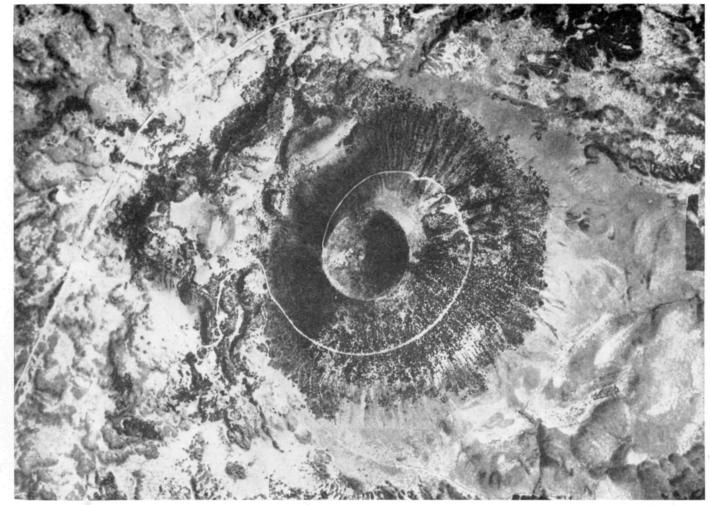
GUIDE TO

OR YOU MAY USE IT FREE OF CHARGE, RETURNING IT TO THE REGISTER STAND UPON LEAVING

CAPULIN MOUNTAIN NATIONAL MONUMENT
29 MILES EAST OF RATON, NEW MEXICO



Aerial View of Capulin Mountain

CRATER RIM TRAIL

CAPULIN MOUNTAIN NATIONAL MONUMENT

Capulin, New Mexico

Capulin Mountain National Monument, one of 180 areas administered by the National Park Service, United States Department of the Interior, was set aside for its scientific and scenic value. It represents a fine example of a volcanic cinder cone, and from its rim may be seen some of the finest views obtainable from any peak. The monument contains only 680 acres, but living in and around it are numerous deer, a few bobcats, some ringtails, pack rats, badgers, foxes, coyotes, jackrabbits, cottontail rabbits, ground squirrels, porcupines, one golden eagle, and many kinds of birds. The best time for observing animals and birds here is early morning and late evening.

This area belongs to you and is part of your heritage as an American citizen. The men in uniform of the National Park Service are anxious to serve you and welcome the opportunity to make your stay more enjoyable.

No unsealed firearms are allowed in the monument.

Wildlife, plants, and rock formations are protected for you by law.

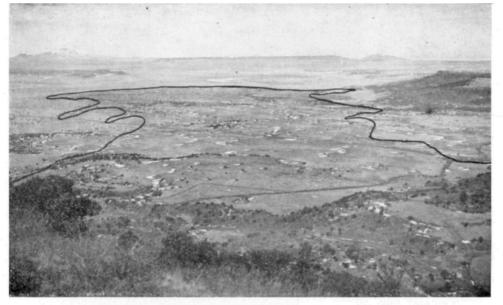
Leave all the wildflowers for others to enjoy.

KEEP AMERICA BEAUTIFUL!

How to use this guide booklet:

Follow the sign pointing up the Crater Rim Trail. Stop at the numbered posts along the way. Numbered paragraphs in this booklet will explain what to see and look for by the post of the same number.

The Crater Rim Trail walk, a little over a mile in length, is the best way to learn about Capulin Mountain and the surrounding country-side. The trail usually takes less than an hour, and ends at the parking area. Be sure to wear low heeled shoes!



View from Post No. 1, showing Laughlin Peak and Lava Flow

POST NO. 1. SMALL LAVA FLOW

Look at the flat land below you. The picture above outlines the lava flow which issued from the base of Capulin Mountain. The humps are hard lava. Such flows were molten rock when they were formed. The mountain you are standing on is made up mostly of volcanic cinders and not lava.

