

A photograph of a person standing near ancient stone ruins under a large rock overhang. The person is on the left, looking towards the ruins. The ruins are made of stacked stones and are partially covered by the overhang. The foreground has some green plants.

Island Trail

**WALNUT CANYON NATIONAL MONUMENT
ARIZONA**

PRICE: 15 CENTS IF YOU TAKE THIS BOOKLET HOME



Looking up canyon from the "Island"

NATIONAL PARKS AND MONUMENTS

Walnut Canyon National Monument is one of more than 250 areas administered by the National Park Service, U. S. Department of the Interior. These include such magnificent scenic areas as Grand Canyon and Yosemite National Parks and other Parks and Monuments set aside for their scenic, scientific, and historical values.

In order to preserve the Parks and Monuments for the enjoyment and inspiration of future generations it has been necessary to prohibit hunting, grazing, mining, woodcutting, and other such activities which would destroy the handiwork of nature. We hope you will join with us in protecting Walnut Canyon National Monument by taking only pictures and inspiration and leaving only footprints and goodwill.

There are practically no records of poisonous snakes at Walnut Canyon. In summer the Arizona mountain king snake with colorful black, white, and orange-red bands may be seen. It is harmless, however, and must not be disturbed.

KEEP AMERICA BEAUTIFUL!

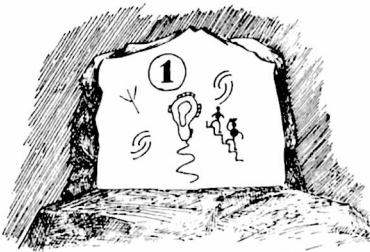
Cover picture courtesy of Petley Studios.

THE ISLAND TRAIL

WALNUT CANYON NATIONAL MONUMENT

This self-guiding trail leaves the observation terrace and drops 185 feet by ramp and stairway to the "Saddle." From there the trail is comparatively flat, and completely encircles the "Island" at the level of the ruins. You will visit and see more than 100 of the 400 small cliffdwellings in Walnut Canyon.

Follow the numbered markers. The trail is five-eighths of a mile round trip and takes about 50 minutes.



1. General view. Here the canyon makes a large horseshoe bend. In this small section, and particularly around the Island in front of you, occurs the heaviest concentration of prehistoric cliffdwellings in the canyon.

Note the different types of vegetation on each side of the canyon. On the north side (or southern exposure) grow desert plants typical

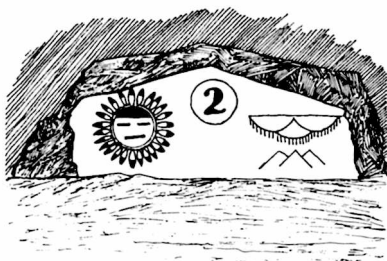
of southern Arizona. On the other side are plants common at higher and colder elevations.

Walnut Creek, which formerly flowed along the bottom of the canyon, was dammed in 1904 to form Lake Mary, and is now Flagstaff's water supply; otherwise, there would be a running stream in the canyon today. The early Pueblo Indians no doubt picked the canyon for their homes because it had permanent water.

The trail now descends to marker No. 2, at the saddle. The trail is safe but steep, and there are several flights of stone steps; be very careful in your descent.

To insure your safety and to preserve the unspoiled beauty of this National Monument, as well as protect its archeologic structures, the following rules and regulations must be observed:

- Picking flowers, throwing rocks, molesting wildlife, or collecting specimens of any kind is prohibited.
- All travel into the canyon is limited to the main trail, and visitors must not hike off the trail for any reason.
- If you smoke, be very careful on the trail. A carelessly dropped cigarette stub or match may start a bad fire.



2. Looking down canyon (to your left) is a graphic view of the geologic formations exposed in Walnut Canyon. On the opposite page are sketches showing how the canyon was formed.

1. Two hundred million years ago this area was a vast flood plain near sea level, where shifting sands formed extensive dunes. These sands now make up the

Toroweap Formation, the oldest rock layer exposed here — the twisted, crossbedded sandstone rising from the canyon floor.

2. Later this flood plain was submerged, and for countless centuries was the floor of a large, shallow body of water called the *Permian Sea*. The calcium carbonate deposited on the floor of that sea now makes up the *Kaibab Formation*, or upper half of Walnut Canyon. It contains many marine fossils.

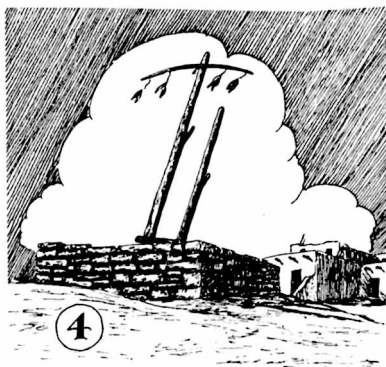
3. Ages later, this entire plateau was gradually lifted from sea level to its present elevation. Streams draining the land began cutting channels to the sea. The uplift, coupled with stream-cutting action, formed many canyons such as this. Erosion carried away overlying deposits and began to widen the canyons. Softer strata (eroding more rapidly than the harder ones) formed caves and overhangs like those occupied by prehistoric Indians here in Walnut Canyon.

