River Flowing From The Sunrise

Aton, James M

Published by Utah State University Press

Aton, James M.
River Flowing From The Sunrise: An Environmental History of the Lower San Juan.
Project MUSE. muse.jhu.edu/book/9418.

For additional information about this book
https://muse.jhu.edu/book/9418

For content related to this chapter
https://muse.jhu.edu/related_content?type=book&id=204139
Humans have hunted and herded animals, gathered and cultivated plants, and generally made a living in the San Juan River area for at least the last twelve thousand years. Although always a marginal area, the river valley’s population reached a high point during the Anasazi occupation between 1500 B.C. and A.D. 1300. During this prehistoric period, the San Juan landscape was certainly no untouched Eden. To be sure, since Euro-Americans entered the San Juan country and applied the technology of the Industrial Revolution, they have changed the landscape more dramatically than both prehistoric and historic Indians. Yet, before one accounts for that massive environmental change, it is crucial to understand the roughly twelve thousand years preceding it.

Although pre-Columbian Indians in the San Juan basin manipulated their environment, the influence of climatic variation cannot be ignored. During the prehistoric period, the San Juan changed from an Ice-Age climate with cooler temperatures and much more precipitation to the drier, warmer weather it now experiences. The first recognized and established entrants into the San Juan, the Clovis hunters, and their successors, the Folsom hunters, lived during the five-hundred-to-thousand-year transition from the cool, wet Pleistocene to the warm, drier Holocene. Moreover, all the prehistoric groups that archaeologists distinguish—Clovis, Folsom, Plano, Archaic, and Anasazi—had to cope with climatic changes during their tenure on the San Juan. They all made land-use decisions based on the environmental deck nature dealt them, on the skills and tools they had to play the game, and on the imaginative and cultural ideas they brought to the table. Often they hedged their bets wisely, but other times they overplayed their hands. None of these groups lived in perfect harmony with the San Juan landscape, although the Archaic lifeway persisted longer than any other.

Interest in San Juan prehistory has focused largely on the Anasazi from roughly 1500 B.C. to A.D. 1300. The Anasazi fired the imagination of the American public in large part because, in contrast to Indian groups before and after, they built magnificent structures. More than other Native American groups in the area, they reflected a Euro-American definition of civilization. The often-neglected groups of prehistoric Indians in the San Juan area, however, deserve equal consideration. It is crucial to understand how the hunting-gathering Clovis, Folsom, and Archaic Indians manipulated the San Juan environment and changed themselves in the process.

In the late Pleistocene, sometime around 10,000 to 9000 B.C., the Clovis hunters walked into the San Juan area. This is what they found: Weather conditions were cooler and wetter, but today’s temperature extremes did not exist. Rather than four seasons, two split the climatic year: a mild, cool summer and a wet, cold winter. The growing season extended longer, and plant species varied considerably, unlike the relatively less diverse environment of the Holocene, 8000 B.C. to the present.

A twentieth-century visitor to the late-Pleistocene San Juan River would be shocked to see what luxuriant vegetation grew in the bottoms as well as how massive the river flows were. That time traveler would find plants flourishing now commonly found on Navajo Mountain, Elk Ridge, or in the Abajo Mountains. A few would be barely recognizable. Tall Douglas firs, white
birch, limber pines, and blue spruce lined the banks of the river and its tributaries. Also common were red osier dogwood, alderleaf mountain mahogany, wild rose, and Rocky Mountain and common juniper. The more recognizable plants would have been Mormon tea, prickly pear cactus, narrowleaf yucca, cattails, big sage, and Indian ricegrass. This green, rich environment was just the kind of place that attracted Columbian mammoths, Shasta ground sloths, Yesterday’s camel, and other giant animals of the late Pleistocene. For the Clovis hunters, it probably was “a veritable Garden of Eden.”

Although it is unclear exactly who were the first Americans and when they arrived, the Clovis hunters (named after Clovis, New Mexico, where their artifacts were first discovered and identified) remain the first verifiable group of humans in the New World. While a few possible pre-Clovis sites have been excavated by archaeologists at places like Monte Verde in Chile and Meadowcroft Rock Shelter near Pittsburgh, none of them has passed all the criteria established by archaeologists. This situation is changing rapidly, and many archaeologists privately think a pre-Clovis presence will soon be accepted. Clovis points, however, have turned up in every state in the U.S. The majority of these sites lie on the Great Plains, but at least a score of them are on the Colorado Plateau. One sits on Lime Ridge, overlooking Comb Wash and the San Juan River.