The higher mesas a little to the right are capped with older lava flows. Thousands of years of erosion have left the hard lava cap standing high because the softer material all around was washed away. Laughlin Peak, located in the upper left of the picture, elevation 8,836, is the highest volcano in the area.

Post No. 2. Mountain Mahogany (Cercocarpus sp.)

Late in the summer slender, curly, white feather-like plumes can be seen in large numbers on each bush. Each curly plume is attached to a seed which is eventually blown away by the wind. The plume twists and untwists with changes in moisture and helps drill the seed into the ground. In the spring this bush bears tiny whitish flowers. This plant is also called "deer browse" because the deer like to eat it.

Early Indians sometimes used the wood for digging sticks and tool handles as the wood from this member of the Rose family is very hard.

Post No. 3. Chokecherry (Prunus sp.)

This plant gives us the name Capulin (cap-oo-LEEN) in Spanish, and the abundance of the shrub here is what caused the mountain to receive its name.

It is a very pretty plant to see early in the spring, when the ends of the stems form solid clusters of tiny white flowers. At this time the blossoms have a sweet fragrant odor. Birds, animals, and men relish the fruit. If you try one, be ready for something a little sour. Leave some fruit for the next fellow to try, if you are lucky enough to be here when it is ripe. No berries, flowers, or shrubs may be taken from the monument.

Post No. 4. Gambel Oak (Quercus gambelii)

This small oak, growing behind and to the right of Post No. 4, is sometimes called Scrub Oak. Named for William Gambel, early naturalist who studied plants and animals of the southern Rocky Mountains in 1844, it is common throughout the Southwest. It almost always grows in thickets, partly because it sends up shoots from the widespread roots. This makes it a good soil binder, and helps prevent soil erosion.

The acorns furnish food for many kinds of birds and animals. Especially in the winter when many other food sources fail, it becomes the staff of life for many of our small animals. The dense oak thickets

give protective shelter to wildlife.

Man used the wood for bows, clubs, digging sticks, and handles. He has eaten the acorn by roasting, boiling, and grinding it into flour. In these modern times, however, it is easier to buy food.

Post No. 5. Crater View

Although the crater looks oblong from this viewpoint and every point around the rim, the aerial photograph opposite the first page of this booklet will show you it is almost a perfect circle.

The cinders which make up this cone seem to have an acid content, favorable for the growth of vegetation. Look across the crater and a little to your right. From the highest point down to the bottom there was almost no vegetation in 1910, but now the slope is almost covered. The abundance of trees and shrubs on Capulin Mountain has occurred during the last 45 years.

POST NO. 6. SHRUBS LEANING INTO THE WIND

Look on up the trail. See how the shrubs (Pinyon Pine) are leaning away from the crater. This is true almost all the way around the rim. When you face Post No. 6, if you will turn a little to your right you will be facing our prevailing wind, which is from the southwest. The shrubs on up the trail are leaning into this wind. Apparently it comes into the crater on the low side where your car is parked, whirls around the inside of the crater and spills out over the rim forcing the shrubs to grow out away from the crater, and in a few cases they grow into the prevailing wind. Note the Mountain Mahogany growing to the left of Post No. 6.

Post No. 7. Skunk-bush (Rhus trilobata)

If you have been watching as you walked along, you have noticed a lot of this bush by the trail side. Its name probably comes from its strong aroma. It has yellow flowers, and bright red berries. You can see some of these bushes directly to the left of Post No. 7. Indians ate the berries, used the pliable stems in making baskets, and as a mordant for dyes.

Next to Post No. 7 on the left side is a Buckwheat bush.



Pinyon Pine leaning away from crater

Post No. 8. Lava Flow With Ripples

Look down at the base of this mountain and follow a winding lava flow toward the east (your left). These interesting "ripple marks" were caused by the movement of hot lava beneath the surface which had cooled and hardened to a crust. The large volcano beyond the lava flow is Sierra Grande, which will be mentioned later.

