VISIONS FROM CANYON WALLS

Petroglyphs and Pictographs from the Pinon Canyon Maneuver Site

By Lawrence L. Loendorf

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PREFACE

Archaeological and historical sites on the Pinon Canyon Maneuver Site are protected by federal laws; theft and vandalism are federal crimes. Artifacts should be reported to the appropriate officials and never collected.

The significant sites on the PCMS are protected from inadvertent damage by Army activity. Sites are not developed for public visitation and site location information is not given out. Many of the same kinds of sites, including the world-famous dinosaur trackway, are located in the Picketwire Canyonlands and public visits can be arranged through the U.S. Forest Service, Comanche National Grasslands in La Junta, Colorado.

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VISIONS FROM CANYON WALLS

Petroglyphs and Pictographs from the Pinon Canyon Maneuver Site

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Illustration by Hannah Hinchman and Linda Olson
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ACKNOWLEDGEMENTS

Most people think that archaeologists make their living digging in the ground. They do, but they also spend hundreds of hours studying their findings and writing scientific reports. These reports are usually full of complicated terms and lingo that make sense to other archaeologists but are hard for the general public to understand. To solve this problem, archaeologists are starting to write about their work in more reader-friendly language and make their reports available to a broader public audience. This small book is one example. It is written for the soldiers who train at the Pinon Canyon Maneuver Site and for others who visit the area's rock-art sites.

Writing this popular book would not have been possible without Nancy Debevoise's capable editing skills and Hannah Hinchman's superb artistic talents. Thanks also to Steve Chomko, Mary Barber and Tom Warren of the Army's Directorate of Environmental Compliance and Management, who provided encouragement and support. The book project was made possible through a cooperative agreement between the National Park Service, the Midwest Archeological Center and the Department of Sociology and Anthropology at New Mexico State University. Melissa Connor coordinated the agreement for the National Park Service.

Linda Olson of the Art Department at Minot State University in North Dakota devoted countless hours to recording rock art at Pinon Canyon. Many of her excellent pen-and-ink illustrations appear in this book. Max Canestorp of the U.S. Fish and Wildlife Service was a valuable source of photos and information about the region's rock art. Others who have helped in various ways include Janet Lever, Renee Beltran and Hadley Harper.

FOREWORD

IF YOU WALK UP A CERTAIN SIDE CANYON NEAR THE PURGAtoire River on the Pinon Canyon Maneuver site, you'll find a cave. On the ceiling of the cave is a painting that shows a red-striped tepee, a dancing warrior and captured guns.

Powerful medicine men of the Kiowa and Cheyenne tribes who roamed the high plains and western mountains in the 1600s lived in "medicine tepees" like the one shown in the cave painting. The tribes' medicine men and warriors had visions and dreams of visits with supernatural beings who offered to help them in various ways. Generations of Native Americans have passed down these stories and tribal elders have shared some of them with people who are studying rock paintings and engravings at Pinon canyon. The following story is made up. It is based on information from the elders, and presented here because it explains why and how someone might have made the red-striped tepee painting.

How Sitting Bear Saved His People

The full moon glowed so brightly that it lit up the whole countryside beyond the mouth of the cave. Sitting Bear had never seen the moon shine with so much light. He looked out over the moonlit land and saw nothing moving. But he knew that powerful spirits lived and traveled in the deepest shadows that the moon couldn't reach.

Sitting Bear had been sitting at the mouth of the cave for three nights, watching the moon grow larger and brighter each night. All the time, he prayed to the spirits to visit and help him understand why his

people were losing horses and battles to the enemy.

He was stiff and chilled from sitting on the cold ground. He had no food, no water and no fire. Surely, he thought, on this fourth night, with the moon fuller and brighter than he'd ever seen it, the spirits would take pity on such a poor man. Surely, the spirits would come to him.

Suddenly, Sitting Bear heard a noise in the darkness. It sounded like a man clearing his throat or coughing, far in the distance. Then he heard footsteps and loose rocks clattering as some living thing came toward the cave. Sitting Bear could see nothing. Then he heard the footsteps again, this time inside the cave. Excitement made his skin prickle and his hair stand outward, but he was not afraid. After all, what could it do to him? He was so hungry, thirsty, cold and tired that he would surely die anyway. Maybe he was already dead and this was all a dream.

The sounds came closer. Suddenly a little man stepped out of the shadows, a perfectly formed little person no taller than Sitting Bear's knees. The little man was carrying a torch and wearing nothing but a loincloth. His arms and shoulders were hard with muscle.

Sitting Bear had heard about these little people and how strong they were in spite of their size. Others had told him they had seen a little person walk straight up a sheer rock cliff carrying a whole bull elk on his shoulders.

The little man motioned for Sitting Bear to follow him. They walked deep into the cave, and the rock seemed to pull back to let them pass. After what seemed like a long walk, they came to a large room. At the far end, several people gathered around a fire.

As the little man led Sitting Bear to the fire, one of the people offered him some water. "I am thirsty," Sitting Bear cried out, "but I cannot drink until I learn why my people are losing their battles!"

Another person offered Sitting Bear some food. "I am hungry," he cried out again, "but I will not eat until I learn why my people are losing their horses!"

Someone else offered him a place to sit by the fire, but Sitting Bear refused. "I am tired and cold," he replied, "But I cannot rest until I learn why my people have lost their power."

Finally, a fourth person leaped up and rushed toward him, his knife drawn. Sitting

Bear looked at the man and said, "Kill me if you must, but I suffer no greater death than the warriors who die among my people without knowing the reason."

Suddenly a large man stood up and held up his hand. "I am the spirit of the rock!" he said in a loud voice. Turning to the others around the fire, he said, "My brothers, Sitting Bear is a brave man. And he is not selfish. Look at him. He thinks about his people before he thinks of himself."

Turning to face Sitting Bear, the large spirit said, "I control the power of the rock. The power to make your body and your weapons as hard as the rock. I shall give this power to you, Sitting Bear, so that you can help your people turn their defeats into victories."

"You must return to the mouth of the cave," the large spirit continued, "And you must build a fire there. Let it burn down into coals. Then search the walls of the cave for a seam of yellow clay. Place four large chunks of this yellow clay into the coals. After four hours, you will find that the yellow clay has turned into bright red pigment."

Sitting Bear listened carefully. He knew each word and every detail was important. "Grind the red pigment until it is very fine," the rock spirit continued, "Then mix it with some bear grease from your medicine kit to make red paint. Return to your people, and give some of the paint to all of your warriors. Tell them to paint their bodies and their shields with it. When the warriors go into battle, their bodies will be as hard as stone and their shields will turn back the enemy's arrows and lances."

Sitting Bear nodded that he understood.

"Go now and help your people!" the rock spirit commanded. As Sitting Bear stood up to leave, the rock spirit called out, "Remember to put the red paint on your own body and shield, Sitting Bear! And paint your medicine tepee with a red stripe, to remind you of the rock's power in you!"

Sitting Bear wondered if he should paint the red stripe around the bottom of his tepee or down the side. But it was too late to ask. The little man was leading him away.

When they got to the mouth of the cave, Sitting Bear offered to pay the little man for helping him. But he refused. "For my payment," the little man replied, "you need only to leave some of the red pigment. I will go now and return later to get it."

After the little man disappeared, Sitting Bear built a fire, found the seam of yellow clay and placed several large chunks of it into the coals. Then he set out for his village to get bear

grease from his medicine bag to mix into the pigment when it was ready.

When he returned to the cave, the first thing he saw was a painting on the ceiling, glowing in the light from the dying campfire. The painting showed his tepee, with a red stripe painted around its base and a red shield hanging by the door. Next to the tepee was a picture of his brother warriors doing a victory dance. Nearby was a picture of many horses, captured from the enemy, tied to a picket line.

Sitting Bear's spirits soared. The painting was a sure sign that his people would win their battles if they followed the rock spirit's guidance.

This story helps explain what scientists recently found in the cave. In addition to the painting of the red-striped tepee, dancing warriors and captured guns, they found a seam of yellowish clay, the remains of a campfire with red-colored pieces of clay in the ashes and a stone grinding tool, called a metate.

Experts who study the art, tools and other remains of past peoples and their activities are called archaeologists. The rock paintings they study are called pictographs. Engravings pecked into rock surfaces are called petroglyphs.

Rock art is one of the most important links we have with people who lived on this continent long before white people arrived. Pictographs and petroglyphs give us a colorful glimpse of another world, a world rich with medicine men, spirit beings, warriors and wild animals.

Archaeologists are like detectives, looking for clues about the way people lived hundreds

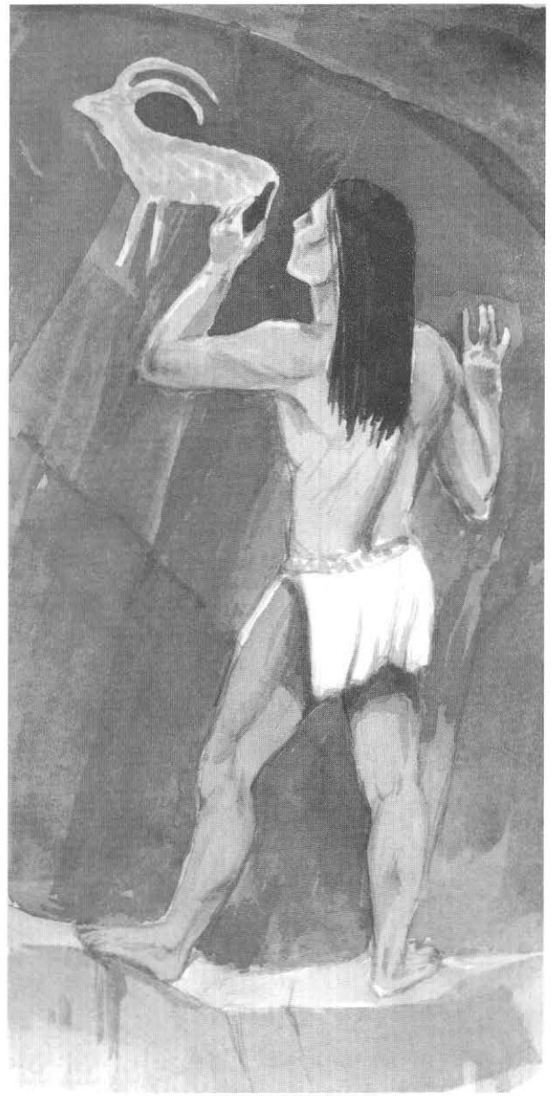
-- and even thousands -- of years ago. Rock art tells stories about these people's way of life: the animals they hunted, the plants they gathered and prepared, their spiritual beliefs and their movements from place to place as they followed the seasons throughout the year.