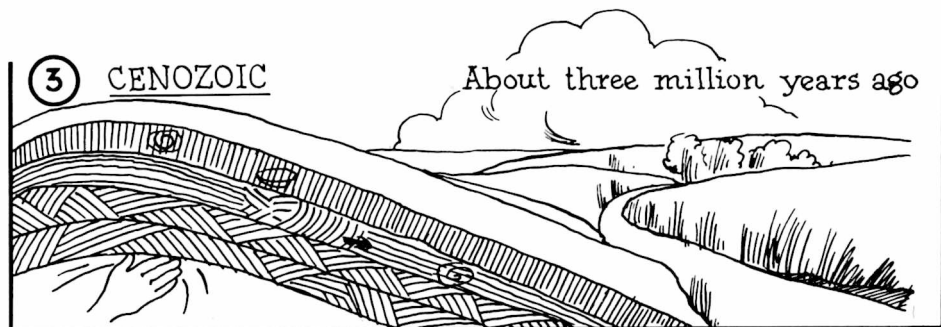
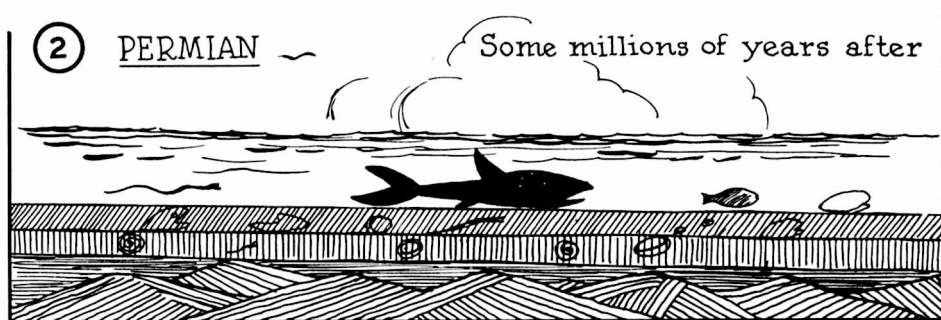
4. The San Francisco Mountain volcanic field became active, spreading lava flows in all directions. The latest eruption was that which occurred about A. D. 1065.

3. Although not the best preserved of the ruins you will visit, this once was an extensive string of rooms. Tree-ring studies have established dates of occupancy at about A. D. 1120. The cliffdwellings in Walnut Canyon were abandoned between A. D. 1200 and 1300.

Near the center of the room is what remains of an ancient fireplace —almost obliterated, so please do not walk on it. From here numerous rooms may be seen on this side of the canyon and directly across.

4. Ponderosa pine (*Pinus ponderosa*). The needles occur in groups of three and are 5 to 11 inches long. These trees may live up to 500 years and are considered the most important forest tree in the Rocky Mountain region. Modern Pueblo Indians use ponderosa pine for their kiva or ceremonial ladders (see sketch). Hopi Indians





How the canyon was formed

attach the needles to prayer plumes to bring cold. The needles are also smoked ceremonially.



5. Douglas-fir (*Pseudotsuga menziesii*). This tree requires more moisture than is found on the south slopes of the canyon. The wood is harder, stronger, and more durable than pine. Douglas-firs are conspicuous on the cool slopes facing north, while pinyon and juniper are dominant on those facing south.

The boughs of this tree are used by Pueblo Indians today in ceremonies and dances, particularly by the Hopi, who travel long distances to collect fir branches for their collars in Kachina dance costumes. They believe that the color of the needles in early spring will foretell growing conditions for the coming year. It probably had similar uses among the cliff dwellers.

6. This overhanging ledge furnished an ideal house site, although apparently was never used as such. Perhaps the women gathered here in the shade on hot days to chat and grind their corn or make pottery. Undoubtedly Indian children have played in its cool protection.

These ledges were used by prehistoric Indians because they afforded good watertight roofs for their homes. The recesses were formed by differential weathering and exfoliation. Moisture seeps into the cracks behind the surface of the softer layers of limestone, then freezes, expands, and cracks off thin layers of rock.



7. Blueberry elder, "elderberry" (*Sambucus glauca*). The blue-black berries of this plant are eagerly consumed by birds and small animals and no doubt were eaten by early Indians. Nowadays the berries are used in making jams, jellies and pies.