Looking straight ahead while you face Post 8, in the distance to your left you will see old crop lands, some of which were broken out as early as 1910 and were dry-farmed to beans and wheat. You may be surprised to know that the little town of Capulin shipped over 300,000 bushels of wheat in 1912. Prolonged drought in the early 30's caused many of the farms to be abandoned, and you see many returning to native grass.

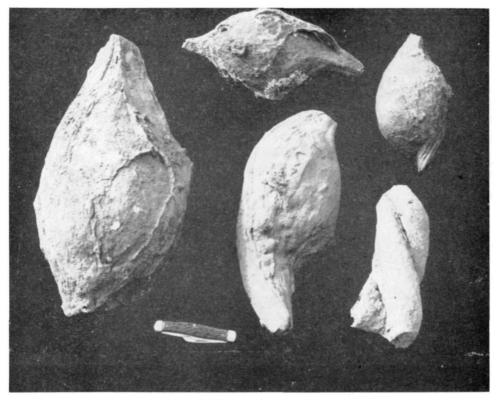
Every peak in your field of vision from left to right is a volcano.

KEEP LEFT

Post No. 9.

Here are tremendous chunks of volcanic material called ejecta, or lava, thrown out of the crater along with cinders and ash. Capulin Mountain was formed as volcanic activity in this area was ending. In general the mountain is composed of layers of ash, cinders "lapilli," and small bombs (blobs of lava thrown into the air and shaped round) usually well stratified and interbedded with thin layers of caliche. Caliche is a limey clay.

Colors on this rock are caused by Lichens, explained later.



Volcanic bombs

Post No. 10. Best View of the Crater

The crater is 415 feet deep on the highest side and 100 feet deep on the low side where the parking area is located. It is approximately 450 feet in diameter. The mountain rises about 1,000 feet from base to top. Elevation at the highest point, across the crater and to your left, is 8,215 feet above sea level. You will be at that high point very soon.

BE CAREFUL OF LOOSE CINDERS IN THE TRAIL

Post No. 11. Porcupine Damage

The small Pinyon pines here show the scars of considerable Porcupine damage. In winter and spring the animals chew the bark from Pinyon and Ponderosa Pines and eat the succulent, growing part of the tree called the cambium layer. The trees are often killed by girdling.

Post No. 12. Prickly Pear Cactus (Opuntia sp.)

Even though this area is no desert we have cactus plants. Cacti are superb examples of plant adaptation to desert conditions. With both shallow and deep roots they are well equipped to take up available moisture. In their fleshy joints they store water. The joints expand and fatten when there is plenty of moisture, and contract, becoming thin and wrinkled during drowth. The waxy skin reduces water evaporation, and spines protect the plant against thirsty rodents. Prickly Pear Cactus grows on the right side of the trail for the next 50 feet.



Sierra Grande as seen from Post No. 13

Post No. 13. Sierra Grande

The large mountain slightly to your right when facing Post No. 13 is called Sierra Grande, and is 8,732 feet above sea level. It is a volcanic mountain over 40 miles around itts base, and about a million years old.

You can see the little town of Des Moines, 12 miles away, at the left foot of the mountain. Directly over Post No. 13, in the far distance, you will see a notched mountain which is called Rabbit Ears Mountain, named after a Kiowa Indian chief who used to roam this country. Remember its location, as we will mention it again.

Post No. 14. PINYON PINE (Pinus edulis) Left of the post, and behind you.

Pine expresses best the flavor of the region. Its fragrance is so popular that an incense has been made from it. Here at Capulin Mountain are some very fine, large examples of this tree. It seems to thrive in cinders, as can be seen by those along the roadside on the way up here. Some of those trees have cinders piled 3 feet and more up the trunks, and they are some of the largest in the area.

Pinyon nuts, which form in cones, are highly nutritious, but the tree does not produce them every year.

Since the Pinyon pine is the most abundant tree on Capulin Mountain, see if you can identify it farther along the trail. We will point it out again.

