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TRACKS THROUGH TIME

Prehistory and History of the Pinon Canyon Maneuver Site Southeastern Colorado

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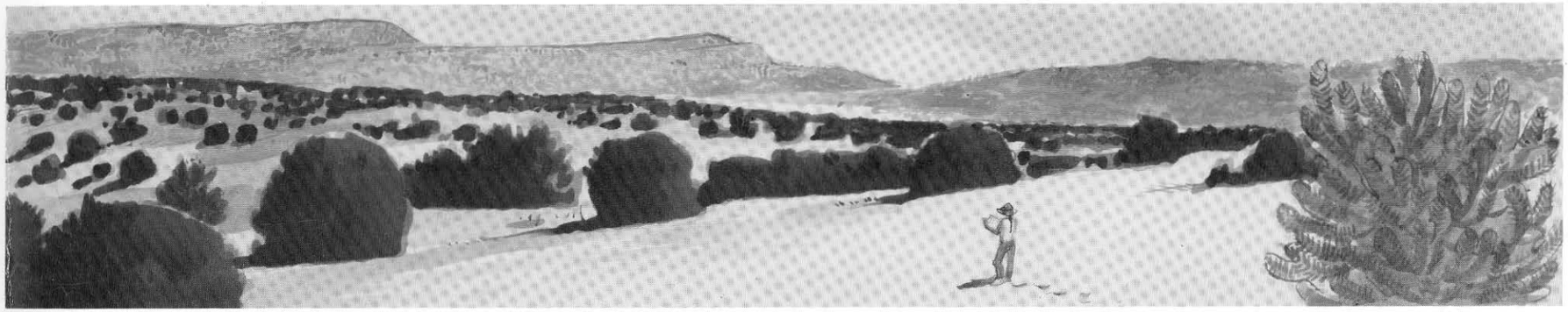

by Lawrence L. Loendorf

Prepared for and funded by the United States Army Directorate
of Environmental Compliance and Management
Fort Carson, Colorado

Administered by Midwest Archaeological Center
National Park Service
Lincoln, Nebraska

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Edited by: Nancy Debevoise
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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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ACKNOWLEDGEMENTS

After years of writing in "scientific" jargon, I found it enlightening to try to write a popular book. I certainly now have a better appreciation for Henry David Thoreau's statement, "Simplicity, simplicity, simplicity! I say, let your affairs be as two or three and not a hundred or a thousand; instead of a million, count half a dozen, and keep your accounts on your thumbnail." The emphasis of this small book has been simplicity -- a book that can be read and understood by the public.

The completion of this task would not have been possible without the help of many others. Foremost is Steve Chomko who, together with Tom Warren and Mary Barber, initiated and encouraged the project for Fort Carson's Directorate of Environmental Compliance and Management. Melissa Connor of the National Park Service's Midwest Archaeological Center offered comments and assistance.

Another part of the project included a series of oral interviews with ranchers who formerly lived in the Pinon Canyon Maneuver Site. Set up by Bobby Hill and Joella Hill and completed by Dianna Clise. A video program, *Souls of the Purgatoire*, detailing the history of the PCMS and the ranchers, completed by Hadley Harper, includes some of this interview information.

Leo Karpinski read an early draft for me. Sharon Kahin also worked on portions of the historical section. The final editing and conversion of the manuscript into a style that could be understood by the public was completed by Linda Gregonis and Nancy Debevoise. The book could not have been completed without their help. Hannah Hinchman did nearly all of the pen-and-ink drawings and completed the initial layout of the manuscript. She is especially talented at producing popular accounts in an attractive format.

Max Canestorp of the United States Fish and Wildlife Service supplied photographs for the manuscript and helped me with several requests for information. Hadley Harper and Peter Halter also gave me photographs.

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INTRODUCTION

More than 50 years ago, a rancher reported large, elephant-like footprints sunk into a rock ledge above the Purgatoire River in southeastern Colorado. Scientists came to see them. Because of the age and type of rocks they were walking on, the scientists (called paleontologists) knew that the rancher had discovered dinosaur footprints. They could tell from the tracks that several dinosaurs had been walking side by side, probably in a herd.

The tracks belonged to Aptosaurs, large lumbering beasts with long necks and small heads. Aptosaurs were up to 60 feet long, with front shoulders about 15 feet high, and they weighed as much as 25 to 30 tons. These dinosaurs lived in shallow, tropical swamps during a time known as

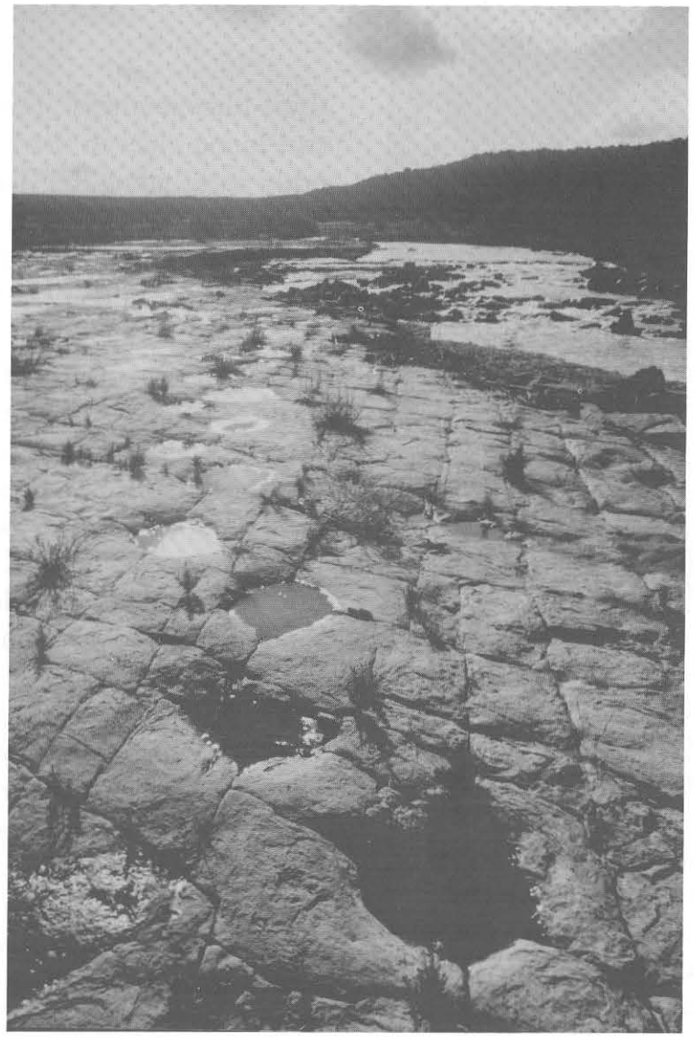
the Jurassic period, some 150 million years ago.

Aptosaurs ate lush plants that grew in the swamps, using their long necks to reach leaves from the upper branches of trees. Sometimes they reared up on their hind legs to reach the highest limbs. As they ate, they kept watch for predators.

But what could prey on these huge animals? The scientists found clues to this puzzle in other rocks along the river. Near the aptosaur tracks were smaller, three-toed tracks left by the hind feet of another kind of dinosaur called allosaur.

Allosaurs weighed as much as 3 tons and were 30 feet long. About half their length was a stiff tail that helped balance them as they ran along on their strong back legs. They used their smaller front legs and sharp-clawed paws to grab and hold their prey.

Allosaurs' heavy jaws were lined with huge, saw-toothed teeth as sharp as butcher knives. They could open their jaws the way snakes can to take large bites. These beasts were very good hunters. Much as wolves do, allosaurs followed after herd animals like aptosaurs. They



The tracks of the dinosaurs are preserved in stone. These rows of tracks where the dinosaurs walked, now found along the Purgatoire River, are among the longest continuous sets in North America.

Photo by Max Canestorp

The three-toed, meat-eating Allosaur is stalking the larger plant-eating Aptosaur.

waited for young or injured animals to stray away from the group, then closed in for the kill.

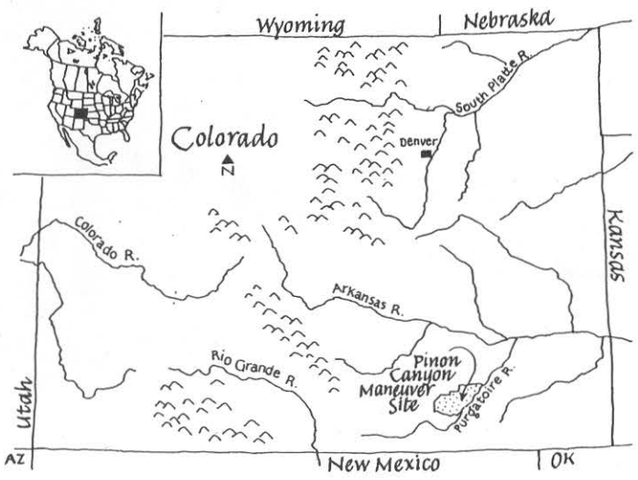
The tracks that the paleontologists found preserved in stone tell part of the story about what has happened in southeastern Colorado over the last 150 million years.

Starting around 75 million years ago, the Rocky Mountains were pushed up by forces that pulled and broke apart the huge North American continent that was home to the dinosaurs. Over millions of years, the mountains rose, gently tilting the once-flat rocks that lay under the swampy ground. Water flowed from those mountains and formed the Purgatoire River. The river cut through layers and layers of rock over a long period of time, finally exposing the dinosaur tracks.

By then, glaciers had come and gone in the mountains, and many other animals had traveled over the land once trampled by dinosaurs. These animals included mammoths, rhinos, camels, horses, bison, bears, and lions. By 12,000 years ago, people also came into the area drained by the Purgatoire and the streams that fed into it.

Today, part of this area is the Pinon Canyon Maneuver Site, a tract of land used by the U.S. Army to train soldiers. Lying between La Junta and Trinidad, Colorado, this rugged area is cut by steep river canyons and arroyos. Above the canyons are areas of dry, high plains that are covered with short grasses and cacti.

The canyons and plains of the Pinon Canyon area have provided food and other resources for many generations of people. This is the story of those people and the scientists who have been studying them for the past 14 years.



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ARCHAEOLOGY AT PINON CANYON

Like paleontologists, archaeologists also study ancient forms of life. While paleontologists concentrate on the ancient plants and animals that lived on Earth before humans evolved, archaeologists work with human prehistory and history. Archaeologists use many different clues to solve the mysteries of our human past. Some of these clues are called artifacts, and they include things like stone tools, pottery, and pieces of ancient "trash" left over from cooking or making clothing.

Artifacts are often found in the same places with other remains, called features. *Features* are things like stone rings that mark the places where tipis once stood, and charcoal and burned earth from ancient campfires. The places where artifacts and features are found are called archaeological *sites*.

Clovis projectile point, 13,000 to 9,000 years old.

Pinon Canyon has many archaeological sites, ranging from Indian camps more than 7000 years old to the homesteads of early Euro-American settlers from the last century. Even places where today's Army performs maneuvers may someday be called archaeological sites if future scientists can find evidence of soldiers' past activities. This evidence might be things as small as brass shell casings and as large as tank tracks.

The clues that archaeologists find in one site are often hard to figure out and the evidence is never complete. But by studying many sites spread over a large area, scientists have put the pieces of this puzzle together to understand how thousands of generations of people have used this region over the last 12,000 years.

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THE FIRST COLORADANS

We are not sure when the first people came to southeastern Colorado. Some archaeologists believe that humans have always lived on the North American continent. American Indians believe that this is true, based on stories that generations of tribes have told about how they began life here.

But most archaeologists think that American Indians are related to groups of people who traveled from Siberia, in northeastern Asia, to Alaska over the Bering Straits -- land now covered by the ocean. They think this migration happened during the Pleistocene era, the time of the last major Ice Age.

Scientists think this for two basic reasons. First of all,

they haven't found any tools, remains of campfires, ancient shelters or human skeletons that would prove that people lived in North or South America before the late Pleistocene era.

Second, American Indians have the same blood types and body features as people who live in Asia, especially Siberia. For both of these reasons, scientists called physical anthropologists think that it has not been very long -- only about 15,000 or 20,000 years -- since American Indians left their people in Asia and traveled over the land bridge to North America.

If these scientists are right, when did American Indians first make it to the southwestern part of what is now the United States?

