

Weeping Rock

a spring of life



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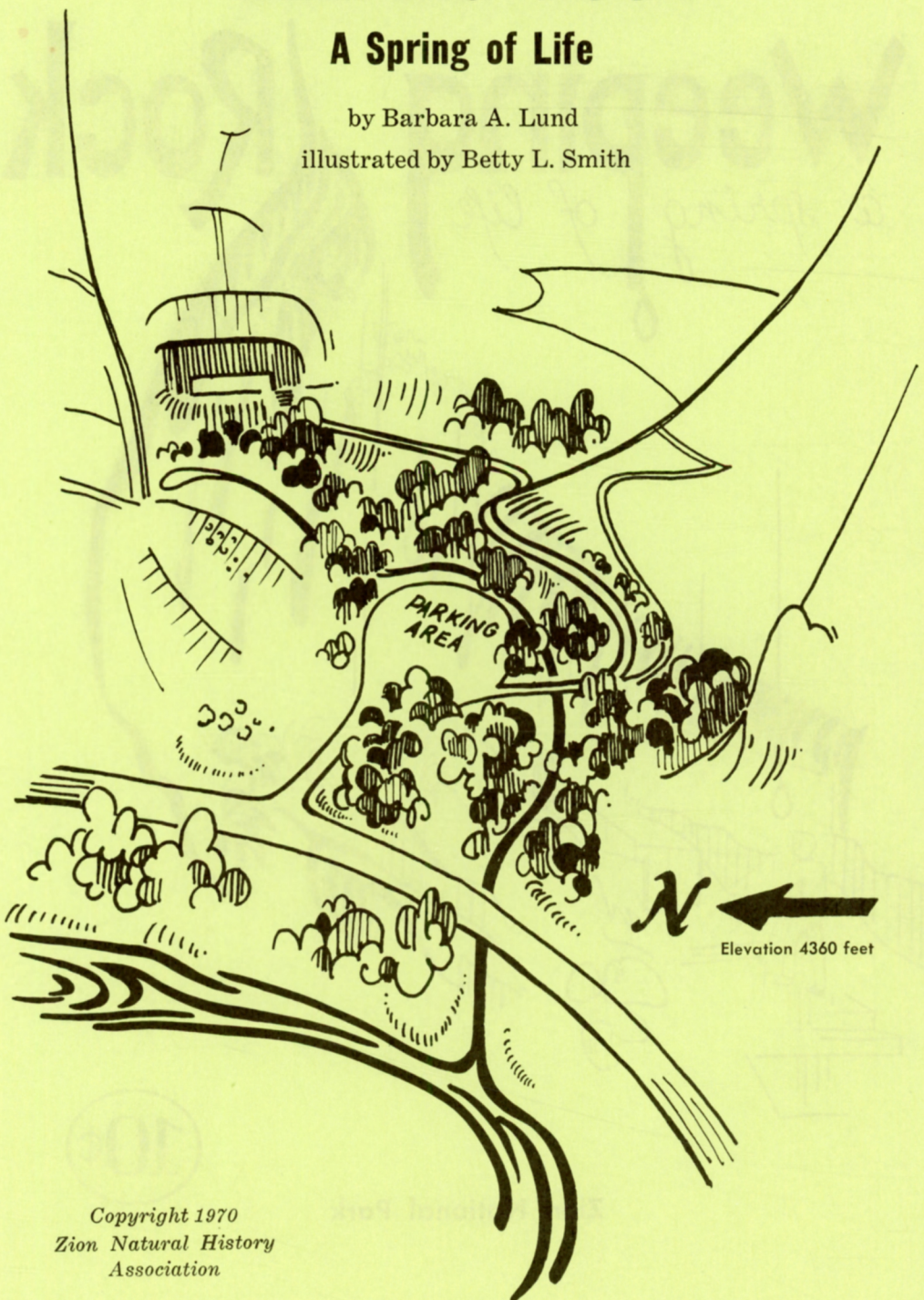
Zion National Park