What brought these hunters to the San Juan area apparently was the presence of Columbian mammoths and an occasional mastodon. Clovis hunters probably traveled in groups of forty or fewer, including both sexes and all ages. Although they appear to have specialized in these two large animals, they also hunted other large herbivores, such as camels, ground sloths, long-horned bison, giant short-faced bears, horses, and musk oxen. When time and opportunity presented themselves, they also probably caught rabbits, wild turkey, and other smaller animals. Wild Rice has been a staple of southwestern Indian diets since the first Clovis hunters. It was ground into a meal and also made into a drink. (James M. Aton photo)
vegetables no doubt formed part of their diet during the warm season. Like any hunters, the Clovis people were opportunists, but they probably preferred mammoths. Within five hundred years or less, however, mammoths were extinct. Clovis hunters may have been the culprits.

The extinction question has drawn much attention precisely because one interpretation of it is an archetypal story of the Fall. Subsequent Native American groups might come and go, like the Navajos whose sheep overgrazed the hills north of Bluff, but somehow those environmental trespasses seem less portentous. This creation story says that when people entered the Garden, they destroyed a vital, even totemic, part of that paradise: those magnificent mammoths which waded along the lush bottoms of Comb and Butler Washes. These people—the Clovis hunters—might have committed the Original Sin of the Americas.

We explore this extinction possibility in depth because it reveals crucial information about the changing San Juan environment. It shows what kinds of plants and animals inhabited the area. It demonstrates the way climatic change affected aspects of the landscape. And it throws in the human element: the application of technology to manipulate an environment, along with the cultural and ethical values that accompanied it. Whatever the exact source of the Pleistocene extinctions, this creation narrative frames an important question for the rest of this book. The complete story of the San Juan River demands that we ask not only what the river landscape looked like, but what people found and did there. One can view the mammoth-extinction story as the beginning script of a San Juan River palimpsest.

Standing twelve to fourteen feet tall and weighing upward of twenty thousand pounds, Columbian mammoths appeared in North America nearly two million years before the Clovis people. They grazed on grasses and shrubs, their flat teeth especially suited for grinding. These giant creatures ate prickly pear, gambel oak, grass flowers, sedge, birch leaves, rose, saltbush, big sage, and smaller amounts of blue spruce, waffleberry, and dogwood. All of these plants flourished in the moist bottoms of the San Juan and its tributaries like Comb Wash.

By the time the Clovis hunters arrived, possibly because the environment was drying out, mammoths appear to have been congregating near water sources. This seems especially true on the now-arid Colorado Plateau. It may

From Clovis Hunters to Corn Farmers 15
account for the Lime Ridge campsite near the San Juan; it was probably a hunting stand from which Clovis Indians stalked mammoths in either Comb Wash near camp or along the San Juan River, a short distance to the south. The Lime Ridge site was perfectly situated to give Clovis hunters a long view of these drainages, all the while staying upwind. It offers a 360-degree view of the surrounding area, and in particular overlooks a side canyon that runs into Comb Wash. This drainage was probably a corridor for animals to move between the Lime Ridge uplands and the lower riparian zone.12

The hunters probably ambushed several mammoths from sites like Lime Ridge. Female mammoths and their offspring would have been especially vulnerable to mass killings because elephants behave altruistically. Studies of elephant behavior in Africa reveal that if one is killed, others (especially females around offspring) will rally around, making them easier prey.13 Other scholars believe that while Clovis hunters did not habitually kill groups of mammoths, they would have if the opportunity presented itself.14 But kill mammoths they definitely did. The question is to what extent?

At the end of the Pleistocene, both flora and fauna underwent major changes in the Americas. As the climate warmed and dried along the San Juan, for example, plant communities started to crawl up the drainages and slopes toward the ridges and mountains, chasing a cool, wet climate. The blue spruce-limber pine-Douglas fir communities once lining the San Juan ended up on Navajo Mountain, Elk Ridge, and the Abajos. Pinyon-juniper woodland communities from the lower Sonoran and Mojave Deserts, in turn, replaced them. Desert shrubs
communities, likewise, took over from pinyon-juniper. Plant environments were changing radically, and species of megafauna in the San Juan and elsewhere, like the much-hunted Columbian mammoth, became extinct. Was it because of climate change or due to the Clovis hunters?

For years scientists had assumed that the giant mammals of the Pleistocene died gradually because the weather patterns altered and the ensuing Holocene environment no longer supported them. Many still hold climate to be the culprit. But in 1967, Arizona archaeologist Paul S. Martin first proposed the “overkill thesis”: Clovis people had hunted the megafauna to extinction. In his groundbreaking work, Martin showed that some thirty-one genera of large mammals disappeared about ten thousand years ago. He theorized that these animals had evolved without fear of human hunters. When the first hunters arrived in America, “there was insufficient time for the fauna to learn defensive behaviors.” The result was a hunting blitzkrieg.

In a mere one thousand years, he postulated, a band of forty Clovis hunters could have spread throughout the Americas and multiplied to over a half-million people, wiping out the vulnerable mammoths and other megafauna as they went. Unaware of what they were doing, the Clovis hunters kept pushing on to new hunting grounds, taking the easy prey; perhaps at times they even wasted much of the mammoth because there were so many. When the large animals disappeared, Martin said, populations crashed, and hunters turned to other animals and food-gathering strategies. Following this massacre, mammoths, mastodons, and other giants no longer lumbered along the lush bottomlands of the San Juan, eating sedge and rice-grass. After two million years in North America, all that remains of the mammoths are piles of bones and desiccated turds. If Paul Martin is correct, these first Americans were responsible for perhaps the most dramatic of many extinctions in North America.