Most archaeologists think that the people who came from Siberia to North America were blocked by huge glaciers and couldn't move south until the glaciers started to melt, about

12,000 years ago. They think this because they've found human evidence from that time, including spear points and other tools, campsites, places where hunters killed large animals, and a few human skeletons.

From the clues they've found so far, archaeologists think that the earliest Americans were nomads who traveled around rather than staying in one place, hunting animals and gathering other food from the land.

EARLY HUNTERS & GATHERERS

Early hunters and gatherers, whom archaeologists call *Paleo-Indians*, lived in a world of giants. Mammoths roamed across the plains, along with bison, camels, and horses. Big sabertooth lions and relatives of today's wolves hunted the region, taking down animals that were very old, young, sick, or hurt.

Paleo-Indians had to compete with the lions and wolves when they hunted animals. They hunted in groups, armed with weapons made from stones.

Hunters knew how animals acted and used this knowledge in stalking their prey. For example, when they are frightened, bison run into the wind. Using this knowledge, they chased the bison over cliffs to kill them or trapped them in arroyos where they couldn't get away. Since the hunters were on foot, this was a fairly safe way to get a lot of meat without putting themselves in very much danger. There were horses in North and South America at the time of the Paleo-Indians, but they were killed for food instead of being tamed for riding. Horses disappeared from the Americas around 8,000 years ago and weren't seen again until Spanish explorers brought riding horses with them in the 1500s.

One early bison-drive site has been found in eastern Colorado. It is called the Olsen-Chubbuck site in honor of the two men who found it in the 1950s and told professional archaeologists about their discovery.

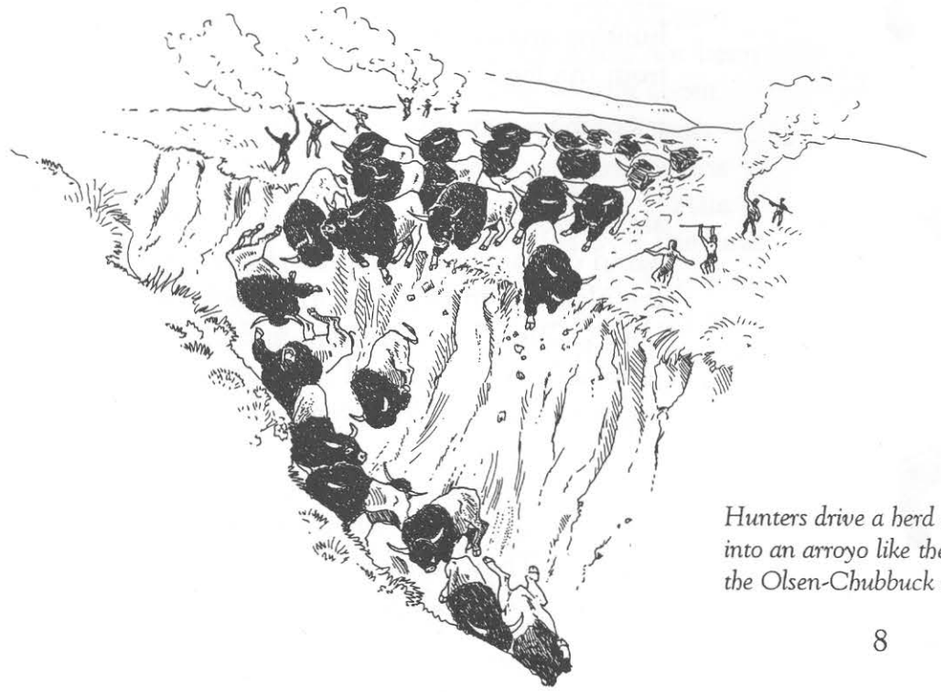
After a lot of careful work, diggers pieced together the story of a bison hunt that happened at the site one fall day

around 10,000 years ago. On that day, hunters stampeded a herd of bison down a hill into an arroyo that was about 10 feet wide and seven feet deep. When they hit the arroyo, the animals broke their legs and necks.

About 190 bison of both sexes and all ages were hurt or killed in the drive. The hunters quickly killed the wounded animals and started cutting meat from the carcasses.

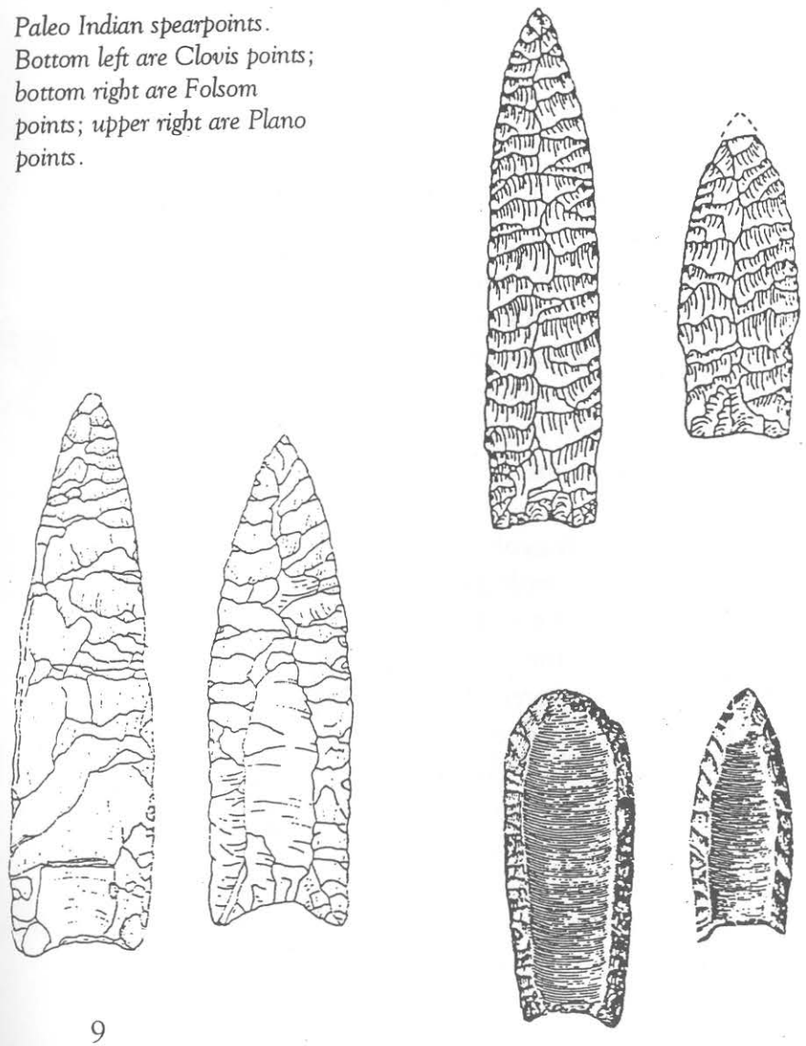
They butchered all the animals in the same way. First, they cut meat from the animals' humps. Then they cut off the front legs and shoulders and took the meat from them. Finally, they cut away the back legs and hips and stripped them of meat. The hunters then stacked the back leg and hip bones on top of the front-leg bones and put the skulls and backbones on top of the big bone pile.

By studying the bones from young and unborn animals in the pile, scientists figured out that the bison were killed in late October or early November. This was a good time to hunt bison, for a number of reasons. First of all, mid-fall was after the breeding season, when bison bulls were fighting with each other over females and were very dangerous. The calves had been weaned by then, so their mothers weren't as willing to fight hunters to save their young ones. Winter was also coming, and the hunters needed enough meat to last them through the cold months. Freezing weather would help keep the meat fresh until they needed it.



Hunters drive a herd of bison into an arroyo like the one at the Olsen-Chubbuck site.

Paleo Indian spearpoints. Bottom left are Clovis points; bottom right are Folsom points; upper right are Plano points.



STONE TOOLS

Diggers found almost 70 stone tools in the bone pile: spear points, knives made of "flakes" of stone, and sharpened stones used to scrape bison hides. These tools gave the scientists clues about the Paleo-Indians' travels. Weapons like spear points were made of a kind of stone from as far away as Texas and North Dakota. The hunters either traded stones with people from other regions or they traveled hundreds or even thousands of miles to collect the stones themselves.

Whether they traded or traveled, the Paleo-Indians were very fond of certain types of stone used in making tools. They were experts at flintknapping -- chipping away pieces of stone to make smaller, sharper tools -- and they went to a lot of trouble to get good raw materials. Most of the stones they used were colorful and shiny, like glass. The spear points made from these "silicified" stones are also very beautiful to look at, so scientists are fairly sure that the Paleo-Indian made them for artistic reasons as well as for killing bison and other animals.

MYSTERIES AND CLUES

Archaeologists know a lot about how early hunters killed and butchered animals, but they don't know very much about other parts of the Paleo-Indians' lives. For example, scientists aren't sure what kind of shelters the Paleo-Indians lived in, but they've found clues that bison hides were probably used to cover a kind of lodge that could be taken apart and moved when the people traveled.

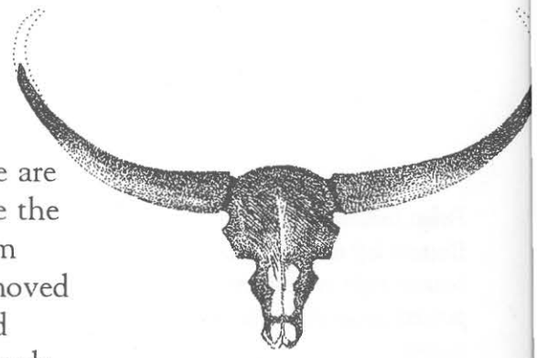
Modern-day hunters and gatherers usually gather more than they hunt. Only about a fourth of their diet is meat, while the rest is from plants. Many archaeologists think that Paleo-Indians lived a life very much like the hunters and gatherers of today, but they haven't found many clues about how the Paleo-Indians gathered and prepared food from plants.

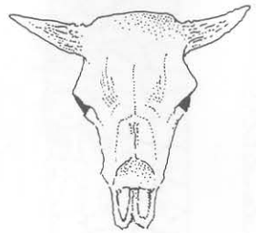
Diggers have found a few grinding stones that were used to crush seeds into flour, but these tools are nothing compared to all the different kinds of hunting tools they've found in the same areas. Maybe the Paleo-Indians ate mostly meat and only a little food made from plants, like today's Inuit (Eskimo) tribes.

The lives of all nomadic people are very hard, but the Paleo-Indians made the best of it. They headed south to warm places like Texas for the winter and moved north in the summer to Wyoming and North Dakota, where they followed herds of bison and other animals that also migrated with the seasons.

No Paleo-Indian sites have been found at the Pinon Canyon Maneuver Site, but many sites have been found nearby. Scientists are sure that hunters traveled through the area because eroded rocks and soils from the same time period are found all over the region.

Scientists who study both geology and archaeology (called geoarchaeologists) figured this out. By digging in the soils along the arroyos leading into Pinon Canyon, geoarchaeologists discovered that ancient floods had made huge changes in the area. For example, Van Bremer Arroyo, near the southern border of the maneuver site, flooded with such force that soils laid down more than 2,500 years ago were washed out of the arroyo's lower end. Any Paleo-Indian remains that might have been in the arroyo were lost thousands of years ago.





Bison have become smaller through the centuries.