WEEPING ROCK

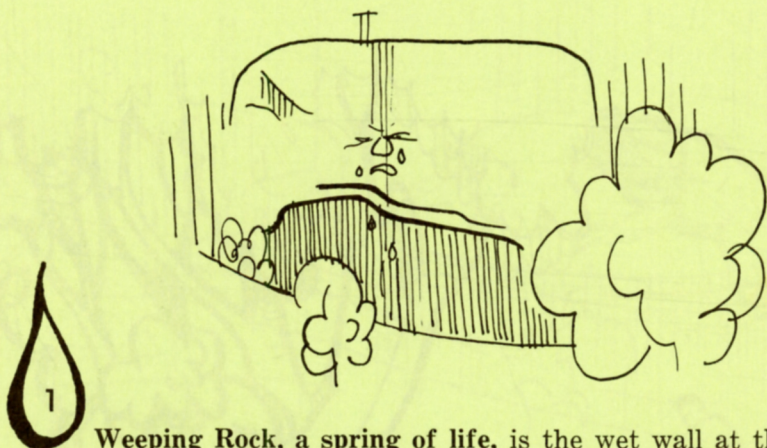
A Spring of Life

by Barbara A. Lund

illustrated by Betty L. Smith



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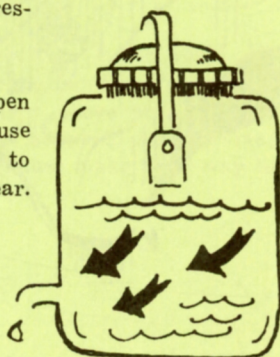
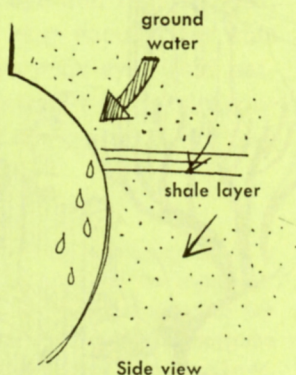


Weeping Rock, a spring of life, is the wet wall at the head of this small box canyon. Here you'll find many living things in delicate balance with their physical setting. The spring water relates to nearly everything, living and non-living. Take the quarter-mile trail to enjoy this fascinating story of water and life.

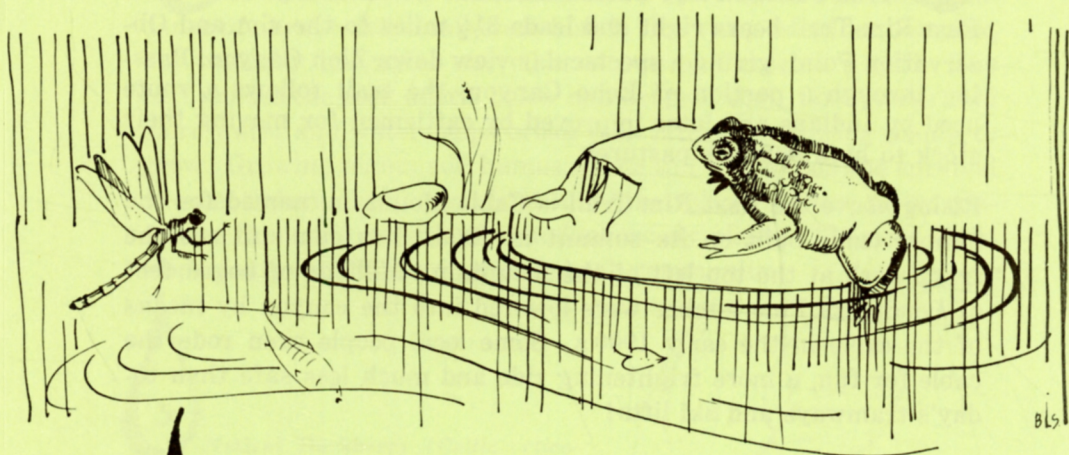
What Makes Weeping Rock? Stream-deposited muds, topped with wind-blown sand filled the lowlands here millions of years ago. Pressure over the ages squeezed muds into thin shale layers and sand into thick sandstone layers.

Water passes easily through sandstone, but slowly or not at all through shale. Water from rain and snow that falls on the plateau above soaks into the sandstone as groundwater. When it reaches the shale, it moves sideways toward the cliff face where pressure is less.