Since 1983, the United States Army, Fort Carson Command, has used the upland rolling areas of the Pinon Canyon Maneuver Site for training activities associated with wheeled vehicles, helicopters and other high-performance aircraft. The Army also trains special forces at Pinon Canyon. *(See map, page 17)*

Before training started, the Army completed a report called an Environmental Impact Statement. In the report, the Army promised to study and protect the area's archaeological and historical resources. As they began their work, archaeologists were surprised to find a large number of rock art sites in the region, done in a variety of types and styles. Much of the rock art was tucked into rockshelters and caves deep in the rock walls of the canyons that drain into the Purgatoire River. They found more rock art on small rock outcrops along arroyos and still more along a rocky ridge known as the Hogback.

As a result of these rock art discoveries, the Army started a program to record and protect Pinon Canyon's most important rock art. During 1988 and 1989, archaeologists conducted one of the biggest rock-art research projects ever undertaken in North America. They published the results of their studies in a number of scientific publications. The titles of their reports are listed at the back of this book, under Additional Information, and the publications in which they appeared are available through the Army's Directorate of Environmental Compliance and Management at Fort Carson.

This is the story of the people who created the Pinon Canyon Maneuver Site's rock art long ago, the people who are decoding its mysteries today and the people who are working to preserve it for future generations.



MAKING ROCK ART

THE PICTOGRAPHS FOUND THROUGHOUT THE PINON CANyon Maneuver Site are painted in shades of red, yellow, black and white. Red is the most commonly used color and black is the second most popular color. Yellow and white are less common. In other parts of the country, rock artists used blue and green paints, but no one has found paintings with these colors at Pinon Canyon.

Rock artists created their colors by mixing colored clays and minerals with animal fat to make liquid paints. They also may have mixed blood and crushed plants into the clay and minerals.

To make red paint, artists used ochre, a clay-like material that contains a reddish mineral called hematite. They created red paint the same way Sitting Bear did in the story: by putting chunks of clay containing hematite in the hot coals of a campfire and baking them for several hours.

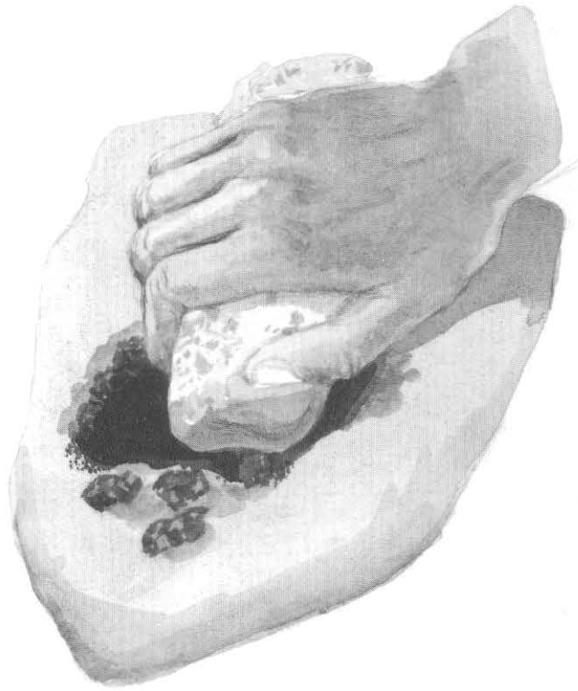
Artists made yellow paint from a mineral called limonite. To make white, they either used white clay or ground gypsum crystals into a fine white powder. For black, they used a mineral called manganese, which they found in places where water had seeped through rocks and deposited the mineral on rock surfaces. Sometimes they also used lumps of charcoal as "pencils" to draw black lines on the rocks.

Scientists recently began using instruments like scanning electron microscopes to study how artists made their paints. They've discovered that artists also used minerals like feldspar and talc as fillers to increase the volume of their paint "recipes".

How Pictographs Survive

Many pictographs have survived for hundreds of years. How could they last for so long, when our modern-day paints fade and flake from our houses and other surfaces in just a few years?

First of all many pictographs have probably faded away, leaving only those that we can still see today. In the second place, most of the the surviving pictographs were painted in protected areas such as inside caves or under overhanging rock ledges.



But the most important reason why these rock paintings have lasted so long has to do with the rocks themselves. Minerals inside the rocks mix with water as it seeps through cracks and out onto the rock surface. As the water dries, it leaves minerals on the surface that actually protect the paintings underneath, the way a coat of wax protects your car's paint.

Paintings that are lucky enough to be covered by these minerals last for hundreds of years. On the other hand, much like wax buildup, surface minerals can dull or fade the way paintings look. Eventually, the paintings might be hidden entirely by mineral buildup on top of them.

Making Petroglyphs

The artists who made rock engravings took advantage of the mineral-laden water that seeped onto rock surfaces and stained them dark brown or black. This stain or coating is called rock varnish.

Artists used rock varnish to make their carved designs stand out. They used a sharp tool, usually a pointed rock, to peck at the varnish until they cut through to the lighter-colored stone underneath. They created striped designs by cutting fine lines through the dark varnish, and made larger shapes by rubbing the varnish with a rock to remove it and expose the lighter stone below.

At the Pinon Canyon Maneuver Site, most petroglyph artists used a fist-sized chunk of hard, glass-like stone with a pick-shaped point. Archaeologists have actually found some of these tools at the base of rocks below petroglyphs, where artists dropped them when they had finished making their designs.

When you look at a large group of petroglyphs, you might think that their artists spent days--or even weeks-- creating them. But some modern-day experiments in making petroglyphs show that these engravings were fairly easy to make. Some petroglyphs may have taken several days to finish, but most probably only took a few hours.

Many people think that petroglyph artists used small bones or antlers to peck designs into rock surfaces. But experiments show that bones or antlers shatter when you try to use them as rock-pecking tools.

Dating Rock Art

Today, archaeologists use the latest equipment and precise testing methods to figure out just when pictographs and petroglyphs were made. But for many years, they relied on detective work and their knowledge of past cultures to figure out the age of rock art.

Perhaps the easiest way to date a pictograph or petroglyph is by using the clues shown in the art itself. A drawing with guns in it, for example, could not have been made until after guns started to be used in the Pinon Canyon Maneuver Site region -- about 250 years ago. The same thing is true of rock art showing horses, because artists' tribes didn't have horses until the Europeans brought them into the area in the 1600s.

Rock art with bows and arrows in it can be much older, since archaeologists know that people have been using bows and arrows in the Pinon Canyon area for about 1,700 years. Using this clue by itself obviously doesn't help archaeologists date a work of rock art, since it could have been made at any point in a 1,700-year period.

The biggest problem with relying on

clues like guns and horses and bows and arrows to date rock art is that only a few of the Pinon Canyon's rock artists used these images in their work.

Another way archaeologists can date petroglyphs and pictographs is by studying layers of rock art that have built up over time as artists drew or pecked new images on top of ones created by earlier people. This process is called "superimposition." The image on top is obviously newer than the art work underneath. But there's a problem here too, because not many rock-art images at the Pinon Canyon Maneuver Site are on top of one another.

New and More Precise Dating Methods

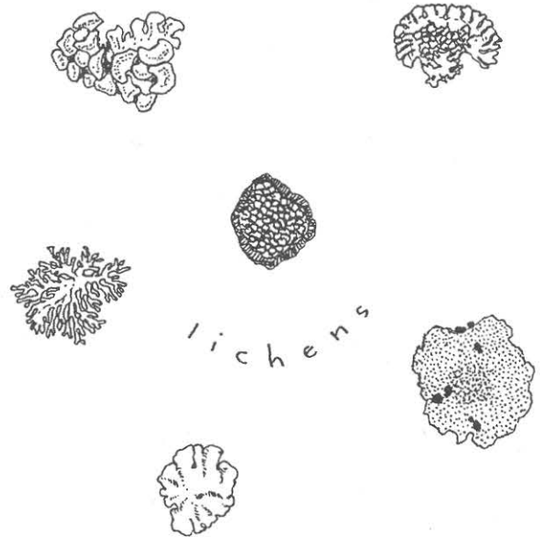
In the past 20 years, scientists have made a lot of progress in their rock-art dating work. They now use radiocarbon dating methods, which they call "C14" for short. And they use a process known as accelerator mass spectrometry, which they call "AMS," to date even very small samples of rock art and other materials. The whole testing procedure is called "AMS C14 dating."

The most famous example of AMS C14 dating is the Shroud of Turin, a burial blanket or shroud that many people believe was placed on the body of Jesus Christ. To learn how old the shroud was, the museum where it is kept allowed scientists to have a single thread of the blanket, about an inch long. This thread was then divided into four parts and used by four different dating laboratories to figure out the age of the shroud. They learned that the shroud was probably made and used at a time more recent than the life of Jesus. Even though the tests didn't confirm people's beliefs about the shroud, they did show that scientists need only a tiny bit of material to date items like the Shroud of Turin and the rock art at Pinon Canyon.

As explained earlier, pictograph paint is made of two main ingredients: pigment and a more liquid substance added to make it spreadable. Pigments like red ochre and black manganese are inorganic materials that cannot be dated. But the liquid substances that artists mixed with clay or minerals to make paint sometimes

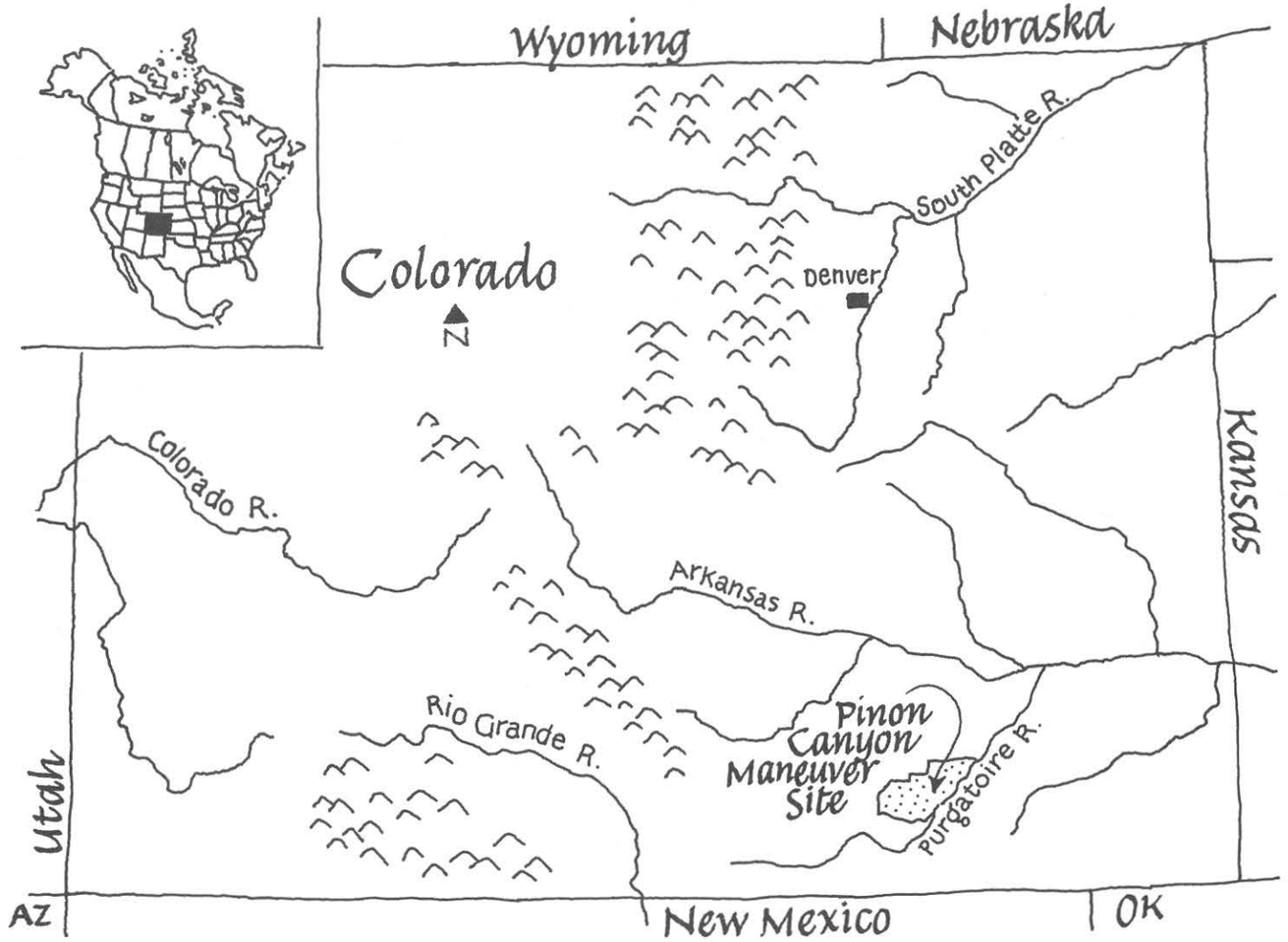
contain organic ingredients. Analysts can use this organic matter in AMS C14 dating tests.

