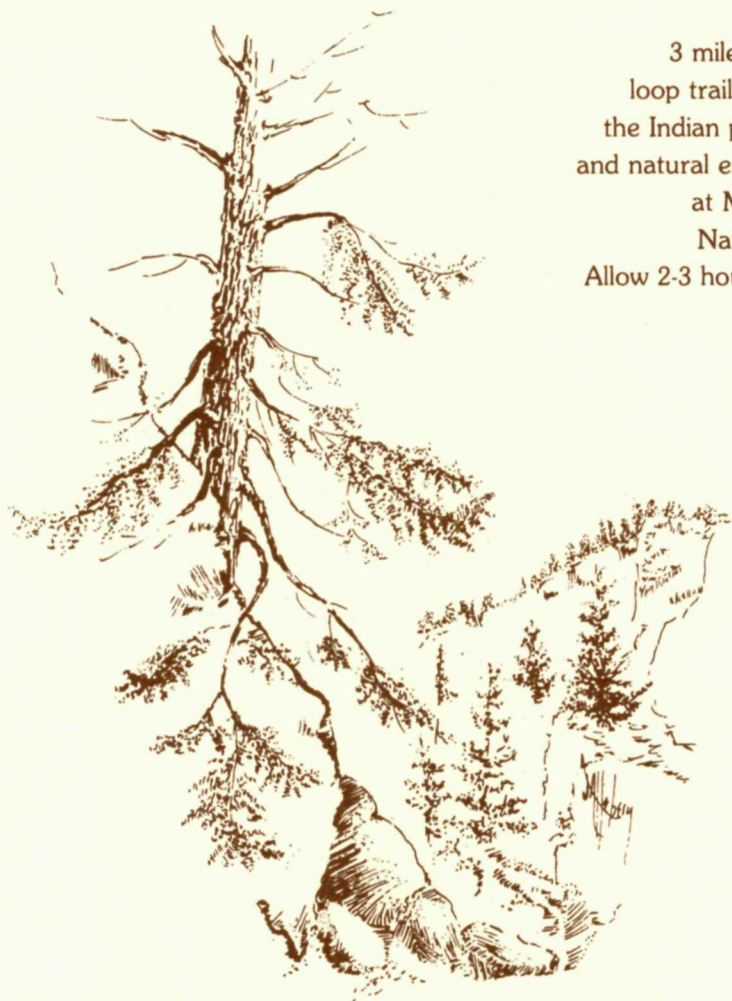


PETROGLYPH TRAIL GUIDE

3 mile round-trip
loop trail introduces
the Indian petroglyphs
and natural environment
at Mesa Verde
National Park.
Allow 2-3 hours for trip.



50¢

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and return it to the box at the end of the trail.

PETROGLYPH POINT TRAIL

Mesa Verde National Park has a wealth of natural history in the great variety of its plant and animal life and its interesting geology. All of these elements are interwoven with the prehistoric Indian civilization which centered on the mesa from around AD 600 to AD 1300. The Indian people had a tremendous understanding of their natural environment and the use of that environment to fulfill needs of food, shelter, and clothing.

In the centuries that elapsed from the abandonment of the Mesa Verde to the entrance of white men into the Southwest, there was little change in the material culture of the Pueblo Indians. These people, who live in northern Arizona and New Mexico, are probably the descendants of the Anasazi who lived here in Mesa Verde. It is from records of the early explorers and missionaries and later from reports of early ethnologists who studied the Pueblos that we derive the reconstruction of Mesa Verde life.

On this trail you will be introduced to the natural environment of the Mesa Verde and the ways it was used by the Indians. This loop trail is about three miles (4.8 km.) in length and returns you to the headquarters area.

PLEASE DO NOT PICK FLOWERS, DEFACE ROCK, LITTER,
OR IN ANY OTHER WAY MAR THE BEAUTY OF THIS TRAIL.

