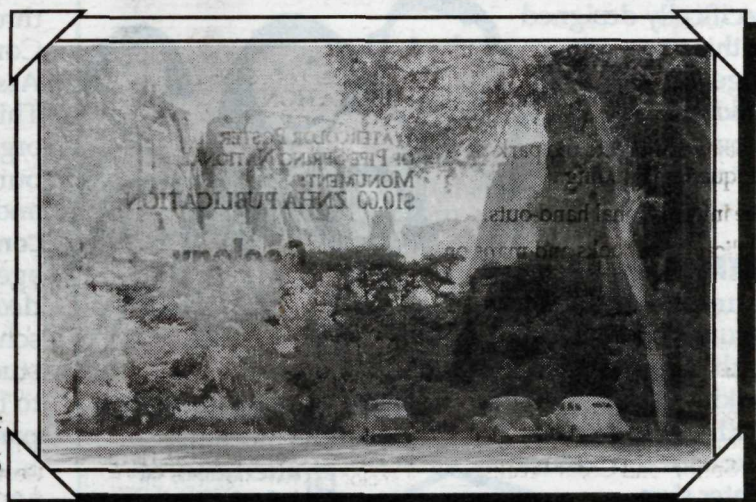
Honeymooners in Zion in the early days. 1909



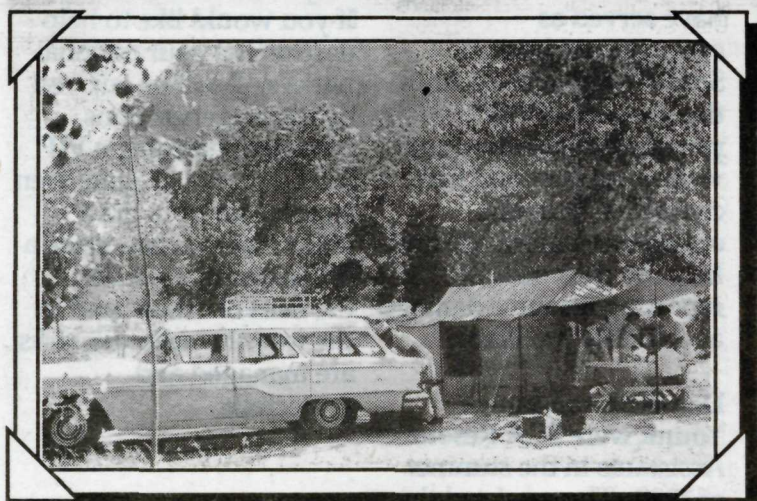
The first park naturalist for Zion, Angus Woodbury, points out features at the Temple of Sinawava. 1929



Civilian Conservation Corps barracks near South Campground. 1936



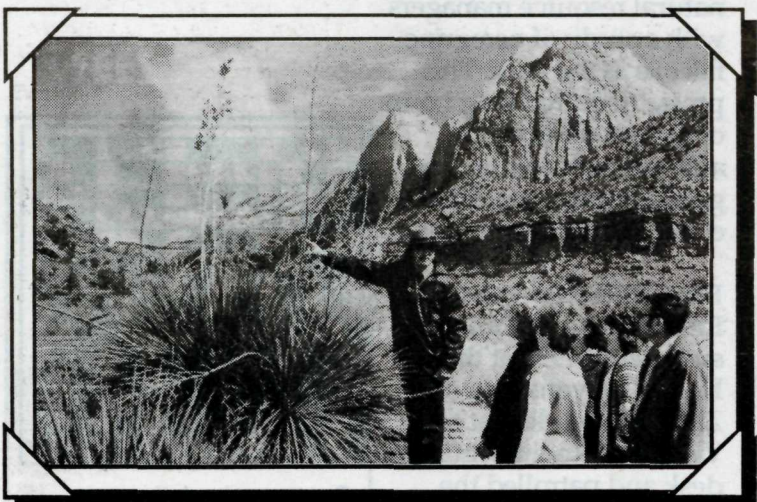
At the Temple of Sinawava. 1945



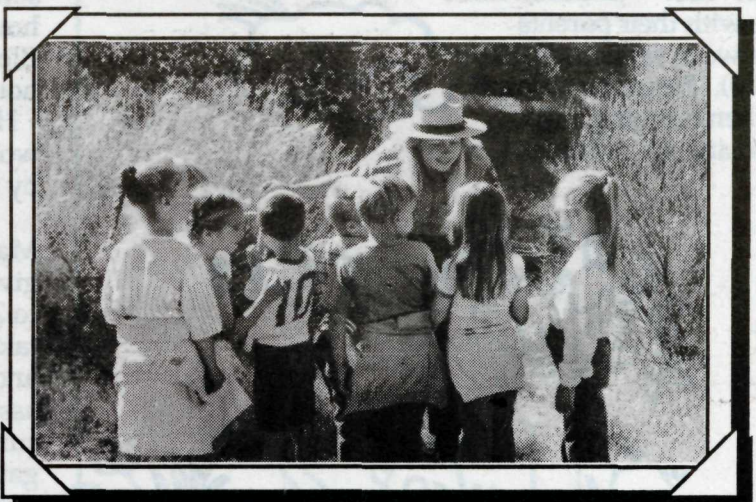
A family outing in Zion. 1950's



The "billionth" visitor to Zion National Park. August 1962



A ranger talk at Zion Canyon Visitor Center. 1970's



Zion Junior Ranger Program. 1988

ZION NATURAL HISTORY ASSOCIATION

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Did you know that the books, maps, and other things you buy at the Zion Visitor Centers help support the park? Zion National Park, as many National Park Service areas, is assisted by a non-federal, non-profit "cooperating association." The Zion Natural History Association (ZNHA), one of the very first such organizations, publishes and sells interpretive and informational items in Zion's two visitor centers and at two nearby national monuments, Pipe Spring and Cedar Breaks.

Here are examples of ZNHA projects:

- This newspaper, The Sentinel, distributed free.

- Zion's widely praised Junior Ranger Program.

- A major addition to the park headquarters building.

- Free informational hand-outs.

- Publication of books and maps on Zion.

- Support for living history programs at Pipe Spring.

- Funding for research in the park.

- Support for Student Conservation Association volunteers at Zion, Pipe Spring and Cedar Breaks.

Donations from ZNHA to date total about two million dollars.

Zion

ZION NATIONAL PARK, TOWERS OF STONE: by J.L. Crawford. An excellent general work that summarizes the essence of Zion, its landscape, plants, animals and people. \$6.95 ZNHA PUBLICATION

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 3. Kolob Reservoir
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 5. Smith Mesa
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