But first they had to solve a problem: the rocks on which artists painted their designs can also contain organic matter. So scientists had to find a way to remove organic matter from the paint without also taking organic substances from the rock, which would confuse their test results.



The best method they've found so far to do this is a low-temperature process that frees the organic matter from the paint but keeps the organic matter in the rock from being released. Using vacuum equipment, analysts turn the paint's organic matter into a gas. They hold the gas inside the vacuum container until they can date it.

Dating a petroglyph is a little easier, depending on the AMS C14 dating methods used. Scientists have learned that tiny bits of lichen or other microscopic plants that live on rocks grow in pecked areas of petroglyphs. These plant bits then got trapped under the rock varnish as it gradually covered the petroglyph. So analysts can take a tiny sample of the plant matter that's been preserved under the rock varnish and that will also tell them when the petroglyph was made. The plant bits first have to be separated from the rock itself, which is a tricky process, but not impossible. Then this organic matter is tested with AMS C14 dating methods.


Wyoming
Nebraska
South Platte R.
Colorado
Denver
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Rio Grande R.
Pinon Canyon Maneuver Site
Purgatoire R.
Utah
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New Mexico
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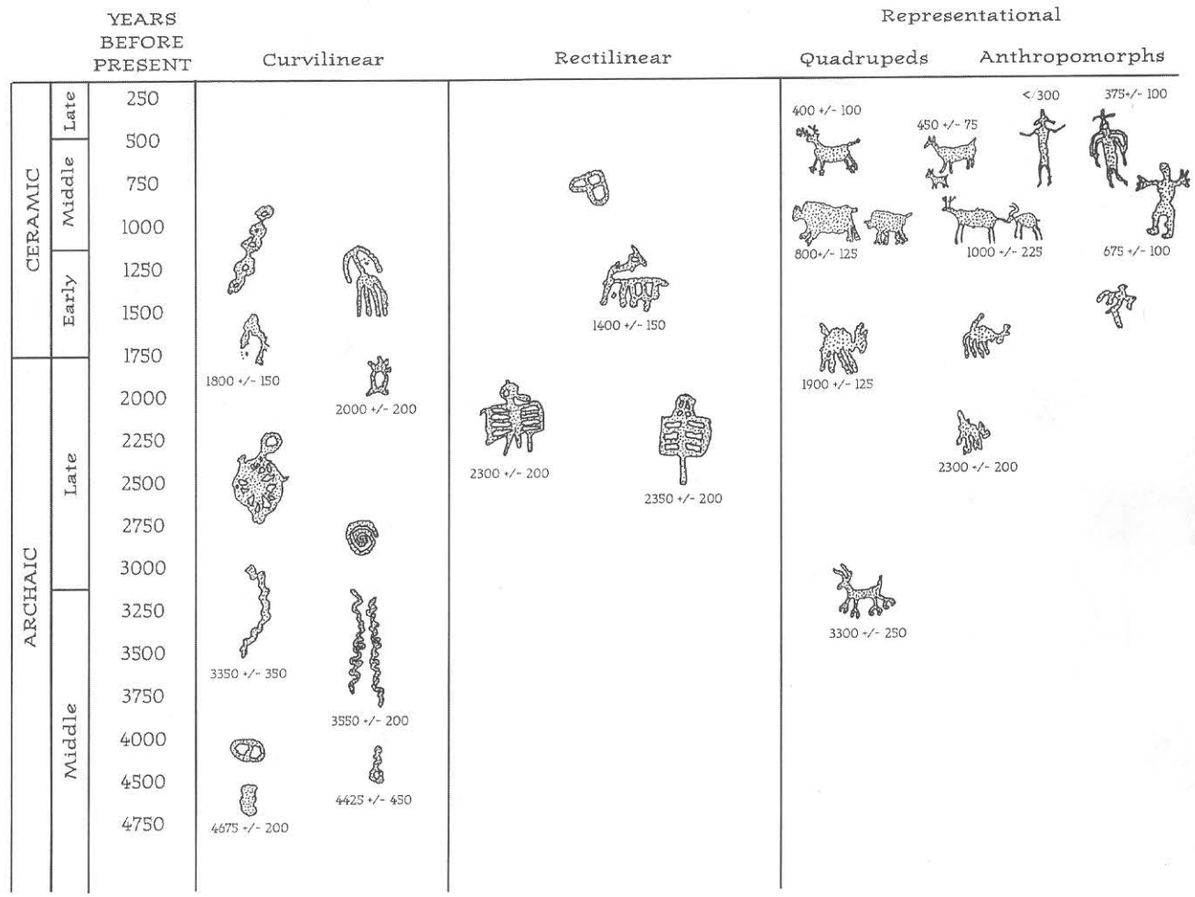
YEARS BEFORE PRESENT
Curvilinear
Rectilinear
Representational
Quadrupeds
Anthropomorphs
CERAMIC
Late
Middle
Early
ARCHAIC
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1750
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3300 +/- 250
3350 +/- 350
3550 +/- 200
4425 +/- 450
4675 +/- 200

ROCK ART IN PINON CANYON

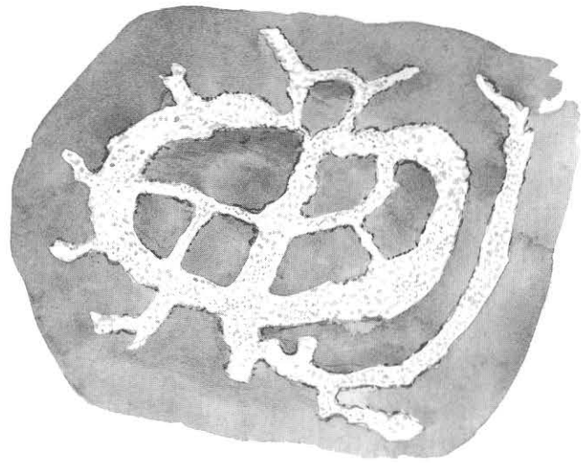
RESEARCHERS HAVE BEEN EXPERIMENTING WITH SOME promising new petroglyph-dating methods at the Pinon Canyon Maneuver Site. Using these methods, they've been able to match the site's rock art with other artifacts from different time periods.

The oldest rock art that archaeologists have found at the site dates from the Archaic period, which lasted from about 7,500 BP (before the present time) until about 1,800 BP. The most re-cent rock drawings and engravings were made by sheep herders and cowboys who spent time in the area about a hundred years ago.

Archaic Period

During the Archaic period, people lived in rockshelters and caves in the canyons of the maneuver site. They ate mostly roots, seeds, nuts and berries, but they also hunted animals, using a spear-throwing tool called an atlatl. Since archaeologists haven't found any evidence that the Archaic people killed many large animals like deer and elk, they may have relied on rabbits and other small game.

Archaic hunters made two kinds of petroglyphs. The first is called the "Pecked Abstract Style." Artists used curving, twisting lines, dots and lots of different kinds of circles: connected circles, circles inside of circles, circles with spokes inside, circles with rays coming out of them and spirals. This style of petroglyph was especially popular during the middle Archaic period, between 4,600 and 3,000 years ago.



Later, between 3,000 and 1,800 years ago, artists started using more rectangular abstract designs. These late Archaic Period petroglyphs are made up of parallel lines, lines that cross at right angles and grids.

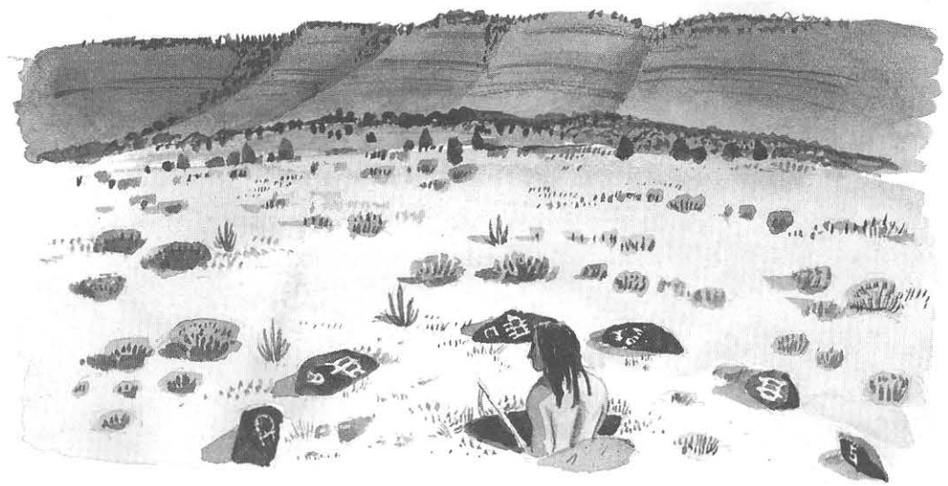
The second kind of petroglyph that artists made during the late Archaic period is called the "Pecked Representational Style." Some of these show graceful animal forms, although it's hard to tell exactly what kind of animals they represent. For example, some Archaic-period animal petroglyphs look like deer or elk, but almost none of them have branching antlers. Instead of debating exactly what kinds of animals

Archaic-era artists were pecking into rock faces, archaeologists usually use general terms like "zoomorph" for an animal design and "quadruped" for a four-legged animal.