1. The large Douglas fir (*Pseudotsuga menziesii*), is not a true fir but more closely resembles a hemlock. The tree is found on Mesa Verde in moist draws and side canyons as well as along the north rim. This extremely large tree is probably around 300 years old. Pueblo Indians of Mesa Verde used the Douglas fir for construction purposes in their cliff dwellings.

Look for other Douglas firs as you walk along the trail. You will notice that the needles are about an inch long, narrow at the base, flat, and blunt. The cones are 2-3 inches (5-7.6 cm.) long and easily identified by the three-pronged tongues which stick out from under

the scales.

Near the trail in front of the Douglas fir is a wild rose (*Rosa woodsii*). There is no evidence that the Anasazi used this particular plant. Some modern Pueblos grind the petals and mix them with grease for the treatment of a sore mouth. Others gather the pretty pink flowers using them as a perfume for the house.

2. The Utah juniper (*Juniperus osteosperma*) tree is one of the two dominant trees of the mesa top forest. The vast majority of trees throughout the Mesa Verde are junipers or pinyon pines. The juniper is often mistakenly called a "cedar", but there are no true cedars native to the Western hemisphere.

On this walk look for the tracks of some of the animals of the mesa. Mule deer, ringtail cats, cottontail rabbits, coyotes, and foxes are some of the most common four-legged travelers on our trails. Bobcats and mountain lions are the rarely seen cats of the mesa. Bighorn sheep are infrequently sighted.

The common raven (*Corvus corax*) is the large, noisy, crowlike bird commonly seen soaring the canyons. Its much larger size, deeper hoarse caw, wedge-shaped tail, and the more extensive soaring distinguish this bird from the common crow. This carrion feeder helps keep the forest clean.

3. Across the trail on the left above the rock is a young pinyon pine tree (*Pinus edulis*). The needles of the Douglas fir occur singly on the branch whereas the needles of the Pinyon pine are grouped together in twos or threes. These bundled needles are characteristic of pines. Pinyon can be recognized from other pines by the short needle (1½ inches or 4 cm. long) in bundles of two or three. The needles of pines, firs, and spruce, as well as the scale-like leaves of the junipers, are adaptations for the conservation of water. Their waxy needles lose very little moisture compared to broadleaf trees such as elm or maple.

Indians throughout the Southwest make important uses of the pinyon pine. The nuts, which grow several to the cone, are usually toasted before being stored for winter. They are also ground with corn, used as a flour, and eaten fresh or parched. Pinyon gum is used

to mend cracks in pottery and to waterproof baskets. Navajos use the gum in making black dye. Medicinally the pinyon is also important. The needles are chewed as an aid in curing venereal disease. Pinyon gum is burned and the smoke inhaled after death by a family for protection against sorcery. The timber has been used for construction, fuel, and charcoal.

4. This Douglas fir was possibly blown down by the wind many years in the past. Notice the shallow roots—a characteristic of trees growing in the rocky talus slope and mesa tops. One might consider wind an enemy of the forest, but in reality nature's balance depends upon it. Cone-bearing trees (Douglas fir, pine, and juniper) require the wind to carry pollen from the male cones to the female cones so that the species can continue. Furthermore, many of the seeds of cone-bearing trees as well as other plants are dispersed to favorable growing areas by the wind.

Notice the cross-cut end of the log facing the trail with its concentric layers of growth rings. Each year the tree added another growth ring. A wide ring denotes a wet year while a narrow ring signifies a dry year. From the study of these growth rings (dendrochronology) archeologists are able to date the age of the ancient Indian dwellings.

5. This shrub is Utah serviceberry (*Amelanchier utahensis*). The fruit and leaves may be infected with parasitic orange rust (fungus) whose wind-blown spores infect the Utah juniper and Rocky Mountain juniper. After damaging the leaves and twigs of these trees, another crop of spores is produced which reinfect the serviceberry. By late summer therefore the plant looks golden from a distance because of the abundance of this parasite.

