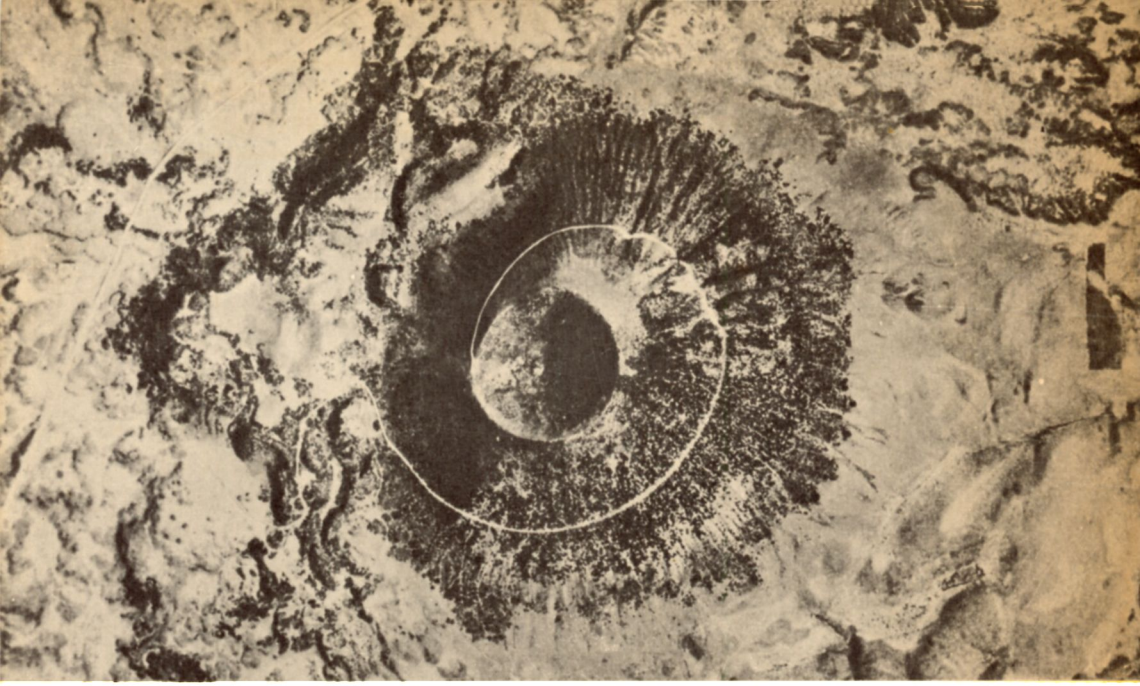
Crater Rim Trail

15 CENTS IF YOU TAKE THIS BOOKLET HOME

CAPULIN MOUNTAIN NATIONAL MONUMENT
NEW MEXICO



Aerial View of Capulin Mountain

Capulin Mountain National Monument, one of more than 285 areas administered by the National Park Service, is a fine example of a volcanic cinder cone. From its rim, you may see some of the most impressive views obtainable from any peak.

The monument contains only 775 acres, but living in and around it are numerous deer, a few bobcats, some ringtails, woodrats, badgers, foxes, coyotes, jackrabbits, cottontails, ground squirrels, porcupines, and many kinds of birds, including the golden eagle. The best times for observing these are early morning and late evening.

The area belongs to you and is part of your heritage as an American citizen. Uniformed employees of the National Park Service are eager 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.

BE CAREFUL WHILE WALKING ON THE TRAIL. SOME PLACES ARE STEEP AND MAY HAVE LOOSE STONES.

CRATER RIM TRAIL

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 at posts of the same numbers. References to "right" and "left" are to directions as you face the numbered sides of the posts.

The Crater Rim Trail, a little over a mile in length, offers the best way to learn about Capulin Mountain and the surrounding countryside. The walk usually takes less than an hour and ends at the visitor shelter.

Post 1. Small Lava Flow.

Look at the flat land below you. The picture below outlines the lava flow which burst forth from cracks at the base of Capulin Mountain. The humps are hardened lava. Such flows were molten rock when they were formed. The mountain you are standing on is mostly volcanic cinders, however, not lava.