BUILD NO FIRES

Post No. 15. Juniper (Juniperus)

This tree is very often a companion to the Pinyon pine, but is easily distinguished by its lacy, drooping foliage. Fence posts are made from its very rot-resistant wood. In some years the blue Juniper berries grow profusely, and birds eat them. In the old days Indians roasted them for eating. You may know this tree as "Cedar."



Layering of cinders as seen along road to summit

Post No 16. Cinder Mining Operation

The black and red scar at the base of this cinder cone was caused by a now discontinued cinder quarrying operation, which took out 180,000 cubic yards of cinders to be made into concrete building blocks. The quarry is just off the monument. The red-topped mountain in the distance, slightly to your left, is called Twin Mountain, and is slowly being destroyed. The cinders are bull-dozed off the mountain, crushed, and loaded into railroad cars. The railroad uses most of them for railroad beds, but some are used for other purposes, such as building blocks. Capulin Mountain could be similarly used were it not a national monument.

Post No 17. Ladybugs

Beginning in late July, through August and September, Ladybird Beetles (Coccinellidae) by the bushel swarm on rocks and bush stems in this location. Look under the bushes for them. This important and large family of beetles (Ladybugs, most people call them) is very important in destroying many pests such as Mealybugs, Scale insects, and Aphids. In fact, they are sold commercially to orchardists and other plant growers.

Post No. 18. View of Five States

Take a good look from left to right. Seldom will you see so much country from one spot!

Are you ready to hear about some of the things you've just seen? Here goes: starting at your right when facing Post No. 18, look beyond the left leg of Sierra Grande and you will see a notched mountain. This is Rabbit Ears Mountain (pointed out at Post No. 13), and is near the town of Clayton, New Mexico. Ten miles beyond Clayton is the Texas border, and on clear days you can look into Texas.

When you face Post No. 18 and look straight ahead as far as you can see, you are looking in the general vicinity of Boise City, Oklahoma, and beyond into the southwestern corner of Kansas.

Directly to your left is about north. If you are lucky and have a very clear day, you can see Pike's Peak in Colorado, elevation 14,110 feet, about 200 airline miles away. To the north, another well known peak in Colorado, visible from here by turning to your left, is the west Spanish Peak, elevation 13,623 feet, rising all alone from a very flat, long mesa. It is about 65 airline miles from here. Keep turning to your left until you have almost turned around and can see a far distant range of mountains. These are the Sangre de Cristos, and are part of the Rocky Mountain range. You are now 8,215 feet above sea level.

POST NO. 19. CINDER CONES AND A TRAIN ROBBER

Look straight ahead, facing Post No. 19, until you spot a small village in the distance. This is Folsom, New Mexico. The Burlington railroad runs through Folsom. In 1896 the railroad was called the Fort Worth and Denver, and the infamous William (Black Jack) Ketchum robbed one of the trains. He had an arm shot off in the ensuing gun fight. He was later captured and taken to Clayton, where he was tried and hanged. Local legend says he had a cabin on the other side of the closest hill you see from here, called Mud Hill. Mud Hill is a volcano of about the same age as Capulin, and looks as if the lava broke through the rim of the crater. Behind Mud Hill and to the left a little, is a cinder cone called "Baby Capulin." It does look very much like the cinder cone you are on, and is about the same age. A recent dating by Carbon 14 gives the age of Capulin Mountain as approximately 7,000 years. Read the Geological Notes at the back of the booklet for more explanation about this date.

Post No. 20. Main Lava Flow From Capulin Mountain

Notice the scattered trees on the left side of the road. These mark the main lava flow from Capulin Mountain. It extends about 7 miles, reaching to the Dry Cimarron, which runs through the village of Folsom.