Serviceberry is common throughout Mesa Verde on shallow soils of mesa rims and ridges and on canyon slopes such as this. The five-petaled white flower is abundant in the early spring, usually appearing long before the blossoms of other plants. The fruits, which somewhat resemble miniature apples, are eaten by wildlife. Indians eat the fruit fresh or dried, although because of Mesa Verde's semi-arid conditions they may remain dry and tasteless.

6. Located on this cliff face are dark streaks referred to as desert varnish. This type of stain is common throughout the Southwest. It is caused by the dissolving of iron oxide and manganese oxide in water which runs over the rock during spring rains and snow melting. The water evaporates leaving these mineral deposits remaining on the rock. Also a black lichen grows on these more moist areas.

The white substance on the lower portions of this cliff is the limy cement, calcium sulfate. The calcium sulfate was dissolved in water, carried from the stone, and then deposited on the surface when the water evaporated.

7. The crusty orange, yellow, gray, and black growths on this rock are lichens (pronounced lye-kens). Each lichen is actually composed of a fungus, which attaches to the rock and absorbs minerals and water, and an alga, which produces food. This is an ecological relationship whereby neither plant could survive on its own, but together they prosper.

Lichens are the only plants known which can live on bare rock. They produce some weak acids which help break down stone. When lichens die, they contribute organic material to the decomposed rock starting soil formation. Later mosses and higher plants such as grasses and trees can live in the more abundant soil.

Pueblo Indians ground up lichens into powder and applied it to sores or to teeth and gums as a toothache cure. The Hopi refer to lichens as the food of the War Gods.

8. Look at the rock directly in front of you that serves as a step along the trail. This rock shows evidence of ripple marks made in the sand of an ancient shallow sea. The ripple marks were preserved when another layer of sediment covered them, and through the ages the sand cemented into sandstone. When the rock strata weathered and broke down, a crack occurred along the border of the two sediments exposing the ripple marks. Such marks are common in Mesa Verde, especially in cave floors such as at Balcony House.

9. This small shrub is bitterbrush (*Purshia tridentata*). A com-

mon shrub throughout the Park, it becomes abundant after a fire. The small, yellow, inconspicuous flowers are numerous from April to July. The species name "tridentata" means "three toothed", and by looking closely at the leaves you can see how the plant gets this name. Bitterbrush is an important browse plant for deer.

10. The low-growing, holly-like shrub in this area is creeping holly grape or Oregon grape (*Berberis repens*). Commonly found in side canyons under shady thickets, it forms a dense, evergreen ground cover which prevents erosion. The clustered yellow flowers occur in April and May while the small purple berries ripen in early fall. Birds and mammals eat these berries, and some Indians eat them fresh or make them into jam. The Navajo make a medicine for rheumatism from the leaves and stems.

Along the trail on the left side, particularly beyond the large rock, are chokecherry (*Prunus virginiana*). The chokecherry grows in moist areas and produces clusters of small white flowers. The fruit is a small, dark red, juicy cherry which has a large pit. The chokecherries are eaten fresh or cooked and dried for winter. They are often used in making preserves and jelly. The Jicarilla Apache grind the berries into a meal and make them into black, sweet cakes which are stored for winter. The wood was used by Pueblo Indians to make bows.

11. Overhangs such as this one and the others housing cliff dwellings are common in the cliff house sandstone (uppermost member of the Mesa Verde formation). Water from rain and melting snow seeps down through the porous sandstone. Beneath this sandstone is a sandy shale layer through which the moisture cannot penetrate. Thus water at this point flows out to the canyon wall creating springs and seepages. During warm, winter days moisture enters the cracks and crevices of the sandstone. At night when it freezes and expands, the water acts like a wedge to pry loose pieces of rock. Eventually this action produces the overhangs – locally called "caves".

The Gambel oak (*Quercus gambelii*) in front of you is easily recognized by the deeply lobed leaves which are larger than other Southwest oaks. The presence of gambel oak indicates moist soil.