Not all archaeologists and paleontologists, however, accept Martin’s thesis, and there is fierce debate. Many believe that the appearance of Clovis hunters and mass extinctions were a coincidence. Climate alone might have delivered the knockout punch. These Ice-Age mammals had coevolved with certain kinds of plant communities, which began to change between 10,000 and 9000 B.C. For many of these mega-herbivores (large plant eaters) like the mammoth, a reduction in the kinds of plants they preferred created greater competition with other animals. Moreover, the change from a two-season to a four-season year meant that many plants that mammoths browsed on no longer had a full growing season. Thus, plant diversity declined, and megaherbivores might have found it increasingly difficult to forage for the high-protein diet they needed. They would have been pushed to eat lower-protein plants with higher toxins. As a result, megafauna with conservative digestive systems would have lost out to animals which could adapt. The Clovis hunters might have merely shown up at places like Lime Ridge to witness the sorry spectacle and take advantage of dead or dying animals. Another explanation postulates that the mammoths and other large mammals were on the ropes when the Clovis hunters appeared; these hunters merely delivered the fatal blow.

One factor that must be considered when discussing the slippery eel of Clovis responsibility for mammoth extinction is what religious obligation they may have felt toward the animals they killed. No one will ever know. But if ethnographic comparison and contemporary hunters and gatherers offer a clue, and we can take a giant leap in time, space, and circumstance, the Clovis probably had little concern for conservation. Robert Brightman, in his study of Rock Cree relationships with the animals they hunt and trap, points out that the gods or overspirits provide the animals. The spiritual relationship with the supernatural controllers of the game, not the animals and their reproductive thresholds, determines the availability and scarcity of meat. Similar conclusions have also been reached about historic, traditional Navajo hunting practices. There is no way of knowing what Clovis hunters camping on Lime Ridge thought about mammoths, leaving archaeologists plenty of opportunity to speculate.

With the collapse of the Clovis-megafaunal hunting lifeway, Paleo-Indians retooled and concentrated on hunting the long-horned bison (Bison antiquus). These hunters, known as Folsom, after the initial discovery of their artifacts at
Folsom, New Mexico, settled mostly in the Great Plains area, where bison congregated in largest numbers, even up to the last century. Folsom presence on the Colorado Plateau was less pronounced than Clovis. Sites near Green River, Utah, and along other riparian drainages, together with long-horned bison remains in similar places, suggest that these animals followed the lead of other megafauna: They grazed the waterways. Although the Folsom groups apparently did not bump into each other on the Colorado Plateau and the San Juan, it is quite possible they engaged in less hunting alone and more hunting and gathering combined because fewer bison frequented higher areas like the cavernous plateaus around the San Juan.

The dividing line between various Folsom and Plano groups and the succeeding Archaic culture is unclear. As one San Juan archaeologist put it, “The whole Archaic period is blurred and poorly resolved.” Nevertheless, many aspects of Archaic lifeways can be described with confidence. Their presence on the Colorado Plateau is well established and extensive. The term Archaic describes a general hunting-gathering lifeway that persisted at least intermittently from 6500 b.c. to a.d. 1. This length of time alone indicates the success of this subsistence pattern. It is wrong, moreover, to assume that theirs was a hand-to-mouth existence, scavenging for every available ricegrass plant or rabbit to fend off starvation. Rather, the Archaic appear to have exploited selected animals and plants in different ecological zones.

The earliest Archaic sites in the San Juan area are near Navajo Mountain in Dust Devil and Sand Dune Caves, the so-called Desha Complex Archaic, dated around 6000 b.c. Elsewhere near Glen Canyon—at Bechan Cave, on the northwestern Colorado Plateau, at Cowboy Cave, and at Sudden Shelter—and at Old Man Cave in Comb Wash, Archaic camps date to the seventh millennium b.c. To the east, excavators have also found Archaic sites in the Middle San Juan basin near Chaco.

Certain generalizations about the San Juan Archaic and their environment are possible. Their population waxed and waned according to wet and dry weather cycles, with a general trend toward increasing as the Anasazi period neared. Over the millennia, the Archaic evolved from concentrating on hunting, like their Paleo-Indian forebears, to gathering plants. The reasons are not clear. Did environmental conditions like the altithermal (a long period of higher-than-normal temperatures between 4000 and 2000 B.C.) lead to less game? Did the increasing numbers of Archaic people result in overhunting? Did the Archaic find gathering plants a more efficient way of meeting their nutritional needs? Or was it a combination of all these factors?

