

Who Will Keep the Night?

Angela M. Richman, Pecos National Historical Park, P.O. Box 418, Pecos, New Mexico 87552;
angie_richman@nps.gov

*No sight that human eyes can look upon
is more provocative of awe than is the night sky scattered thick with stars.*
— Llewelyn Powys, philosophical poet

Parks across the country have been set aside to preserve a diversity of natural and cultural resources, from the impressive thermal features in Yellowstone to the historic Liberty Bell in Philadelphia. However, one resource historically has been overlooked; it is both natural and cultural and can be found in every park. It can even be found in your own back yard: it is the night sky. For millennia the night sky has remained unchanged, but within the past hundred years it has become filled with airplanes, satellites, and the glow of city lights. When we go out and look at the stars, planets, and moon, we are seeing essentially the same sky that ancient peoples once saw. The night sky is our best link to all human cultures that have gone before us, providing a way for us to better understand them. Although it has been affected by the technology of humans, of all the resources on Earth it is the one we have the most power to restore.

All over the world human beings have been sky watchers for thousands of years. The sky and objects within it have appeared as magical and faithful companions integrated into daily life. In many canyons and valleys, on buttes and mesas, and in many of the cultural remains across the southwestern United States, we find evidence of astronomical activities. Sun, moon, and star images are carved into or painted onto rock faces. Some of these images interact with celestial objects throughout the year, revealing light and shadow events that display and mark the passage of time. Some buildings are aligned to the solstice or equinox and entire communities may have settled in certain locations based on a distinct horizon in order to obtain an accurate calendrical cycle. Based on deductions from archeological sites and by understanding present-day American Indians, we know this calendrical cycle was important for determining many events, such as when to plant and harvest crops, perform certain ceremonies, and hunt. These are basic societal activities that need to be done at certain critical times in order to sustain human life. It is also apparent that observation of celestial objects and phenomena was fundamental in the ancients' mythology, possibly giving them a way to identify their role and place within the universe and to connect them with their entire surrounding envi-

ronment.

Chaco Culture National Historical Park is a unique place located in the northwest corner of New Mexico. By about 900 AD, this canyon was bustling with people. Archaeologists believe that up to 6,000 people lived here at one time, and thousands more would travel through. In many ways, life would have been very similar to our lives now. These people had the same mental abilities and hence the same power of imagination we have. They spent a lot of time and effort building vast roadways extending hundreds of miles. They constructed homes and buildings, both public and religious, some containing hundreds of rooms. They were farmers who worried about what they were going to eat and when. They were also astronomers who would sit under the immense sky at night and ponder over all they saw there. They left behind for us many clues demonstrating how they tried to give order to what might have seemed like chaos in the sky.

Fajada Butte is a very distinctive landmark at Chaco and can be seen from up to 40 miles outside the canyon, serving as a beacon for travelers then and now. Atop this butte is one of the most complete solar markers in the world. It has become known as the "Sun Dagger" (Figure 1). This site consists of three sandstone slabs that lean on their side against

Understanding, Managing, and Protecting Opportunities for Visitor Experiences

the cliff face. Beneath these slabs two spirals have been carved and strategically placed to physically interact with the sun at special times throughout the year. The summer solstice is the longest day of the year, when the sun will rise at its northernmost position along the horizon. On this day, when the sun reaches its highest point in the sky (around noon), light at the Sun Dagger will shine through the gaps between the three slabs and project a dagger of light that completely bisects the larger of the two spirals. On the winter solstice, when the sun is at its southernmost position, two daggers of light will bracket the large spiral. Then, on the vernal and autumnal equinox, the sun's position is directly between the two solstices. It rises due east and sets due west, when there is equal amount of daylight and darkness. On this day the two daggers of light bisect both spirals. From the first sliver of light to the last, the daggers move quickly and very accurately mark these special times, giving all those who are privileged to witness it a feeling of living on a moving planet. We can be

sure the order and magic of this event was greatly anticipated year after year.

The Sun Dagger is a beautiful example of how sites interact with the sun. However, the stars were also an inspiration in developing these markers. Many of the walls of the buildings in Chaco Canyon align directly north-south or east-west. It has been suggested that not only was the North Star used to give direction, but was also used in the planning of individual buildings and to precisely lay out the civilization as a whole. At least four buildings lay on the north-south line, one of which is Casa Rinconada, a ceremonial kiva. All great kivas have a doorway either on the north or south side. The northern doorway in Casa Rinconada was built of extra-large proportions allowing those inside to see the North Star at night.