The dense growth (up to 10 feet high) provides cover and valuable browse for deer. Leaves are shed in the fall after turning yellow to reddish in color. The acorns provide food for rock squirrels, chipmunks, Stellar's jays, etc. Pueblo Indians used the wood for construction purposes, digging sticks, bows, rabbit sticks, and war clubs. The acorns were gathered, roasted slightly, pounded, mixed with dried meat or fat, and the mixture stored in hide containers.

12. This common shrub, mock orange (*Philadelphus microphyllus*), is found especially in the southern parts of Mesa Verde. Many people confuse this shrub with cliff-fendler bush. Both have four-parted white flowers with similar leaf arrangements and growth patterns. However, the mock orange is smaller than cliff-fendler bush, and its lemon-like smell is more fragrant. The fruit is eaten fresh by some Pueblos.

13. Many animals affect plants in other ways than by eating leaves or fruits. This pinyon pine and the one on the right show evidence of bark damage by porcupines. Although by eating the inner bark the porcupine seldom kills the tree, the open wound can allow organisms to more easily infect such trees. If the animal girdles the trunk completely, thereby cutting off circulation between the branches and roots, then the entire tree will be killed.

The wounds here happened many years ago, and the healing processes have worked well enough that the trees seem little affected. Tree injuries heal only from the edges so that each year as new wood is added under the bark the injured area becomes smaller.

About 25 yards (23 meters) down the trail on the right side is a large juniper which has been infected with bark beetles. The common term "bark beetle" is applied to a group of beetles belonging to the family Scolytidae. On the southeast side of the tree you can see the tunnels produced by these beetles.

In nature all things have controls. If the porcupine damaged too many trees, sooner or later his food supply would be depleted and some of his species would die of starvation. Coyotes, bobcats, martins, and other animals in turn are natural enemies of the porcupine and prevent his species from becoming too plentiful. Both porcu-

piners and bark beetles aid in thinning out excess trees. This system of controls is a necessary part of a well-coordinated pattern in nature.

14. This shrub, mountain mahogany (*Cercocarpus montanus*), is quite common throughout Mesa Verde. Since it grows on shallow soils in the canyons and on the mesa tops, it is helpful in preventing erosion. It also provides an excellent browse for deer. The small, inconspicuous flowers have no petals. The seed has a long, spiral plume which aids in wind dispersal. In late summer the entire shrub takes on a silver look from these plumes.

The Navajo and some Pueblos make a red-brown dye for wool and leather from the stems and root bark of the mountain mahogany. The Hopi use the wood for making their weaving battens and combs. Other Pueblos powder the leaves with salt. This powder is mixed with water and taken as a laxative.

15. From this point there is a good view of the canyons. The area vegetation varies from the mesa top forests to the near desert conditions of the lower canyon bottoms. These low areas were not suitable for agriculture but did yield clay for mortar and pottery. In addition to a variety of grasses, the canyon bottoms are dominated by big sagebrush and greasewood.

The talus slope below the trail has various species of plants characteristic of these dry, rocky slopes. Shrubs such as bitterbrush, mountain mahogany, serviceberry, yucca, and skunkbush sumac help secure what little soil that does exist on the slope.

16. Below the trail is a species of oak which is rare to Mesa Verde. Shrub live oak (*Quercus turbinella*) is common to the evergreen shrubby or chaparral vegetation in New Mexico and Arizona. Here it is restricted to a few small groups in dry rimrock sites. The smaller leaves which prevent water loss help adapt this oak to the arid conditions.

17. The silvery-green shrub to the right of the marker is big sagebrush (*Artemesia tridentata*). Not only is it an important plant of the canyon bottom floodplains, it is also dominant in scattered stands on the mesa top where the soil is deep, fertile, and free of alkali. Early pioneers identified soil quality by the growth of sage

brush, and today it is considered a good indicator of prehistoric dwelling sites. Many Indians use this abundant shrub for fuel. A "tea" is made from the leaves which is said to be a cure for coughs, colds, and indigestion.