Post No. 21. Mule Deer

Approximately 100 mule deer stay in the vicinity of Capulin Mountain. During the winter they stay high up on the mountain side, and in early morning can be seen grazing in the crater. In summer they feed lower down, and the visitor must be up early to see them, or happen on a bunch in late evening. There is no water on Capulin Mountain, so there is much movement between here and the surrounding country-side. The wooded mesas a little to your left are favorite routes for their travels to and from Capulin Mountain. Only in the last few years have deer been numerous here. They are protected in the monument, but hunting is done outside its boundaries.

Post No. 22. Folsom Man Site

The closest, high, sharp, pointed cone, almost straight ahead when facing Post No. 22, is called Jose Butte. Several miles behind that butte is the famous Folsom fossil quarry where, in 1926, scientists first proved really ancient Indians had actually lived in North America. They found

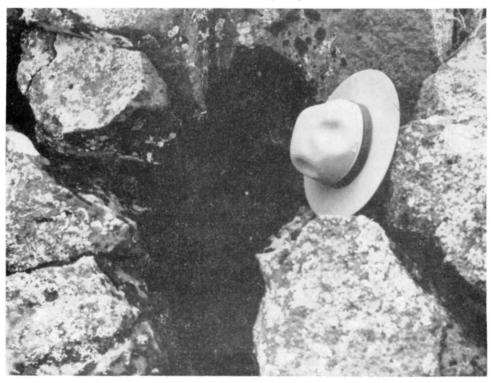
beautifully flaked and channeled dart points of stone among the bones of an extinct species of bison. There were no tail bones, and the "tail goes with the hide," so it is believed the Folsom hunters had killed the buffalo at a pond and skinned them there. Folsom Man is now dated at about 10,000 years ago, so it is possible he may have seen Capulin Mountain erupt. His stone and bone weapons and tools have been found in many places since, mainly in the western high plains. Scientists think he much resembled modern Indians.

Post No. 23. What's This Tree?

Without reading this, you probably know it is the Pinyon Pine again. Post No. 14 mentioned the nut was edible. In addition to eating the Pinyon nut, the early inhabitants of the southwest used Pinyon gum for cementing turquoise stones in jewelry and for water-proofing baskets. The wood burns with a pleasant, pungent odor, and is still used for fuel by Pueblo Indians along the Rio Grande, and by anyone else who uses wood for fuel and is able to get it. In the last century, Kiowas, Apaches, and Comanches lived around this area.

The greenish-gray ground growth is a lichen which does not seem to hurt the tree. The bush to the left of the post is the Mountain Mahogany again, which you have been seeing all along the trail. (Explanation, Post No. 2.)

Warm air vent at the base of Capulin Mountain



Post No. 24. Giant's Grave and Warm Air Vents

Look down toward the bottom of the mountain and slightly to your right and you will see a long cigar shaped ridge. This is called "Giant's Grave." Beyond is a rough, rocky ridge made up of lava. In this ridge are several vents where warm air has been felt. Moss is growing around the openings. Any volcanic area has a number of these tubes leading into the earth, and they act like giant lungs, warming the temperature at the surface of the earth. Geologists believe this whole volcanic field is dead and will erupt no more.

POST NO. 25. LICHENS, BUILDERS OF EARTH

On this huge boulder the gray, green and orange blotches are called lichens (LYK-ens). They actually consist of two kinds of plants, an Alga and a Fungus living together. The alga furnishes the sugar made by photo-synthesis in its green cells, and the fungus absorbs the water and soil salts necessary for the growth of each partner. Lichens produce a weak acid which slowly wears away at the rock until some soil is formed. Then the mosses, a higher type of life, move in and crowd them out, and in turn, as more soil is formed, are crowded out by grasses and annual flowers, shrubs, and trees. Thus the earth's crust has been changed since life began.

Post No. 26.

The sharp peak in front of you on the right is called Jose Butte. This butte is composed of rhyolite, a very hard material, unlike the cinders in this mountain. The sharp peak on the left is called Robinson Butte. Both of these are of volcanic origin.

This is a good view of the Sangre de Cristo Mountain range, which is the farthest line of peaks on the horizon and is very often snow-capped.