In Canyon de Chelly National Monument, Arizona, you may find hidden in many rock shelters what archeologists first called "ancient planetariums"; a more appropriate term today would be "star ceilings" (Figure 2).



Figure 1. This dagger bisects a carved spiral to mark the beginning of the summer solstice; the Sun Dagger, Chaco Culture National Historical Park.

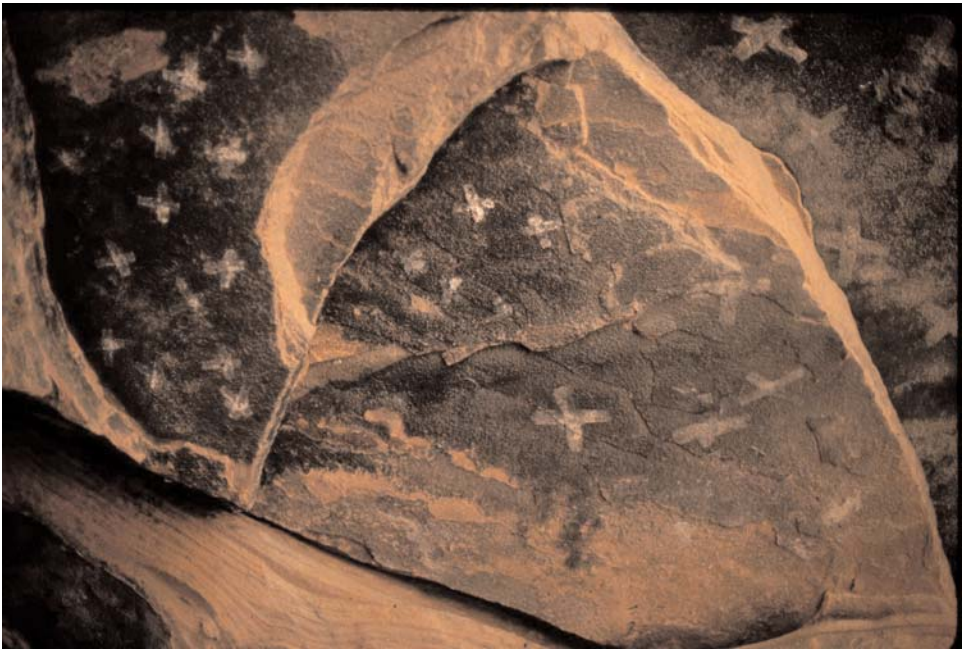


Figure 2. The ceilings of many of the alcoves scattered around Canyon de Chelly National Monument are adorned with stars.

The ceilings of such rock shelters have four-pointed stars painted on them. Some of these images were shot up with an arrow dipped in paint. Some believe they functioned somewhat like a planetarium of today, displaying the stars during the day in order to tell stories and mythologies under them. We can never be completely sure of the intended purpose of such places, but we do know the Navajo created these star ceilings, and most Navajo rituals were performed for protection. In addition to looking to the stars for protection, the Navajo used certain star patterns to symbolize many of their moral codes. The Fire Star (North Star), Revolving Male (Big Dipper), and the Revolving Female (Cassiopeia) serve as a reminder of how life should be inside a hogan as each of these constellations revolve around one another and revolve around the center fire. Dilyéhé (the Pleiades star cluster) are carefully observed to know the proper time to plant crops. A farmer must wait until this star pattern can no longer be seen in the evening sky in the spring or a late frost will likely destroy the crops. They also must be sure to

plant before Dilyéhé can be seen rising in the morning sky or it will be too late for the plants to mature before winter. When the tail end of Scorpius, which is known as the Rabbit Tracks, reaches a certain position in the sky, it signals the beginning of hunting season. Even with all our modern comforts we can still see how these star patterns serve as a guide to plant gardens or to hunt.

Not only for the Navajo, but also for many of the Pueblo Indians, astronomical activities flourished for decades in their communities. Modern-day Puebloans believe the night sky is an important resource to preserve and protect, not only for the connection to past generations, but also for the teaching of future generations. Some still teach their children about the sky in the home environment. Many tribes across the country are aware of their cultural past and take pride in connecting their youth and themselves to their ancestors through observations and oral histories.