To the left of the marker is skunkbush sumac (*Rhus trilobata*), one of the most common shrubs at the base of cliffs and on ledges of moist side canyons. The plant has a strong odor, especially if you rub one of the leaves and then smell your fingers. The shrub is not poisonous even though it is closely related to poison ivy. The five-parted, small, yellow flowers appear in early spring before the leaves develop. The fruit, a berry, is sticky, reddish, and acid to the taste. Birds and wild animals eat these berries. Modern Pueblos eat the berries fresh, grind and mix them with other food, or make them into "lemonade". Indians use the twigs in several types of basketry and in the construction of cradles. The buds have certain medicinal qualities and are used as deodorant or perfume.

18. This plant, Mormon tea (*Ephedra viridis*), is common in the southern part of Mesa Verde and is well adapted to the canyon slope environment. Its leaves are merely small scales or bracts which act as an aid in conserving water. The stems contain chlorophyll to make food. Mormon tea has separate male and female plants, the one here being male. About 30 feet (9 meters) ahead on the left is a female plant. Compare the male and female cones.

Mexicans, Indians, and early Mormon pioneers brewed a tea from the stems of this plant. Medicinally the tea was used in the cure of venereal diseases, kidney infections, stomach troubles, and coughing problems. It contains a high percentage of tannin which the Indians used in tanning animal skins.

19. Notice the axe grooves at about eye level on this flat rock. The Anasazi used stone for tools since they had no metals. They made axe heads out of hard rocks, sharpening them by rubbing the stones on sandstone. These axe grooves are the result of such processes.

20. Look closely at the ends of some of the branches on this juniper tree. The interesting growths, or galls, are called "juniper

stars". A midge (a frail, two-winged fly resembling a tiny mosquito) lays its eggs on the tip of the branch. The eggs hatch into larvae which are housed in the gall. Eventually they mature into adults and emerge from the gall. The gall resembles a cancerous growth, and some research is being done to see why it occurs.

Across the trail are some gambel oak. At times "oak apples" can be found on the branches and leaves of the oak. These galls are produced by cynipid or gall wasp (a small, four-winged, ant-like wasp).

21. In front of the marker about 3 to 10 feet (1 to 3 meters) above the trail you can see evidence of cross bedding. When sediments were being deposited, the ocean currents caused them to be laid down in layers across one another at different angles. Then these sediments were cemented and compacted into sandstone, thus preserving the cross bedding.

22. Cliff fendler bush (*Fendlera rupicola*) is common in the canyons but is particularly abundant in the shrub zone of the north rim. This plant closely resembles mock orange yet can be distinguished by the stem-like base of the petals and the eight stamens (mock orange has many stamens). The large, four-petaled, white flowers are easily recognized in the spring. They bloom later and do not have the sweet odor of the smaller mock orange flowers.

23. Along the cool, moist base of the cliff you can see poison ivy (*Toxicodendron radicans*). Poison ivy has an inconspicuous, five-petaled flower which develops into a yellowish-white berry. This plant is readily identified by the shiny green leaves with three leaflets. Inflammation and blistering of the skin develop after contact with the plant. However, many animals eat the leaves and fruits with no ill effects.

24. Pictograph Point is the largest and best known group of petroglyphs in Mesa Verde. The panel is misnamed because pictographs are painted on rock whereas petroglyphs are carved into the rock. The Anasazi stood on the ledge and chipped the design through the exterior desert varnish to the light sandstone beneath. In 1942, four Hopi men from northeastern Arizona visited

Pictograph Point and interpreted some of the glyphs. The following text gives their interpretation. See drawing on rear cover.