Post No. 27. Volcanoes Everywhere

Look over to your left and all the way to your right, and remember that every peak is a volcano. The volcanic field to which Capulin Mountain belongs is about 40 miles long north-south (your left to right) and 20 miles wide east-west.

We hope you have enjoyed Capulin Mountain National Monument and this trail. Be sure to return this booklet to the register stand, or you may purchase it if you wish by depositing 10 cents in the coin slot in the register stand in the shelter at the parking area.

GEOLOGICAL NOTES

Through past ages there have been many outbursts of volcanic activity in this part of New Mexico and adjacent portions of Colorado. Among the most recent of these was that which formed Capulin Mountain and nearby cinder cones.

Inconsistent as it may seem, the oldest volcanic rocks which resulted from lava outpourings millions of years ago are represented by the high, lava-capped mesas and plateaus, while evidences of more recent volcanism are found at lower levels. This is due to the fact that in earlier times the general surface of the land in this region was much higher, and the ancient lava capping has protected the portion it covered from erosion. Between these very old lava flows, the softer rock has been eroded away so that more recent outbursts of lava flowed into these lower valleys. Thus the Spanish Peaks, Fisher's Peak, Johnson's Mesa, Mesa de Mayo, and other high mesas and plateaulands in this region are relics of very old volcanic activity.

Lower lava fields and such volcanic mountains as Sierra Grande southeast of Capulin Mountain, represent a more recent period of volcanism less extensive than the earlier. That this activity took place hundreds of thousands of years ago is evidenced by the amount of erosion that has taken place and by the well-established vegetative cover

found on the formations of this period.

The most recent volcanic action in this region came about in the immediate vicinity of Capulin Mountain between 4,400 and 10,000 years ago. Studies carried out in 1954 by Professor William R. Muehlberger of the Department of Geology of the University of Texas indicate that Capulin Mountain itself is one of the older cinder cones in this recent group. Lava from its eruptive activities covered yellow, caliche-bearing alluvial deposits dated by the radiocarbon method as having been laid down about 8,000 B.C. Three other cinder cones in the immediate vicinity of Capulin Mountain: Baby Capulin, Twin Mountain, and Purvine Hills, have erupted even more recently. Lava flows from Baby Capulin and Purvine Hills blocked the Dry Cimarron River, sediments deposited in the water backed up by this lava dam covering the earlier lava flow from Capulin Mountain. Charcoal found in an Indian fire-pit, near the Folsom Man locality, in the alluvium of these recent water deposits gives a radiocarbon date of approximately 2,350 B.C.

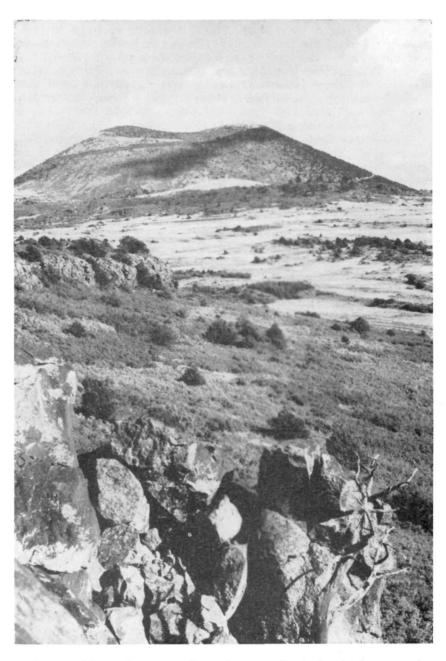
This evidence indicates the latest volcanic activity in this vicinity took place between the dates of 8,000 B.C. and 2,350 B.C. with the lavas of Capulin Mountain being the oldest to pour out during this period. Based on these findings, Professor Muehlberger believes it safe to state that Capulin Mountain is between 4,400 and 10,000 years old,

probably closer to the older figure.

CONSERVATION — CAN A LAYMAN HELP?