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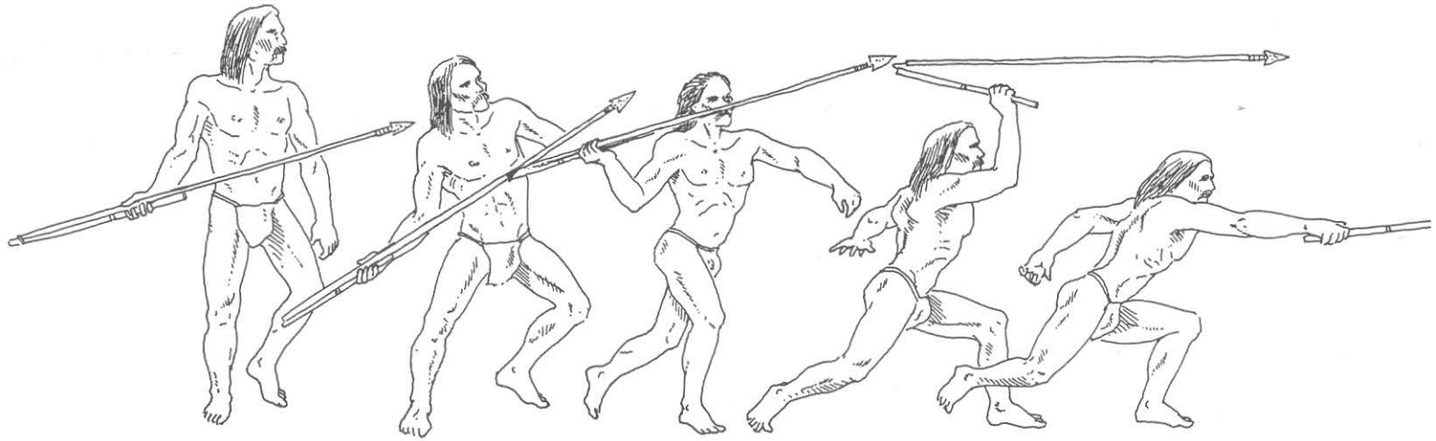
CHANGING TIMES: THE ARCHAIC PEOPLES

Around 7,500 years ago, the Paleo-Indians' nomadic way of life ended in southeastern Colorado. People started to settle down, getting what they needed from the local area or nearby regions. They made tools out of several kinds of local rocks, called basalt and chert. These stones weren't as good for making tools as the ones the Paleo-Indians used. And instead of being beautiful and well-made, their tools look like they were made quickly, used a few times and then thrown away.

One of the tools they made were stone points that had notches or stems for tying them onto wooden spears. These spear points look very different from the stone points made by the Paleo-Indians. To make their spears go longer distances, hunters used spear throwers called atlatls.

Because the people who lived during this time lived very differently from the Paleo-



The atlatl, for throwing short spears or darts, was in use from Paleo-Indian times through the Archaic. The illustration, adapted from Brian M. Fagan's book The Great Journey: The Peopling of Ancient America, *shows the motion needed to propel a dart with an atlatl.*

Indians, they are called Archaic people. Why were they so different? Scientists think it's because the climate changed.

HEAT AND DROUGHT

Around 12,000 years ago, North America's big glaciers began to melt. This changed the climate of the whole world, making it hotter and drier. This heat -- and the drought it caused -- reached its height around 7,500 years ago. Experts who study geology and ancient climate changes call this period the *climatic optimum*. North America's new climate changed the way the land looked and changed the kinds of plants and animals that lived on the land, which changed the way people lived.

During the height of the climatic optimum -- from 7,500 to 5,000 years ago -- the high plains of southeastern Colorado, Oklahoma, and northern Texas became so dry and hot that the Archaic people stayed away from them. There are very few archaeological sites from this time on the plains, but archaeologists have found a lot of sites in the nearby mountains and foothills, areas that would have been cooler and wetter.

During Archaic times, people began to use more plants for food. Archaeologists know this because they have found lots of shallow basins made from stones (called metates) and hand-held grinding stones (called manos) that people used for crushing and grinding seeds.

These grinding stones were often made out of sandstone or another grainy stone. Tiny bits of sandstone fell off these tools every time people used them and this sand got into the food they were grinding. Human skeletons found where these grinding stones were used have teeth that are worn from sand in their food.

BASE CAMPS

During certain times of the year, the Archaic people lived under rock ledges and in shallow caves. During other seasons, they used their cliff-side shelters as base camps when they traveled to different areas to hunt game, gather seeds, and pick berries. Archaeologists sometimes call this way of life *"central-base wandering."*

Base camps made a lot of sense: tools and other important things that were not used every day could be left there instead of taking them along on trips. But base camps also caused some problems. Anyone who knew the habits of a certain band of people also knew when they'd be at their base camp and when they'd be away. Friends knew when it was a good time to visit, but enemies knew when it was a safe time to raid empty camps.

Dogs were common in Archaic camps, and they probably warned people when friends or enemies were near. (The Paleo-Indians also may have had dogs, but by Archaic times dogs lived in most camps).

After the climatic optimum, from 5,000 to 3,000 years ago, the Archaic people moved back out onto the plains. Archaeological sites dating back to this time are common at Pinon Canyon.

One of these sites, which has been given the number 5LA3242[1] is about 30 yards north of Van Bremer arroyo. Greasewood, cholla cactus, and native prairie grasses grow here. The area around the site is fairly flat except for a low limestone bluff about 70 yards north of the site that sheltered the Archaic people from north winds.

CAMPFIRES AND COOKING

Archaeologists first noticed the site when they found groups of stones that had been cracked and reddened by heat and fire. The stones were mixed with charcoal, ash, and pieces of stone left over from making tools. They found a total of 34 stone groups, and they think these are the remains of campfires (called hearths) or pits used for roasting foods.

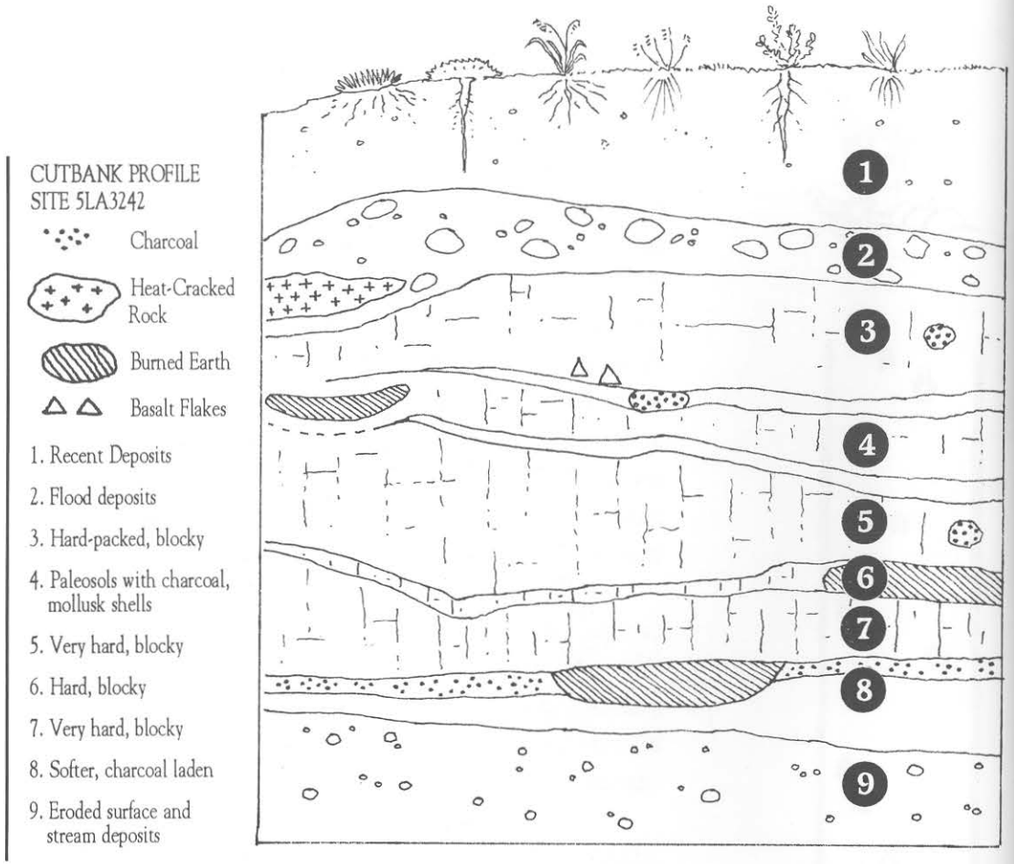
To see what might be buried at the site, archaeologists used shovels and trowels to clean and straighten 10 feet of the cutbank along the north side of the arroyo. Then they made a sketch, called a

[1] Throughout the Untied States and in most countries of the world, archaeologists use numbering systems to record sites. This site was recorded using a system devised by the Smithsonian Institution and used by the Colorado State Historic Preservation Office. The number 5 refers to the state of Colorado (fifth on the list of states alphabetically); LA refers to the county -- Las Animas; and 3242 indicates that the site is the 3,242nd site recorded in Las Animas County.

"profile drawing," of what they found.

The archaeologists discovered that the soils at the site came mostly from dirt washed over the banks of Van Bremer Arroyo. The soils were in layers (strata), one on top of the other. The soils on top had clay and silt in them, moved there by recent flooding of the arroyo. The flooding had also washed away a lot of soil, so there wasn't very much archaeological evidence in the upper layers. But in the deeper layers, scientists found charcoal and ash mixed in with artifacts. These remans were put there during long periods of time when the flat, high places above the banks of the arroyo were not flooded.

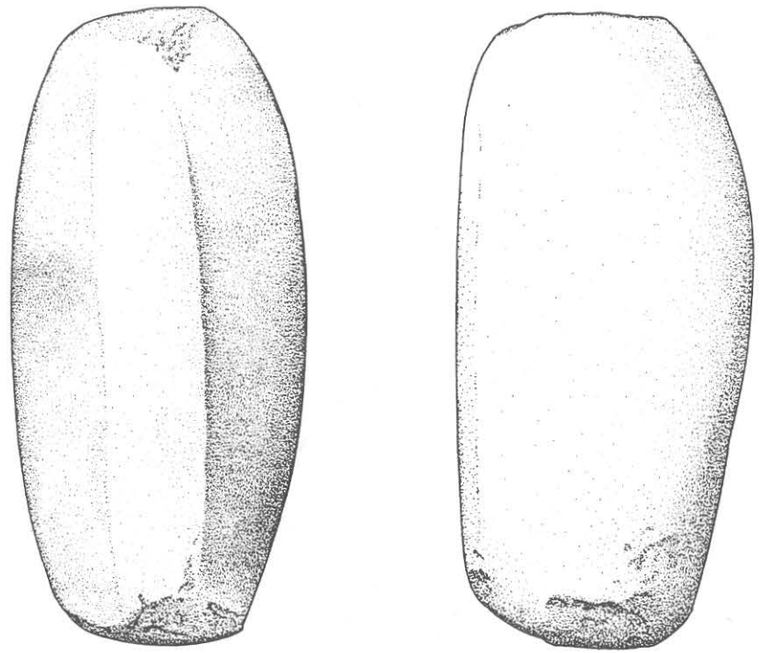
The remains of hearths and roasting pits were found at two spots in the cutbank. In other soil layers, diggers uncovered charcoal that had been washed out and scattered from other hearths. Experts used radiocarbon testing to figure out that charcoal taken from the lowest hearth area, about four-and-a-half feet down, was around 4,250 years old. Other remains may be buried even deeper, under what is now the bottom of the arroyo.



The artifacts and features that archaeologists found in the cutbank make them think that from about 5,000 to 1,800 years ago, this site was a popular camping place for hunters and gatherers. Artifacts they discovered just under the surface mean that the site may have been used even more recently.

Two views of an edge-ground cobble. Note the smooth edge of the rock where it has worn from use. Manos, the more typical grinding tool, are smooth on the flat faces of the rock.

Nearby, archaeologists found three manos (hand-held grinding stones) sticking out of the steep side of a gully that drained into the main Van Bremer Arroyo. To learn more about why these manos were together, the scientists started to dig out the area. During their dig, they found two more manos that had been buried in the bottom of a pit.



The pit was filled with charcoal, fire-blackened soils, and heat-cracked stones. People had used the pit as an underground oven to dry plant seeds or to roast roots, bulbs, and other plant parts. After they used the oven, they stashed the manos in the bottom of it and covered them with heat-cracked stones, probably to hide them. It looked like people planned to come back to the site and use the manos again, but for some reason they never did.

Scientists used radiocarbon testing to figure out that the charcoal in the oven was about 3,250 years old -- about a thousand years newer than the oldest hearth at the site. This means that the site was used over and over again during thousands of years.

Two of the manos the diggers found have ground edges. These edge-ground manos might have been used to process plants for cooking, since others like them have been found in areas where people ate a lot of *camas root*, an onion-type bulb. While camas grows in the mountains of Idaho and Washington, it does not grow in southeastern Colorado.

Some of the plants used by early hunting-gathering people at Pinon Canyon, clockwise from left: nodding onion, lamb's quarters, sunflower, amaranth, saltbush.

The Running Pithouse site west of Trinidad, Colorado. These excavated rooms were connected for access from one to another.

Photograph courtesy of Loretta Martin; Louden-Henritze Museum, Trinidad State Junior College.