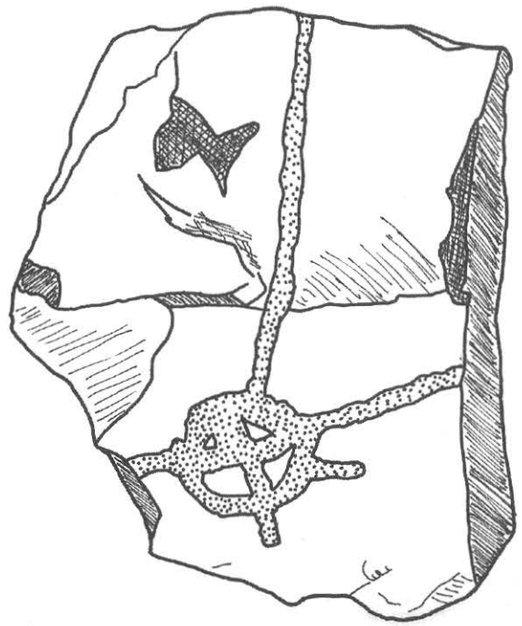
The Boulder Sites

You can see some good examples of these two petroglyph styles at a group of five sites along an arroyo at Pinon Canyon. Archaeologists call them the boulder sites because the petroglyphs are pecked into watermelon-sized rocks that are scattered over a large area. This is very unusual, since most petroglyphs were made on canyon walls, in caves or on large rock outcrops.

Because many of the boulders are small enough to be picked up, archaeologists wonder if ancient people carried them from place to place or arranged them for a special event, like a ceremony. To test this idea, archaeologists dug out a few of the boulders and turned them over to see if there were any petroglyphs on the sides that had been buried. But they found only heavy deposits of minerals, telling them that the boulders have been in the same place for a long time.



The petroglyph boulders are arranged in groups. Some are circled around small pits, about three feet deep, that petroglyph artists probably dug into the dirt. Each pit has a



dozen or more petroglyph boulders around its rim, where they could be seen by a person sitting in the pit.

Archaeologists were curious about what might have happened in the pits, so they dug into them. All they found were a few stone tools and some small bits of charcoal. But dating tests showed that the charcoal in the pits and the petroglyphs around them were the same age, so both may have been used in some kind of ceremony.

The oldest petroglyph ever found at Pinon Canyon is at the boulder sites. Dating tests show that it was made 4,675 years ago. It shows a curving, circular abstract figure, and is a good example of the Pecked Abstract Style.

If you use your imagination, some of the rectangular-grid petroglyphs made during the late Archaic period look almost human. But archaeologists haven't found any well-made human figures from this era at Pinon Canyon.

This is not the case elsewhere. Archaic-period rock art showing large human figures has been found at dozens of sites in the American Southwest.

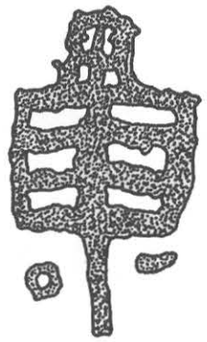
Ceramic Period

After the Archaic period comes the Ceramic period. Archaeologists working at Pinon Canyon have subdivided this era into early Ceramic (1,800 to 1,000 years ago), middle Ceramic (1,000 to 500 years ago) and late Ceramic (500 years ago to the present time). Artists who traveled through Pinon Canyon made petroglyphs throughout this period.

Archaeologists think that many people of the early Ceramic period still lived in

caves and rockshelters, but some also built rock-wall houses that were probably covered with roofs made out of brush. By the middle Ceramic period, rock-wall houses were common. Some of these houses, found in villages, have as many as 70 connected rooms.

Two rock-art styles were popular between 1,500 and 500 years ago. Archaeologists call them the "Purgatoire Pecked Style" and the "Purgatoire Painted Style." Both styles include animals and humans.



The human figures are usually shown from the front, although some are done in profile. They have knobby knees and bent arms. Toes are seldom shown, but many of the hands have fingers. Some of the figures seem to be dancing.

Both styles include a wide variety of animals. Some clearly represent animals like bears, birds and snakes. Others feature large racks of antlers and resemble deer or elk. Still others have curving horns, suggesting bighorn sheep.

Zookeeper Petroglyphs

Archaeologists have found a panel of petroglyphs on the eastern boundary of the maneuver site that shows a human figure surrounded by 46 animals, some of which are connected by a line to the human figure. Because it appears that the animals are under the human figure's control, archaeologists have dubbed this petroglyph "the zookeeper."

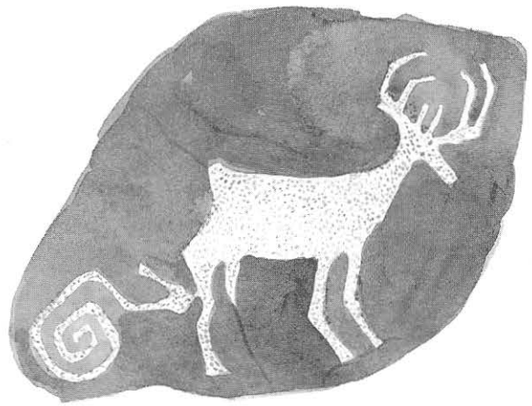
Prehistoric hunters had visions and trances about spirit animals that helped hunters in various ways. A hunter may have created "the zookeeper" as a portrait of himself and his magical animal helpers.

It's interesting to try and figure out exactly what kinds of animals the artists were trying to show. Many of them are clearly real-life animals, like snakes, while others look like imaginary spirit animals.

The animals with large, branching antlers resemble deer or elk, but those with smaller antlers or horns are harder to identify. Horns turned to the side or over the animal's back might be bighorn sheep, and maybe those with antlers pointing to the front are antelope. Those without horns or antlers might be females or young ani-

mals. Smaller four-legged animals with long tails and short snouts could be dogs, coyotes or wolves.

Archaeologists know that bison lived in the region, so there is no reason why they should not be shown in the zookeeper panel, but it doesn't look like bison are included among the panel's animals.



A petroglyph at a nearby site shows a partly coiled rattlesnake biting the back leg of a deer. Archeologists have dated this petroglyph and know it's about the same age as the animals in the zookeeper panel. This shows that rock artists who lived during the same time period were using two different styles, one fairly abstract and the other more realistic.

The Zookeeper Site is about a dozen yards from the Point Site, where archaeologists have found the remains of several rock-wall houses. By dating bits of charcoal found in the houses, archaeologists learned that people lived here from 950 to 1,000 years ago.

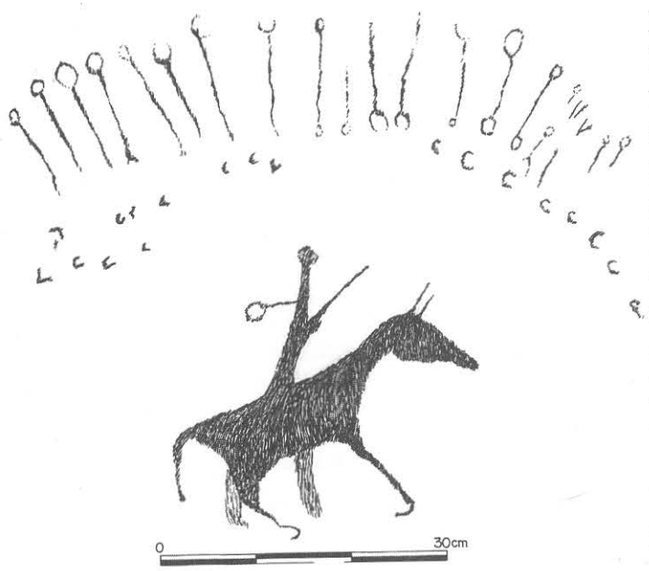
Because the sites are so close together, archeologists thought they might be related. Sure enough, they learned that the zookeeper petroglyph was between 900 and 1,000 years old.

Perhaps the hunters who lived at the Point Site used the Zookeeper Site as a small shrine where they left offerings. Or perhaps the site was a place where medicine herbs and ceremonial objects were stored. Many of the rock-art sites along the canyons at the maneuver site are tucked into small alcoves or caves, and the art is placed above rock ledges where bundles of things could have rested. The Zookeeper Site has a ledge like this below the panel of petroglyphs.

Sitting Bear Cave

Ceramic-period rock artists also painted images on the walls of caves found in the maneuver site's canyons. Inside a small cave near the Zookeeper Site are a number of pictographs painted in what archaeologists call the "Purgatoire Style."

The site is known as Sitting Bear Cave because one of the largest figures



shown in the paintings is a big black bear who appears to be sitting on his haunches. Bears have been honored by hunters and gatherers all over the world because of their power, intelligence and human-like behavior. Just like humans, for example, they can sit upright and use their front paws as hands. Both bears and people eat meat, vegetables and fruit. Both are fierce fighters and both are very smart. It's easy to understand why ancient humans respected bears and saw them as animals that offered access to power.

Other animals in Sitting Bear Cave include several groups of red-painted, four-legged animals that look like deer, bighorn sheep and antelope. These animals are much smaller than the bear, and many are placed near poorly formed human figures.

Just like in the zookeeper petroglyph, animals are clearly the stars of the Sitting Bear Cave paintings. Humans are standing among them, but they aren't chasing the animals or relating to them in any way.

Because the animals and humans shown in Sitting Bear Cave and the zookeeper petroglyphs are similar, archaeologists believe they were probably made at about the same time -- between 900 and 1,200 years ago.

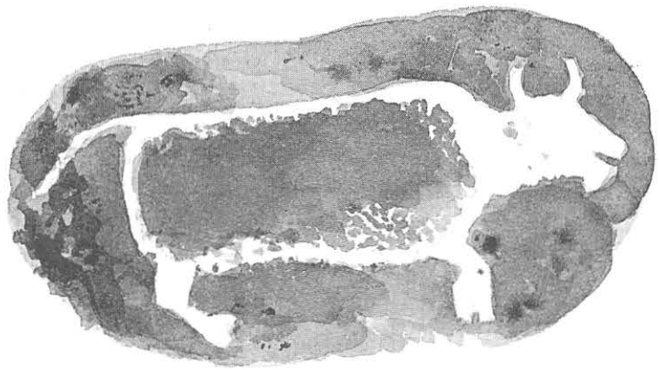
But unlike the zookeeper petroglyphs, which were all created during a century-long period, other figures were drawn in Sitting Bear Cave 600 to 700 years later

than the bear and the red-painted animals. These drawings were probably made with pieces of charcoal. Because they show horses and riders, and horses weren't brought into the region until about 400 years ago, archaeologists know that the site was used by historic Indian tribes like the Commanche, Kiowa, Ute or Cheyenne.

One of the most interesting things about Sitting Bear Cave is that some of the paintings have been damaged. Many appear to have been struck with a pointed object, which broke off chunks of paint in the process. Archaeologists believe the damage was done several hundred years ago.

There is evidence that those who struck the paintings were from the tribes listed above. Indians were known to practice "coup counting," which involved striking powerful or dangerous things with a ceremonial stick. Hitting an enemy with a lance or short stick showed bravery in the face of danger. It appears that some warriors also counted coup on rock paintings. If they successfully challenged the powerful figures shown in rock art, they would surely conquer their enemies as well.