- a. "Sipapu", the place at which the Pueblo people emerged from the earth (Grand Canyon)
- b. Eagle Clan symbol indicating a separation of that clan from the other people and settlement near their point of origin
- c. Mountain Sheep Clan symbol denoting that clan's separation from other migrating people and their settlement some distance from the others' travel route (Tradition says this clan "dropped off" in the vicinity of Shiprock, New Mexico.)
- d. Parrot Clan symbol telling of that group taking up residence at some distance from the Mountain Sheep Clan
- e. Two interpretations:
 - 1) Horned Toad Clan symbol denoting the locations of their split from the migrating Pueblos
 - 2) "Lizard spirit" (specifically the green collared lizard) symbol whose influence upon the people led them into a period of wandering without direction — almost approaching lunacy
- f. The "whipping kachinas" who "straightened out" the people and gave direction to their later travels
- g. Two interpretations:
 - 1) The actual end of migration — Mesa Verde
 - 2) The "prophesied" end of the migration — modern Hopi villages
- h. Two interpretations:
 - 1) Mountain Lion Clan symbol
 - 2) Representation of an "all-powerful" animal spirit watching over the people in their travels
- i. Whipping kachinas "influencing" the people as represented by the figures marked "j"
- j. Representations of the Pueblo People
- k. Kachina Clan symbol

These are modern day Hopi interpretations and may or may not have been the interpretations given them by the "rock artists" who

produced them.

25. From this point you get a good overview of the Mesa Verde geology. The geologic story began about 100 million years ago during the latter half of a period referred to as the Cretaceous. At that time the entire area was covered by a shallow sea. Conditions in this sea were similar to those in the present day Hudson Bay or Gulf of Mexico. This ancient sea was continually receiving sediments from the streams that emptied into it. Slowly, over thousands of years, the level of the sea raised and lowered several times.

Sometime during this period the Mesa Verde area was deep under water with the shoreline far away. Very fine sediment settled at this time, and when this fine material was compacted and hardened by the weight of later deposited sediments, it became the Mancos shale. Later the sea advanced again depositing coarse sands such as you can see on our modern beaches. These sands hardened to become the Point Lookout sandstone (older and lower) and the Cliff House sandstone (younger and higher).

At still other times the sea receded to the north leaving a section of swamps and bogs similar to those around Louisiana today. Just as the present Mississippi River occasionally overflows its banks and deposits layers of mud, silt, and sand, so did the rivers of that ancient time. As the plants of the thick swamp growth died and fell to the bottom of the swamp, they were buried along with the sediments. This sedimentary and organic material hardened and formed the series of rock strata known as the Menefee formation. The rich organic portions of the Menefee formed low grade bituminous coals, the silts and mud formed shale, and the sands formed sandstone.

The formations described above are the only ones that can be seen in the Mesa Verde today, but other formations that were deposited before the Mancos shale lie beneath it. Moreover, even above the Cliff House sandstone some layers were deposited, but they have all been removed by erosion. At the close of the Cretaceous, about 60 million years ago, the sea left this area and never

returned. Slowly, over a period of hundreds of thousands of years, all of the Southwest began to rise higher and higher above sea level and was broadly warped into low domes and depressions. Intermittently for the next 60 million years these crustal movements of the earth continued — a process still in progress today. Throughout this time the raised areas were eroded with the resulting materials being deposited in the eroded areas. This erosion roughly kept pace with the crustal deformation.

Sometime recently, probably only about a million years ago, the Mesa Verde assumed its present flat tableland appearance. All of the formations above the Cliff House sandstone had eroded away, and the mesa surface took on its southward tilt. However, the deep canyons that you see today had not been formed. Water from rain (probably much more abundant than today) and melting snow and glaciers gathered into intermittent streams which flowed down the gently sloping mesa emptying into the ancient Mancos River. Weathering and erosion slowly deepened these southward flowing, parallel channels until they became the present canyons. For the past few thousand years change has been slow due to very little crustal movement and reduced precipitation.

26. In the upper branches of the juniper tree in front of you is an example of juniper mistletoe (*Phoradendron juniperinum*). The ecological relationship shown here is parasitism. The mistletoe sends root-like structures into the branch and receives nourishment from the host juniper. The fruit is a sticky whitish berry. The seed is “shot” out as the berry bursts and can carry a considerable distance. The sticky seeds are also carried by birds to other trees. Pueblo Indians eat the mistletoe berries when other foods become scarce. The Hopi use the berry as a coffee substitute and as a medicine for stomach disorders. A similar species, dwarf mistletoe (*Arceuthobium campylopodium*), parasitizes the pinyon pine, especially in the southern parts of Mesa Verde.