8. This site once contained four rooms, of which only a few walls are left. Notice that the vegetation here is different. You are on the west side of the Island, which receives little sun, is colder, and has plants found in the great forests of the northern United States. In just a few more steps you will emerge into a desert climatic zone.

9. These are the best preserved ruins on the trail. Some restoration has been done around the doorways, using a dark mud to distinguish it from the original. The black soot deposit on the ceilings is the result of using pitchy pine for firewood. If you look closely at the inside walls of this room you will see the handprints of the women who plastered it—prints placed there long before Columbus landed in America. Do not touch the walls, for the handprints are delicate and might crumble easily.

Note the smoke-blackened rocks in the wall. They show that the stones were re-used from an earlier dwelling, probably constructed on this same site. Fifteen feet down the trail from this marker you will see a T-shaped doorway, which gave access to the room, and was easily covered during cold weather with a skin or mat. Note the small opening above the door. The fireplace was built near the center of the room and smoke escaped through this hole. Each room probably housed a family of four or five, and may seem small, but most of their day must have been spent outside.



10. Blue yucca, datil (*Yucca baccata*), also known as "soapweed" and "Spanish bayonet." This plant was most important in the economy of the early cliff-dwellers. It furnished them food, shelter, and clothing. Yucca is pollinated by a small moth whose larvae feed on seeds. Indians prized the fruit, buds, flowers, and stalks for food, and used its fiber for baskets, mats, cloth, rope and sandals. Leaves were sometimes laid across rafters or vigas in buildings and covered with mud for roofs. The root makes good soap. (See page 6).

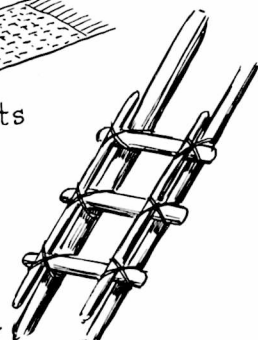
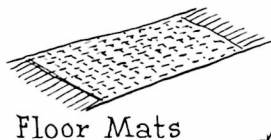
11. In construction of houses women did much of the work, including plastering and possibly the laying of stones in mortar. Men helped with heavier "hod-carrying" duties. Women also took care of the home, made pottery, and helped farm. The men hunted, wove, farmed and managed religious ceremonies. As with their descendants, the present-day Pueblo Indians, they were probably matrilineal, i. e., the children followed the mother's clan.

The hollowed-out stone against the wall is a metate (meh-TAH-tay) or grinding stone.

FOOD



SHELTER



Nets and Snares
for catching Birds
and Animals
for Food

CEREMONIAL
OBJECTS



YUCCA



SOAP



CLOTHING



Sandals



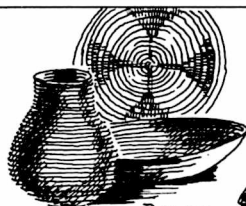
Robes made of
Yucca fiber and
wrapped with
rabbit fur or feathers



Loincloths



UTILITARIAN OBJECTS



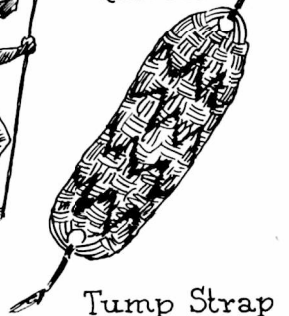
Baskets, Bags



Quivers



Burden
Baskets



Tump Strap

12. Joint-fir or "Mormon tea" (*Ephedra viridis*). This shrub can withstand great drought and grows in many dry places throughout the Southwest. A pleasant, though bitter, tea may be brewed with the leaves, which contain tannin. "Mormon tea" is used medicinally by practically all southwestern Indians.

13. Little is left of these rooms but rubble. Most of the damage was done by vandals. Portions of only two walls are standing, but directly across the canyon from this point you may see a dwelling in an excellent state of preservation. Originally the walls were covered with plaster so that none of the masonry was visible. Apparently the balanced rock on the rim above this room did not frighten the Indian builders. Rooms built on two separate levels of the cave to the left of this site gave it the appearance of a two-story dwelling.



Balanced rock above room

direct descendants of these people will be found) this plant has many medicinal and ceremonial uses. The berries are eaten by almost all kinds of wildlife.

15. Barberry, or "algerita" (*Berberis fremontii*). This plant is valued by the Hopi for tools of various kinds. The wood is very strong and makes excellent arrowshafts, spindles and battens, while the yellow inner wood makes a splendid dye. Mahonia is a good winter browse for deer.

16. Arizona walnut, or "black walnut" (*Juglans major*). This tree, belonging to the same family as the hickory and pecan, is the one for which Walnut Canyon was named. It grows usually along streams, and ranges from northern Mexico and Arizona to central Texas.