It works like your picnic water jug. When you open the spigot at the bottom, gravitational forces cause the water to flow. Weeping Rock lacks a spigot to turn off and the sandstone water jug drips all year.







2

A Stream of Life. What is there about water to hold such universal fascination for man? It pleases the eye and lulls the ear, but why? We don't know. But pause here long enough for this pleasant stream to have its effect on you. Let your eyes find patterns in the motion, delight in the colors, and interest in the dragonflies and fish. Listen for the quiet gurgling of the water as it flows among the rocks.

This stream is filled with living things because the water is clean. It is a community of plants and animals adapted to a special physical environment. In the water you can find algae growing, fish swimming, toads coming to lay their eggs, and dippers diving for food. Dragonfly young prowl the bottoms of the pools in search of other insect prey while the adults cruise the air above, hawking for winged food.

From our vantage point, this place is a small serene spot in the world. But it really is much like other places, with constant struggling for life and competition for material things. Floods from Echo Canyon above provide frequent but short-lived catastrophies. Some organisms can adapt to and survive the muddy water and debris, but others wash out and must make their way back, just like people after a river flood.

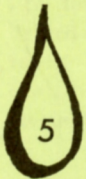
Trail Junction and Cable Mountain. From this junction, the East Rim Trail bears right and leads $3\frac{1}{2}$ miles to the rim and Observation Point, giving a spectacular view down Zion Canyon. Passing through a portion of Echo Canyon, the trail follows a route used by Indians and later improved by cattlemen for moving their stock to high summer pastures.

Rising above the East Rim Trail is Cable Mountain, named for the lumber cable built on its summit in 1904. You can still see the framework at the top left of the mountain. Millions of board feet of Ponderosa Pine lumber were lowered into the canyon by means of the cable in the early 1900's. Some local people even rode the cable for fun, a more frightening ride and much less safe than today's tramways and ski lifts!

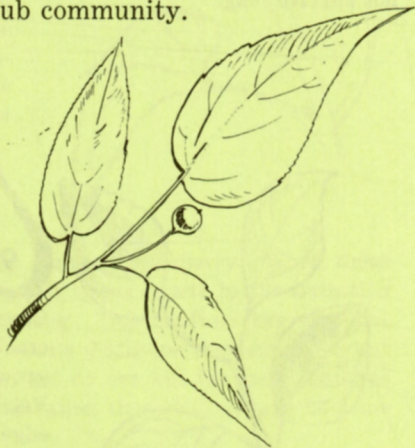




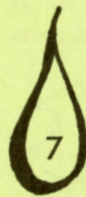
A Hillside Alive with Shrubs. Why is there such an abundance of shrubs and small trees here? The story is rather complex, but basically the water carved a canyon and created a cliff. The cliff shades the rock debris below and keeps it cool. Cool places hold more water and water helps break rock into soil, allowing plants to grow. Growing plants add humus to the soil which aids the survival of essential small soil organisms and other plants. These many conditions favor the growth of abundant woody plants. The next eight stops point out members of the shrub community.



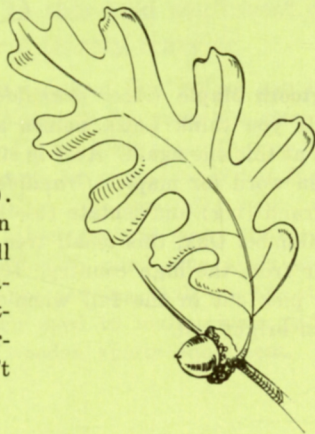
Netleaf Hackberry (*Celtis reticulata*). You will see the cork-ridged bark of this small tree frequently along the trail. Because it is uncommon elsewhere in the park, we know that conditions are most favorable here. The sweet brown berries feed many birds in the fall.



Boxelder (*Acer negundo*). Boxelder should be familiar to many people for it grows wild in most states and is frequently used as a shade tree in new housing developments because it grows rapidly. Air currents waft the winged seeds like tiny helicopters to high cliff niches.