The answers are inconclusive, but the questions raise important considerations about the interaction of people with the landscape along the San Juan. In general hunting supplanted by gathering is a more efficient way of supplying food. It is possible that the Archaic, over a few thousand years, unknowingly pushed game—deer, bighorn sheep, and elk—to their limit and were forced to begin gathering wild plants.

Archaic gatherers were opportunists, but they did not wander aimlessly, searching for plants to eat. They moved in a regular pattern and returned to productive areas. They scouted before gathering and possibly communicated with other bands as to prolific plant locations. In general Archaic bands in the San Juan area followed the seasons: In the spring and summer, they might camp and gather plants on dunal grasslands like those above Bluff and Montezuma Creek. Come fall they moved to the pinyon-juniper uplands near Navajo Mountain, Elk Ridge, and Cedar Mesa to hunt game and gather wood for fuel and shelter. After 2000 B.C. when pinyon became common, they also gathered pine nuts at higher elevations. Throughout the year, they probably dropped down to the San Juan and its tributaries, where plants, game, and fuel were readily available.

Recent work in the Chaco River basin suggests that the Archaic employed a “mapping on” strategy. During the spring and summer, when various greens or seed-bearing plants were reaching harvest stage, Archaic bands located near a particular field of, say, goosefoot and picked its leaves. Then they moved to another area, where, for example, dropseed was maturing and picked its seeds. This high mobility, especially during the warm months, was based on knowledge of their home areas and the way weather affected certain plants’ growth.
In contrast to the common belief about arid lands, the high deserts and river bottoms of the San Juan country were a grocery store of plant food. Two plants in particular formed the basis of prehistoric Indian diets throughout the Archaic period and strongly supplemented Anasazi crops: chenopods (goosefoot) and amaranths (pigweed), together called cheno-ams. Interestingly both plants “pioneer” disturbed soil, areas that have been trampled by human feet or disrupted by digging. Thus, when Archaic groups winnowed seeds from these two plants, unknowingly they were replanting for the next year.

Goosefoot grows in alkaline soil, making the salty greens especially tasty. Its seeds were parched and eaten dry or made into a meal. Distillation of the stems made a powerful anthelmintic that dispelled parasites. Pigweed also greens up throughout the spring and summer. In late summer, its seeds were parched, popped, and ground into a meal. Sometimes it was stirred into a drink. Pigweed produces more protein per land unit than corn; it is nutritionally superior to true cereals in protein, carbohydrates, and fat. In fact, caches of pigweed have turned up in archaeological sites worldwide.

Besides goosefoot and pigweed, Archaic bands in the San Juan area collected a variety of grass seeds, especially Indian ricegrass and dropseed. Indian ricegrass continues to play a vital role in southwest Indian diets even today. Its seeds were ground into meal after cooking or parching. While this plant is not viewed as a pioneer, it has been found in disturbed sites, especially on south-facing slopes of slide areas. Although lower in starch and sugar than wheat and other cultivated grains, ricegrass yields 120 calories per ounce. Dropseed is another seed-bearing grass that grows in areas shunned by more palatable grasses. Aside from their nutritional value, these grasses provided both fiber for the diet and bedding.

Many other plants produced edible seeds for the Archaic, such as cattails, fiddlenecks, and composites like the sunflower. Archaic gatherers also feasted on a variety of berries and fruits from vegetation near the San Juan, like prickly pear cactus, blackbrush, blackcap, wild rose, creeping hollygrape, honeysuckle, and serviceberry. The Indians picked other greens, peas, seeds, and roots in season. Supplemented by meat from deer, bighorn sheep, rabbits, birds, and other small game, the Archaic diet was well rounded and met all nutritional needs.

Before moving on, it’s important to ask how well the Archaic people succeeded. This hunting-gathering way of life lasted by far the longest in the history of human occupation on the Colorado Plateau. Contrasted with the Paleo-Indians (who shared much with them), the Anasazi, or subsequent Indian groups, as well as Euro-Americans in the Southwest, Archaic practices stand as singularly successful. Coupled with its longevity is the relatively benign impact the Archaic lifeway had on the environment. As one archaeological team asserts, the “long tenure of the Archaic in the San Juan Basin testifies to the overall success of this adaptive system.”

It is not clear whether the Archaic ultimately adopted farming or horticulturalists moved in from the south. If the Archaic did begin to experiment with farming—and it is clear that the cultigens (corn, squash, and later beans) as well as agricultural techniques came from the south—the question is why. Hunting and gathering, after all, had worked well for a long time. The usual answer is population increase.

Imagine the scene: An Archaic family along the San Juan near Montezuma Creek finds itself more pinched for space every year. One year a new band moves into the Aneth area, where the Montezuma Creek band has always gathered Indian ricegrass. An enterprising neighbor from Aneth shows the Montezuma Creek band that they can plant corn seeds in an alluvial fan. In late summer, if the weather has not been too dry, they can harvest the corn, eat it, and store some for lean winter times. The Montezuma Creek band asks, “How can we lose?”