Although the sky is usually dependable, if you watch it long enough, it can still throw in an element of surprise, such as the random

Understanding, Managing, and Protecting Opportunities for Visitor Experiences

shooting star, to more uncommon things like comets or supernova. In Chaco Canyon just seven miles west of the Sun Dagger, there is a pictograph placed in a thoughtful location to shelter it from weathering. It consists of a handprint, crescent moon and star burst (Figure 3). Some believe this to be a recording of a supernova. In 1054, at the height of the Chacoan civilization, a supernova occurred that could be seen for 23 days during the daytime before slowly fading out. Those living in Chaco at this time could have read by it at night. We can be sure that they noticed it. What a mysterious event to occur in an other-

at its brightest, a crescent moon could be seen next to it. The handprint might be the artist and historian's signature. Others who have visited this rock art panel suggest it represents Venus and the moon, which frequently align in the sky. Still others believe it to be the sun and moon, which would mark a sun-watching station. No matter how one chooses to see these symbols, they are still of astronomical significance.

There is another symbol located at this site, which I believe makes it even more powerful. It is placed on the vertical wall just below the others. There are three concentric



Figure 3. The upper three images are painted on an overhang about 25 feet high. Some believe that they may represent a supernova that appeared in 1054. The concentric circles painted below may represent Halley's Comet, which appeared in 1066.

wise constant sky. They probably understood it differently than we do today, and perhaps it scared them a little. It could have been interpreted as a sign from their gods or as an omen that a change was about to happen. The first day the supernova appeared and when it was

rings with a large tail of red paint protruding away from them. It has been suggested that it looks like a comet. In 1066, Halley's Comet could be seen in the sky over New Mexico, only 12 years after the appearance of the supernova, making it possible for the same

Understanding, Managing, and Protecting Opportunities for Visitor Experiences

person to have recorded both events. How sad it would be if such a rare event were to happen today and most of the people living on this planet would not be able to see it.

To help connect visitors to the astronomical past, some of the staff in Chaco Culture National Historical Park and volunteers from the Albuquerque Astronomical Society have developed an on-going astronomy program. The geologic formations found there make a scenic backdrop for the observatory located just behind the visitor center. Telescopes, research-quality computers, and cameras are available to visitors to extend their experience of the night sky beyond unaided vision. Park staff and volunteers are experts in sharing the sky with today's sky watchers. Those who participate in the program have the opportunity to look through a telescope, or to sit in the darkness and be overwhelmed by the pristine sky. Many who visit Chaco can have new experiences with the sky, like seeing the Milky Way or the moons of Jupiter for the first time. They will also learn of the ancient astronomy once practiced there. Connecting to the past culture at Chaco can help visitors understand their own culture and how they fit into the universe today. What else could be a more appropriate national park experience?

It is a feeble light that comes to us from the stars, but without it what would be the present condition of Man's mind?

— Jean Perrin, physicist

The sky hasn't changed much with time, and our reason for viewing the sky hasn't changed: we still want to pontificate how we fit into the universe. The Ancestral Puebloans were astronomers too, just using different tools of science to gain this universal understanding. With modern technology, professional and amateur astronomers alike have been able to look deeper into space, and therefore further back in time, than ever before. With powerful telescopes and cameras, astronomers can conduct research and obtain beautiful images of deep-space objects. However, with the encroaching light pollution, now astronomers of all kinds have only a few places they can go to observe a high-quality

sky. They travel high atop mountain peaks, they have sent telescopes into space, and they have discovered the dark skies in our national parks. Some will drive hundreds of miles to escape a city to observe the sky in a national park. The Anasazi merely had to step outside their doors.

After becoming aware of the importance of the night sky to national park visitors, the National Park Service (NPS) started a small project dedicated to preserving the night sky. The NPS Night Sky Team is using CCD (charged couple device) cameras to take baseline measurements of light pollution affecting certain parks nationwide. Some parks, such as Petroglyph National Monument, which borders the large metropolis of Albuquerque, has already lost a large portion of their night sky. Other parks throughout the American Southwest are under serious threat of losing their night sky in the near future if urban expansion continues at its current rate. Satellite images of the Earth at night taken over the past 40 years show the steady increase of light pollution. Scientists have estimated what the night sky will look like in the next 20 years if we continue to ignore it; the amount of sky that will be lost is disastrous. We have a great opportunity now to educate people and save the night sky from disappearance.

For years now we have recognized the importance of preserving sites such as the Sun Dagger at Chaco, or the star ceilings at Canyon de Chelly. By preserving these sites, we are preserving a piece of the people who made them. However, we have forgotten to preserve the thing that inspired them. If the Ancestral Puebloans, or even our own ancestors, faced the same problem of losing the night sky as we do today, how dramatically different their lives would have been and hence how different our lives would be. We have already lost the pristine sky where most of the world's people reside. We have a responsibility to preserve this resource for our children, and it is imperative we keep at least a few places where people can go to be inspired by the sky. There is hope; we haven't completely lost the sky yet. ❖