27. From this point the trail winds through the pinyon-juniper forest which is referred to as a “pygmy forest” due to its lack of tall trees. Here plant associations are typical of the semi-arid South-

west regions where precipitation averages between 15 and 20 inches (38 and 50 cm.) and elevation ranges from 5000 to 8000 feet (1500 to 2500 meters). The understory of shrubs, cacti, and other plants is also characteristic. Mountain mahogany, bitterbrush, serviceberry, gambel oak, yucca, rabbitbrush, etc., are found throughout this forest in varying degree. The mesa top soils are composed of loess, a wind-blown red soil from the southwest, and of residual sandy soil formed from the weathering of local sandstone. At this location the soil is quite rocky, but much of the mesa top soil is deep and fertile — perfectly suitable for the Anasazi agriculturalists.

Naturally the plants of the pinyon juniper forest do not exist without a close relationship to many animals. Various mammals, birds, reptiles, and insects are an integral part of this environment and utilize plants for food, home, and the like. This intricate balance of nature helps to preserve every inhabitant of the area.

28. Utah juniper was a very important plant to the Mesa Verde Anasazi. The shaggy bark of the tree was used as roofing material, as stuffing in sandals for wintertime warmth, and even for stuffing pillows. Modern Pueblo people daily use the bark as tinder and kindling material. The wood itself is used for bows, fuel, and recently for fenceposts. The Navajo make a green dye for wool from the juniper leaves. Many Pueblos gather the green berries. They mix these fruits with chopped meat, put the mixture into deer stomachs, and roast it in coals. The berries, which have the taste of gin, are used in other ways to season meat. The Zuni parch the berries and grind them into meal.

29. Here you see some typical plants of the warm, dry Southwest. Cactus and cactus-like plants have thick, fleshy stems, leaves reduced to spines, and a waxy covering. These adaptations prevent the loss of water. Their roots are shallow so that they can absorb moisture immediately before it can evaporate or run off.

To the right of the marker is hedgehog cactus (*Echinocereus coccineus*). This cactus is common throughout the rimrock areas of Mesa Verde. Its violet-purple blossoms are abundant in the spring. The Hopi collect the cactus in the spring and dry it for use as sweeten-

ing. The Navajo eat the fresh fruits of several species, but according to legend this particular species is poisonous. They say, "It makes your heart feel as if it were twisted". This species is used medicinally as a heart stimulant.

To the left of the marker between the small juniper and the yucca are prickly pear cacti (*Opuntia polyacantha* and *Opuntia phaeacantha*). The large yellow flowers appear in spring and early summer. The blooms last only a short time, resulting in a cylindrical, greenish-yellow or reddish fruit. Among practically all the Pueblos the fruits are gathered, the spines are removed by rolling or burning, and the fruits are then eaten. Both modern and ancient Indians harvested the fleshy stems. These are eaten raw, roasted, stewed, or dried and ground into meal. The Navajo use the fruit to make a pink dye for wool.

30. Broadleaf yucca (*Yucca baccata*) is a very common plant of Mesa Verde and the Southwest. It is often mistakenly referred to as a cactus although it is actually a member of the Lily family. Its cactus-like characteristics enable it to survive arid and semi-arid conditions. The Pueblo Indians found a great number of uses for the yucca. At Zuni the fruits are pared and eaten raw. They also make a conserve of the fruits. Its roots can be used as soap which gives it the common name, soapweed. The Navajo treat many diseases by bathing a patient in yucca-root suds which have been placed in sunlight. It is used by all the Pueblos for making garments, rope, twine, cordage, baskets, mats, and sandals. Central leaves are gathered, folded into a bundle, and dropped into boiling water. Juniper ashes are added, and the leaves are peeled and chewed. Then the fibers are separated and tied into bundles for later use.