The Zookeeper Site and Sitting Bear Cave are fascinating examples of rock art that has survived five times as long as the United States has been a country. Unless someone destroys them, these petroglyphs and pictographs, left by unknown artists so long ago, will still be there for our grandchildren's grandchildren to visit.



Late Ceramic Period

The late Ceramic period, which began about 500 years ago, marked the beginning of the end of the Purgatoire petroglyph style. The rock art from this period is beginning to change.

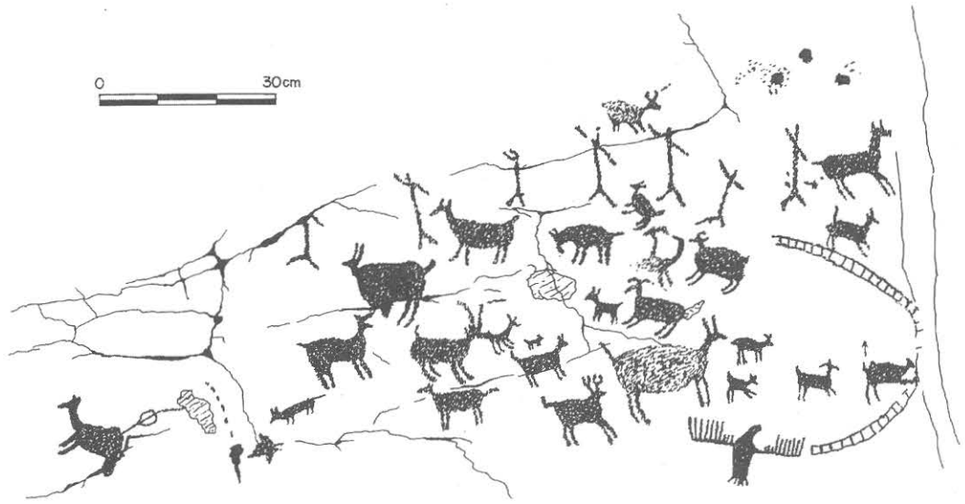
For example, some of the humans start to look more like stick-men, with less flesh or muscle on their arms and legs, although the animals continue to be well made.

Bison are the most popular animal depicted in the rock art of this period. Along with small stick-men, many petroglyphs show large bison, bighorn sheep, deer or elk, animals that look like antelope and well-made birds with spread wings.

The Corral Site

A good example of late Ceramic-period rock art at Pinon Canyon is called the Corral Site because it is set between several large blocks of sandstone that form a natural corral. In fact, a rancher from the recent past fenced off one side of the site and used it as a corral.

The petroglyph panel located on the inner side of one of the boulders enclosing the corral shows a dozen stick-men surrounding 24 animals. A grid pattern that looks like a net is in the animals' path, and it appears that the humans are hazing or driving the animals into the net. Most of the animals seem to be headed toward the net. But at least one animal is running in the opposite direction, as if it has escaped the drive, and others are turning away, as if they, too, are trying to escape. Near the



net, a large bird is standing with its wings spread, as if it is watching or even directing the drive.

Many of the animals look like bighorn sheep, antelope and deer. Although bison were the animals most commonly driven into arroyos and over cliffs on the North American plains, there are no bison among the animals shown on the panel.

Antelope are probably included on the panel because the hunters of this period captured these animals by surrounding and driving them into various kinds of enclosures, barriers or traps. George Bent, a trapper and trader who lived in southeastern Colorado in the 1800s, watched Cheyenne Indians drive a bunch of antelope into a circle of men and women who held hands to create a human barrier. The confused animals ran around and around the circle while the men clubbed them in the head as they tried to escape.

Ancient hunters also drove animals into nets made of twisted strips of rawhide. Examples of these nets have been found rolled up and stashed in crevices under rocks at sites in the northern Plains.

In this kind of hunt, one group of men and women drove a herd of animals toward a spot which the animals usually used as a place where they could escape predators. Another group of men and women would block the animals' access to this normally safe place. For example, bighorn sheep like steep, rocky areas where their sure feet and leaping ability help them escape slower, clumsier enemies. Ancient hunters stretched a net across the rocks, hid and waited for others to drive the sheep into the net. Sometimes the hunters used dogs to help them and sometimes they howled like wolves to scare and confuse the bighorns.

Archaeologists have found butchered animal bones at only one animal-drive site in the entire Pinon Canyon area. This site is a short distance from the Corral Site.

Archaeologists think that artists made the Corral Site petroglyphs to show a medicine man's magical control over animals. Perhaps the medicine man waited and prayed in the natural corral until he had a dream. In the dream, he may have had the power to fly or the ability to see where the animals were. Then he could tell the hunters where to find the animals so they could be driven into the net. Maybe the dream even gave him the power to coax the animals into the trap.

Protohistoric Period

Archaeologists use the terms protohistoric and historic for the time periods after white people started to explore North America. On the southern Plains, the protohistoric period began in the 1600s, when whites brought guns, horses and iron tools to the Indians. This period lasted for the next 200 to 300 years. Next comes the historic period, which is marked by written descriptions in diaries and journals. Written records about Pinon Canyon rock-art sites didn't begin until the 1800s, when white homesteaders moved into the area and started ranching.

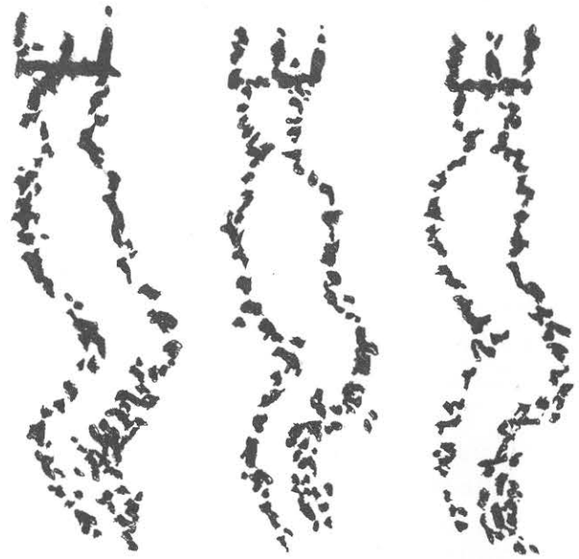
Guns and horses changed the lives of the tribes who lived in the maneuver site region. They started moving around more, hunting bison on horseback and raiding neighbors for horses.

The region's rock art changed too. In the new "Plains Biographic style," pictographs and petroglyphs show battle scenes. Bows and arrows, shields, lances, clubs and horses are easy to see in these scenes. Some of the rock art from this period shows painted tepees like the one described in the beginning of this book.

The first written accounts of the area say that the Apache people lived in the Pinon Canyon area. The Comanche, the Ute, the Kiowa and the Cheyenne people were neighbors, and the tribes

often raided one another, mainly to get horses.

Less than 200 years ago, Mexican families started to use the area to graze small herds of sheep and raise some garden foods along the river bottoms. Later, whites brought cattle into the region.



The Mountain Spirits

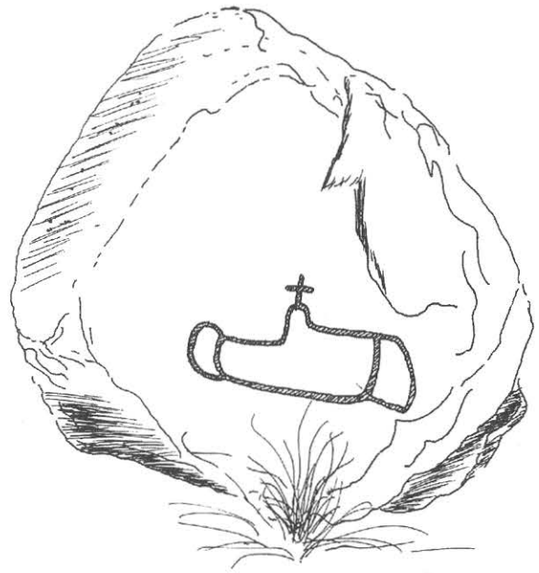
At several places in Pinon Canyon there are human-like figures that appear to be wearing headdresses that look like those of Apache mountain spirits. The Apache tell about spirits that live in the rocks, sometimes at the back of caves, where there is another world, like a lost continent. The mountain-spirit world looks very much like that of the real world, with lakes and trees and other natural features, except that they exist in a realm that only certain people can visit. The Apache explain that many of the petroglyphs found on the rocks in Pinon Canyon were put there by the mountains spirits.

Sometimes, Apache men put on costumes with headdresses representing mountain spirits and dance for hours. In these dances, the men often coax the spirits to come out of the rocks and join in the dance. When this happens, the mountain spirits will sometimes take a dancer into the world inside the rocks and teach him some magic. Petroglyphs of mountain spirits show how important these ceremonies are to the Apache.

Historic Period

Old diaries and historical records tell of Catholic priests who drew crosses and churches on the rocks near ancient rock art. They thought that petroglyphs and pictographs were pagan symbols and believed that the spiritual power of rock art had to be destroyed if they were to succeed in converting Indians to Christianity. The priests drew crosses on many of Pinon Canyon's petroglyphs.

Cowboys also drew and carved their brands on the rocks and sometimes painted pictures of their cattle, marking their sides with brands.



In the late 1800s, many of the cowboys driving cattle from Texas to Montana used a trail that came through the pass at Raton, New Mexico. When landowner Dick Wootton decided to charge cowboys a fee to

take their cattle over "his" pass, Charles Goodnight and Oliver Loving made a new route that passed just west of Pinon Canyon. Some of the cowboys who chased cows around the area spent their nights in a rock shelter along Van Bremer Arroyo. They left behind petroglyphs of their horses, their initials and their brands.

The XIT Brand

Perhaps the most famous brand was that of the XIT Ranch in Texas, which sprawled over more than three million acres. The brand was designed by a cowboy who remembered that X was the Roman numeral for the number 10, and since the ranch was bigger than 10 counties, he created the XIT, or "Ten in Texas" brand.

Cattle rustlers had a hard time changing the XIT brand into another design. But cowboys remembered a smart rustler who managed to change the brand into a five-pointed star. This worked best on cows that had been branded in a sloppy way.

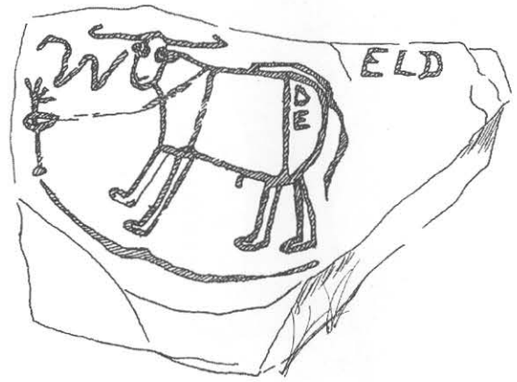
The star petroglyph in a rockshelter in Pinon Canyon was probably carved by a cowboy to show his companions how the rustler changed the XIT brand.