View from Post 1, showing Laughlin Peak and lava flow.

The mesas a little to the right are capped with lava flows that are older than those from Capulin Mountain. 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 8,820 feet, is the highest volcano in the area. The long flat-topped ridge to the right of Laughlin Peak is Larga Mesa, capped with hard volcanic rock that is millions of years old.

Post 2. True Mountain Mahogany *(Cercocarpus montanus).*

Late in the summer many slender, white, featherlike plumes can be seen 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. It is called "deer-browse," because deer like to eat it. Plain "mountain-mahogany" is its usual name.

Indians sometimes used the wood for digging-sticks and tool handles, for the wood from this member of the rose family is very hard.

Post 3. Common Chokecherry *(Prunus virginiana).*

This plant is called *capulin* (cap-oo-LEEN) in Spanish, and its abundance here gave the mountain its name.

It is a 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. Men, birds, and animals relish the fruit. If you try one, be ready for something a little puckery. 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 area.

Post 4. Gambel Oak *(Quercus gambelii).*

This small oak, growing behind and to the right of Post

4, is sometimes called "scrub oak." It is one of the most common shrubs on Capulin Mountain. Named for William Gambel, early naturalist who studied plants and animals of the southern Rocky Mountains, it is widespread throughout the Southwest. It almost always grows in thickets, partly because it sends up shoots from its spreading roots. This makes a good soil binder and helps prevent soil erosion.

The acorns furnish food for many kinds of birds and other animals, especially in winter when many other food sources fail. The dense oak thickets also give protective shelter to wildlife.

Men used the wood for bows, clubs, digging-sticks, and handles, and have eaten the acorn by roasting, boiling, and grinding it into flour.

Post 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 are obviously favorable for plant growth. 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 nearly covered. Most of the growth of trees and shrubs on Capulin Mountain has occurred during the last half century. There are many theories for this.

Post 6. Shrubs Leaning Into the Wind.

Look on up the trail. See how the shrubs (pinyon) are leaning away from the crater. This is true almost all the way around the rim. When you face Post 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 the wind. Apparently the wind 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

Pinyon leaning away from crater.

grow out away from the crater, and in a few places they grow into the prevailing wind. Note the hairy cercocarpus growing to the left of Post 6.

Post 7. Skunk-bush *(Rhus trilobata).*

If you have been watching as you walked along, you have noticed many of these bushes by the trailside. They have a pungent aroma, yellow flowers, and bright red berries. You can see some of these bushes directly to the left of Post 7. Indians used the pliable stems in making baskets, ate the berries, and used them as a mordant for dyes. One common name for the plant is "squaw-bush."

Post 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," or pressure ridges as the geologists call them, were caused by movement of hot lava beneath a surface which had cooled and hardened to a crust. The red cinders at the foot of the mountain were spewed from the volcano. The large

volcano beyond the lava flow is Sierra Grande, which will be mentioned later.

Looking straight ahead while you face Post 8, you will see in the distance to your left old crop lands, some of which were plowed as early as 1910 and dry-farmed to beans and wheat in 1912. Prolonged drought in the early thirties caused many of the farms to be abandoned, and you see many returning to native grass. The name of the town was changed from Dedman to Capulin in 1916.

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

KEEP LEFT

Post 9.

Here are tremendous chunks of volcanic lava called *ejecta,* thrown out of the crater along with cinders and ash. Capulin Mountain was formed as volcanic activity in this area was ending. The mountain is composed of layers of dust, ash, cinders, lapilli (small volcanic stony or glassy fragments), and small bombs (blobs of lava that were thrown into the air and became rounded in form) usually well stratified and inter-bedded with thin layers of caliche (a limy clay).

Volcanic bombs.

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

Post 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 1,450 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. For your safety, stay back from the edge.

Post 11. Porcupine Damage.

The small pinyons 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. This may girdle and kill the trees. The brown lumps are beads of sap that flowed from the torn edges of the cambium layer.