In fact, it appears that from before 1500 B.C. to A.D. 1, horticulture along the San Juan was a hedge against bad years, a little extra money in the bank when hunting and gathering were not paying off as well as usual. Still, using either the migration or gradualist model, this adaptation took time. Unfortunately, the archaeological record cannot tell us about all the individual decisions that bands of people made year in and year out to change to sedentary farming. Hunter-gatherers leave less garbage for archaeologists to sift through than farmers like the
Anasazi. As one archaeologist so aptly puts it, “In contrast to our lithic-based, foggy view of the ephemeral and elusive PaleoIndian and Archaic periods, the Basketmaker [Anasazi] people leap forth from their dry caves fully dressed (by Basketmaker standards), coiffured, painted, and equipped with a wonderful array of skillfully made baskets, bags, tanned hides, feather and fur robes, and tools of all sorts.” The leap appears sudden, but it really was not.

Throughout their tenure in the San Juan area, the Anasazi continued to supplement their diet with the wild plants and animals they had relied on during the Archaic period. The more they did so, like the Kayenta Anasazi (south of the San Juan River and west of the Arizona-New Mexico border), the healthier they stayed. Research indicates that, in general, hunter-gatherers enjoyed better health than horticulturalists because their diets were more rounded.

The wild plants eaten by the Basketmaker (1500 B.C. to A.D. 750) and Pueblo (A.D. 750 to 1300) Anasazi along the San Juan were largely the same ones Indians had been eating since Paleo-Indian times. They also added some. Their staples were cheno-ams, ricegrass, dropseed, juniper berries, four-wing saltbush, yucca, sunflower, globemallow, ground cherry, purslane, Mormon tea, pine nuts, plantain, beeplant, wild onion, tansy mustard, parsley, and buffaloberry. The Pueblo groups, however, intensified horticulture and food storage, presumably because of population increase. One striking feature of Anasazi horticulture is the way building homes and especially planting fields encouraged the growth of many wild, “pioneer” plants they had always eaten. The greater the population increase and accompanying soil disturbance, the more plants like goosefoot, pigweed, sunflower, beeweed, and prickly pear cactus thrived. It was a true symbiotic relationship for the San Juan Anasazi. Moreover, evidence suggests they encouraged these weeds to grow by watering and tending them.

This same sort of symbiosis occurred with hunting. For example, at Basketmaker sites west of Bluff on the dunes above the San Juan, rabbits, deer, Canada geese, sandhill cranes, and prairie dogs, to mention a few, wandered into the fields the Anasazi planted along the river. The Anasazi then hunted and trapped these invaders to augment their diets. It is hard to know if they realized the ways farming increased the production of many wild foods and animals. But given their long tenure in the area, they probably did. In general, however, throughout the whole two-thousand-plus-year Anasazi period, gathering and hunting decreased as horticulture increased. Growing populations led to overhunting and reduced the range for any one band to locate deer, bighorn sheep, and elk.

Besides hunting, gathering, and agriculture, the Anasazi grew cotton (also imported from Mexico) for blankets and clothing. Some articles, like the so-called Telluride Blanket excavated by pothunters in San Juan County in the 1890s, have survived and demonstrate extraordinary craftsmanship. The Anasazi also raised turkeys to incorporate the feathers into their fur robes and use in ceremonies. Toward the end of the Pueblo III period and approaching abandonment, however, they began to eat their turkeys. This practice indicates a period of pronounced economic, cultural, and environmental stress. As one archaeologist put it, “It is like us eating our dogs.”

Like the Archaic, the San Juan Anasazi built homes near their crops. Basketmaker pit-houses were especially wood intensive, using perhaps hundreds of pinyons, junipers, cottonwoods, or ponderosa pines for just one large dwelling. One distinguishing feature of the Pueblo period is the introduction of wattle and daub or stone into building techniques. Masonry obviously created a more permanent structure, while pit-houses only lasted about ten years before termites and rot undermined them. It is possible that depleted resources hastened the change from wood to rock.

The south-facing, passive-solar position of many Anasazi masonry structures like River House (or Snake) Ruin on the river is well known, thanks in part to the budding solar-energy movement of the 1970s. These structures provided excellent solar heating during the winter when the sun was low on the horizon. Conversely, in summer the overhanging cave roofs cooled residences when outside temperatures were reaching one hundred degrees. Their use of solar energy and some apparent
solar petroglyph calendars in places like Chaco Canyon and Hovenweep prove the Anasazi watched the sun closely and knew how to predict astronomical events.41

Another interesting feature of Anasazi farming was their sophisticated irrigation systems. Near Navajo Mountain at Beaver Creek in Cha Canyon, the Anasazi constructed intricate, rock-lined ditches to direct water from the creek into their fields. The ditches ranged in length from ten to thirty yards. Many of them featured small, tapered stones which slid in and out of the faces of other notched stones to allow water into a ditch or move it along to the next one. In addition to these complex irrigation channels, the Anasazi farmers constructed stone wind-screens on the upwind sides of their fields to prevent sand from blasting their plants and drying out the soil. At nearby Desha Canyon, just east of Cha, the Anasazi also built terraced plots, which tied into their ditches.42 In all, the Anasazi, like their descendants at Hopi, Zuni, Acoma, and elsewhere, were skilled farmers who utilized a variety of methods to water crops in a high-risk, arid environment.