The small thick-shelled nuts are eaten by Indians of New Mexico

14. Rocky Mountain juniper (*Juniperus scopulorum*) sometimes erroneously called cedar. Bark was used to make sandals and pot rests. Digging sticks and rakes for farming were also commonly made from this wood. For the Hopi Indians (among whom the nearest



Barberry

and Arizona, and by nearly everybody else with patience enough to crack the hard, black shells and pick out the rich and delicious nut meat. Navajos used to make a golden-brown dye from the hulls, with a lighter brown dye from young twigs.

Rodents eat many fallen nuts, and store many others. Seldom does a new plant start, and even then barely appears above ground till the roots have "established to their complete satisfaction" that they have soil and moisture enough for a young tree!

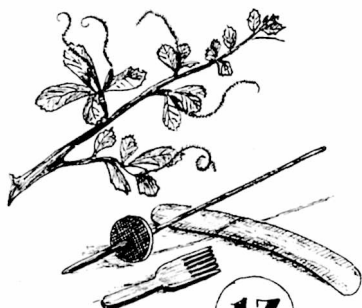


Arizona walnut

16

17. Birchleaf cercocarpus or birchleaf mountain-mahogany

(*Cercocarpus betuloides*). The wood of this plant was utilized for various implements such as combs and battens for weaving. Its dry wood makes a very hot fire with little smoke. A decoction of the roots when mixed with juniper ashes and powdered barks of alder makes a red dye commonly used for dying leather.



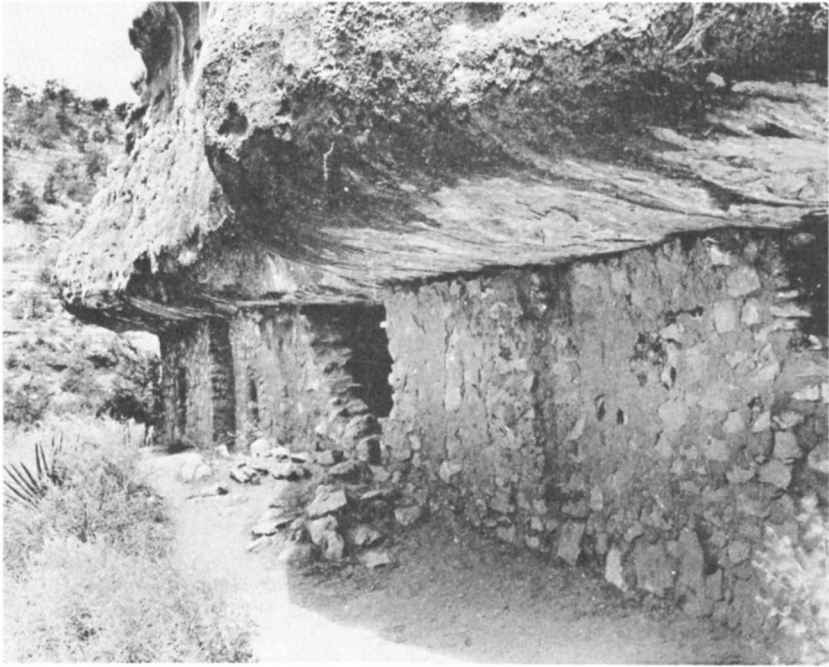
17

Birchleaf cercocarpus

18. You are now about to begin your climb back to the museum, a climb of 185 feet. We suggest you stop occasionally to rest, enjoy the scenery and read the paragraphs that follow. At the museum a park ranger is on duty the year around to protect this area for you, to explain outstanding features, answer questions, and direct you to other Indian ruins and scenic areas of the southwest. He will consider it a privilege to answer your questions.



This booklet is not included in your admission fee but is loaned for your use while in Walnut Canyon as a public service by the Southwestern Monuments Association. We hope you have enjoyed it. Please drop it in the collection box when you leave or you may purchase it for 15 cents if you wish to take it home.