But other plants with bulbs do grow in the area, so people may have used edge-ground manos to prepare bulbs for baking in their underground ovens or to mash the bulbs once they had been cooked.

Scientists tested some of the soils from the oven for pollen to see what kinds of plant food people may have eaten at the site. The tests found pollen from the *aster*, *chenopod* and *amaranth* plant families. One of the plants in the aster family is the sunflower. Chenopods include plants like goosefoot, which can be used as greens or for flavoring. And a number of plants in the amaranth family grow tiny seeds that can be prepared a number of ways. Amaranth was an important food plant to many Indians groups in the American West and Mexico.

HOME BUILDING

During the last part of the Archaic period (from about 3,000 to 1,800 years ago), people's lives changed. They had more contact with people from other areas, and they began to build houses.

One house, found a few miles west

of Trinidad on the Purgatoire River, was dug about three feet into the ground. It was made up of four connected pits that were used for rooms, and the house was about 18 feet by 36 feet at its largest point. Benches for sitting were cut into the ground around the inner walls of three of the rooms. Diggers also found the remains of 12 posts that were used to hold up the roof.

Archaeologists call these sunken dwellings "pit houses." They were fairly common in the Southwest during this time period. Pit houses usually had roofs made from logs and tree branches, held up by posts. Inside, most of them had benches around the walls and central fireplaces.

At Pinon Canyon, people who lived from 3,000 to 1,800 years ago built a different kind of pit shelter. They dug circle-shaped pits about three feet into the ground and then built up the walls another one and a half feet with blocks of basalt. One of the shelters found at Pinon Canyon had a small pit about five to six-and-a-half feet across and a larger pit that was six-and-a-half to eight feet across. Both of the pits were big enough for one or two people to sit or crouch in, but they were too small to have been used as houses, so they must have had some other use.

Archaeologists from the University of Denver dug out these pits and found that their walls were funnel-shaped and there were small fireplaces in the bottom of the pits. The only artifacts they found were a few bits of chipped stone, one possible pronghorn antelope toe bone, and a small, corner-notched stone point. Radiocarbon tests showed that charcoal found in the pits was around 2,400 years old.

Photo by Peter Halter

Two human-like petroglyphs on boulders at site of 5LA5598.

ROCK ART

The site where the funnel-shaped pits were found has been given the number 5LA5598, and it is known more for its rock art than its pit shelters. There are two kinds of rock art: designs that are pecked or scratched into stone (called *petroglyphs*), and designs that are painted or

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THE CERAMIC STAGE

After the time of the Paleo-Indians and the Archaic people, but before Columbus landed in North America, came a period that archaeologists call the *Ceramic Stage*. During this time, people in some parts of Colorado began to make pottery. The oldest pottery found so far at the Pinon Canyon Maneuver Site may have been used as long as 750 years ago.

Archaeologists use words that can be confusing when they talk about the people who lived during the Ceramic Stage and the sites where clues have been found about the lives of these people. But if you look at the chart at right, you can see how scientists divide up this time period, using terms like "the *Plains Woodland Period*," "the *Graneros Focus*," "the *Apishapa Focus*," and "the *Protohistoric Period*.".

Ceramic Stage

Name	Time Period	
Plains Woodland Period	A.D. 200 to 800-1000	Las Animas Tradition
Graneros Focus		
Arkansas Phase		
Middle Ceramic Period	A.D. 800-1000 to 1550	
Ashipapa Focus Period	A.D. 750 to 1300-1400	
Antelope Creek Phase*	A.D. 1200 to 1500	
Protohistoric Period*	A.D. 1550 - 1750	?

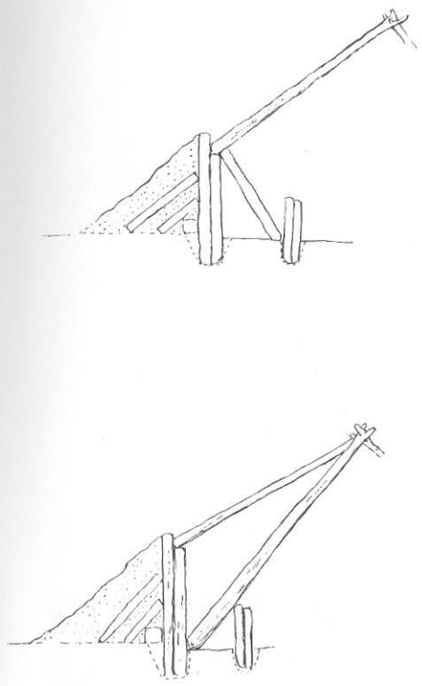
*No known architectural sites have been identified in the area.

THE PLAINS WOODLAND PEOPLES

The name Plains Woodland is used to designate the time when people started to live in villages in southeastern Colorado. Some villagers may have grown corn, beans, and squash in gardens along the floodplains of the rivers. They may also have made pottery, but archaeologists have discovered that these practices were not common to all groups.

The Forgotten Site

A few years ago, two teams of archaeologists searched both banks of Burke Arroyo and found a number of important sites. Near the end of their dig, they brought their boss to look at what they had found. Their boss looked at an island in the middle of the arroyo and asked both teams what they had found on it. It turns out that nobody had searched the island: each survey team thought the



Two possible arrangements for the roof construction on the houses at the Forgotten Site.

other team had worked on the island. So their boss went out to the island and discovered another archaeological site. Because of the mix-up, the island was named the Forgotten Site.

On top of the ground on the island, archaeologists found fire-reddened rocks from old fires. Radiocarbon tests showed that these fire remains are 1,200 to 1,300 years old, during the Plains Woodland Period.

Two sets of sandstone slabs were poking out of the ground at the Forgotten Site. Archaeologists went to work, like detectives, to figure out what these slabs meant. They soon realized that the stone slabs were the walls of two ancient houses.

Archaeologists dug out the houses to learn more about what they looked like and how they were built. Most parts of the houses had fallen into pieces, but their sandstone slab walls were still standing, poking up as high as two-and-a-half feet above the ground. These slabs sheltered people from the wind and protected the fires they made inside the houses.

By digging around the bottom of the slab walls, archaeologists learned that the walls were sunk into trenches, so that about one-fifth of their length was buried in the ground.

The dirt on the site is about one-third clay. Charcoal and burned earth in the trenches and around the base of the walls may mean that the house builders used fires to bake the clay-filled soil around the bottom of the walls so that they would stay put and not fall in on them.

Inside the walls, the builders had put another row of sandstone slabs, about eight inches shorter than the outer walls. Some of the inside slab walls may have been set in trenches too, but keeping them standing was not as hard because they were braced by the outer walls.

The houses on the Forgotten Site had circular and oval- shaped floor plans about 14 feet across, but it's hard to tell, because the inside walls have fallen in. It looks like the outside walls didn't totally close in either of the houses. Because diggers didn't find the remains of any doors to the outside, maybe one side of the house, or part of one side, was left open.

The roof was even harder to figure

Artist's reconstruction of the houses at the Forgotten Site.

out. The roof could have been held up by three or four poles that met at the top, making a cone shape.

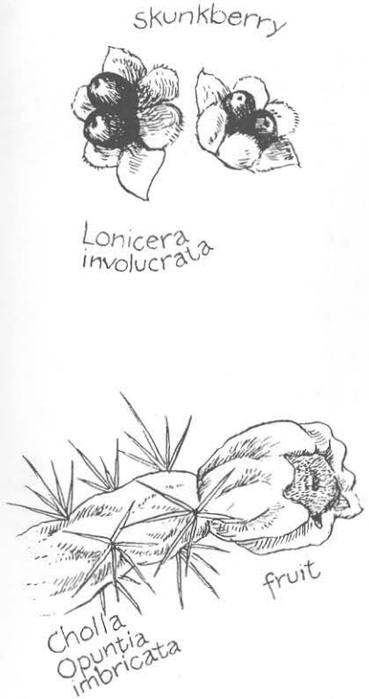
During the dig, archaeologists tested dirt samples around the houses for pollen. They found a lot of grass pollen in the dirt, meaning that the roof beams may have been covered with a grass thatch.

The "floors" of the houses were made by clearing away the cactus and other plants that were in the way. These dirt floors were not packed down very hard, which probably means that people didn't use these houses very much.

Diggers found several fireplaces and roasting pits inside the houses. People most likely used open fires to warm themselves and do some cooking. Small pits about the size of buckets were lined with pieces of sandstone and covered with sandstone slabs. These were probably used for baking and roasting food. Manos and metates found on the floor near the roasting pits were probably used in preparing food.

Archaeologists also found a large pit shaped like a bathtub in one of the houses. The pit was empty except for some dirt, a few bits of charcoal, and small burned sandstone rocks. A number of large sandstone slabs and a metate

The excavated remains of one of the houses. Note the roasting pit inside the rock-slab walls.



Skunkberries and cholla.

had been placed on top of the pit. Archaeologists think this large pit was used for cooking, so they went to work trying to figure out what kind of food people cooked in it.

Even though they looked very carefully, they didn't find any burned bones around the houses. They did find some clues that people may have cooked a few rabbits, probably on open fires, but it looks like they mostly ate cactus buds.

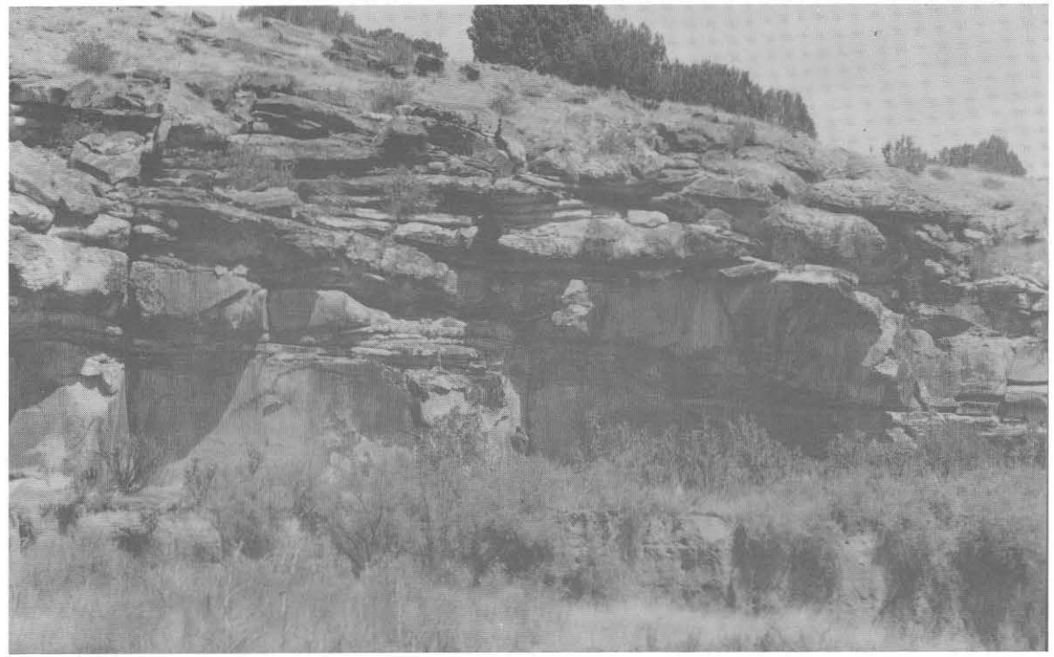
It seems hard to believe that the prickly, pesky cholla cactus -- which manages to stab nearly everything and everyone in its path -- was an important source of food for people who lived at the Pinon Canyon Maneuver Site. But we do know that many southwestern Indian tribes ate cholla stems and buds. First, they dug a pit to roast the cactus and lined it with stones, which they heated with firewood. When the stones were hot and the wood had burned away, cooks filled the pit with separate layers of grass, cholla buds and stems, and hot rocks. Then they covered the pit with dirt and left it overnight. The next day, they uncovered the pit, removed the gooey mess of roasted cactus, and ate it.

Cooked leftovers were usually dried and kept for later use. For a smaller meal, the Indians roasted cholla buds and stems in campfire ashes.

Roasted cholla was mixed with greens from saltbush or lambsquarter to make a sort of vegetable stew. Mashed skunk berries were sometimes used to perk up the flavor of the bland, mushy cactus.

Archaeologists found pollen from all three of these plants on the manos and metates discovered in the houses at the Forgotten Site, so the pits were probably used for roasting cholla and the houses sheltered the cooks while they prepared the cactus. Because cholla has buds in May and June, scientists knew that people used the site at that time of year. But there is so little evidence of cooked food at the Forgotten Site that people probably didn't use the houses during other seasons.