Post 12. Plains Pricklypear *(Opuntia polyacantha).*

Even though this area is not a desert, cactus plants grow here. Cactuses are superb examples of plant adaptation to desert conditions. With both shallow and deep roots they are well equipped to take up available moisture. They store water in their fleshy joints. The joints expand and fatten when there is plenty of moisture and contract, becoming thin and wrinkled, during drought. The waxy skin reduces water evaporation, and spines protect the plant against thirsty rodents. Pricklypear cactus grows on the right side of the trail for the next 50 feet.

Post 13. Sierra Grande.

The large mountain to your right when you face Post 13 is called Sierra Grande. It is 8,720 feet above sea level at the top and is more than 40 miles around at its base. This volcano is approximately a million years old.

You can see the little town of Des Moines, 8 miles away at

Sierra Grande as seen from Post 13.

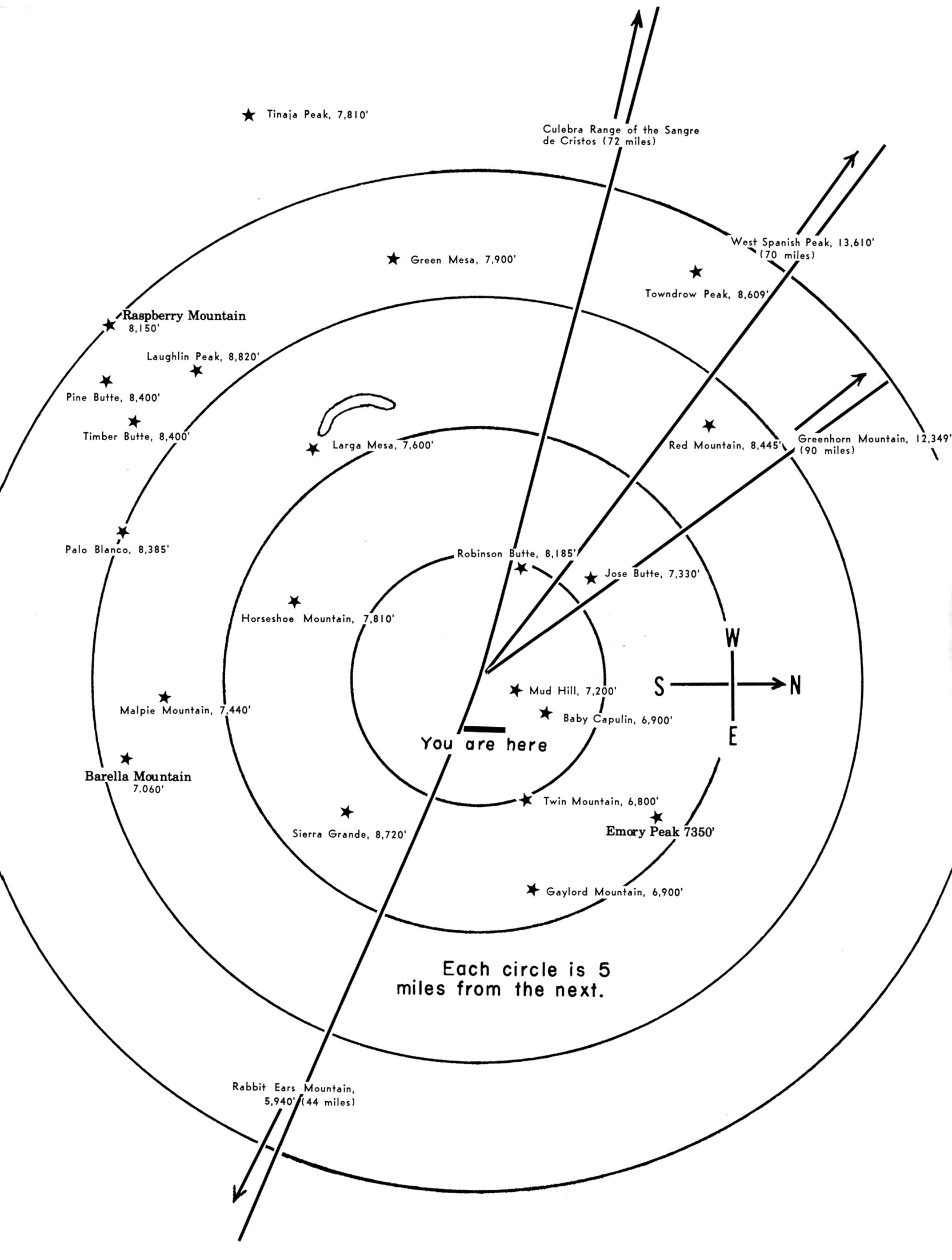
the left foot of the mountain. Directly over Post 13, in the far distance, you will see a notched volcanic mountain, which is called Rabbit Ears Mountain, named after a Kiowa Indian chief who used to roam this country. Remember its location, for we will mention it again.