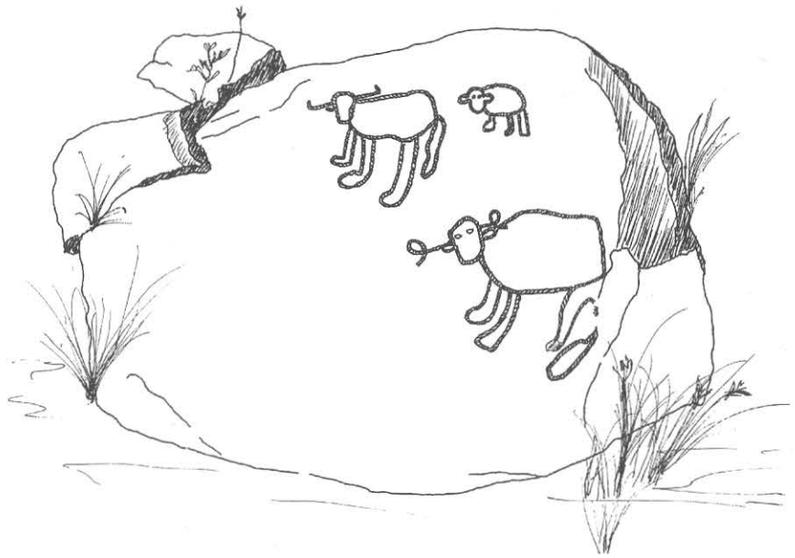
Some of the recent rock art at Pinon Canyon was probably done by lonely cowboys and sheep herders who were bored and had nothing better to do.

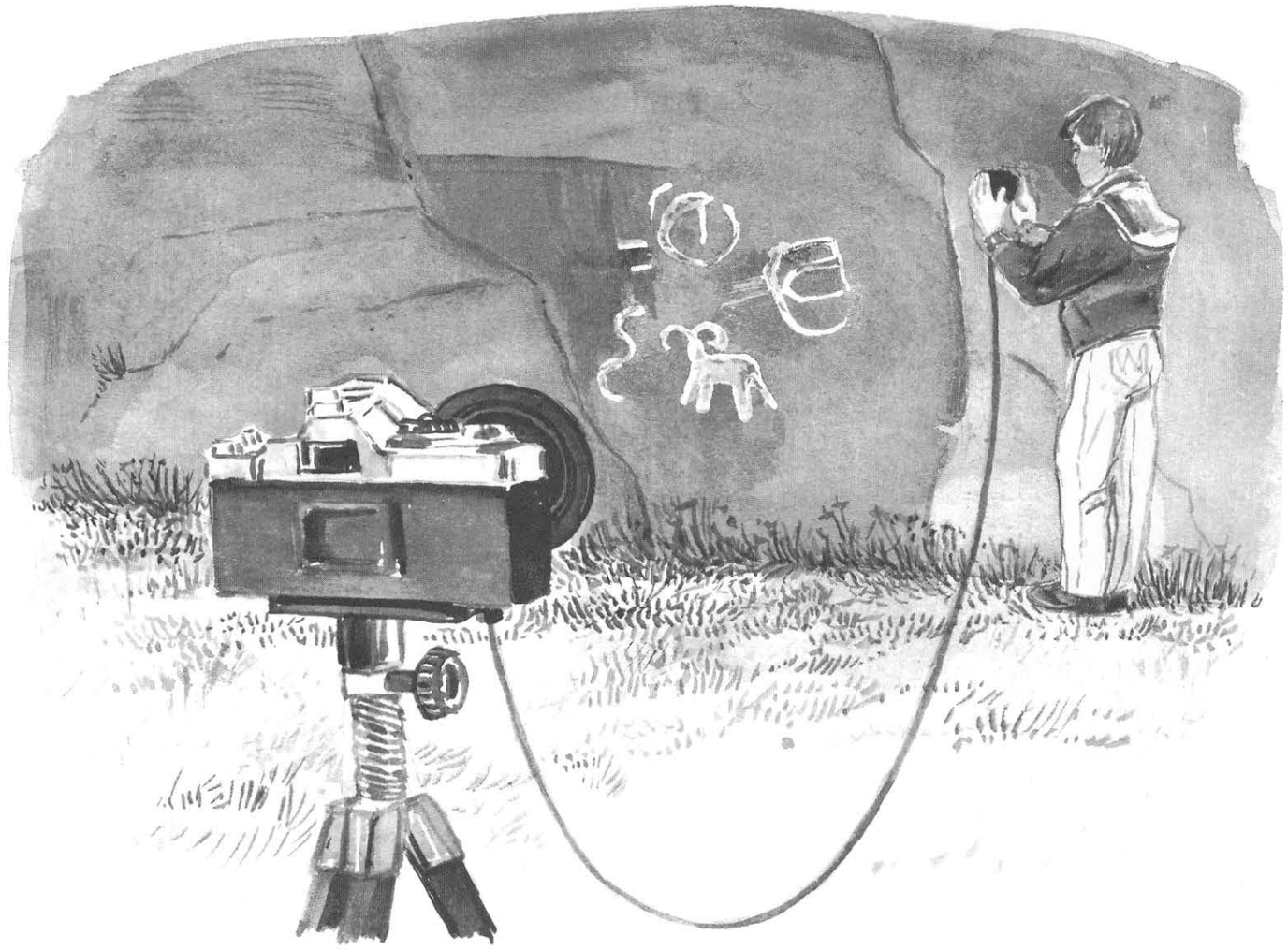
Prehistoric people, on the other hand, seldom if ever made pictographs and petroglyphs just to pass the time. Archaeologists

believe that most ancient rock art was created to describe and document the mysteries and bounty of the natural world and the magical and powerful events that inspired their spiritual beliefs.

So, while the cowboys' rock art is interesting to see, it's not a good idea for anyone who visits rock-art sites these days to draw on the rocks. With so many people working in and visiting Pinon Canyon, if everyone decided to make their mark the rocks would soon be completely covered with drawings and initials.







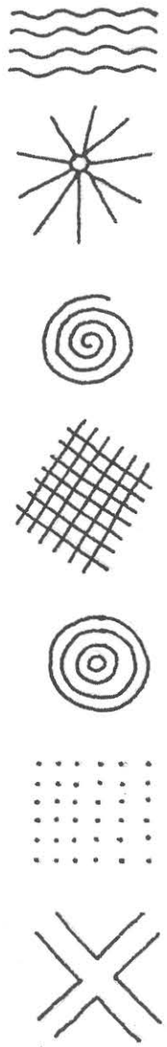
ROCK ART'S VALUE TO ARCHAEOLOGISTS

ROCK ART HELPS ARCHAEOLOGISTS LEARN MORE ABOUT the spiritual lives of past cultures. Hunters and gatherers, in particular, believed strongly in the supernatural world.

Many hunting and gathering tribes, like those who lived on the Great Plains and traveled through the Pinon Canon Maneuver Site, practiced a ritual called the vision quest. This ceremony included fasting, refraining from water and praying at a remote spot, often a rock art site, where they waited for a visitor from the supernatural world. The visitor often came in the form of an animal like a bear or an eagle. If a person was worthy, the visitor would give him special power. In return, Plains Indians honored these animals with special tributes. Painting their visions on the canyon walls was a way to pay tribute to the supernatural animal spirits.

Abstract Rock Art

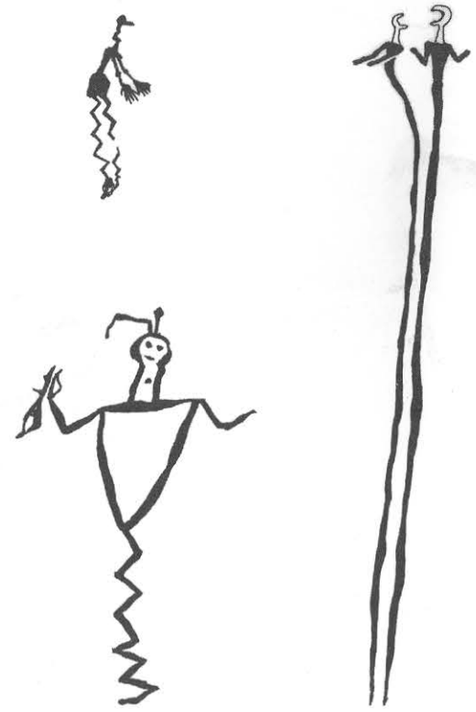
Many people wonder why so many pictographs and petroglyphs in North America seem to be abstract figures that don't look like a familiar person, animal, plant or object. Archaeologists are now starting to think that these abstract forms come from the artists' dreams or trances -- what psychologists called altered



states of consciousness.

Hunting and gathering peoples all over the world had medicine men and sometimes medicine women who got their powers from supernatural beings who visited them in dreams or visions. To bring on a vision, medicine men or women would travel to a rock art site and pray, going without food or water for days.

Low blood sugar from a lack of food or heat stroke from going without water in a hot climate can make people fall into a sort of trance that can bring on visions. Scientists have asked people what happens when they have these kinds of visions. Most people report a similar process as their visions develop. First, they see small flickering bits of light that scientists call phosphenes or entopic phenomena. You can get an idea of what this looks like by closing your eyes and pressing on your eyelids. By asking a lot of people to describe the light patterns they see, scientists have identified nine different groups of image patterns.



In the next stage of a vision, people who see these zigzag lines and groups of dots try to recognize something familiar, like an animal, in the light patterns they see.

During this stage, most people say they feel as if they are flying or

swimming, and some people say they feel like they are being sucked up in a whirlwind or down into a whirlpool. After this, people usually feel as though they are crossing into another realm where they meet supernatural spirits who help them solve problems.

What does this have to do with rock art? Archaeologists think that the abstract forms shown in rock art may portray the flickering images that come with visions.

Rock Art as Spirit Helpers

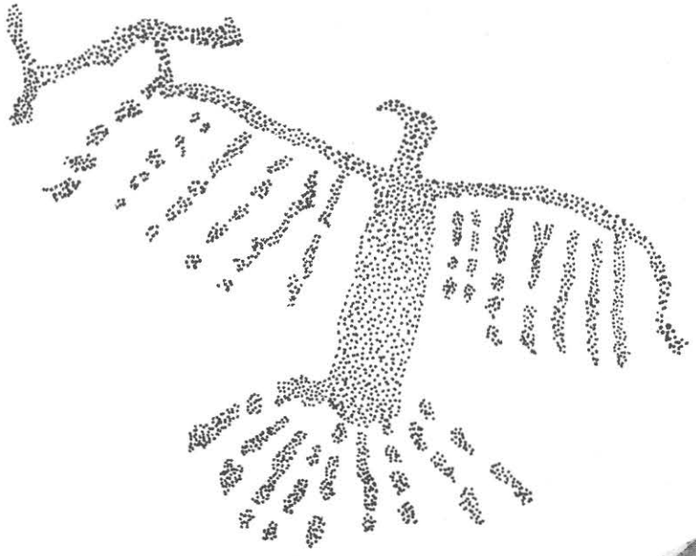
Hunters and gatherers often had animals that served as their spirit helpers. They usually got their animal guardians in vision quests or dreams, like the one described at the beginning of this book.