So where did they spend the rest of the year? Archaeologists looked for clues in other areas of the Pinon Canyon Maneuver Site where they knew these people had lived more than a thousand years ago.



The large rockshelter known as the Sue Site. Excavations uncovered artifacts and parts of houses that range in age from the Archaic through the Ceramic Stage.

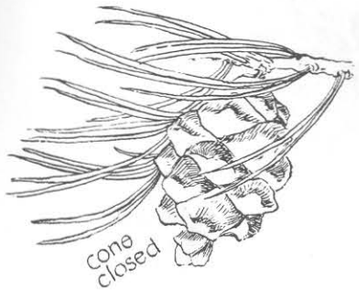
The Sue Site

One of the important sites in the region is a large rock shelter named the Sue Site, discovered on Van Bremer Arroyo. Soil layers at the Sue Site range in age from the Archaic Period through the Ceramic Stage and into the Historic Period, so it is a good place to look for clues about many different kinds of people.

Archaeologists had many problems sorting out the clues at the Sue Site, because people had dug new pits or house foundations into the remains of much older pits and houses, mixing up the remains. Mice and rats made things even more confusing by digging into soil layers and scattering remains all around.

In spite of these problems, archaeologists were able to sort out areas of the rock shelter where people of the Plains Woodland period lived from 1,300 to 1,200 years ago. Diggers found thick layers of artifacts mixed in with charcoal and ash in the rock shelters. This told them that fairly large groups of people had used the rock shelters as base camps for much of the year.

Diggers found open areas where



people cooked and smaller areas closed in by stacked sandstone slabs where they slept and stored things. These sleeping and storage areas are much like the houses on the Forgotten Site except that at the Sue Site people didn't need to build roofs because the over-hanging rock ledge made a natural roof over their heads.

Small groups of people probably traveled away from this base camp to places like the Forgotten Site where they roasted cholla and dried it for future use. Other people went out from the rock shelters to hunt large animals and small game, to find the stones they used to make spear and arrow points, and to gather the wood they needed for bows and arrows.

Archaeologists found the remains of rabbit, deer, ground squirrel, gopher, and crayfish at the Sue Site. The crayfish remains were an important clue because they show that people must have used the site between June and October, when crayfish are most active. And since one of the rabbit bones came from a young animal, which would have been born in the spring, this is more evidence that the site was used in the spring or early summer.

Diggers also found gopher and prairie dog bones at the site. Today, we think of these animals as pests that are not good for eating. But we know that Indians who lived in western deserts hunted small animals like gopher and ground squirrel by pouring water into their holes, forcing them out and into nooses.

Using this hunting method, Indians could catch 25 to 30 animals in a short time. An adult male ground squirrel weighs about a pound, and once it was skinned and gutted, there would only be about 10 to 12 ounces of meat. But if hunters caught several dozen ground squirrels in several hours, they could get 15 to 20 pounds of meat, which would feed quite a few people.

Evidence from the Forgotten Site and the Sue Site shows that the Plains Woodland people lived in their base camps along streams in the summer and made trips back and forth in the spring to hunt small animals and gather cactus and other plants. But what did they do in the fall, and how did they survive winter?

Big Arroyo Hills

Archaeologists have found dozens of sites in the juniper and pine forests at the Pinon Canyon Maneuver Site where people gathered pine (pinon) nuts in the fall and roasted them for food. Sites in the Big Arroyo Hills contain large numbers of one-hand manos, basin-shaped metates, and many pieces of larger stone tools.

Many of the smaller tools are tube-shaped pieces that may have been used to break up pine nut shells (hulls) or to line storage pits. Very few chipped stone tools like spear points, arrowheads, and knives have been found at the sites. And while diggers have found charcoal and ashes from former fires, they haven't uncovered any evidence of houses.

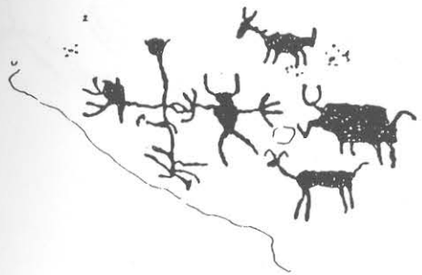
Native groups in the American West collected pine cones in the fall, after a heavy frost but before the cones opened. They used two different methods of harvesting and processing pine nuts.

One way was to use long poles with hooked ends to pull pine branches down and break off the cones. Then they roasted the cones in a fire, which opened the cones so cooks could get at the nuts. Next, they ground the partly roasted nuts on flat metates to break the hulls. They separated the hulls from the nuts by putting them on "winnowing" trays and tossing the broken hulls and nuts into the air, letting the wind blow the hulls away.

Another way the Indians gathered and prepared pine nuts for cooking was to wait until the cones had opened on the trees, put blankets under them and beat the branches with sticks until the nuts fell onto the blankets. They roasted the nuts by putting them on winnowing trays with hot coals and removed the hulls by grinding them on flat metates.

Either way, the Indians ate as many roasted nuts as they wanted and then stored the rest. Sometimes, they stored whole cones, but usually they removed the nuts from the cones and stored them in their hulls. They stashed the cones or nuts in pits lined with stones and covered with sticks and leaves or they simply piled them on the ground and covered them with rocks, sticks, and leaves.

Petroglyph known as the Zookeeper, with a detail enlarged below.



Surviving the Winter

So now we know that the Plains Woodland people spent the fall in the pine and juniper forests of the Big Arroyo Hills, where they gathered and prepared pine nuts. We also know that they spent the spring in arroyos and at the edges of rolling prairies where they gathered seeds and cactus buds. And we know that they spent their summers at base camps in canyons where there were rock shelters and caves, hunting small animals and gathering plants.

But what did they do in the winter? Staying warm, dry, and fed must have been very hard for the hunters and gatherers of the Plains Woodland people. Only small groups of people could have made it through the winter eating stored seeds and pine nuts.

Archaeologists haven't figured out how large groups of people made it through the winter. Some think they stayed close to the Purgatoire and other major river bottoms where they could gather wood for fires to keep warm. Others think that people stayed in their rock shelter base camps in the winter as well as the summer.

But how and where did they get food? Some scientists think the Plains Wood-land people left the Pinon Canyon Maneuver Site in the winter and headed for the mountain front, where they set up winter camps near present-day Pueblo or Colorado Springs. They could have survived the winter by following and hunting the large herd animals that roamed the plains during other seasons and then moved into sheltered valleys along the mountain front for the winter.

Rock Art

Like the Archaic people who came before them, the Plains Woodland people also made petroglyphs. One petroglyph panel near a Plains Woodland site shows a single human figure in the midst of many

animals. This is called the Zookeeper Site because the figure is set in the center of the petroglyph, holds a crossed staff, and looks like he is the "keeper" of the animals around him. A few of the animals are tied together by a line which might mean that the keeper has a magical control over them.

The Apishapa Focus Peoples

By the Middle Ceramic period, about 1,000 years ago, the time of the Plains Woodland people ended and the time of the Apishapa Focus people began. The Apishapa Focus people lived much the same way, but there were some differences.

First of all, the Apishapa people made more pottery than the Plains Woodland people. They mostly made large, round jars with wide mouths, and their pots were usually grey or brown, without any other paint colors. Most of the arrow points they made were small, triangle-shaped blades with notches on their sides rather than at their corners.

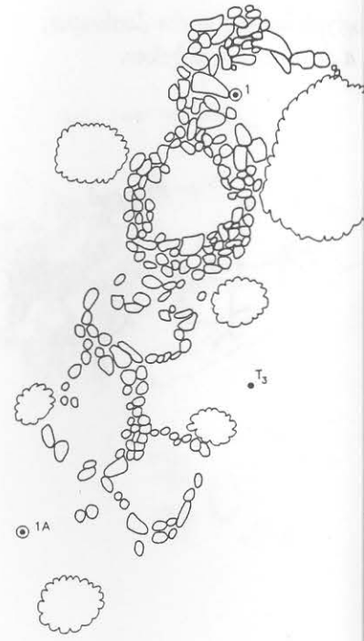
Second, the Apishapa people began to plant gardens and grow maize, beans, and squash. Archaeologists know this because they've found corn cobs, beans, squash seeds, and pollen from these plants during their digs at Apishapa sites. Curiously, the number of these garden products is very low and some large Apishapa village sites have no evidence of gardening. this suggests it was a secondary source of food.

The biggest difference of all is that the Apishapa people built houses with many rooms. Archaeologists have found most of these homes near the mouths of river canyons that lead to the Purgatoire River.

The Sorenson Site

The Sorenson site is set high on a peninsula of rimrock overlooking the Purgatoire River. Getting to the site isn't easy. First, you have to climb sheer canyon walls up to the rimrock. Then you have to get over the high stone walls that block a narrow neck of land you have to cross to get to the site.

Archaeologists have found the remains of several very large houses at the site. All of the houses were made by stacking sandstone slabs to make vertical and horizontal



Connected remains of houses made by stacking rocks in the lower walls.

walls. The largest house has 25 rooms, some of which were probably used for sleeping and others used for storage.

Excavations have also uncovered a lot of manos, a fair number of chipped stone tools, and a few corner-notched spear and arrow points. So far, no pottery has been found.

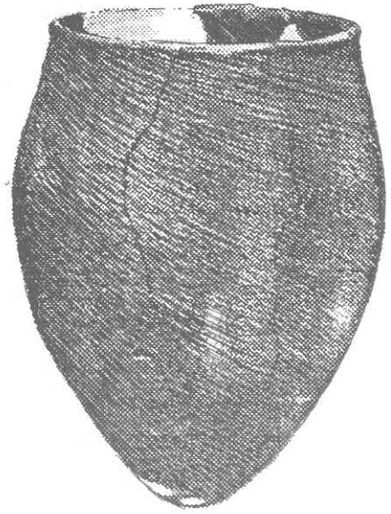
Scientists did a radiocarbon test on charcoal found in an old hearth to figure out when people lived at the site. The tests showed that people were here about 1,000 years ago, but couldn't tell how many years they lived at the site before and after that time. Another test, called cation-ratio dating, showed that the site may have been used as recently as 750 years ago.

Archaeologists still aren't sure *who* lived at the Sorenson site. Was it the Plains Woodland peoples or the Apishapa Focus peoples?

The houses at the site are so "modern" compared to the kinds of homes the Plains Woodland people built in the region that it makes sense to assume that the Apishapa Focus peoples built them. But the site is so large that it may have been used during several time periods -- first by Plains Woodland people and later by Apishapa people.

If the Plains Woodland people made their homes here, it must have been during the height of their culture because the large number of houses at the site could have held several hundred people at once. Feeding such a large group meant that the people who lived here had to be good at hunting herd animals like bison, gathering food from many wild plants, and maybe growing food crops in gardens.

But archaeologists haven't found any evidence of bison kills in the region, and with the scanty evidence of gardening, it is difficult to understand what people were eating.



Plains Woodland-type pottery vessel.

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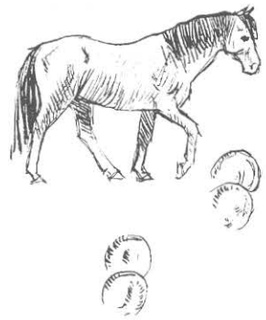
PROTOHISTORIC PEOPLE

About 500 years ago, a new era began, a time that archaeologists call Proto-history. At the start of this period, groups of people from the North began to move into the Pinon Canyon Maneuver Site region. These tribes are known as the Apachean people, and they spoke a language called Athapaskan.

It had taken the Apachean people about 300 years to move from their homeland in northwestern Canada to southeastern Colorado. First, a half-dozen tribes left their Athapaskan- speaking relatives and moved south, settling in central Montana and northern Wyoming.

They stayed in this region for several hundred years before a number of tribes moved farther south. The Navajo were the



largest tribe that traveled in these migrations, but the Jicarilla, Mescalero, and Lipan Apache tribes moved south as well.

We know that the Jicarilla's new homeland included the Pinon Canyon Maneuver Site because archaeologists have found round jars and other pots in the area that were made by the Jicarilla.

Like other hunters and gatherers who made their homes here, the Jicarilla lived in tepees. They used stones to hold down the animal-hide covers of their tepees. Diggers have found the stone tepee rings the Jicarilla left behind when they moved their camps.