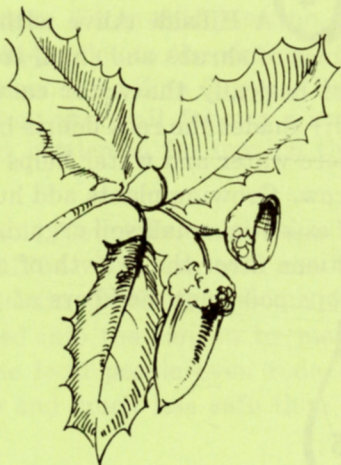


Gambel Oak (*Quercus gambelii*). Large thickets of Gambel Oak grow on high plateaus of Zion, but only small numbers in a few locations at this elevation. Acorn crops are sporadic, but whatever is produced is quickly eaten by squirrels, deer, and jays—if the worms don't get there first.



8

Shrub Live Oak (*Quercus turbinella*). The south-facing slope across the stream is covered with small hardy live oaks which grow well in dry warm soil. On this cooler slope the shrub grows to a small tree but seldom produces acorns. We don't know what the missing ingredient is, but here bigger does not mean better, for without acorns the species will not survive long.



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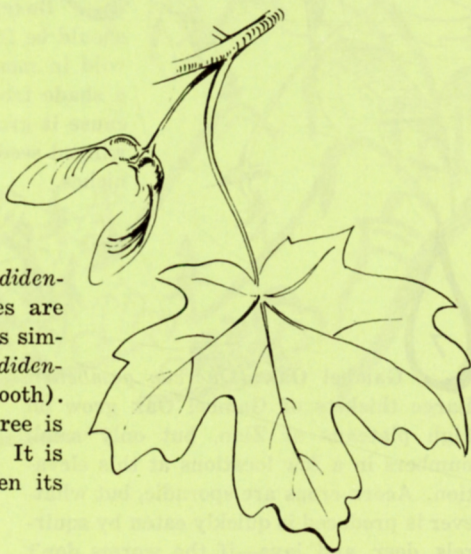
Singleleaf Ash (*Fraxinus anomala*).

Can you imagine the tree roots forcing a small crack open to what you see today? Living, growing things have great power. The related Velvet Ash tree grows below at the stream edge. The Singleleaf Ash does better on this sandy, well-drained talus slope where there is less water and more air about its roots.



10

Bigtooth Maple (*Acer grandidentatum*). If you think Latin names are hard, look at this one again. *Acer* is simply a Latin word for maple. *Grandidentatum* is grand (big) and dentate (tooth). Like the Gambel Oak, this small tree is an invader from the high country. It is easiest to pick out in the fall when its leaves turn bright red.



11

Canyon Grape (*Vitis arizonica*).

Grapes are vines, not shrubs, but they use shrubs and trees for support. They climb to expose their leaves to the sun. This may shade out the support tree, as happened here, but it can mean the eventual end of the grape, too. Death is as natural in the scheme of things as birth and life. It is not bad, as we so often think, but simply necessary. The death of the tree means food and life for beetle larvae. Woodpeckers have drilled holes to find the larvae to eat. Eventually the woodpecker may add humus to the soil and help a tree to grow. So the elements recycle and life goes on.



12

Plant galls. Parasites came with the Netleaf Hackberry. When these insects lay their eggs in the leaf stem, the plant tissue reacts to the irritation by producing a cancerous growth about the egg. This confines the egg, but also provides food for it when it hatches. Galls disfigure the leaves, to our eyes, and may reduce their food production, but do not kill the tree. Perhaps this tells us that if a resource is used in moderation there will always be some left to use.

13

Tall Trees. Lining the banks of temporary and permanent streams are many tall trees, mostly Fremont Cottonwoods (*Populus fremontii*) and Velvet Ashes (*Fraxinus velutina*). They grow only where abundant permanent water exists, for one of their requirements of life is to always have wet roots. Indians and early pioneers knew about the cottonwood and ash. They were sure to find water within digging distance at the base of one of them, even if no surface water was in sight. In this arid southwest country, such knowledge could mean life for a thirsty traveler.



Velvet Ash

Are the roots of this Velvet Ash in water? Yes. Although far from the stream below, this and other trees along the dry wash have their roots in groundwater not far beneath the surface. To remember how to identify ashes, which grow in many states, keep this association in mind—the seeds are shaped like canoe paddles. Ash wood is strong and is often used to make canoe paddles and other wooden sports equipment.

