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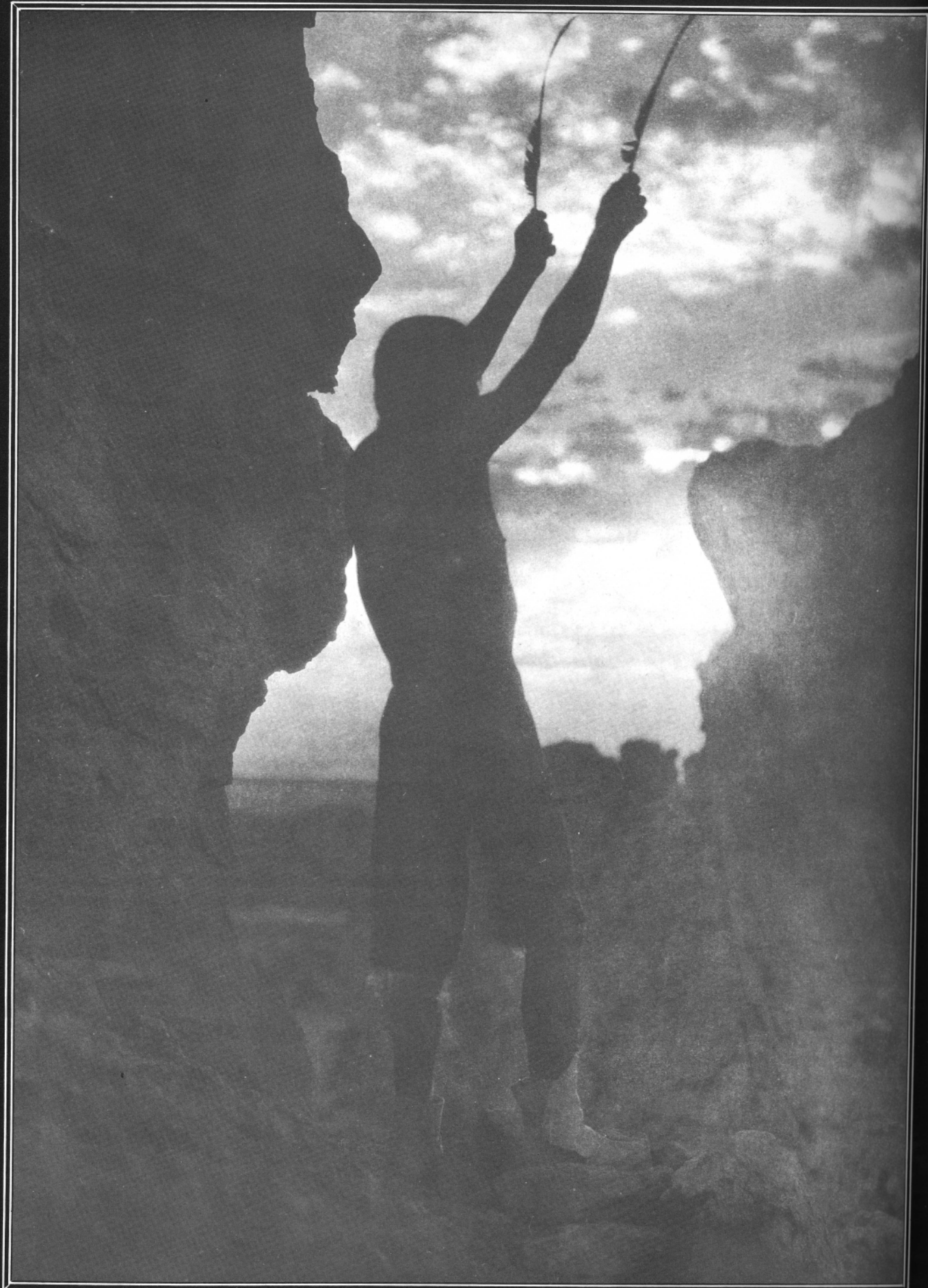
COMMENTS:

Discusses pictographs found in Southwest in terms of their use as astronomical markers.