What may not have been so obvious to them was farming’s detrimental effect on their environment. In pinyon-juniper uplands like Cedar Mesa north of the San Juan, the Anasazi likely practiced slash-and-burn horticulture, torching trees and then clearing the stumps. For a few years, the fields produced large crops before depleted soils forced the farmers to clear a new patch. Still, for the first few years of a fallow period, an abandoned field continued to grow garden weeds like amaranths, purslane, and goosefoot, as well as shrubs with edible berries like currants and three-leaf sumac. Nevertheless, in a seventy-five-to-two-hundred-year period on Cedar Mesa, the Pueblo II and Pueblo III Anasazi

River House (or Snake) Ruin along the San Juan River receives full sun at the winter solstice. At the summer solstice, it is in full shade. The Pueblo II Anasazi (a.d. 900–1100) who built this and many other houses in Four Corners country understood solar gain. (James M. Aton photo)
The Anasazi used check dams like this reconstructed one at Hovenweep (facing page) to catch precious water in an arid environment. (James M. Aton photo)

effectively destroyed the arable lands they created by slashing and burning. These methods probably shortened the duration of their occupation and hastened abandonment of Cedar Mesa before A.D. 1300. Forest depletion also occurred at Chaco National Monument and probably contributed to the Anasazi’s demise there near A.D. 1150. Unlike those on Cedar Mesa, Chaco’s surrounding forests never recovered, probably because populations along the Lower San Juan were smaller.

In the Dolores River area, not far from the San Juan, the Anasazi’s razing of forests led to the loss of sage grouse, disruption of large-game migration, increased erosion, and sage and wood depletion in general. Likewise, farming at the Coombs Site near Boulder, Utah, markedly reduced pinyon, juniper, and sage during Pueblo occupation. “Environmental degradation,” the Coombs Site archaeologist writes, “is an apt description of its severity.” In short the Anasazi’s intense use of wood for fuel and structures greatly affected the forest ecology and erosion in these areas.

This same sort of environmental impact was felt on the San Juan River. Unfortunately, the Middle and Lower San Juan have not attracted the intense scientific scrutiny of the Chaco or Dolores areas. A Basketmaker III site west of Bluff, however, demonstrates some interesting facts about erosion. Cutting cottonwoods and reeds to construct wood-intensive pithouses probably intensified the bank erosion along the San Juan which followed Basketmaker III times. All told, San Juan Anasazi horticulture probably had a substantial impact on the ecosystem. Still, the Anasazi did not fundamentally reduce the carrying capacity of the land. Historic activities like logging, mining, farming, and grazing have altered the landscape “much more than any prehistoric impact.”

One of the most discussed aspects of Anasazi culture, of course, is the general abandonment
of the San Juan River circa A.D. 1300. It is well
known that many Mesa Verde Anasazi (north
of the San Juan) and Kayenta Anasazi (south
of the San Juan and west of Chaco) migrated south
to settle on the Hopi mesas. Other Anasazi
groups moved east to live along the Rio Grande.
The prevailing question remains why did they
leave the area? It does seem, as one archaeologist
put it, as if “someone should have stuck
around.”

Nearly all the hypothetical answers relate
in some way to the environment. The discovery
of tree-ring analysis by A. E. Douglass in the
1920s gave archaeologists an especially valuable
tool to measure rainfall in a particular year.
Dendrochronology in the San Juan country

From Clovis Hunters to Corn Farmers  23
The Pueblo III Beaver Creek Anasazi community (A.D. 1100–1200) used a variety of techniques to irrigate their corn fields, including this rock-lined ditch which took water directly out of the San Juan. (Museum of Northern Arizona Photo Archives, NA 7175)
shows that a great drought persisted for at least fifty years through 1276, apparently pushing Anasazi farmers out of marginal areas. Besides the great drought, another theory advanced is arroyo cutting due to environmental degradation. As already noted, deforestation at Chaco would have contributed to arroyo cutting, leaving the fields high and dry. The extent of arroyo cutting elsewhere in the San Juan drainage, however, is less clear.