31. This juniper tree indicates evidence of sapsucker work. The lines of holes drilled through the bark are done by Williamson's sapsuckers (*Sphyrapicus thyroides*) and the yellow-bellied sapsucker (*Sphyrapicus varius*), members of the woodpecker family. These birds nest in the high mountains but are migrants here in the spring and fall. They obtain food by drilling through the bark into the

cambium, the soft conductive tissue immediately under the bark. The cambium and sap make up a small percentage of the total diet, while ants, other insects, and various plant material make up the bulk of food the sapsuckers need.

32. Notice the open bare areas in this part of the forest. This lack of vegetation is characteristic of lower elevations receiving less precipitation and of areas like this with a southern slope where water runoff and drying are rapid. The vegetation is spaced due to the lack of water, with most of the understory occurring in the shade of the trees. The roots of the trees grow out beneath the open areas to collect what moisture does soak in. Most of the plant life in this forest is dependent for ground water on the winter snows that melt slowly and soak in rather than the brief summer showers that tend to run off quickly. Research indicates that winter snows were the important factor in growing successful corn crops for the Anasazi. Modern dry-land farming practices support this idea.

33. Snowberry (*Symphoricarpos oreophilus*) is a common underbrush along the north rim and in shady side canyons but is uncommon in the drier pinyon-juniper forest. This plant is easily identified by the light bluish-green leaves which are situated opposite one another on the stem. The small, pink, bell-shaped flowers appear in pairs in the spring and early summer. These produce white berries containing two bony seeds. These berries remain on the bush for a long time. Deer browse the plant, and birds eat the berries.

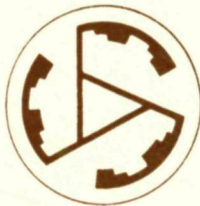
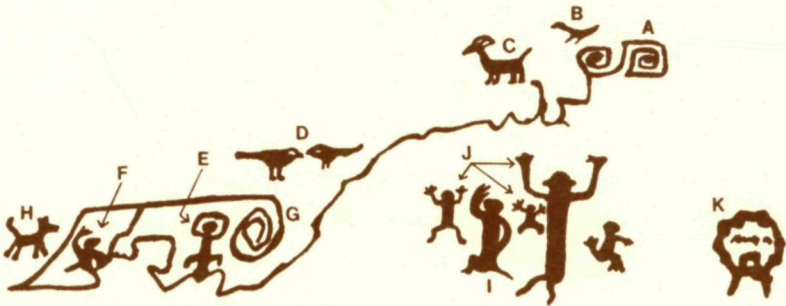
As you continue along the trail you will notice the abundance of dead wood lying about the forest. Dead plants are composed of matter which is needed by future generations. The National Park Service policy is to protect the environment in its original state. Dead trees are normally left in the forest and serve as homes for birds, squirrels, reptiles, and many insects. These organisms, along with fungi and bacteria, break down the wood and return the needed minerals to the soil. These logs also help retain the soil and prevent erosion. The decayed matter makes the soil more water-absorbent.

34. Although squaw apple (*Peraphyllum ramosissimum*) is rather rare on this part of Mesa Verde, it is common to abundant near the north rim and on clay slopes of the Mancos shale formation below the east escarpment. The pink apple-like blossoms appear in spring, and by mid-August the very bitter fruit is ripe. It is not known how Indians might have used this fruit, but a "wild crab apple" preserve can be made from it. This shrub along with others you have seen on this trail make beautiful ornamentals. In our need to conserve water we should select these plants which are adapted to the semi-arid environment. Pinyon pine and juniper require very little water and yet develop into excellent ornamental trees.

"...Man (the Anasazi) certainly rose well above the other animals in his ecological complex but still lived in fairly close association to them and to the other elements in his surroundings. Seven centuries later we exact more controls over our environment yet still face problems of overpopulation, decreasing resources, and social, political, and religious troubles as did the Anasazi of Mesa Verde..."(Robert H. Lister, *Environment and Man in Mesa Verde*, Naturalist, 1969).



PETROGLYPHS



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