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Offering to the Sun – San Ildefonso, an Edward S. Curtis photograph from the 1920s.

The Anasazi Sun-Watching Stations

*Solar rock art indicates significant sites
for the observation of annual celestial events.*

By Craig Benson

THE SUN PRIEST stands near a cliff face in the chill pre-dawn air, his gaze fixed to the southeastern horizon. At last, the first glimmering of fiery gold bursts from a distant notch in the mountain ridge profile far away. Sunrise. The sun priest knows that the sun will advance no more on its journey north along the ridge each morning. It is the summer solstice, heralding a new season of the ancient Anasazi year. And throughout this region, other sun priests are also watching the eastern horizon at this moment, each from a special observing place, marked by a carving or painting on rock, a calculated *sun-watching station* from which there can be no doubt in the sun priest's mind that this is the day—the day of the farthest northward advance of the sun.

Archaeoastronomy, the scientific study of astronomical practices, applications and structures of prehistoric peoples, has relatively recently been developed in the Southwest. Yet in the last few years the importance of astronomy to the Anasazi people has been effectively demonstrated by Jonathan Reyman, Ray Williamson and other scholars.

Working on a research project initiated by Dr. Williamson, I have focused my study since 1977 on petroglyph and pictograph sites which were evidently selected by the Anasazi because of their usefulness in observing significant cyclical astronomical events, such as the summer and winter solstices. Moreover, there is evidence that variations in depictions of the sun in many of these drawings and carvings may indicate the specific phenomena that can be properly observed from a given sun-watching station.

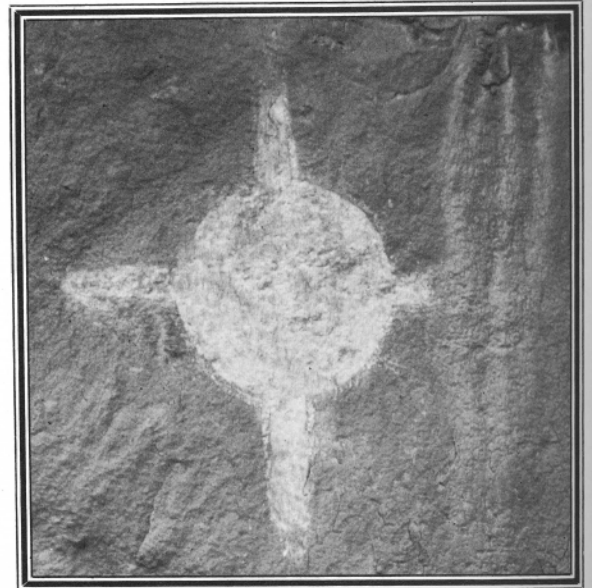
In the course of studies of astronomically aligned Anasazi Pueblo II and III phase A.D. 950-1300 buildings early in this research, we became aware of several unmistakably astronomical pictographs and petroglyphs. Several of these depictions are traditional Puebloan representations of the sun. The existence of sun-watching stations, or sun shrines, in the historic pueblos that are marked by images of the

sun led us to inquire whether the sun symbols we were finding marked prehistoric sun-watching stations. The existence of such sun-watching stations would provide strong clues to the type of calendrical system used by the Anasazi. The importance of "calendars" based on solar, lunar and stellar observations is well documented in the literature concerning historic and present-day Pueblo ceremonial and agricultural practices (see Parsons, Dozier, McCluskey, Aveni).