We don't know what happened to the Apishapa Focus peoples who were living in the Pinon Canyon Maneuver Site area when the Apachean tribes moved in. They may have retreated west and joined the Ute people who lived in the mountains of north-central Colorado.

The Jicarilla and other Apache tribes were powerful and skilled warriors who built fort-like places called strongholds that they defended from enemies. They picked high places for their strongholds, spots with good views and lots of food and water so that they could surve

Adapted from an early Spanish hide painting now displayed at the Palace of the Governor's Museum, Santa Fe, New Mexico.

sieges. The Apache fortified their strongholds with high stone walls.

AN APACHE BATTLE

One of the most interesting clues about these strongholds and the battles that were fought around them is a 300-year-old hide painting that shows a fight between the Apache and Spanish invaders. Historians think the battle may have been fought at a place near the Pinon Canyon Maneuver Site.

We can learn a lot about how the Apache fought their battles by looking at this painting, which is owned by the state of New Mexico and displayed in Santa Fe. It shows a fortified stronghold at the center of a battle between the Spanish, who are on horseback, and Apache warriors, who are on foot. Some of the Apache are defending the stronghold from behind its stone walls, while others are outside the stronghold, protecting their bodies with large shields.

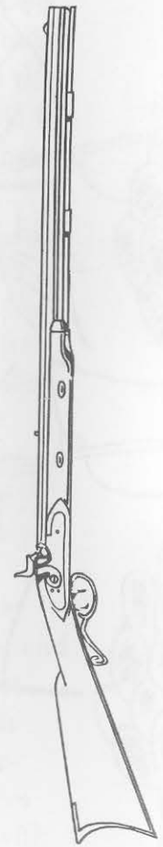
We know from other evidence that the Apache made these shields from buffalo hides, scraping the hair off the hides and then drying and painting them with colorful designs. The shields were so strong that stone arrow points often bounced off them. They were only used by warriors on foot, since carrying them on horseback would have slowed down a galloping rider.

It looks like the shields were large enough to protect two warriors, who fought side by side. In the painting, a man holding a shield is also carrying a club or a rake-like weapon used for hand-to-hand combat. His partner behind the shield is armed with a bow and arrows.

HORSES AND GUNS

Spanish and French explorers brought horses and guns into the region about 400 years ago. While they were handy in some battles, horses and guns were often more trouble than they were worth to the Apache.

For example, it was hard for the Apache to get the amount of gun powder they needed. And it took much longer to load and fire a musket than it did to shoot arrows. Most Apache warriors stocked up on iron arrowheads, lance points, and knives instead.



Iron arrow points traded by Europeans to Indians.

Horses could cover a lot of ground in a short period of time, but they needed to be fed and watered every day, which wasn't always possible during strike-and-retreat raids. Another problem was that horses left clear trails that the Apache's enemies could use to track warriors back to their stronghold. And, during a long siege, stronghold defenders didn't have enough water to share with horses.

But horses and guns were a blessing to other tribes like the Kiowa. This tribe had left its homeland in Montana, traveling first to the Black Hills region of eastern Wyoming and northern South Dakota and then moving on to the southern Plains. The Kiowa migrated south 300 years ago, about a century after the Apache. They raided Spanish settlements in New Mexico, stealing horses and trading them to other tribes further north.

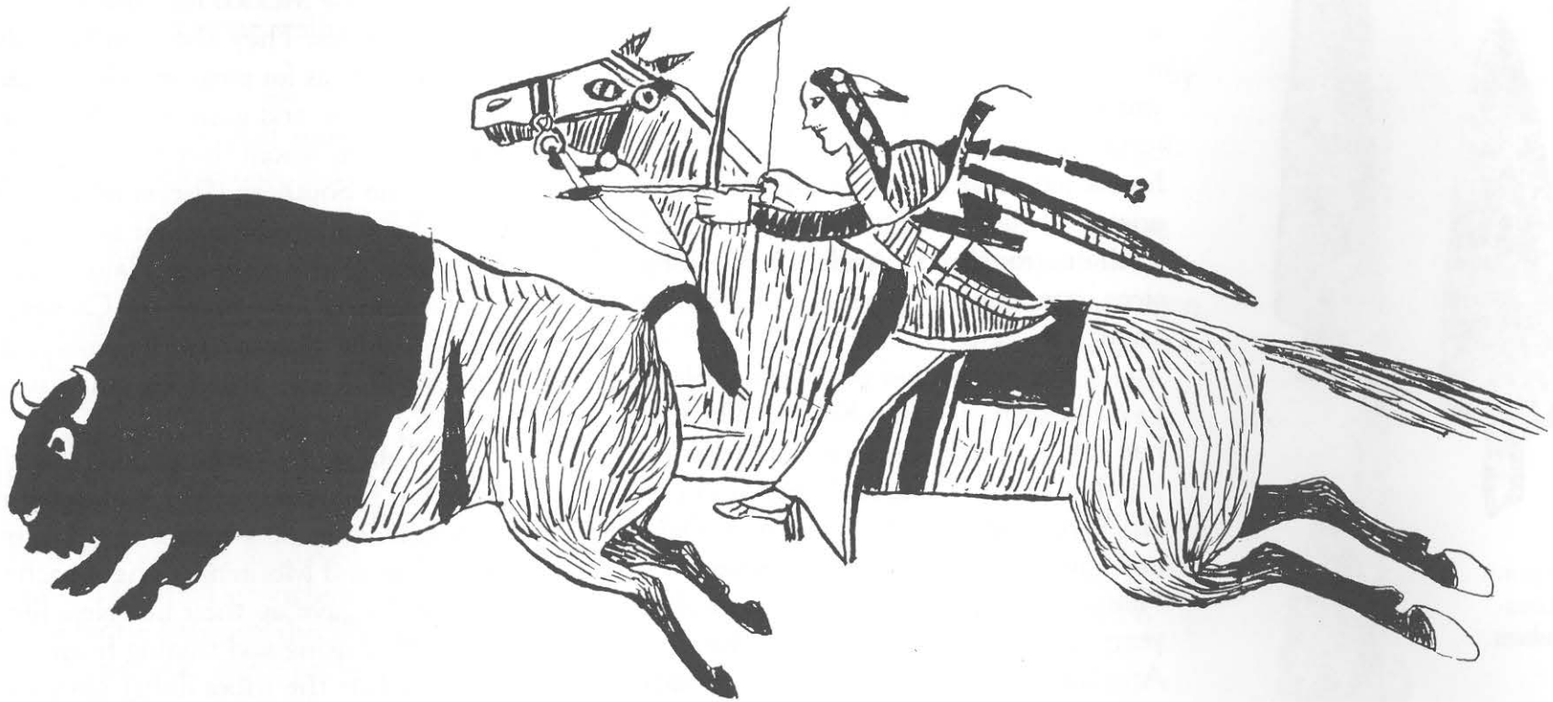
The Comanche tribe saw the Kiowa's success and moved south from Wyoming, where they became one of the most feared of all the southern Plains tribes. The Comanche were a constant menace to the Spanish, raiding settlements in New Mexico for horses and other treasures. They also attacked other Indian tribes as far away as central Kansas, stealing horses and guns as well as women and children, whom they sold as slaves.

The Southern Cheyenne were the last tribe to move from their northern homeland to the southern Plains. Like the Comanche, the Southern Cheyenne wanted to be closer to settlements and camps with horses that they could steal or trade for other goods.

During the entire period, the Utes stayed in Colorado, where they acted as middle men, trading horses to tribes in Wyoming and Montana. The Apache, too, finally gave up their horseless lifestyle and started using and trading horses.

While the tribes didn't always use horses in their raids and battles, horses were a huge help in searching for and killing bison. Grazing bison moved over great distances in a single day, and it wasn't easy for hunters to find them.

Because there weren't many bison in the Pinon Canyon Maneuver Site region, the animals weren't a big part of



Indians often drew pictures of their own exploits. This hunting scene is adapted from a Kiowa drawing.

the tribes' food supply until horses came along. But horses changed people's hunting habits and diets. In pre-horse times, hunters could only drive bison over cliffs or into traps. But once they had horses, mounted hunters could travel fairly long distances to find large bison herds, chase them on horseback and shoot them one at a time.

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THE HISTORIC PERIOD

After conquering the Aztecs, the Spanish moved up the Rio Grande into New Mexico and began dominating the Pueblo Indians who lived along the river's fertile farm lands. The Pueblo Indians didn't give up easily. At one point, they joined together and drove the Spanish back to Mexico. But the Spanish came back, about 250 years ago, and took control of the Pueblos and their lands.

SPANISH AND INDIANS: TRADE AND CONFLICT

From this time on, the Spanish mounted a number of expeditions from both Old and New Mexico. They explored the Pinon Canyon Maneuver Site region, first to search for gold and other treasures and later to punish the Apache, Comanche, and other tribes for raiding Spanish settlements.

Iron pots were popular trade items, sometimes being disassembled and turned into other tools.

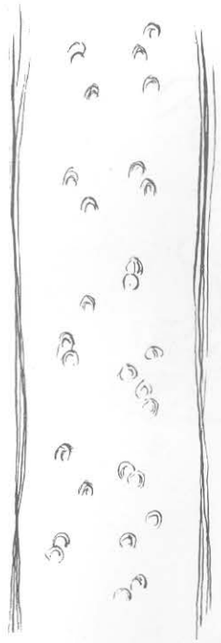
The Spanish captured Indian prisoners along the way and took them back to their settlements in New Mexico. They educated their prisoners, made them into Christians, forced them to stay with their captors as servants for a period of time, and then set them free.

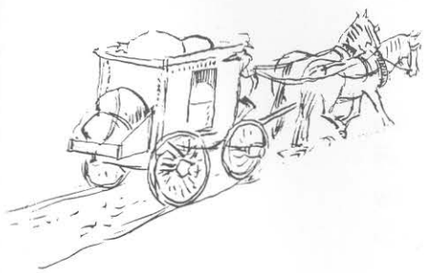
These former Plains Indians, known as "genizaros," often married members of Pueblo tribes and started settlements of their own. The Spanish didn't mind these new settlements, especially when they were located on the edges of Spanish towns so that the genizaros would be attacked first by raiding parties of Apache, Comanche, Utes, Kiowas, and Cheyenne.

Because the genizaros had once been members of these raiding tribes, the battles set brother against brother. But not all contacts between the genizaros and the Plains tribes were hostile. They found that they could be good trading partners, since many genizaros remembered their former language.

In time, a new class of traders, known as "comancheros," started trading corn and other garden crops, pottery, iron kettles, knives, and axes to the Apache and other Plains tribes.

Spanish explorers searched the Purgatoire region for gold. Christianized Indians, known as "genizaros", travelled with the explorers. These "genizaros" also traded with Plains Indians and hunted bison on the plains.





In return, the tribes traded deer and buffalo hides and meat to the comancheros. In the beginning, other tribes traveled to Pueblo settlements to trade with the comancheros, but soon the comancheros began to journey out onto the plains of eastern Colorado, northern New Mexico and Texas to trade with the tribes in their own settlements.

Another important group of New Mexicans, including many genizaros, made trips to the Plains to hunt buffalo. Known as "ciboleros," these groups included a dozen or more families who went to northeastern New Mexico and southeastern Colorado to hunt and butcher buffalo and take the dried meat back to the Pueblos and Spanish in New Mexico. The ciboleros travelled on horseback and used oxen to pull large two-wheeled carts, called "caretas." Hunting with bows and arrows and lances, the groups killed several thousand buffalo each year well into the 1860s. But by this time, the great buffalo herds were gone.

Both the comancheros and ciboleros passed through the Pinon Canyon Maneuver Site region. At this time, the Purgatoire River was known as *El Rio de las Animas Perdidas en Purgatorio*. ("Souls Lost in Purgatory"), perhaps because it was thought that members of an earlier expedition had died on its shores. When French trappers explored the region, they translated the Spanish name into French, calling it the "Purgatoire." Many early ranchers didn't understand this French term. They thought they were hearing "Picketwire," so that's what they named the river. Even today, some people still call the river "the Picketwire."

GOLD, SETTLEMENT, TRANSPORTATION AND TRADE

In 1812, Mexico gained its independence from Spain and started an open-border policy, settling and trading in frontier regions to the north. The Santa Fe Trail was created to link Independence, Missouri to Santa Fe, New Mexico, mak-

ing a travel route for new white settlers from the East.