14

Swamp. Out-of-place though it may seem, this is a real swamp. You can see the water source just above on the wet cliff face. The soil is not very deep and there is too much water runoff to be absorbed by the underlying rock. So, this soil stays wet all the time. Tall trees cannot grow here because of the shallow soil and frequent mud slides. Smaller plants, seen at the following three stops, are better suited to the special conditions here.

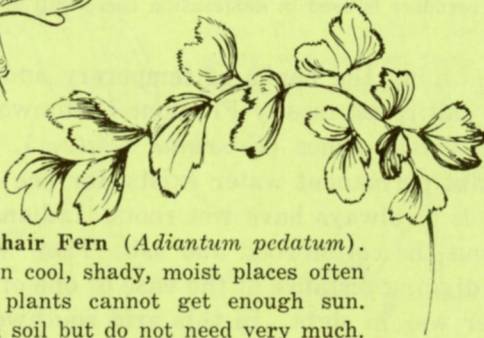


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Golden Columbine (*Aquilegia chrysantha*). Rich soil and wet roots are what help a columbine do well. Two kinds grow and hybridize here, a situation produced by steep canyon walls and the wet habitat.

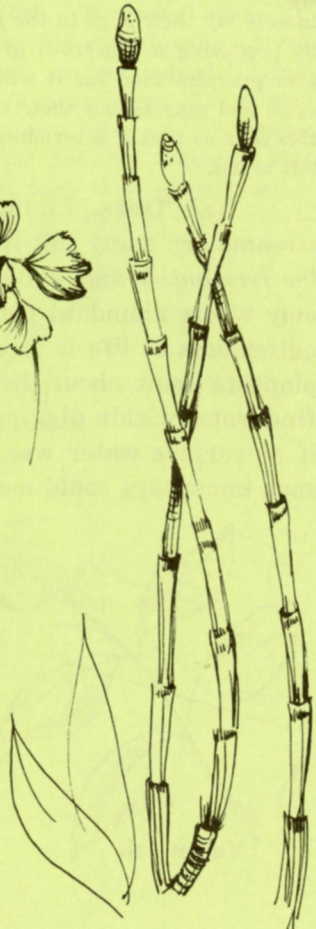
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Maidenhair Fern (*Adiantum pedatum*). Ferns grow in cool, shady, moist places often where other plants cannot get enough sun. They grow in soil but do not need very much.



17

Horsetail (*Equisetum arvense*). Horsetails are plants of swamps and can grow in very wet and muddy places. This hillside is just wet enough and has soil just deep enough to allow a few plants to grow. The stems have a rough surface high in silica, a feature used to advantage by pioneers in scouring out their pots and pans.



18

What Happened Here? Flood! Heavy rains and melting snow on December 6, 1966, produced mud slides and big floods throughout Zion Canyon and as far away as Grand Canyon and the Sierras of California. Even after several years, it is easy to see that this swath from above the trail to the stream below is different. Gradually the vegetation will come back and look like the rest of the slope. It will seem like a long time to us, but the cycle is short in geologic terms and mud slides must have happened thousands of times in the cutting of this small canyon. Such catastrophes are just large and sudden changes in processes which go on all the time in smaller ways.

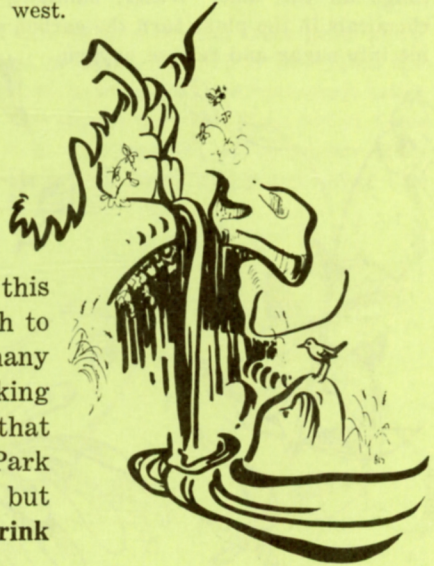


19

Creeping Mahonia (*Berberis repens*). Holly-like leaflets and blue berries of the Creeping Mahonia decorate most shady slopes where it is also cool and moist. Oregon Grape is a similar species of the Pacific Northwest.