As a result of our archaeoastronomical research, many of the sun depictions we have seen do indeed appear to designate sun-watching places. In particular, solar rock art symbols of 10 to 30 cm. dimensions which are isolated from other non-celestial rock art tend to turn up in locations which are classically suited for observing specific celestial events. Since 1977, we have documented and at least partially measured some forty highly probable sites in New Mexico, Arizona, Colorado and Utah, which contain all the essential elements of sun-watching stations, and as many as seventy-five known sites may prove fruitful once they have been looked at more closely. It is quite apparent that sky watching in a deliberate and methodical manner was not at all limited to historic times in the Southwest.

Before describing specific examples from this research, it may be helpful to consider the general problem: In addition to a sun picture or glyph, what other evidence is necessary to declare a particular geographic location a likely sun-watching station? The most essential requirement is a significant geographic feature or features on the horizon that can be used as *foresights*: points properly located so that they align at certain times with specific celestial bodies. An illustration from Stephen's *Hopi Journal* demonstrates this concept and involves particularly the sun, the most important celestial object for determining any yearly calendar.

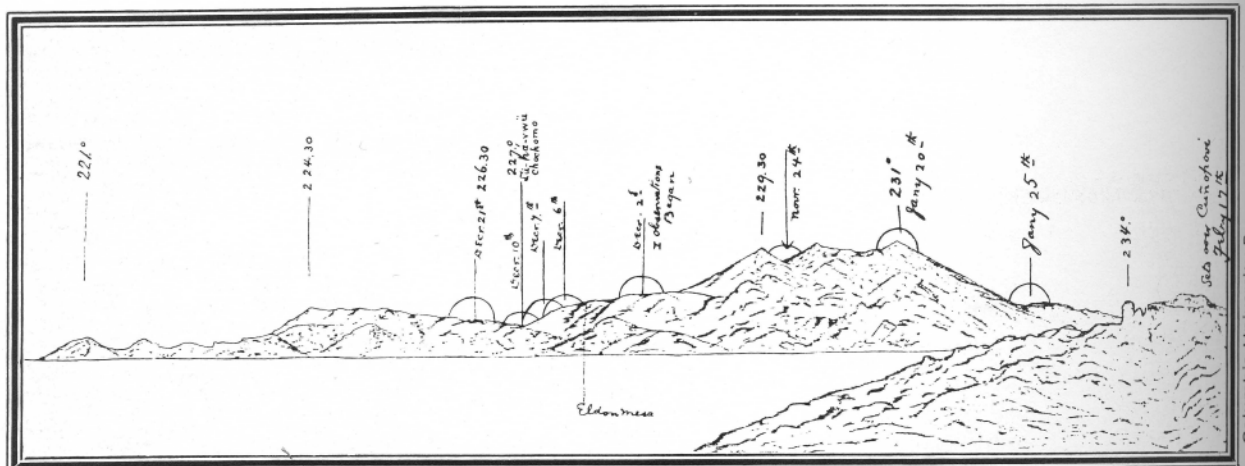
From day to day, the sun rises and sets at different positions along the horizon. The complete cycle takes $365\frac{1}{4}$ days from one of the solstices to the other and back again. In the Hopi case shown here, several days are noted where the sun sets behind clearly defined horizon features. These horizon features bear names which correspond to appropriate days for planting and for the beginning of religious ceremonies.



Sun symbol pictograph at Wiji in Chaco Canyon. Winter solstice sunrise on opposite page is viewed from this point.

At Chaco Canyon in New Mexico, we found a sun symbol at a site which we believe was used as a sun watching station; indeed it is one of the most striking examples. Located in a small *rincon* off the main canyon near the pueblo ruin of Wiji (occupied about A.D. 1100), the sun symbol pictograph is painted on a vertical wall beside one of the ancient roadways detected recently in the canyon. This pictograph bears a close resemblance to historic Puebloan circle-and-four rays depictions of the sun. Across the *rincon* from the sun symbol to the southeast is a well-defined horizon feature in the form of a large natural rock pillar. While standing close to the sun symbol at the winter solstice, a sun priest in about A.D. 1100 would have seen the sun rise immediately behind the rock pillar. The accidental(?) near-match of the apparent width of the rock pillar to the diameter of the rising sun results in a striking visual appearance, but this phenomenon would also have helped a sun priest make an extremely accurate determination of the exact day of the solstice.