Post 14. Pinyon *(Pinus edulis).*

Left of the post, and behind you. Pinyon 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, a few as much as 375 years old. Pinyon seems to thrive on 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 is the most abundant tree on Capulin Mountain, see if you can identify it farther along the trail. We will point it out again.


Tinaja Peak, 7,810'
Culebra Range of the Sangre de Cristos (72 miles)
West Spanish Peak, 13,610' (70 miles)
Green Mesa, 7,900'
Towndrow Peak, 8,609'
Raspberry Mountain 8,150'
Laughlin Peak, 8,820'
Pine Butte, 8,400'
Timber Butte, 8,400'
Larga Mesa, 7,600'
Red Mountain, 8,445'
Greenhorn Mountain, 12,349' (90 miles)
Palo Blanco, 8,385'
Robinson Butte, 8,185'
Jose Butte, 7,330'
Horseshoe Mountain, 7,810'
W
S
N
E
Mud Hill, 7,200'
Malpie Mountain, 7,440'
Baby Capulin, 6,900'
You are here
Barella Mountain 7.060'
Twin Mountain, 6,800'
Sierra Grande, 8,720'
Emory Peak 7350'
Gaylord Mountain, 6,900'
Each circle is 5 miles from the next.
Rabbit Ears Mountain, 5,940' (44 miles)

Layering of cinders along road to the summit.

Post 15. One-seed Juniper *(Juniperus monosperma).*

This tree is very often a companion to the pinyon 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," as it is commonly called.

Post 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. It is slowly being removed. The cinders are bulldozed off the mountain, crushed and screened. Most of them are used for railroad beds, but some are used for other purposes, such as building blocks, landscaping, and

athletic tracks. Capulin Mountain could be similarly used if it were not a National Monument.

Post 17. Lady Beetles (Ladybugs).

Beginning in late July, through August and September in most years, ladybugs 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 is of great value in destroying many pests, such as mealybugs, scale insects, and aphids. In fact, they are sold commercially to orchardists and other plant growers.

Post 18. View of Five States.

Seldom will you see so much country from one spot! Take a good look from left to right, and at your center-fold map, to see what we are talking about.

Starting at your right, when facing Post 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 13) and is near the town of Clayton, New Mexico. Ten miles beyond Clayton is the Texas border.

When you face Post 18 and look straight ahead as far as you can see, you are looking in the general vicinity of Boise City, Oklahoma, and, beyond, the southwestern corner of Kansas.

Directly to your left is about north. If you are lucky and have a fairly clear day, you can see Greenhorn Mountain in Colorado, elevation 12,347 feet, and 96 miles from here. Another mountain in Colorado that you can see by turning to your left is the West Spanish Peak, elevation 13,610 feet, rising all alone from a very flat, long mesa. It is about 70 airline miles from here. Keep turning to your left until you have almost turned around and you 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 19. Cinder Cones and a Train Robber.

Look straight ahead, facing Post 19, until you see 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 badly wounded in the ensuing gun fight. Later captured, he was 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. Mud Hill, as it is called, is older than Capulin. Apparently, its lava broke through the rim of the crater. Behind Mud Hill and a little to the right is a cinder cone called Baby Capulin. It does look very much like the cinder cone you are on, but it is younger. 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 20. Main Lava Flow From Capulin Mountain.

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

Post 21. The Mule Deer.