Prehistoric Indian ruins in Walnut Canyon

GENERAL

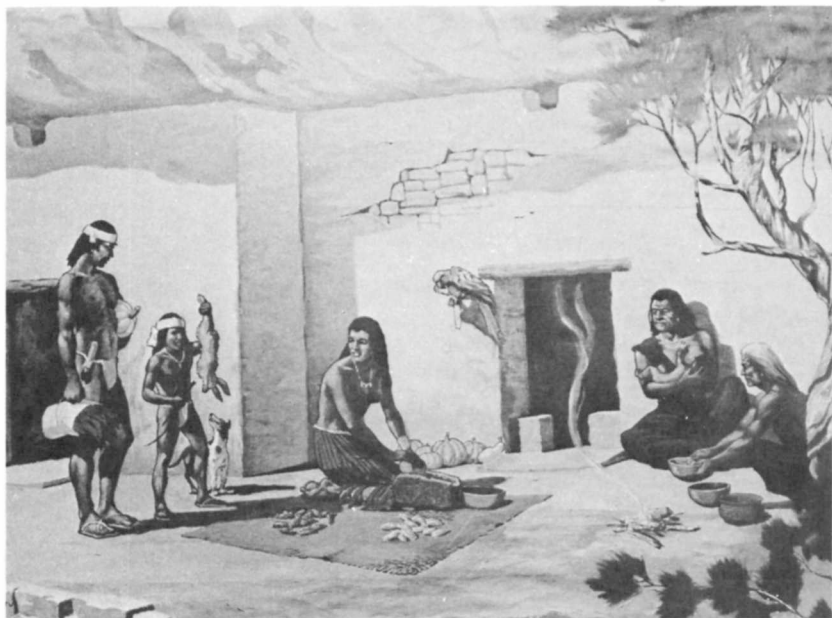
Walnut Canyon National Monument was established by presidential proclamation November 30, 1915 to protect the ancient cliff-dwellings of a departed people. These remains are of great educational, ethnological, and scientific value and the National Park Service preserves them as nearly as possible in their original state.

The cliff dwellings were known to early pioneers in this area and in 1883 were visited by James Stevenson of the Smithsonian Institution. For many years the main road from Flagstaff to Winslow, now Highway 66, ran within a few yards of Walnut Canyon and brought numerous visitors, even in horse and buggy days. Careless digging in Indian ruins, "pot hunting," was then a popular pastime, and the ruins at Walnut Canyon were almost destroyed by thoughtless vandals seeking relics.

In 1921 Dr. Harold S. Colton, former director of the Museum of Northern Arizona, made a survey of the cliff dwellings in Walnut Canyon and located 120 sites, which include more than 400 rooms. Perhaps not all the rooms were occupied at the same time but conservative estimates place the maximum prehistoric population at 500 to 600 people.

WHY DID THEY LIVE HERE?

A permanent stream undoubtedly existed in Walnut Canyon when the Indians built their homes. The canyon is about 400 feet deep and the Indians lived half way down its walls. This required a lot of



Painting by Jay Datus in the Walnut Canyon Museum

arduous climbing whenever they went for water, to gather firewood, to cultivate the fields, or to meet any of their daily needs.

It appears that the choice of homesites here was guided mainly by the existence of the natural caves, which might explain why the Indians selected this particular part of the canyon rather than some spot a few miles up or downstream. Here, too, the main canyon could be entered from a side canyon leading in from the north and emerging practically on the level where most of the cliffdwellings are found.

Not only was there water and natural shelter in Walnut Canyon, but there was tillable land beyond the canyon rim where crops would mature without irrigation. The average annual precipitation is about 20 inches and the crops seen from Highways 66 and 89 depend upon rainfall. The cliffdwellers were farmers, as shown by the remains of beans and squash, and the corn cobs found in their homes. Several varieties of corn and beans were grown.

THE CLIFFDWELLERS AS FARMERS

Soil near the canyon rim is too shallow and rocky to produce good crops, but by traveling 2 or 3 miles to the north you may find soil deep enough to retain moisture. Here seeds could be planted with a sharp stick and tended with a stone hoe. No doubt the cliffdwellers had summer camps near these fields where dark-eyed watchers maintained constant vigil to keep away animals and enemies. What a struggle it must have been to raise crops without benefit of steel tools, fences, insecticides and other advantages now taken for granted!

The Indians farmed at the upper limit of elevations where corn, beans, and squash may be expected to mature in a growing season of

115 days. Since they had no weather bureau, they may have observed the vegetation, like eastern Indians who watched the oaks until their first leaves were as large as a red squirrel's foot. That was the time to plant. However, there must have been unseasonal frosts such as occurred on August 15, 1949, when present day farmers in this vicinity found their crops severely damaged. That is when the Indians needed a reserve supply of seed for next year's planting.