The northern part of the Santa Fe trail, known as the Mountain Branch, passed just north of the Pinon Canyon Maneuver Site, following about the same route as today's highway between La Junta and Trinidad. The supply post of Bent's Fort was first located on the Arkansas River, but in 1852 it was moved to the mouth of the Purgatoire River near La Junta to serve as a stage stop for travelers on the Santa Fe Trail.

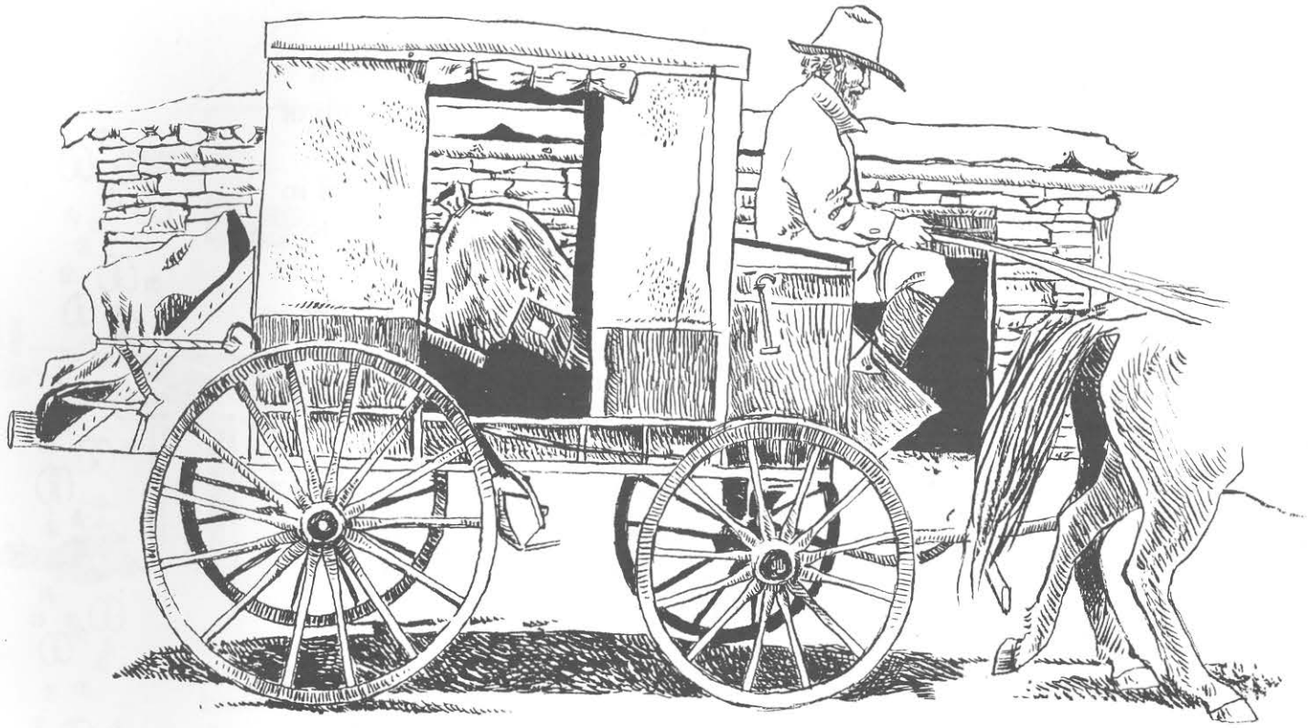
Mexican ranchers had set up sheep-grazing camps along the upper Purgatoire in the early 1800's, but the first permanent settlement was a ranch founded in 1859 by two Hispanic sheep herders, Gabriel and Juan Gutierrez.

In the same year, gold was discovered in the mountains of Colorado, bringing large numbers of prospectors and miners into the region. Denver and Canyon City were founded along Colorado's front range, and Pueblo sprang up further south. Pueblo was first called "Fountain City" because it was set at the head of Fountain Creek, but it soon took the name of an old trading post that had been built nearby.

Soon after the Civil War, the U. S. government mounted a major campaign against all hostile Indian tribes in Colorado to make the area safe for miners and settlers. At the same time that the Indians were defeated and put on reservations, the last of the buffalo were being killed by hide hunters.

This forced the ciboleros and the comancheros to change the way they lived. Since the ciboleros could no longer hunt buffalo and the comancheros could no longer trade with Indian tribes, many of them started small farming and ranching communities, called "placitas." Others started new cattle- and sheep-raising operations, called "rancheras." Some of these placitas and rancheras survive today as modern towns or ranch headquarters, but most were deserted long ago.

Most placitas and rancheras were set up near freshwater springs and other prime spots along the Santa Fe trail. One such site was Hole-in-the-Rock, just north of the Pinon Canyon Maneuver Site, near the head of Timpas Creek. Set near a spring, Hole-in-the-Rock was a major



camping spot for travelers along the Santa Fe Trail. In 1866, Barlow and Sanderson, who had been hired to carry the mail over the trail, built a stage station here.

Five years later, the stage line was changed to a route along the Purgatoire River which ran right through the area that was to become the Pinon Canyon Maneuver Site. The new line served a group of ranches in the Red Rocks community.

The remains of one of the route's stage stations can still be seen in the maneuver site. Archaeologists dug out part of the building and learned that it had a corner fireplace and an outdoor roasting

pit. The same kinds of cooking facilities have been found in many abandoned buildings in the Pinon Canyon Maneuver Site. Because they combine Pueblo Indian and Spanish building styles, they show the mixed heritage of many of the people who built and used them.

SHEEP AND CATTLE RANCHING

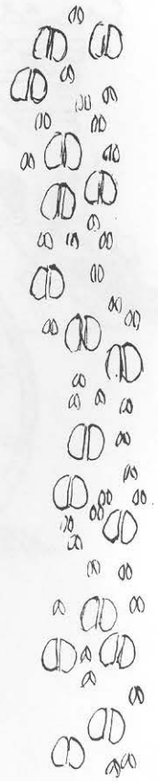
After the stage line was moved, Hole-in-the-Rock became the headquarters for the Circle Diamond Ranch of the Bloom Land and Cattle Company. About the same time, Isaac Van Bremer set up a sheep ranch along the arroyo that still bears his name.

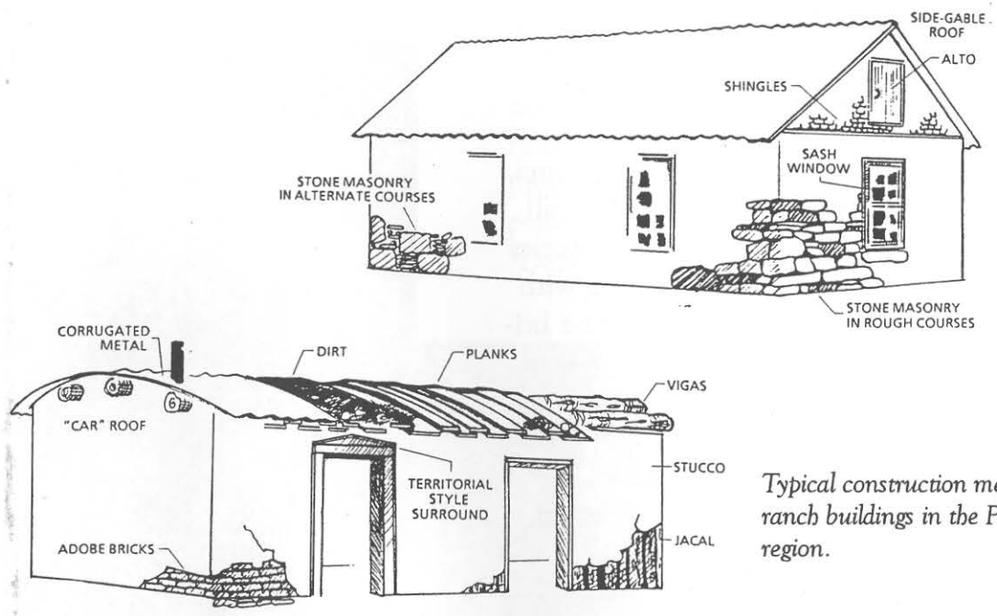
In those days, cattle ranchers and sheep ranchers mixed about as well as oil and water. In earlier times, farmers, many of whom were Hispanic, often had a few head of both sheep and cattle, but most later ranchers raised one or the other -- and had strong feelings about their choice. Samuel T. Brown, who bought the Hogback Stage Stop as his ranch headquarters, raised sheep. So did E.S. Bell, who bought the old Lockwood stage station. But Eugene Rourke set up a ranch on the Purgatoire River near the mouth of Bent Canyon and raised cattle.

In the late 1860s, cattle ranchers in Texas blazed trails to drive their herds to grazing lands and markets outside the state. One of the most famous trails was made by Charles Goodnight and Oliver Loving to drive cattle up to Colorado to feed hungry gold miners.

In 1868, a smart businessman named Dick Wooten bought land on both sides of a trail over Raton Pass and started charging a toll for the horses, cows, and people who came through. The toll was only a few cents a head, but because the Texas ranchers were moving thousands of cattle along the trail, the toll at Raton Pass took a big bite out of their profits. To avoid the pass, Goodnight and Loving moved their trail so that it passed just west of the Pinon Canyon Maneuver Site.

Several of the early cattle ranchers in the Pinon Canyon Maneuver Site region, including Eugene Rourke, got their start by buying the "drags" from cattle-drive trail bosses. "Drags" were cattle that





Typical construction methods for early ranch buildings in the Pinon Canyon region.

had been hurt or worn out by months on the trail. By buying these cattle for very little money and nursing them back to health, many ranchers like Rourke could afford to start their own herds.

Cattle and sheep ranchers in the Pinon Canyon Maneuver Site region had their differences, but they didn't get into the kinds of major disputes and range wars that blew up in other parts of the West. During most of the first half of this century, there were still about as many sheep ranchers as cattle ranchers in the Pinon Canyon Maneuver Site area.

But in the 1940s and 1950s, many ranchers sold their sheep and switched to cattle so that they could make more money. The Circle Diamond Ranch, one of the largest cattle ranches in the region, boosted its herd to more than 5,000 animals, grazing them on land holdings as far away as Montana. Many young men who started work at the Circle Diamond later started ranches of their own in the region.

THE MODERN RANCHES

In 1983, the U.S. Army bought 12 area ranches to create the Pinon Canyon Maneuver Site. These ranches had expanded over time through marriages and land sales between land owners.

The story of ranching in the Pinon

Canyon Maneuver Site is one of good times and lean times. While some ranches were successful, others failed. Always fighting droughts, blizzards, and floods, the ranches that survived did so by their owners' hard work. Close ties between ranches were often forged by marriages.

The life of Beatrice Cross Hill, who was born in 1906, is a good example of the family ties that connected these ranches. In 1873, Beatrice's grandfather, Kelsey Cross, came from Maine to homestead in the Pinon Canyon Maneuver Site region. He and his partners spent years buying up pieces of land, ending up as the owners of a ranch called the Bar VI. After running the ranch for a number of years, Kelsey sold the Bar VI to Beatrice's father, Sandy Cross.

In 1911, Bob Hill, Sr. came to Colorado and worked for about a year for the Circle Diamond Ranch. When the ranch foreman, Bud Monroe, told Bob about another ranch that needed a hand, he went to work there. He left to serve in the Army during World War I, but came back to the area after the war, bought the Big Arroyo Ranch and married Beatrice Cross. Their son, Robert (Bobby) Hill, was born in 1939.

Bobby Hill now works for the Army at the Pinon Canyon Maneuver Site and, partly because he is around the place all the time, he remembers lots of old stories about the ranchers. Bobby grew up with horses, knew how to saddle and put a bridle on a horse when he was five years old, and rode from Thatcher to Brown Sheep Ranch and back--a distance of more than 30 miles -- before he started school.

Some of the ranchers were smart businessmen. For example. Joe Doherty, who owned the Big Canyon Ranch, made so many land deals that he ended up owning "more land than Ireland," as Louise Doherty Compton, Joe's daughter, said.

Louise inherited the Big Canyon Ranch when her father died. She thought the ranch was a "hot, godforsaken place," but she moved there anyway in 1942. Ranch managers Thelma and Howard Sumpter, who had worked for Joe, managed the ranch for Louise.