There are several more probable sun-watching sites at Chaco Canyon National Monument. (These are in addition to the petroglyph-and-stone-slab configura-



Drawing from Alexander Stephen's 1936 Hopi Journal depicts horizon locations of the sun at sunset observed from roof of Bear Clan House on First Mesa. Stephen's diagram shows how alignments are used for accurate recording of annual dates.



Bureau of American Ethnology

Frank Cushing described activities at this sun shrine near Zuni in his early account. Photo is from Stevenson's 1904 report.

tion on Fajada Butte and the astronomical alignment features of some of the Chaco architecture that have also drawn the study of people in archaeoastronomy.)

The emphasis on sun-watching practices in Pueblo ceremonial life and the importance of the calendrical information gained by a sun priest is well described in the following account by Ruth Benedict in *Zuni Mythology*:

The man who went to the sun was made *Pekwin* [sun priest]. The Sun told him, "When you get home you will be Pekwin and I will be your father. Make meal offerings to me. Come to the edge of the town every morning and pray to me. Every evening go to the shrine at Matsaka and pray. At the end of the year when I come to the south, watch me closely; and in the middle of the year in the same month, when I reach the farthest point on the right hand watch me closely." "All right." He came home and learned for three years, and he was made *Pekwin*. The first year at the last month of the year he watched the Sun closely, but his calculations (for winter solstice) were early by thirteen days. Next year he was early by twenty days. He studied again. The next year his calculations were two days late. In eight years he was

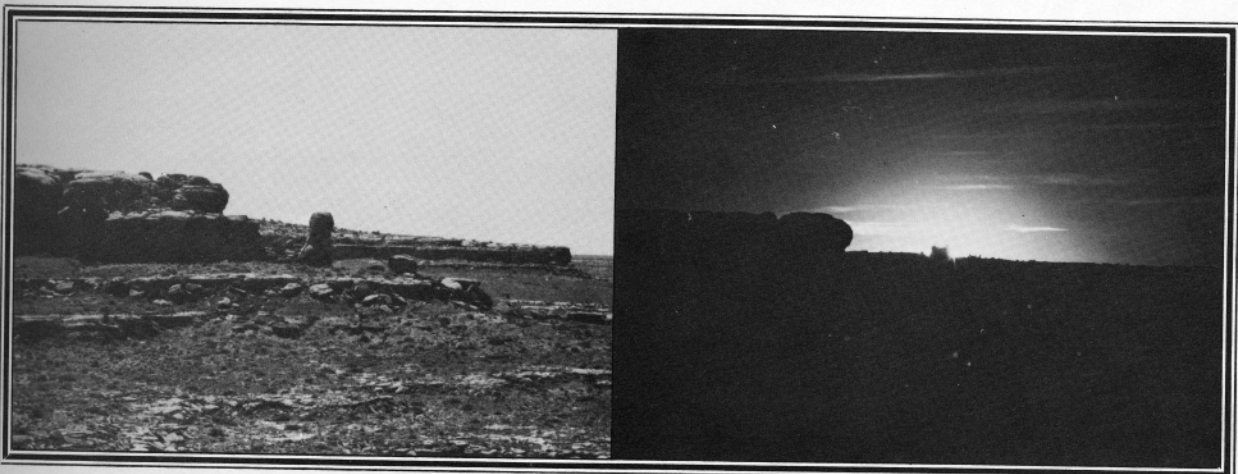
able to time the turning of the sun exactly. The people made prayersticks and held ceremonies in the winter and in the summer at just the time of the turning of the sun.