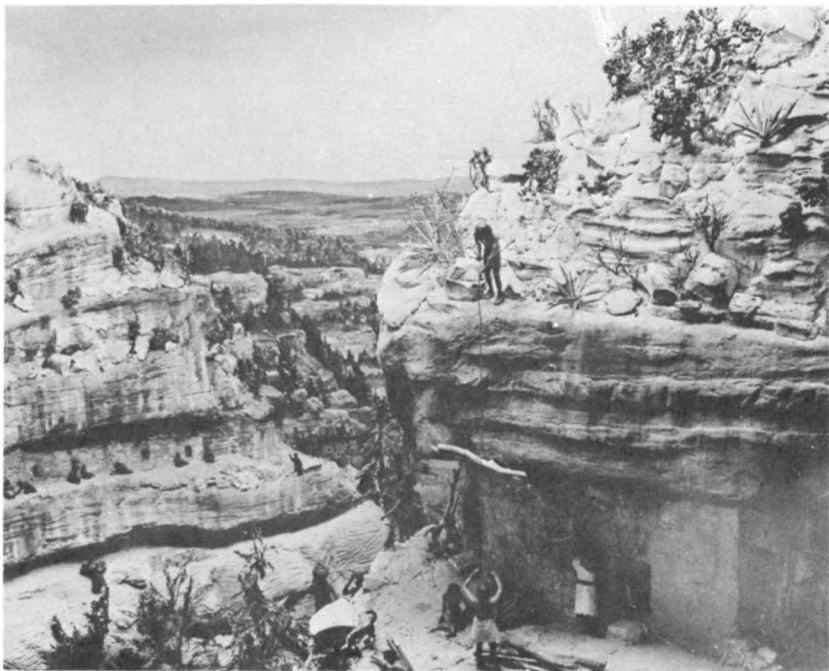
Sunflower seeds were also found in the dwellings, but whether these were cultivated or gathered from wild varieties still abundant in this vicinity is not known.

An understanding of the cliffdwellers' farming activities may be approached by studying the Hopi Indians who live on a reservation about 70 miles north of Winslow, Arizona. Most families have a farm or garden plot where corn, beans, and squash are still the principal crops. At Hotevilla, terraced gardens are built on a hillside, each with an embankment around it to retain moisture. This produces a waffle pattern when seen from above. Some Hopis walk 4 or 5 miles each day to cultivate their fields, then return home with the setting sun.

THE CLIFFDWELLERS AS GATHERERS

Wild fruits in this area include grapes, blueberry elder and currant. Also wild potato is sometimes found in the canyon bottom; the tubers are small, seldom as large as small cherries. These may have been eaten with a seasoning of clay, as is the Hopi custom of today. This salty clay counteracts acid which would otherwise make the

Diorama in the Walnut Canyon Museum



foods inedible. Walnut Canyon produces several annual plants which can be boiled and eaten as greens. These include spider flower or beeplant, lambsquarters, and several types of mustard

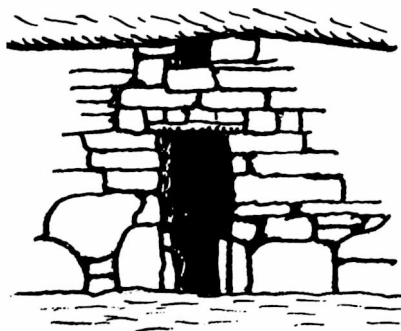
THE CLIFFDWELLERS AS HUNTERS

Among the trash heaps left by these ancient people, archeologists find bones of deer, pronghorn, turkey, rabbit, and various waterfowl. Present day visitors are often delighted to see deer or pronghorn along the approach roads to Walnut Canyon and occasionally turkeys are observed. These are native wild turkeys, which in some parts of Arizona are found in considerable numbers.

Animals found here and considered good food by living Indians include coyote, wolf, fox, dog, bobcat, porcupine, beaver, badger, squirrel, gopher, kangaroo rat and woodrat or "pack rat."

CONSTRUCTION OF A HOME

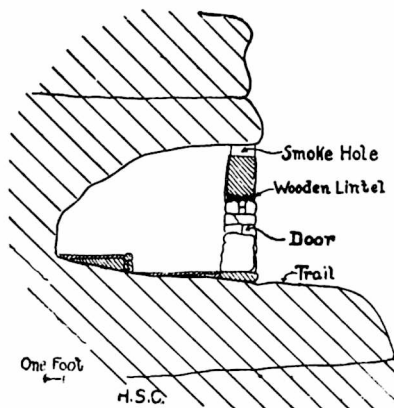
Once the family had selected a cave, they did very little to enlarge it. Most of the cliff cavities are shallow and extend back into the rock no more than 10 to 12 feet. The cliffdwellers closed these cavities with masonry walls and partitioned off the rooms. Walls were constructed from chunks of limestone laid up to form a double wall with the straight faces turned to the outside and the center filled with rubble. They used mud for both mortar and plaster. Because of humus and foreign matter in the soil there is little suitable material on the canyon ledges. However, a layer of clay is found about 100 feet above the stream bed which, when pulverized and mixed with water,



Door of a cliffdwelling showing smoke hole

produces a satisfactory mortar and plaster.

The rooms vary in size, according to the space available, with an average of 170 feet of floor space. The outer wall was set back far enough under the ledge so that rain water running down the cliff would drip outside the wall. The floors were made from hard-packed clay, used in sufficient quantity to produce a fairly level surface. Some rooms examined in 1948 were found to have as many as 10 thin layers, none of which exceeded three-eighths of an inch in thickness.



Section of cliffdwelling

The back floor was sometimes higher than the front, forming a slightly raised platform or bench.