Early scientists like A. V. Kidder have suggested that warfare was the deciding factor in abandonment. Pueblo III structures seem to have defensive postures. Moreover, there is increasing evidence that the Numic-speaking Paiute probably occupied the Lower San Juan by at least A.D. 1300. But even if there was no conflict between the Anasazi and these Paiutes, there is evidence that warfare among Pueblo groups increased during the Pueblo III period. That warfare, says Steven A. Leblanc in his provocative book, *Prehistoric Warfare in the American Southwest*, directly resulted from climate change in the thirteenth century: “In the 1200s . . . the climate deteriorated significantly and warfare became virulent . . . Indeed, there is some evidence that this Late Period of intense warfare was not just a pan-Southwestern phenomenon but a pan-North American phenomenon as well.”

Other theories which archaeologists discuss but find difficult or impossible to document are “the bright lights theory” and the “religious revolution theory.” The former postulates that when crops continued to fail, people tended to congregate where there were more potential marriage partners, more social activities, and more crop surpluses. In other words, they moved to places like the Hopi mesas and along the Rio Grande.

The second theory has been articulated by, among others, the Navajos, who later moved into the territory the Anasazi abandoned and whose name for their predecessors (“enemy ancestors”) was adopted by archaeologists. They believe that the Anasazi were a brilliant culture which went astray. As one contemporary Navajo elder put it, they “shriveled and died because the people transgressed the laws of the holy beings and of nature as they sought ease through the power which they abused . . . A holy way gone bad.” Some archaeologists concur, speculating that the religious life of the Anasazi might have grown too extreme, too abstract, too involved in something that had nothing to do with the land. It might have become a system too rigorous to contend with problems that occur with agriculture in a marginal area. In some ways, this theory meshes with the Zuni idea that the San Juan Anasazi moved because they were looking for a center place where they could regain spiritual balance.

All the environmental stress factors—drought and arroyo cutting—could easily have been part of that cultural-religious transformation. Unfortunately, western science does not have very good tools for measuring prehistoric social and religious change. It seems obvious that environmental factors alone could not have caused such complete abandonment; a change in religious systems may be the only way to account for it. But scientific methods do not help to interpret such a change. No doubt the factors were complex and interrelated.

The problem with studying abandonment of the San Juan area is that we have only physical evidence to map the actions of these highly religious people. The Clovis and Folsom people who first loomed large on the landscapes of North America left very little indication behind of a spiritual life, yet they must have had one. The earliest rock art in the Southwest that is firmly dated is the so-called Archaic abstract style. Close to the San Juan River, this Archaic rock art was first found around the base of Navajo Mountain and is now under the waters of Lake Powell. These panels date from between 2000 and 6000 B.C. The figures suggest they were largely the work of men because of the subject matter: hunting (sheep), religion (kachinalike figures), weaving (design motifs), and farming (maize and sunflowers). The especially high number of sheep represented indicates a hunting shamanism similar to the split-twig figurine complex in the Grand Canyon.

First discovered in the Grand Canyon in the late 1930s and then elsewhere on the Colorado Plateau, the split-twig figurines have generated a flood of commentary and speculation. They provide one key to understanding the psychic relationship between the late Archaic and their landscape. They may even tell us what these
people thought and felt about their prey. These figurines have turned up in California and Nevada as well as the Colorado Basin.

The Grand Canyon figurines, however, which have been dated to 2000 B.C., raise the most puzzling questions because of small, pointed sticks piercing the bodies of the animals. A number of factors, especially their location in isolated caves not used for habitation, suggest that the figurines represent deer or bighorn sheep which the Archaic ritually killed prior to the hunt. As one scholar put it, “If a miniature figure of the animal to be hunted were ritually killed, success would be more certain in the actual quest.” Much of this is speculation based on analogy with hunting cultures worldwide. It is possible the figurines had more prosaic functions, but the spearlike sticks certainly indicate they were something more than toys or dolls.

Besides the split-twig figurines, rock art from that period suggests the same kind of hunting magic was being pecked on sandstone walls. In the Lower San Juan-Glen Canyon region, petroglyphs of bighorn sheep and deer were probably part of the same hunting and ceremonial traditions as the split-twig figurines. Sheep, deer, and other animals have continued to be depicted in southwestern Indian art to the present. While the Archaic cultures turned increasingly toward plant gathering and the Anasazi toward horticulture, it is clear that hunting did not diminish in psychic importance. Stalking, killing, and eating animals loomed large in the religious lives of most native cultures in North America.

Perhaps the power of Anasazi rock art reveals itself most dramatically near the confluence of Butler Wash and the San Juan River on the so-called Kachina Panel. Because it has so many different kinds of figures, the panel is an outstanding example of the variety of Anasazi rock art and what it says about its makers’ relationship with the environment. The huge, trapezoidal human figures seem to be shamanic. Some are phallic, suggesting an association with sexual potency; others contain small, humanlike figures and are probably female. The spectacular headdresses also hint at shamanic flight.