Also in Chaco Canyon, near the Pueblo III ruin of Peñasco Blanco, is another evident sun-watching station. Located on the cliff base below the ruin, the rock art signs which mark the probable sun shrine are painted with hematite and appear on the vertical wall and roof of a shallow alcove. The content of the rock art elements there is strongly reminiscent of the petroglyphs described by Frank Cushing in his late nineteenth century study, *My Adventures at Zuñi*:

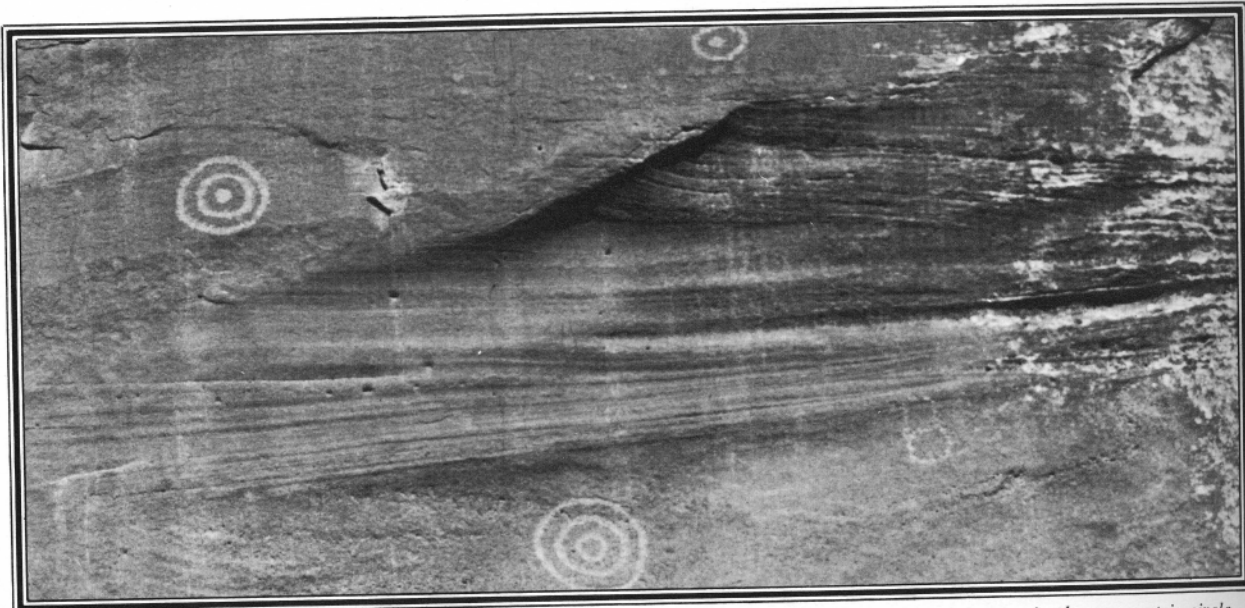
Each morning, too, just at dawn, the Sun Priest, followed by the Master Priest of the Bow, went along the eastern trail to the ruined city of Ma-tsa-ki, by the river-side, where, awaited at a distance by his companion, he slowly approached a square open tower and seated himself just inside upon a rude, ancient stone chair, and before a pillar sculptured with the face of the sun, the sacred hand, the morning star, and the new moon. There he awaited with prayer and sacred song the rising of the sun. Not many such pilgrimages are made ere the "Suns look at each other," and the shadows of the solar monolith, the monument of Thunder Mountain, and the pillar of the gardens of Zuñi, "lie along the same trail." Then the priest blesses, thanks, and exhorts his father, while the warrior guardian responds as he cuts the last notch in his pine-wood calendar, and both hasten back to call from the house-tops the glad tidings of the return of spring.

An illustration from Matilda Coxe Stevenson's 1904 report on Zuni Pueblo depicts the sun-watching station described in Cushing's account. The similarity of the ancient glyphs at the Peñasco Blanco site to the historical Zuni glyphs, and their clear astronomical content, points to the Peñasco Blanco site as a sun-watching spot. The conclusion is further reinforced by the presence of distinct horizon features which can be used for calendar markers at the solstice and equinox sunrises.