20

Waterfall. The water of this small waterfall looks clean enough to drink, but it isn't. Why? Too many street shoes, washed hands, drinking dogs, and spittle. It is too bad that even in the middle of a National Park one cannot sample "wild" water, but please, for your health's sake, **drink only from water fountains.**



WATCH YOUR STEP AHEAD!



Shower Time. To reach this alcove, you had to take a brief shower. Refreshing, wasn't it? Feel the drops again. Are they as warm or cold as you expected? The sandstone water jug keeps the water at a fairly constant temperature all year. It may take two years for rain water to percolate from the plateau to this spring and during this time the water takes on the more even rock temperature.

Take time to also notice the wet wall behind you. Some different plants grow here. If you wonder how they can grow without soil, you might be interested to know that most of any plant's food comes from the air. Soil provides support, minerals and water. The small plants here use cracks for root support, get enough minerals from the rock, and, of course, have plenty of water.

The food from the air is carbon dioxide, something you are breathing out of your lungs all the time. Water, sunlight, and chemicals in the plant turn the carbon dioxide into sugar and release oxygen.



Monkey-flower

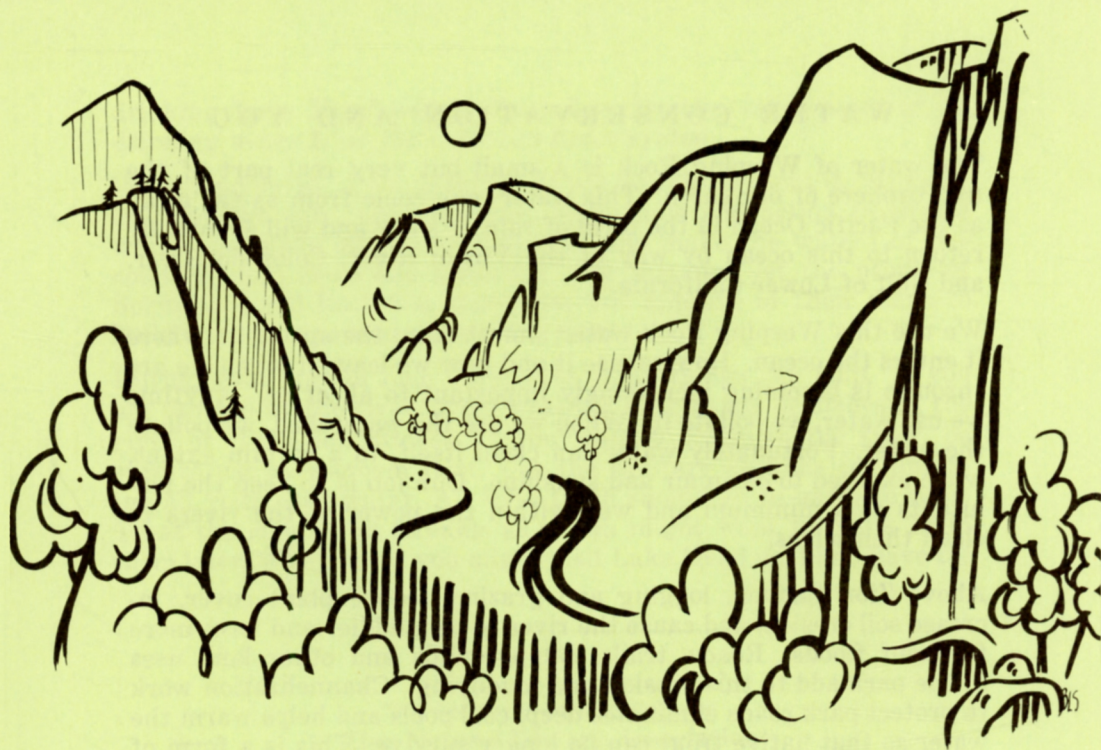


Shooting-star

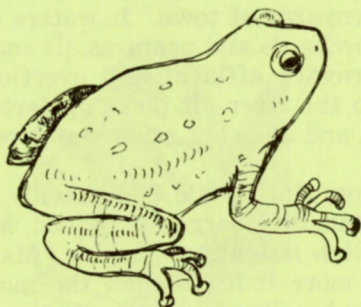


Love Grass

Look for the bright red flowers of the Crimson Monkey-flower (*Mimulus cardinalis*) or the delicate pink of the Shooting-star (*Dodecatheon pauciflorum*). The bunchgrass is a Love Grass (*Eragrostis* spp.)