Little wood was used in construction. There were pole lintels over the doors, and apparently a few pegs set into the walls for supporting garments or other paraphernalia.

Construction tools included stone axes, hammers, and picks. In those tools that were hafted, a groove was made three-fourths of the way around the stone to retain a stick bent in the shape of the letter J and lashed to form a handle.

COOKING

Firepits found in most of the dwellings were usually directly in front of the door 4 or 5 feet inside the room. Smoke vents were placed above the door at the top of the wall against the cave roof. Not all the smoke found its way out since the walls and roofs of many rooms are still heavily smoke-blackened. However, there seems to have been a definite attempt to develop circulation of air by adjusting the size of the smoke vent and the door opening.

Fires were kindled with a wooden spindle rotated on a hearthstick until friction ignited tinder underneath. The spindle might have been made from barberry, the hearthstick from yucca, and the tinder from shredded juniper bark.

Walnut Canyon's early inhabitants used clay pots for cooking vessels. These were placed directly over the fire and were able to withstand considerable heat. Some cooking may have been done over a flat rock (or *comal*) used as a griddle, and other foods could have been broiled over the coals.

They had very little seasoning. Salt was obtainable from the Verde Valley near Montezuma Castle, 65 miles to the south. Salt, likely an item of barter, was eagerly sought, and instead of being found in the daily diet it may have been used almost like a confection.

For sweetening they may well have used agave ("century plant"), cactus fruits, or dried squash.

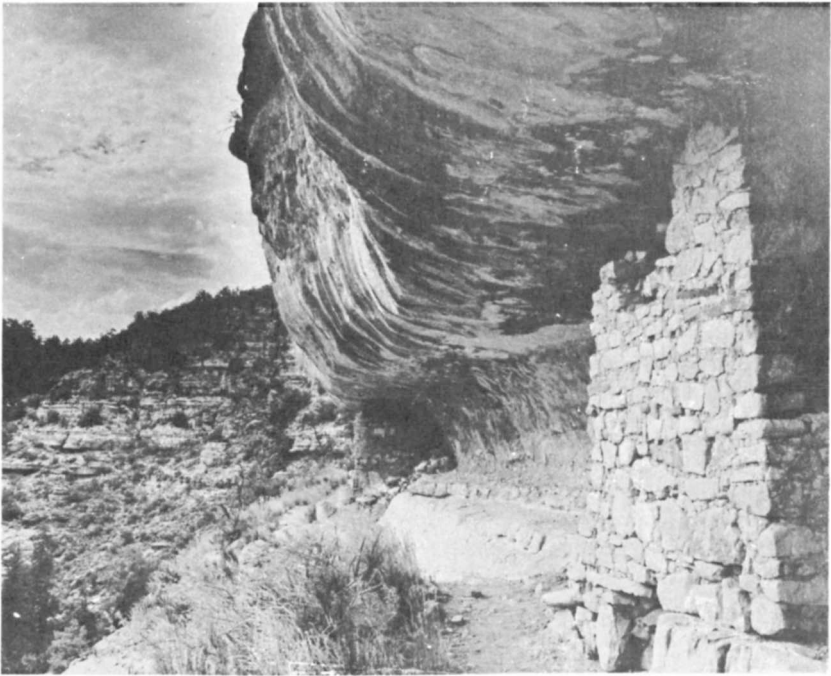


WHO WERE THE CLIFFDWELLERS?

Pueblo Indians are distinguished in the southwest by a combination of three culture traits; the construction of communal houses, the practice of agriculture, and the making of pottery. All these were exhibited by the cliffdwellers in Walnut Canyon. Archeologists designate them as the Sinagua (see-NAH-wah), and place them in the period which marked the zenith of the prehistoric pueblo culture. There are no kivas in Walnut Canyon. The masonry is usually not coursed, perhaps because of the rough building material available.

WHY DID THEY LEAVE?

Forces which may have worked to displace the cliffdwellers were drought, enemy raids, and disease. One of the most probable causes of abandonment was drought. The Sinagua may have found it



Natural weathered caves were ideal housing sites

necessary to augment their water supply by making earthen dams along the lower sides of natural pools (particularly downstream, where the canyon broadens). With only a slight decline in annual precipitation the stream would have failed entirely in early summer and disrupted the entire community.

Tree-rings reveal that 23 years of drought prevailed in the Southwest from A. D. 1276 to 1299. It appears that the Walnut Canyon cliffdwellers were gone before that time, and may have been displaced by an earlier drought of less duration.

The cliffdwellers are not a vanished race. Their blood flows in the veins of living Pueblo Indians. The Hopi are said to have legends which indicate their ancestors once lived in cliff caves. Hopi Indian visitors sometimes comment on the cliffdwellings being the homes of their ancestors, and there is some evidence to support this. Hopis are the same basic type which inhabited Walnut Canyon. Studies made of cliffdwellers' remains reveal that they were a short, stocky people much like the Hopi, whose average height is 5 feet 6 inches.