Probable Anasazi sun-watching stations are not limited to Chaco Canyon, of course. Ongoing investigations indicate that possible sun station/horizon calendar sites are scattered throughout the Four Corners area. Other localities at which more than one



View of the horizon from the sun pictograph at Wijiji, showing the large natural rock pillar breaking the line of the horizon. At winter solstice sunrise (right), the sun rises precisely behind this rock pillar.



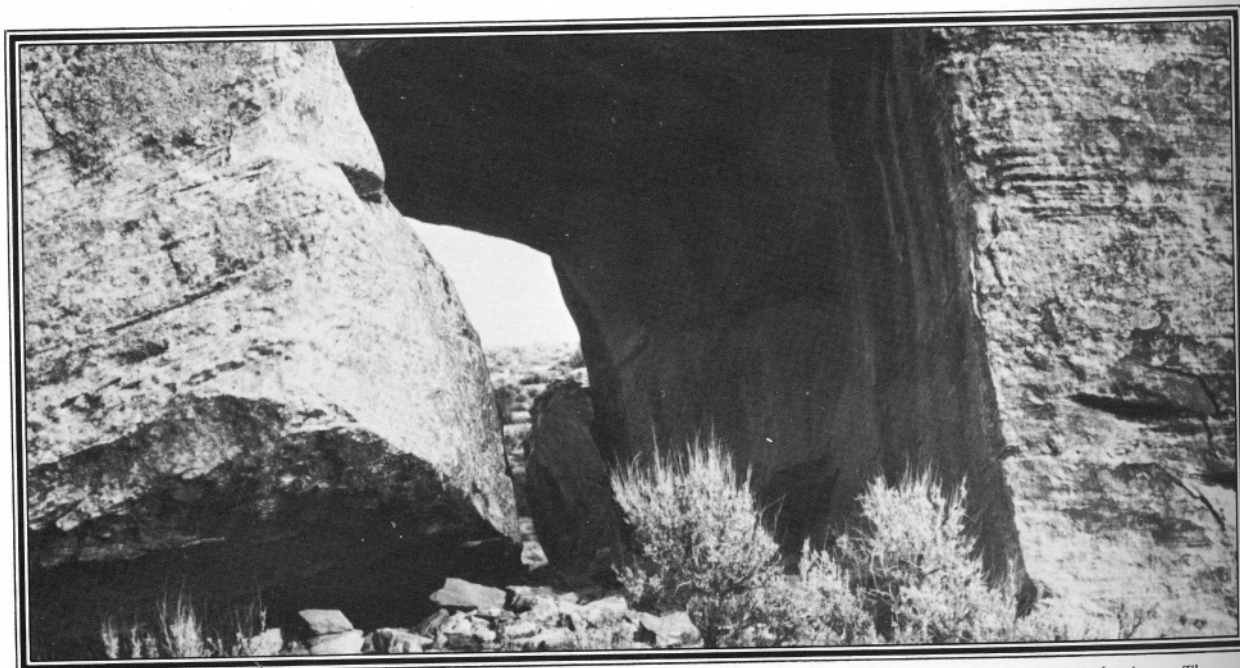
Multiple sun symbol petroglyphs at Loft Site, Montezuma Canyon. Author Benson believes that variations in the concentric circle patterns may in some cases indicate the different phenomena observable from a given site.

probable sun-watching station have been found include Montezuma Canyon in Utah, Canyon de Chelly, Navajo National Monument, Tsegi Canyon and Kiet Seel Canyon in Arizona, Wetherill Mesa, McElmo Canyon and Yellowjacket Canyon in Colorado, and sites north of the Zuni Pueblo vicinity in New Mexico. (The accompanying map indicates locations of a number of probable Anasazi sun shrines in the region occupied by these people. These sites all include the essential components: a sun symbol petroglyph or drawing, a clear view of an appropriate horizon, and some distinctive horizon feature or features which can be used as foresights at critical calendar times of the year.