Look out from the alcove a minute. You can see how the tall trees grow along the stream to the Virgin River and on out of sight. It is clear how thick the small Shrub Live Oaks are on the sunny slope to the right, and how much taller the shrubs are on the shady left slope. The plunge pool below the outlet from Echo Canyon is green with algae and if it is early summer you will know from the noise that it is also full of Canyon Treefrogs for it will sound either like a herd of goats or a boiler factory in miniature.



WATER CONSERVATION AND YOU

The water of Weeping Rock is a small but very real part of the hydrosphere of our earth. This water may come from as far away as the Pacific Ocean in the form of rain or snow and will eventually return to this ocean by way of the Virgin River, Colorado River, and Gulf of Lower California.

We use this Weeping Rock water almost from the spring to where it enters the ocean. How we use it and how we leave it when we are through is becoming increasingly important to all of us. Anytime we use water, we pollute it. When we use the watershed, we pollute the water. Fortunately water can clean itself, to a certain extent, when exposed to clean air and sunshine. Our job is to keep the pollutants to a minimum and well within the power of the rivers to clean themselves.

Above Zion Canyon, logging and grazing reduce plant cover, increase soil erosion, and cause the river to be muddier and have more frequent floods. Roads, trails, campgrounds and other land uses in the park add to this erosion and muddying. Channelization work to protect park roads eliminates deep, cool pools and helps warm the water so that native trout can no longer survive. This is a form of thermal pollution.

The nearly one million yearly visitors to Zion use large quantities of spring water tapped from several side canyons, water which once flowed freely to the Virgin River and freshened it. The used water gets varying degrees of treatment in the park, but it always reaches the river dirtier than when we got it.

Pollution pressures on the river increase beginning at Springdale. Here irrigation water flows through open ditches along city streets and through the barnyards of town. It waters lawns and gardens, pigs and cows, and orchards and pastures. It soaks into the ground and mixes with barnyard effluent and overflowing septic tanks, then seeps back into the river. It picks up fertilizers, insecticides, detergents, bacteria, and a host of other water-polluting substances.

And downstream from Springdale is Rockville, Virgin, LaVerkin, Hurricane, Washington, St. George, Littlefield, Mesquite, and Overton, all with open ditch irrigation systems. Many have overtaxed septic tanks due to more tourists than the motel and restaurant drainage systems can handle. How clean is the Virgin River when it empties into Lake Mead? We don't know. How much more waste can we dump into it before it gets too dirty for self-cleaning and too poisonous for our use? We'd better find out. Why? Because Boulder, Las Vegas and increasing numbers of communities are

drinking Lake Mead water. Even Los Angeles takes some of its drinking water from the Colorado River system.

What can you do? Lots of things, if you will think about it. Support, in your own way, organizations, individuals and action programs which are really doing something to help make the waters of our country more clean and beautiful. For instance, let the people of Springdale and Rockville know that you approve of their plans to build a modern sewage treatment plant.

During your stay in Zion Park, even small things can help. If you are camped by the river, avoid washing your hands or dishes in the river or irrigation ditches. If you want to swim in the river, be sure to use a restroom first. Use the sanitary stations for dumping all your used water. All solid trash should go in garbage cans. Treat the rivers and streams as if you might want to drink from them later. Who knows, you might visit Lake Mead next and have to!

This booklet is published by the
Zion Natural History Association
Zion National Park
Springdale, Utah 84767
for the
National Park Service
United States Department of the Interior

All proceeds from the sale of this booklet are used to aid the interpretive program at Zion National Park. Other interpretive literature, selected to help visitors understand and enjoy Zion and other National Park Service areas, is available at the Visitor Center.