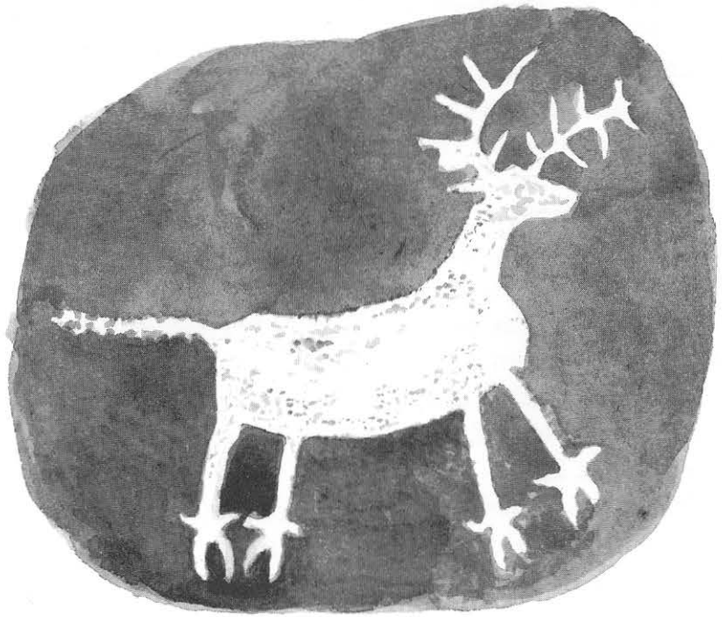
Animal assistants gave people magical powers to heal the sick, wounded or injured. Often, this power would be tied to the animal that gave it. For example, a person whose power came from a rattlesnake could usually pick up rattlesnakes without any fear. He or she could also heal a person who had been bitten by a rattlesnake.

Bears were common animal spirit helpers, in part because they were very smart and could do many human-like things. Eagles and hawks were also powerful spirit helpers that gave people the ability to fly high above the ground to find game or see approaching enemies. Just as today's military uses satellite pictures to track troop movements, ancient hunters relied on people who had the power to fly to watch the movements of their enemies.

Power could also come from non-living things like rocks, wind or lightning. These things talked to people during their visions, telling them what to do to keep their power alive. For example, the rock's power made a man's body as hard as stone so that it could ward off arrows or bullets.

Many of the petroglyphs and pictographs at Pinon Canyon show these spirit helpers.



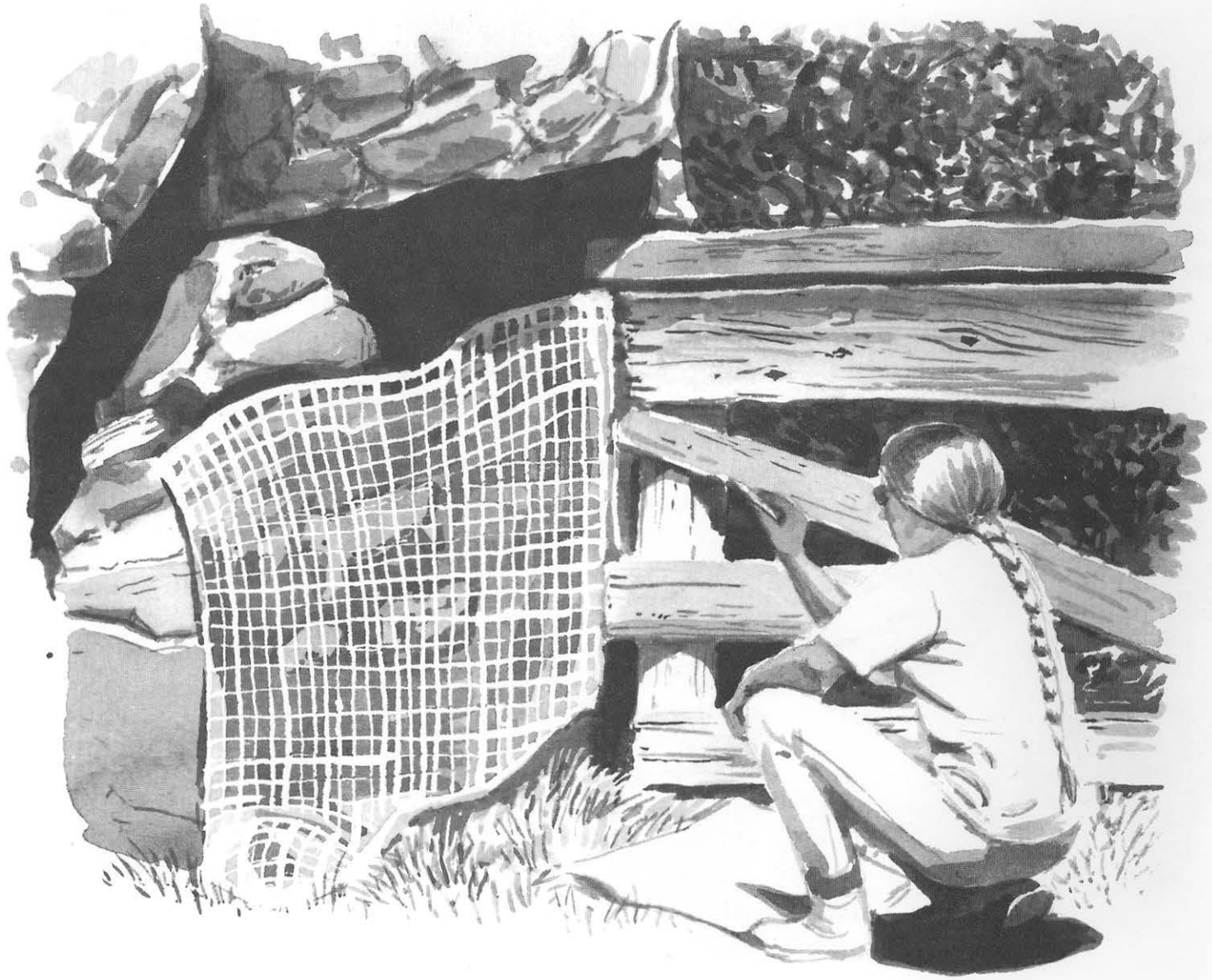


Rock Art as Boundary Markers

Rock art styles are as different as the people who made them. The petroglyphs and pictographs made by the artists of different groups were recognized by other tribes as their symbols, just as each professional football team has its own special logo that it puts on helmets, banners and advertisements to set it apart from its rivals. Ancient tribes created their own rock art "logos" that others recognized and respected.

For example, archaeologists have found petroglyphs showing war-like objects like shields and bows and arrows along trails leading to the mouths of canyons where food was stored. They believe that these petroglyphs were made as "Keep Out" signs to warn travelers that the canyons and the food stored in them belonged to others.

In some areas, two completely different styles of rock art appear on opposite sides of a river. Archaeologists think that this was how competing groups of people marked their territory.



ROCK ART RECORDING

Recording a Rock Art Site

RESEARCHERS WHO RECORD ROCK ART HAVE USED A VARiety of methods over the years. Unfortunately, many of these methods harm or destroy the art. For example, making molds for casts damages the rock varnish and making rubbings creates chemical changes in the rock's surface. This makes it hard or even impossible to use newer methods to date rock art damaged by older methods. The latest rock art dating techniques don't even touch the rock's surface.

The process begins by using good maps to locate a site. Researchers then bury an 18" length of iron rebar that serves as a permanent mapping reference point so that they can find the site again when they want to.

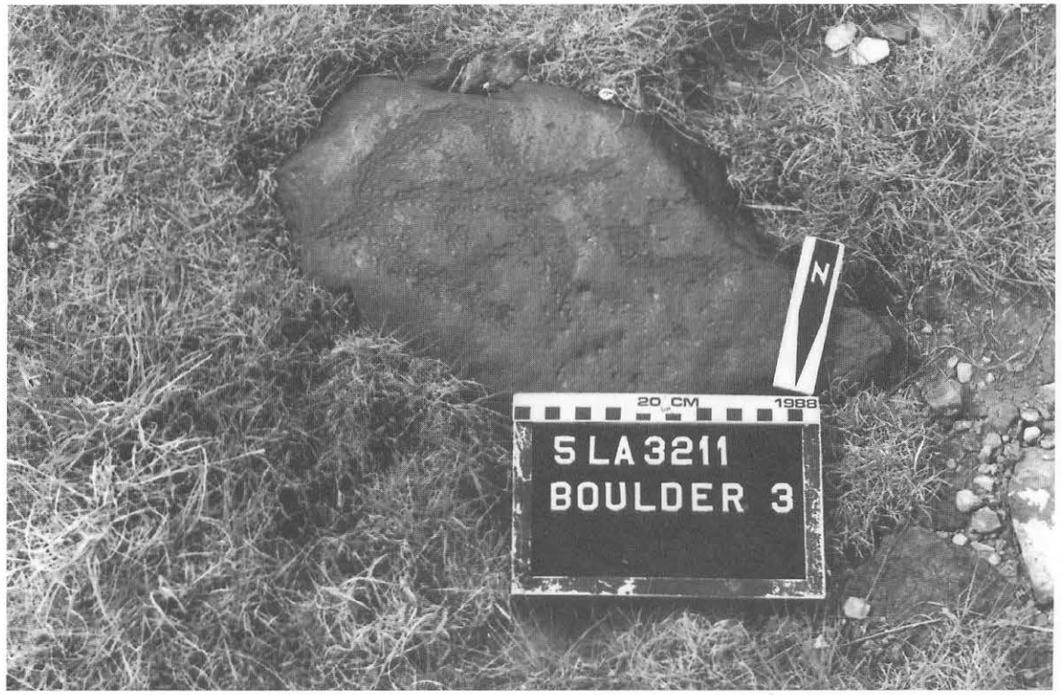
Next, researchers make a site map showing exactly where the rock art is located. For large sites, low-level aerial photographs can be used to record the locations of petroglyphs and pictographs.

Once sites have been mapped, their rock art is divided into panels. A panel can be a single image or a number of images, as long as they are grouped together on a single rock surface.

Next, artists make scale drawings of the panels. First, they use rulers or tape measures to mark the size of each rock image and translate it into a drawing on paper. Some artists make grids

out of string and carefully place them over a rock-art panel to help guide them in their drawings.

Photography is also used to record rock art. Most archaeologists use 35-mm cameras in their work rather than more expensive, bulky photographic equipment. Photographs of rock art turn out best when they are taken in natural light during certain times of the day. Before they take their photos, archaeologists usually study the way the light changes during the day to make sure they're photographing rock art in the best possible light. Subdued light is better than direct sunlight, and light that comes from the side is better than light that hits the front of the panel. If a panel is in the shade, a reflector can be used to direct sunlight onto it so that it shows up better.



Of course, artificial light must be used to photograph rock art inside caves or rock shelters. Archaeologists use extensions, like side flashes, to light petroglyphs from different angles while they're taking pictures in front of panels.