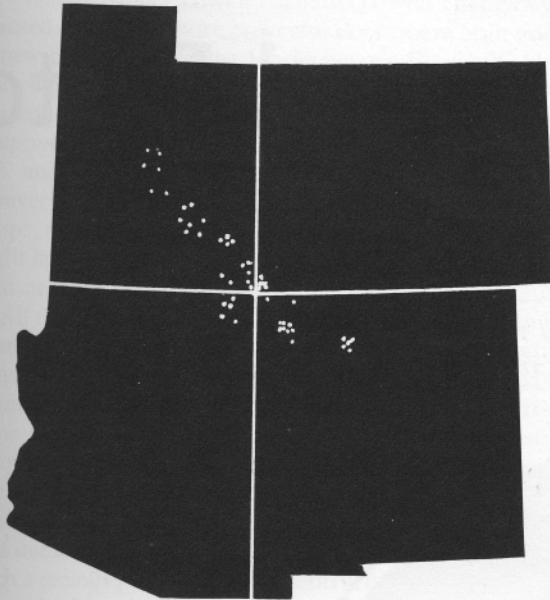
The sun glyph as a component of sun-watching stations may appear alone, or with other related

symbolic astronomical elements. Of the various depictions representing the sun, the predominant ones are composed of concentric circles. An excellent example of such a concentric circle site is the Holly Group shrine in Hovenweep National Monument. Present are concentric circles and related astronomical rock art glyphs. The site has a clear but very limited view of the horizon, which helps define the horizon points for sunrise at the equinoxes and summer solstice.

I am currently analyzing several concentric circle depictions and their potential for indicating *specific* astronomical alignments. In some cases, three slightly different concentric circle sun symbols appear in a row. At these sites, there is the potential for observing more than one of the important annual solar events. Sites



Holly Group shrine site in Hovenweep National Monument. Visible is the clear but limited view of the appropriate horizon. The sun symbols here are of the classic concentric circle type.



Location of a number of the sites studied by the author.

that have such multiple sun glyphs have turned up at Kiet Seel, Montezuma Canyon, Cedar Mesa, and East Chaco Wash. Results thus far point to a possible interesting correlation relating specific styles and types of concentric circles to specific observable solar phenomena. Groupings or sets of concentric circles at certain probable sun-watching stations may denote both type and number of potential alignments present.

Further inquiry should develop an inventory of these "calendrical" sun-watching stations large enough to be adequately treated by methods of statistical analysis. To date, I have been impressed by the consistency and frequency of the patterns at these horizon calendar stations.

In presenting this brief summary of horizon sun-watching practices and some of our research, I have attempted to show the variety of forms these stations may take and how they may have been used by the prehistoric Anasazi. From the archaeologist's point of view, details need to be worked out at some sites, although nearly all of the sites visited seem especially suited for accurate observation of sunrises or sunsets for calendrical purposes.

It is hoped that these studies will lead to a better understanding of prehistoric North American astronomy and the importance placed on sky observations by peoples such as the Anasazi. These inquiries also might aid in the interpretation of some Anasazi rock art through the ethnographic analogy. Although it can be fairly clearly demonstrated that in certain cases specific pictographs and petroglyphs can be understood in terms of ritual practices, the ethnographic analogy technique is imperfect because although Puebloan cultures are known to have been quite conservative and resistant to change in their ceremonial practices, significant changes are believed to have occurred in about A.D. 1300. So far, however, the findings at most of these Anasazi sites involving the requirements for sun-watching stations have been remarkably consistent with one another and also with historic sun-watching practices.

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Prayer Plumes of Zuni's Great Fire fraternity, at winter solstice, from 1904 Bureau of American Ethnology report.