If you are interested in the work of the National Park Service and in the cause of conservation in general, you can give active expression of this interest, and lend support by aligning yourself with one of the numerous conservation organizations, which act as spokesmen for those who wish our scenic heritage to be kept unimpaired "for the enjoyment of future generations."

Names and addresses of conservation organizations may be obtained from the ranger.



Capulin Mountain as seen from the west. Rocks in the foreground are portions of a nearby lava flow.

Capulin Mountain National Monument, a unit of the National Park System, is one of more than 180 areas administered by the National Park Service, U.S. Department of the Interior.

The traveling public is becoming increasingly aware of the National Monuments, which have received less publicity than the great, wellknown National Parks, yet which possess extremely interesting features.

Many of these are in the Southwest; we hope you will take the opportunity to visit one or more of them on your trip.

Administered as a group by the General Superintendent, Southwestern National Monuments, Box 1562, Gila Pueblo, Globe, Arizona:

IN UTAH:

Arches National Monument, Moab

Natural Bridges National Monument (care of Arches) Rainbow Bridge National Monument (care of Navajo)

IN NEW MEXICO:

Aztec Ruins National Monument, Aztec

Chaco Canyon National Monument, Bloomfield El Morro National Monument, El Morro

Gila Cliff Dwellings National Monument (c/o Gen. Supt.)

Gran Quivira National Monument, Gran Quivira Canyon de Chelly National Monument, Chinle

IN ARIZONA:

Casa Grande National Monument, Coolidge Chiricahua National Monument, Dos Cabezas Coronado National Memorial, Star Route, Hereford Montezuma Castle National Monument, Camp Verde Navajo National Monument, Tonalea Sunset Crater National Monument (care of Wupatki) Tonto National Monument, Roosevelt

Tumacacori National Monument, Tumacacori Tuzigoot National Monument, Clarkdale

Walnut Canyon National Mon., Rt. 1, Box 790, Flagstaff Wupatki National Monument, Tuba Star Route, Flagstaff

Other areas administered by the National Park Service in the Southwest follow:

IN ARIZONA:

Grand Canyon National Monument, Grand Canyon Grand Canyon National Park, Grand Canyon Organ Pipe Cactus National Monument, Ajo Petrified Forest National Monument, Holbrook Pipe Spring National Monument, Moccasin Saguaro National Monument, Rt. 8, Box 350, Tucson

IN COLORADO:

Black Canyon of the Gunnison National Monument (care of Colorado National Monument)

Colorado National Monument, Fruita

Great Sand Dunes National Monument, Box 60, Alamosa

Mesa Verde National Park

IN NEVADA:

Lake Mead National Recreation Area, Boulder City

Lehman Caves National Monument, Baker

IN NEW MEXICO:

Bandelier National Monument, Santa Fe

Capulin Mountain National Monument, Capulin Carlsbad Caverns National Park, Carlsbad

White Sands National Monument, Box 231, Alamogordo

IN OKLAHOMA:

Platt National Park, Sulphur

IN TEXAS:

Big Bend National Park

IN UTAH:

Bryce Canyon National Park, Springdale

Capitol Reef National Monument, Torrey Cedar Breaks National Monument (care of Zion) Timpanogos Cave National Monument, Pleasant Grove

Zion National Monument (care of Zion)

Zion National Park, Springdale

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Box 1562 M — Gila Pueblo, Globe, Arizona

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May we recommend, for instance, the following items which give additional information on the Southwest?

- ****3. ARIZONA'S NATIONAL MONUMENTS. King, ed. Comprehensive chapters, written by rangers, on the 16 monuments in the state and Grand Canyon. Beautifully illustrated, maps, 116 pp., cloth bound \$3.00

- **131. NALIKIHU. King. Thorough and concise report on an interesting pueblo in Wupatki National Monument. Technical but has interesting summaries and discussions. 183 pp., 81 plates, 17 tables. \$4.00

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