FOUR CORNERS ARCHAEOASTRONOMY SLIDE SET
ROCKY MOUNTAIN PLANETARIUM ASSOCIATION
1994

This slide set is designed to accompany the booklet "A Guide to Archaeoastronomy at Hovenweep, Chaco Canyon & Canyon de Chelly" prepared by Von Del Chamberlain, Director of the Hansen Planetarium in Salt Lake City, Utah, for the post-conference tour of the 1992 International Planetarium Society conference to the "Four Corners" region of the U.S. The set features photographs of sites described in this booklet.

The majority of the slides were shot by Robert Yaw of Bozeman, Montana. A retired professor of meteorology from Montana State University, Bob is an avid student of Native American sky lore and archaeoastronomy, and has visited many Indian sites especially in the western and southwestern U.S., extensively photographing their possible astronomical alignments and solstice and equinox events. These slides are supplemented by several shots from Jim Manning, Director of the Taylor Planetarium at the Museum of the Rockies in Bozeman, a participant in the 1992 post-conference tour.

The Rocky Mountain Planetarium Association thanks Von Del Chamberlain, Bob Yaw, and Jim Manning for permission to distribute their work for the benefit of RMPA members and the planetarium community. The slide notes were prepared by Jim Manning.

Slide Set

1 Hovenweep Castle. The so-called "calendar room" (showing the doorway) may have been used to keep track of the solstices and the equinoxes. An alignment using the doorway itself could have marked the time of equinox sunset. The "port" above left of the door may have been used to note sunset at the winter solstice, and the port on the north wall (in shadow) around the corner from the doorway, to mark sunset at the summer solstice. (Yaw.)

2 Summer Solstice Port at Hovenweep Castle. This view through the port shows the alignment. At summer solstice sunset, a beam of light could have passed through the port to fall on the lintel of an interior door in the door's upper lefthand corner. (Manning.)

3 Unit-Type House. One of the older structures at Hovenweep (dating from A.D. 900-1100), this pueblo ruin contains four ports in its eastern (far) wall, three of which could have been used for marking sunrise at the time of the solstices and the equinoxes. (Some think that the fourth port, farthest to the right, may have been a lunar port.) (Yaw.)

4 Unit-Type House Close-up. The three leftmost ports, cutting through the wall at different angles, figure in the possible solar alignments. The left and middle of the three

ports (above the doorway) could have admitted sunlight at the times of summer solstice and equinox sunrise, respectively. The port lower and to the right of the doorway could have done the same at the time of winter solstice sunrise. (Yaw.)

5 Holly House Summer Solstice Marker. Near the Holly House Group at Hovenweep is a cave-like rock formation bearing on its wall a set of concentric circles (believed to be a common symbol for the sun) and other pictographs. Shortly after sunrise at the time of the summer solstice, two "tongues" of sunlight appear to the left and right on the rock wall, stretching toward each other (and crossing the sun symbols) until they meet to form a solid bar of sunlight. In this view, the tongues have nearly merged; close examination of the photograph will reveal the three concentric circle pictographs, one "speared" by the right tongue and the other two by the left. (Yaw.)

6 Holly House Solstice Rock Formation. This picture shows the rock formation creating the event in slide #5. The pictograph wall is on the left under the rock overhang; note that the tongues of sunlight have merged to form a solid bar on the upper part of the wall. (The complete "tongue" sequence from beginning to end is available through Bob Yaw and the Museum of the Rockies.) (Yaw.)

7 West Building, Cajon Ruins. The Cajon grouping at Hovenweep consists of two isolated buildings at the edge of a cliff--a small tower building and a larger multi-room building to its west (and visible in this photograph). The tower building has ports that may serve a similar function to those in Hovenweep Castle and the Unit-Type House. But the buildings themselves may serve as a kind of calendrical marker. They are so situated that at the time of the winter solstice, the *setting* sun casts the shadow of the larger west building onto the smaller east tower. At the time of the summer solstice, the *rising* sun casts the shadow of the east tower onto the west building. And at the time of the equinoxes, neither building casts its shadow on the other. This picture was taken at the time of summer solstice sunrise, with the shadow of the east tower falling on the west building. Note also the shadow of the photographer, who was standing atop the east tower to take this picture. (Yaw.)

8 East Building, Cajon Ruins. This picture was taken from the west building facing the east tower (in the left background) at the time of winter solstice sunset, with the shadow of the west building falling on the east tower. (Yaw.)

9 Pueblo Bonito, Chaco Canyon. This 800-room "apartment building" and religious structure was the largest pueblo in Chaco Canyon, the center of Anasazi culture. This view is taken from near one of the structure's many kivas in the open central area of the "D"-shaped complex. (Yaw.)