The area's history includes colorful stories about the cowboys who worked for the area's ranch families. Marcelino Duran

Robert (Bobby) Hill.

The Shehorns at their Model store.

was raised on the Bar VI ranch, where his father worked for Kelsey Cross. Marcelino proudly remembers winning first-place prize money for riding a bronc named "Death Warrant" in a local rodeo.

Charlie Shehorn also worked for Kelsey Cross. He had come to Colorado with his parents in 1911, when he was two years old. Charlie remembers his dad taking a horse named "Firecracker" to the rodeo in Trinidad, where it bucked off every cowboy who tried to ride it. Charlie tried his luck at winning prize money in rodeos, and, like Marcelino, he also rode the bronc named "Death Warrant." He remembers how hard it was to live through the dust bowl of the 1930s, working at a lot of jobs to earn a living, like driving a school bus and farming a place at Lonetree near the end of the Hogback. In 1959, Charlie bought the Model Mercantile, where he still sells gas, groceries, and cold soda pop.

Not all the cowboys who worked on ranches in the Pinon Canyon Maneuver Site region were born in the United States. Adam Arnett, for example, left France when he was in his teens and went to Michigan before he moved to Colorado. Adam worked as a cook at the Circle Diamond until he had

Stella and Marcelino Duran, June 1995, Model, Colorado.

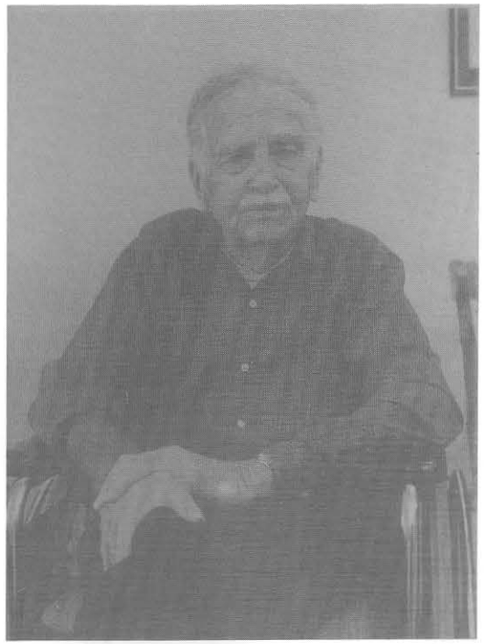


Photo by Hadley Harper

Elfido Lopez. From one of the pioneering families at Pinon Canyon, Elfido went to Denver University for his advanced education. He told interviewers about five phases in his life--cowboy, student, teacher, oilfield worker and warehouse worker.

enough money to send to his brother John in France so that he could join Adam in Colorado. John homesteaded on Taylor Arroyo, just west of Rock Crossing, while Adam lived at the ranch now known as Crowders. Adam's daughter, Margaret, married Jack Crowder in 1947. Jack was born in LaJunta, had worked on and off as a ranch hand, and had lived at Red Rocks before he married Margaret.

John Arnett's daughter, Maryann, worked with her father on the Taylor Arroyo homestead. One of her memories is having to stay home to make sure that all the lambs were in before she could go to the dance in Model. Maryann married Charles Mincic in 1948 and they had three children.

Maryann Arnett was one of a number of the area's ranch children who went to school for a short time at Canyon Compressor Station, a company town built in 1929 for workers at the Colorado Interstate Gas Company on a site north of the Purgatoire River in an area that is now part of the Pinon Canyon Maneuver Site. Two years earlier, the gas company had built a low-pressure pipeline to send

Photo by Hadley Harper

Maryann Mincic and family, June 1995, Hoehne, Colorado.

natural gas from Amarillo, Texas to Denver. Four booster stations were needed along the pipeline to keep the gas flowing. The Canyon Compressor Station, or Pinon Canyon Station as it was also called, was one of these booster stations. In addition to the compressor building, a warehouse and company office, this small town also had houses for company workers, a recreation hall, and the school where Maryann Arnett went for the first grade.

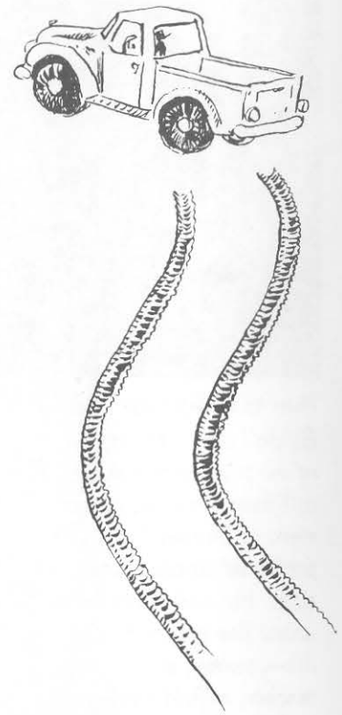
The pipeline was shut down in 1956 and the buildings were sold at auction six years later. Today, about all that's left of the town are some foundations and concrete pillars at both ends of what was once Main Street.

Ranches on the Pinon Canyon Maneuver Site were spread out over a very large area, and neighbors were very important, even though they were miles away. But some ranchers didn't seem to need -- or even like -- their neighbors. Everyone remembers that Bull Watkins, who moved onto the old Tom Hughes place on Lockwood in 1924, didn't get along with the Mincics, the Arnetts, Sam Kirsch, or Frank Monroe.

Most former residents of the Pinon Canyon Maneuver Site remember it as a good place to ranch, "if it rained or if it didn't." But ranching in the area was mostly hard work, trying to make a living from a harsh land. If it rained, you might make a little money. But mostly it didn't rain, and you just survived to make payments to the banker. Sometimes you couldn't make the payments and the bank foreclosed on your ranch. The song, "Mama, don't let your babies grow up to be cowboys," could have been written about the families that ranched on the Pinon Canyon Maneuver Site. "The rodeos and the dances, those were the good times," ranchers recalled -- except that, when all was said and done, "about all you could say was you were still honest and hard-working folk."

THE PINON CANYON MANEUVER SITE TODAY

Since 1983, the Army has used the 236,000-acre Pinon Canyon Maneuver Site for brigade-strength training maneuvers. The area is administered by the Army's Fort Carson Command.



The Army uses the rolling upland areas of Pinon Canyon mainly for training activities involving tracked and wheeled vehicles, helicopters, and other high-performance aircraft. The Army also trains Special Forces at Pinon Canyon.

Before training began, the Army did a report, called an Environmental Impact Statement, in which it promised to keep track of and help repair any damage its training activities did to the area's plants and animals and to study and protect its archaeological and historical resources.

From the start, the Army has committed itself to an environmental-protection program for the natural and cultural resources.

Researchers can review more detailed scientific reports from the Directorate of Environmental Compliance and Management at Fort Carson. So far, the studies include surveys and test-excavation programs to study archaeological and historical sites, and complete excavations at sites that were in danger of being destroyed. Several other studies, along with a series of architectural drawings, have been made of the old stone ranch buildings.

Excavations and studies of some historic sites have already been finished, including excavations of an old stage station and several building remains at a former placita. The information collected during these digs can be used by others who are interested in the area. For example, the placita dig was studied by a graduate student working on a college dissertation.

In another project, researchers con-

ducted one of the most complete studies ever made of rock-art sites in the United States. The authors of yet another study worked with American Indians to identify cultural resources that are important to them and figure out ways to protect them.

The Army is continuing its work to protect and preserve archaeological and historical sites. Important sites have been nominated to the National Register of Historic Places, and several video programs have been produced to tell the public about the results of research studies.

Efforts are also underway to study and protect the natural environment of the PCMS. Since 1983, the Fort Carson Environmental Office, along with the U.S. Fish and Wildlife Service, has been studying wildlife species that lived in the area before training activities began. The study is tracking the effects of the Army's maneuvers on these animals. Other studies are looking at whether training activities have affected soil erosion and the health of the short-grass prairie, pinon-juniper woodlands, and streams and wetlands.

These studies show that military-training activities do have an effect on wildlife at first, but that these impacts last for only a short time. Animals that can do so simply move out of the way of military personnel and equipment and then come back to their home ranges when training exercises are finished.

Plants are also affected by training activities, but the Army reseeds the damaged areas as soon as possible. A land rest/rotation cycle is used, which switches training between the eastern and western halves of the PCMS to help reduce long-term damage to soils and plants. All over the PCMS, certain areas are fenced off and marked "off limits" to protect fragile soils and important wildlife habitats. Archaeological and historical sites are also in these off-limits areas.

The most recent studies show that military exercises cause no known long-term harm to wildlife. In fact, the Army's purchase and use of the land has had some positive effects.

For example, it now looks like training activities do less damage to

wildlife than cattle and sheep grazing do. Cattle are especially hard on cottonwood trees, eating the young tree shoots and harming the older trees by rubbing against them. Since the Army bought Pinon Canyon ,cottonwoods have come back in canyons and wetlands where they had been destroyed by cattle.

Because the area is now public land, hunting is allowed at Pinon Canyon. Seasons for pronghorn antelope, mule deer, and bighorn sheep are set at the same time each year so that hunting doesn't conflict with the Army's training mission.

Hunters can buy a $10 Fort Carson/PCMS permit for both archery and rifle seasons. The Army also allows the public to enjoy other wildlife-related activities such as bird watching and wildlife photography.

Elk were historical inhabitants of the region but, until 1995, they had not been sighted there for many years. Researchers had proposed that elk be brought back into Pinon Canyon, but before the Army could act on the proposal, elk moved into the area on their own. Bulls, cows, and calves are now sighted often in the hilly regions of Pinon Canyon, but there is no elk hunting in the area yet.

The Maneuver Site has also become an important area for other wildlife studies. In one project, researchers are studying how a class of diseases called hantavirus spreads in rodents. The animals are not harmed by hantavirus, but the diseases can kill humans. Scientists are trying to learn why the disease does not harm the animals. When they figure this out, they hope to find a way to help humans who get hantavirus.

The Army will continue to protect the area's natural resources while it pursues its mechanized military-training mission.

>>>>>>>>> GLOSSARY <<<<<<<<<

amaranth -- a family of plants. Some varieties have seeds that were ground and eaten by humans.

atlatl -- hand-held tool used to propel a short spear or dart.

ciboleros --hunters who made expeditions from the settlements of New Mexico to hunt buffalo on the Plains.

chenopods -- a family of plants. Some varieties contain seeds that were eaten by humans.

cheno-am -- a combination word used by palynologists and others when it is not possible to differentiate chenopods from amaranth.

climatic optimum -- hot, dry climatic period following the Pleistocene or ice ages.

comancheros -- traders who travelled between the Plains and the settled villages of New Mexico.

edge-ground cobble -- a mano or hand-held grinding tool that was used along its edges rather than the flat faces of the rock.

genizaro -- an Indian who was captured by the Spanish, made to work as a slave, and given freedom after accepting Christianity.

geoarchaeologists -- scientists who study soils and their settings to learn how they were formed. The results of their studies are used by archaeologists to help them understand the settings of sites.

hantavirus -- a disease transmitted from mice to humans.

maize -- a variety of corn.

mano -- hand-held stone used to grind seeds, roots, and berries.

metate -- a stone surface (often portable) where seeds, roots, and berries were ground with a mano.

paleontologists -- scientists who study fossils to learn about plants and animals in ancient worlds, before the beginning of modern humans.

palynology -- the science of studying pollen to determine the plants that grew in past environments or plants used by humans for food and other purposes.

projectile point -- archaeologists use the term projectile point because they often do not know whether the stone tip was used on a spear or an arrow.

protohistoric -- time period after the introduction of European trade goods but before there are written accounts.

pictograph -- a painting on a rock surface.

petroglyph -- a design or figure pecked or scratched into the surface of a rock.

placitas -- settlements for ranching and farming communities which were passed down through the generations of a family.

Pleistocene -- geological time period when glaciers covered much of the northern parts of the world.

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Additional Information

Papers presented at professional meetings are available by request from the respective author. Copies of published papers should be sought from the publisher. Unpublished reports may be ordered from the U.S. Department of Commerce, National Technical Information Service, Springfield, VA 22161, (703) 487 - 4650. All reports are on file at the Directorate for Environmental Compliance and Management and available for inspection from 8:00 am to 3:00 pm at Building 2420, Curation Facility, Fort Carson, Colorado.