Many mule deer stay in the vicinity of Capulin Mountain. During the winter they are high up on the mountainside and in early morning can be seen grazing in the crater. In summer they feed lower down, and you must be up early to see them, or happen on a band in late evening.

There is no water on Capulin Mountain, so there is much movement of deer between here and the surrounding countryside. 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 permitted outside its boundaries.

Capulin Mountain, from the west.

Post 22. Folsom Man Site.

The closest high, sharp, pointed cone, almost straight ahead when you face Post 22, is called Jose Butte. Several miles behind that butte is the famous Folsom fossil site, where, in 1926, scientists first proved really ancient Indians had actually lived in North America. They found beautifully flaked and channeled spear 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 buffalo at a pond and skinned them there. Folsom Man, archeologists think, lived about 10,000 years ago. His weapons and tools of stone and bone have been found in many places since first discovered, mainly in the western high plains. Scientists believe that he much resembled modern Indians.

Post 23. What's This Tree?

Without reading this, you probably know it is the pinyon again. Post 14 mentioned that the nut is edible. In addition to

eating the pinyon nut, 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. In the last century, Kiowas, Apaches, and Comanches lived around here and used the pinyon.

The greenish-gray growth on the bark is a lichen, which does not hurt the tree. The bush to the left of the post is a true mountain-mahogany, many of which you have been seeing along the trail. (Explanation, Post 2.)

Post 24. Giant's Grave.

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. Most geologists believe that this whole volcanic field is dead and will erupt no more; a few believe that there may be further volcanic activity in this region.

Post 25. Lichens, Builders of Earth.

On this huge boulder are gray, green, and orange blotches 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 photosynthesis 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 breaks down the rock until some soil is made. Then the mosses, a higher type of life, move in and crowd them out. As more soil is formed, the mosses are in turn crowded out by grasses and annual flowers, shrubs, and trees. Thus the earth's crust has been changed since life began.

Post 26.

The sharp peak in front of you on the right is called Jose

Butte. It is composed of rhyolite, a very hard lava unlike the cinders in this mountain. The sharp peak on the left is called Robinson Butte. Both of these are of volcanic origin, which produced the deep lava flows, older than Capulin Mountain, that you see surrounding them.

This place offers a good view of the Sangre de Cristo Mountains, which form the farthest line of peaks on the horizon and are snowcapped most of the year.

Post 27. Volcanoes Everywhere.

Look over to your left and all the way to your right, and remember that every peak is a volcano. The geologically recent 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 that 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 15 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 parts 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 part it covered from erosion. Between these very old lava flows, the softer rock has been eroded away so that more recent lava flowed into these lower valleys. Thus Fisher's Peak, Johnson's Mesa, Mesa de Mayo,

and other high mesas and plateau lands 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 which 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 occurred 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 University of Texas Department of Geology, 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. Baby Capulin, Twin Mountain, and Purvine Hills, three other cinder cones in the immediate vicinity of Capulin Mountain, have erupted even more recently. Lava flows from Baby Capulin and Purvine Hills blocked the Dry Cimarron River, and sediments deposited in the water backed up by this lava dam covered the earlier lava flow from Capulin Mountain. Charcoal found in an Indian firepit, 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 lava of Capulin Mountain being the oldest to pour out during this period. Considering 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.

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SOME OTHER NATIONAL MONUMENTS

Another interesting and even younger cone, surrounded by lava fields, cinder dunes, and other spectacular signs of volcanism, is Sunset Crater National Monument, 15 miles from Flagstaff, Arizona.

To the southwest, along the route of the Old Santa Fe Trail at Watrous, lie the ruins of Fort Union, the largest U.S. military post of the 19th Century southwestern frontier, now preserved in Fort Union National Monument.

To the northwest, 36 miles from Alamosa, Colorado, is Great Sand Dunes National Monument, an interesting natural history area of huge shifting sand dunes.

Pride in your government, love of the land, and faith in the American tradition, are things the National Parks and Monuments give to you. To assure these in fullest measure is our task, worthy of our highest measure of dedication.

National Parks Centennial 1872-1972

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We recommend the following items for additional information on the Southwest:

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