10 Pueblo Bonito Corner Window. The southeast part of the ruins show two examples of corner windows that look directly toward the winter solstice sunrise. Since the walls in front of these windows are no longer standing, it cannot be determined if the front walls would have blocked the view or might have contained other windows for observing the sun. (It should be noted that interior rooms of the ruined pueblo contain additional examples of corner windows.) (Yaw.)

11 Casa Rinconada. The largest kiva in Chaco Canyon, Casa Rinconada appears to be astronomically aligned: the line formed by its two opposite doors and central pit lies due north-south. There are 28 small niches set at regular intervals in its round wall, with six larger niches set lower than the others, two on the east side and four on the west. This view shows the northwestern area of the kiva; the north door is at the upper right, and the central pit is the square structure in the center foreground. Some of the regularly-spaced small niches can be seen along the wall, as well as one of the lower, larger niches; this one in particular may have special significance. (Yaw.)

12 Casa Rinconada Northeast View. This photograph was taken from in front of the special niche (the lower, larger one) seen in slide #10. This view faces the northeast part of the kiva, toward a window in the upper part of the wall to the right of the north entrance. The light of the rising sun on the summer solstice could have passed through this northeast window and fallen on the special wall niche--assuming that the view was not blocked by the wall of the ruined room that lies beyond this window (or that this wall also may have contained a window to permit sunlight to enter), and that the sunlight was not blocked by one of the posts supporting the kiva roof which could have been in the way. (Yaw.)

13 Casa Rinconada Summer Solstice Alignment. This view, shot through the northeast window of slide #11 toward the special wall niche in slide #10, shows the possible summer solstice alignment. (Manning.)

14 Penasco Blanco Supernova Pictograph. This famous pictograph is shown on its overhanging rock face in Chaco Canyon, near the ruins of the pueblo known as Penasco Blanco--which lies at the edge of the canyon rim above it. Some scholars think that the crescent moon and star images may represent a record of the 1054 supernova in Taurus; similar representations are found scattered throughout the Southwest. The hand may designate this as a sacred site. The concentric circle symbol on the vertical rock face below and left of the pictograph is thought to be a common pueblo symbol of the sun, and may indicate that this place was also a sun-watching site. (Yaw.)

15 Supernova Pictograph Close-up. A close-up view of the pictograph of slide #13. (Yaw.)

16 Fajada Butte. Near the top of this rattlesnake-infested butte at the mouth of Chaco Canyon are the leaning rock slabs and spiral petroglyphs that create the famous “sun dagger” phenomenon. At midday at the time of the summer solstice, the rock slabs admit a “dagger” of sunlight which falls on the main spiral chiseled into the rock face behind them. Over a period of minutes, the dagger forms, passes through the center of the spiral, and disappears. At midday on the winter solstice, the spiral is bracketed by a pair of sun daggers. And the equinoxes may be noted by an arrangement of sun daggers over the main spiral and a smaller flanking spiral. Some speculate that the site may also announce the times of major and minor standstills of the moon by the way the rock slab shadows at moonrise fall on the main spiral in the moonlight. The site is closed to the public; slides of the rock slabs, the spiral petroglyphs, and the sun dagger phenomenon may be obtained from the Chaco Culture National Historic Park Visitor’s Center. (Yaw.)

17 Wijiji Sun Symbol. The Chaco Canyon pueblo ruins known as Wijiji may also have housed sun-watchers. Near the pueblo along the cliff face is a pictograph which is believed to be another symbol for the sun--perhaps marking this as a sun-watching site. (Yaw.)

18 Wijiji Winter Solstice Sunrise. From the possible sun-watching site shown in slide #16, a viewer can watch the winter solstice sun rise behind a distinctive sandstone pillar on the distant southeast horizon. This pillar could have served a calendrical role by anchoring one of the turning points of the solar year for the Native observers. (A complete winter solstice sunrise sequence is available through Bob Yaw and the Museum of the Rockies.) (Yaw.)

19 Mummy Cave, Canyon de Chelly. So-called because of the discovery of well-preserved human remains here, this pueblo ruin includes structures believed to have been built as early as A.D. 300 by the Anasazi and added to over the next thousand years. It is one of many Anasazi pueblos in Canyon de Chelly perched on ledges above the sandy canyon floor, probably for security. The Navajo, who came later and today farm the canyon bottom as the Anasazi did long ago, know this pueblo as "House Under the Rock." Canyon de Chelly also boasts excellent examples of Native rock art and Navajo "star ceilings." (Yaw.)

20 Star Ceiling, Canyon de Chelly. Navajo star symbols painted on the ceilings of caves in the canyon walls represent perhaps one of the earliest types of planetariums. These ceilings do not appear to depict known Navajo constellations, and may have served a more symbolic purpose. (Manning.)

21 Star Ceiling, Canyon de Chelly. (Bonus slide.) Another example of an early Navajo "planetarium." (Manning.)