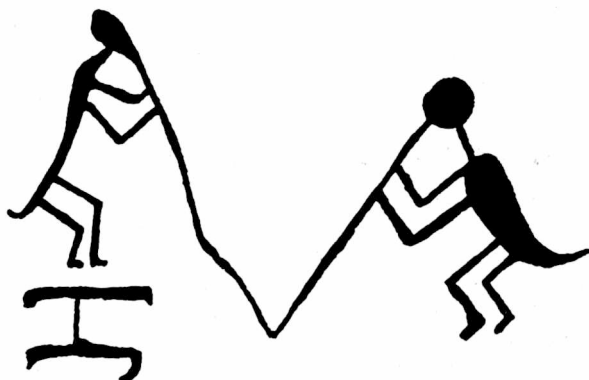
ARTS AND CRAFTS

In addition to pottery making, these Indians did some weaving and basketmaking. They were acquainted with cotton textiles, and since cotton would not mature at this elevation, they had to trade for raw cotton or the finished products. We do not know the full details of what style clothes were worn, but we are sure they adorned them-

selves with shell beads, pendants, armlets, paint of several colors, and jet buttons.

Turquoise was possessed by some of them. The nearest known sources are many miles distant, where it was mined from solid rock with stone and wooden tools. Shells were imported from points as distant as the Gulf of Lower California over trade routes that have been well defined.

Petroglyphs are rare here, perhaps because of the absence of smooth stone on which to work. Rock pictures have been found at only one spot in the bottom of the canyon.



*Petroglyph cut on the walls of Walnut Canyon,
below the "Island"*

Some families may have possessed macaws, since such bones were found in other prehistoric dwellings not far away. Bones of various owls were uncovered in Nalakihiu, a ruin near the Citadel in Wupatki National Monument, but only hawk bones were found in the Winona ruins near Walnut Canyon.

WILDLIFE

Your visit to Walnut Canyon can give you only a hint of the vast amount of wildlife in this area. The Monument is forested primarily by ponderosa pine, pinyon, and juniper. A wealth of wildflowers grows along the trail: paintbrush and yucca in spring, penstemon, cliffrose and fernbush in summer, goldenrod and snakeweed in the fall.

The birds you will see over the canyon, especially during a summer visit, include turkey vulture, violet-green swallow, and raven. Back in the woods or along the trail live a great variety of birds, with jays, nuthatches, titmice, juncos, crossbills, goldfinches, and sparrows often seen. Lizards, all of them harmless, are often found in summer on the museum terrace or along the trail.

Animal life includes deer, pronghorns, and an occasional elk, bear, or mountain lion; bobcats, coyotes, foxes, badgers, skunks, and many of the smaller animals such as rabbits, squirrels and chipmunks.

HOW TO REACH WALNUT CANYON

The entrance road to Walnut Canyon National Monument is an oiled highway 3 miles long, connecting with U. S. 66 at a point $7\frac{1}{2}$ miles east of Flagstaff.

The northern Arizona plateau country has many interesting scenic and prehistoric features. Sunset Crater National Monument, 15 miles north on Highway 89, contains a weirdly beautiful volcanic landscape, with fumaroles, spatter cones, ice caves, and lava flows. Twenty miles farther north is Wupatki National Monument, a large area protecting many prehistoric Indian villages.

Navajo National Monument and Canyon de Chelly National Monument are both areas of inestimable scenic grandeur as well as of prehistoric interest. Both are located far from the beaten path and local inquiry should be made about trips to these and other areas in the Navajo and Hopi Indian Reservations.

CONSERVATION — YOU CAN 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 alining yourself with one of the numerous conservation organizations which act as spokesmen for those who wish our scenic and historic heritage to be kept unimpaired "for the enjoyment of future generations."

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

The National Park System, of which Walnut Canyon National Monument is a unit, is dedicated to the conservation of America's scenic, scientific, and historic heritage for the benefit and enjoyment of the people.

**NATIONAL PARK SERVICE
George B. Hartzog, Jr., Director**

**This booklet is published in cooperation with the National Park Service
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SOUTHWESTERN MONUMENTS ASSOCIATION**
*which is a non-profit distributing organization pledged to aid in the
preservation and interpretation of Southwestern features
of outstanding national interest.*

The Association lists for sale many interesting and excellent publications for adults and children and hundreds of color slides on Southwestern subjects.

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

- FLOWERS OF THE SOUTHWEST DESERTS.** Dodge and Janish. More than 140 of the most interesting and common desert plants beautifully drawn in 100 plates, with descriptive text. 112 pp., color cover, paper.....\$1.00
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