Both color and black-and-white film can be used to photograph rock art.

Different details show up in pictures taken of the same site using both kinds of film. Infrared film can sometimes help bring out details in faded pictographs. Filters cut down on surface glare and improve pictograph colors.

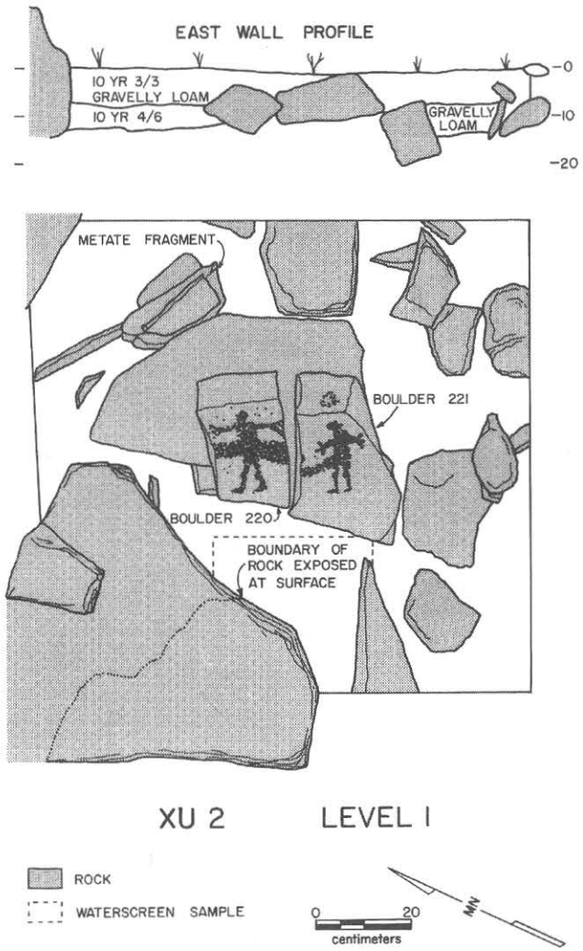
Archaeologists take a number of pictures of each image from different angles. They take at least one shot standing directly in front of the pictograph or petroglyph. Included in these photos is a measurement scale, an arrow that shows the direction the image faces and a data board that tells the site number, the panel number and the date.

Written information goes along with the scale drawings and photographs. It includes measurements of the panel size and each individual image, the direction the panel faces, the hardness and color of the rock and the color of the rock art. If archaeologists can tell whether a painting was made with a finger or a brush, or if a petroglyph was made by cutting or packing into the rock surface, they include this information too.

After archaeologists finish doing their basic recording, they usually invite specialists to the site to gather small samples they can use to analyze the paint used in pictographs and figure out when pictographs and petroglyphs were made. In both North America and Australia, native people are consulted during this rock-art sampling process.

Sometimes, archaeologists dig carefully around rock-art sites to learn more about the art, the artists and the times in which they lived. For example, digging can reveal parts of panels that have been buried by debris over time and can uncover tools and other materials that artists used to make petroglyphs and pictographs. Samples of pollen and other organic matter can help archaeologists learn about medicinal or ceremonial plants that were used at the site.

Basic rock-art analysis follows standard archaeological procedures. Archaeologists have developed ways of grouping rock-art styles found in certain areas and from certain time periods that are called typologies. These typologies are very helpful to specialists who study how ancient people moved from one region to another.



An important part of rock-art research involves protecting and conserving sites. Sadly, rock art sites have been destroyed by people who leave graffiti, shoot at or chip away at the art or vandalize it in other ways. Specialists called conservators have developed ways to control visitors to rock art sites and to reduce or remove graffiti.

What to do if You Find Rock Art

Soldiers and others who travel around the Pinon Canyon Maneuver Site can find petroglyphs and pictographs if they explore the site's canyons and rock outcrops. If you find rock art, there are a few common-sense rules -- and official regulations -- that you should follow.

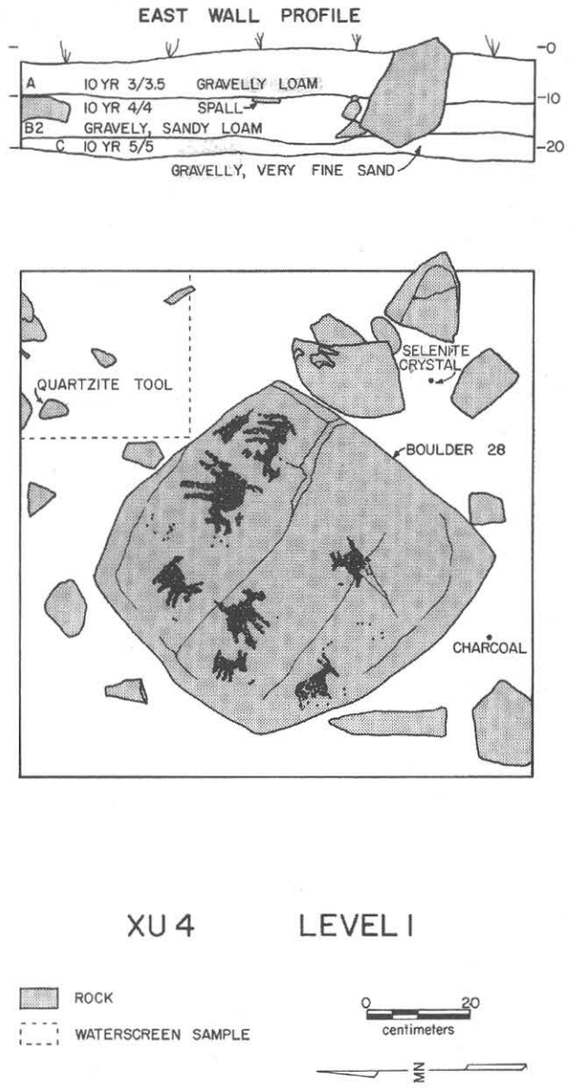
Federal laws say that you can't touch or damage rock art. Anyone who is caught harming rock art can be fined or even jailed. Needless to say, putting your name or initials on rocks near petroglyphs or pictographs is against the law. It's also against the law to collect arrowheads or other artifacts that you might find at rock art sites. And it's also important not to move any rocks in steep areas where they are loose and can easily roll down slopes, because this starts erosion which can ultimately damage a site.

Of course, you can take photos or make sketches of rock art. You might also want to mark the site on a map and report your discovery to the land managing

agency. At Pinon Canyon, this is the Directorate of Environmental Compliance at Ft. Carson, Colorado. Although the archaeologists who are working in Pinon Canyon may already know about the site, there's a chance that you may be the first person to find it.

Left:
The petroglyph boulder in this diagram, only 10 inches across, is small enough to be carried. So archaeologists dug around its base to find out if it may have been moved and set up for viewing. But they learned this was not the case; the rock was in its original position.

Right:
This plan map is of an excavation where archaeologists have removed 4 inches of soil from the area around the base of a petroglyph boulder. They found a sharp chunk of quartzite meant to be held in the hand, as a tool to peck out the designs. They also found selenite crystals, which may have been crushed to make a white powder.



AFTERWORD

Because rock art is the only recorded history we have about the earliest Americans, petroglyphs and pictographs are priceless treasures. Once they're lost, they're gone forever. That's why it's so important to study and record rock-art sites before they erode away or are destroyed by people and their activities.

Unfortunately, the government agencies that manage our public lands don't have the money or the staff they need to study and protect rock art sites. Public funding for arts and humanities projects has also been cut, so those who want to study and preserve rock art can't afford to do this important work. We need to find new and creative ways to protect rock art sites before they are lost.

Luckily, volunteers have stepped forward to help record rock art at many sites in the West. A number of "field schools" use volunteers to help them record rock art.

For example, a field school sponsored by the Arizona Archaeological Society has recently completed recording rock art at several major sites in the state, including the Chavez Pass site in Coconino National Forest, Inscription Point on the Navajo Reservation and sites in Wupatki National Monument.

The Texas Parks and Recreation Department, working with the Texas Archaeological Society, has figured out an excellent new way of recording rock art. Every year, they sponsor a field school where volunteers are welcome to help scientists record rock art. Volunteers are currently working at sites on the Pecos River.

Another field school has been sponsored in the past by various federal agencies and the American Rock Art Research Association (ARARA). Volunteers who attend the field school have recorded rock art in Arizona, California and New Mexico.

If you'd like more information about these and other field schools, you can send for a copy of La Pintura, a newsletter published by ARARA:

Ken Hedges, Editor
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American Rock Art Research Association
8153 Cinderella Place
Lemon Grove, CA 91945-3000

Additional Information

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GLOSSARY OF TERMS

altered state of consciousness -- A state of trance or a vision induced by fasting, meditation or drugs and often used by a shaman to obtain knowledge from the world of the spirits.

anthropomorph -- A human or human-like figure in a pictograph or petroglyph.

archaeologist -- A scientist who studies past ways of life by finding the artifacts and features former people left behind.

artifact -- Something, usually portable, that was made or modified by a human.

binder -- The agent used to mix with pigment or to make paint; binders are often from sources like animal fats or plant oils, but they can be as simple as water.

entopic phenomena -- Sometimes called phosphenes, they are tiny flickers of light that are visible in the eyes, and usually seen in periods of stress as during a severe headache or extreme thrist.

ethnography -- Information about the lifeways and customs of former and current cultures, usually Indians in North America; anthropologists often obtain ethnographic information by interviewing elderly Indians.

feature -- Something, usually non-portable, that was made and used by humans.

hematite -- A red-colored, iron-bearing mineral, often ground into powder for pigment.

hunter and gatherer -- Name used for groups of people who survive by hunting small and large game animals as well as by collecting and processing plants for food.

mano -- A hand-held stone used for grinding on a metate.

metate -- The stone dish or base, used with a mano for grinding or pulverizing.

monochrome -- Painted in a single color.

pigment -- The coloring agent in paint, often made from inorganic clays and minerals.

pictograph -- A painted rock art design.

petroglyph -- A pecked or incised rock art design.

Pleistocene -- Geological time period of the glaciers; the ice ages.

polychrome -- Painted in more than one color.

protohistoric -- The time period just prior to written accounts; in the American West, this time is the century or two after Indians received EuroAmerican trade goods, but before there were written accounts regarding these Indians.

rock varnish -- A dark-colored coating on the exterior surface of rocks. Varnish is especially prominent in desert or dry areas.

shaman -- A person of medicine in hunting and gathering cultures who has special power obtained through communication with the supernatural spirits.

superimposition -- Layering of one thing over another; in the case of rock art, a pictograph or petroglyph that is drawn over an existing one.

quadruped -- An animal with four legs, or as used here, a representation of an animal that has four legs.

vision quest -- Practice where a person goes to an isolated place to pray and to wait for a vision, going without food and water. The vision usually comes after three or four days and in it, the person is often instructed in the proper ritual to obtain power.

zoomorph -- An animal or animal-like figure in a pictograph or petroglyph.