Rock-art scholar Polly Schaafsma believes that the anthropomorphs “not only had ceremonial impact” but “they were probably representations either of supernatural beings themselves or of shamans. Images such as these may have been thought to contain the soul force of the beings they represent. The many hand prints around or in the torso area . . . support this possibility; they . . . identify the supplicant who had offered prayers to, or through, the beings portrayed.” In other words, the hand prints said to the spiritual powers, “I made this offering. Please recognize it.” The bighorn sheep and yucca plants on this panel emphasize the sacredness of the twin subsistence activities of the late Archaic-early Basketmakers: hunting and gathering.

Much like the rest of Anasazi culture, Pueblo rock art seems literally to have exploded around the San Juan and Colorado Plateau. This may have had something to do with increased population and sedentarism. As populations grew and consolidated, multiclan villages developed. Some of the rock art may have helped different clans maintain their separate identities during a time of increasing social complexity. Besides the actual clan identity, certain symbols apparently documented who “owned” which fields, check dams, and so on.

Even with the shift to sedentary horticulture and decreasing numbers of game, both the depiction of sheep on rock walls and studies of contemporary Pueblo Indians reveal that a lot of social and ceremonial organization still went into hunting animals for food and other uses. Horned sheep have always had supernatural significance for San Juan Indians. Horns not only suggest shamanic power but are also associated with one of the most widely known kachina figures, Kokopelli, the humpbacked flute player. Known by his Hopi name, this figure first appeared on rock walls around A.D. 1000, during Pueblo II times, with his flute, humpback, and phallic. Yet earlier flute players appear in rock art from Basketmaker III times. This figure may have been significant even in late Archaic times.

In Hopi mythology, Kokopelli is a kachina figure associated with increased rain, crops, and fertility. He plays his flute over springs to attract rain clouds. Additionally, he is a hunting magician and often appears with sheep and deer. Sometimes he carries a bow and arrow rather than a flute. His hump may contain babies,
blankets, belts, or seeds. These he gives to the women he seduces. Thus, both his humpback and phallus are associated with fertility and procreative powers. In many ways, Kokopelli may be compared to the trickster archetype, who, in spite of unrestrained sexuality, changes from an unprincipled, amoral force to a creator who brings order and security, in the form of meat and corn, into the world.

Less prominently depicted than the male Kokopelli is a female Kokopelli Mana figure. While not Kokopelli’s wife, she shares his spirit in terms of sexuality and fertility.\(^6\) Kokopelli and Kokopelli Mana appear to have had major ritualistic and religious significance for the Anasazi. This society believed success in hunting, raising crops, and producing offspring—all of vital ecological importance—depended on these figures’ sacred help.

Most other natural features of Anasazi life were also depicted on rock walls along the San Juan: corn, badgers, bear tracks, dogs, stars, crows, suns, frogs and lizards, mountain lions, rabbits, turkeys, water skates, snakes, and ducks. The water skate, known as Tekeowati or “the mother of animals,” was seen in visions by Hopi who were thinking of game. Snakes were symbols of water and, hence, prosperity and abundance—similar to their associations in planting cultures worldwide. They also help hold the world together because they are magically associated with gravity. Ducks have long been connected with shamanism. In the Rio Grande Pueblo world, they serve as seed bearers and messengers to the rain clouds of the four sacred directions and the gods. Also, inversely, holy beings may assume the form of a duck.\(^6\)

In conclusion, rock art was intricately tied to the way the Anasazi made a living from hunting, gathering, and farming. In ways we will never know, the Anasazi depicted their sacred relationship with plants and animals on the walls, the “canvases,” where they lived. The rock art of the San Juan River and elsewhere in the Anasazi world shows not only some of the changes in their way of life but the manner in which they attempted to cope spiritually with
ecological and environmental changes. Since the San Juan Anasazi have persisted for over three thousand years, including their modern-day counterparts at Hopi and elsewhere, it is clear that religious figures on rock walls have been a factor in their survival.

Ultimately, the story of prehistoric Indians’ relationship to the San Juan landscape is very complex. As we learn more about these peoples’ interaction with their environment, the story will become both clearer and more complex. Some elements of the story are known, however, and probably will not change. For at least twelve thousand years, Indians along the San Juan River gathered the same plants for food and other uses. They continually hunted virtually every animal available, from megafauna like the mammoth to very small game like the rabbit. Some, like the mammoth, they may have driven to extinction. Other populations, like deer, they may have altered. In general, hunting remained a strong element in the spiritual lives of Anasazi even as corn, beans, and squash filled their stomachs.

While farmers now do not have the luxury of moving so easily to another region when weather patterns change, prehistoric Indians did so for nine to ten thousand years. Their flexibility with climate serves as a valuable lesson about adaptability. Prehistoric Indians along the San Juan sometimes made unwise land-use decisions, but they generally had a relatively benign impact. In most cases, land and animal populations can recover from neglect and abuse—the pinyon and juniper on Cedar Mesa, for example. The environmental history of prehistoric Indians shows just how hard it is to live well in a landscape as arid as the San Juan. Even when a culture has intimate knowledge of a region’s ecological processes and components, and a mythology to match, it still struggles to endure.