

## The Enigmas of Fajada Butte

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### Introduction

One of the major icons of astronomy in Chaco Canyon is the shaft of light that forms behind the three slabs of Fajada Butte and crosses the center of the spiral petroglyph on June solstice (Sofaer 2008). Although it has received enormous attention since its discovery in 1978, the cultural context of the phenomenon continues to be ambiguous. That a shaft of light crosses the center of the spiral petroglyph at June solstice is uncontested. However, claims that the three-slab site was established during the Classic Bonito phase and that it uniquely marks lunar standstills are less certain. In addition to the three-slab site, two other features of Fajada Butte that continue to be puzzling are the rooms near its summit and the monumental ramp on its southwestern side.

Fajada Butte (Figure 3.1) is the single most dramatic topographic feature of Chaco Canyon, and it may have been a spiritual magnet, perhaps the primary magnet, for early migrants. Windes (1993) suggests that the butte was the sacred center of the Fajada Gap community, a group of 54 small house sites, which flourished in the AD 900s and early 1000s. The community contains one of the earliest Great Kivas to be constructed in Chaco Canyon. Previous investigations of astronomy in Chaco Canyon have primarily focused either upon the three-slab site of Fajada Butte or upon Great Houses and Great Kivas (Malville 2008; Malville and Munro 2011; Sofaer 2008; Williamson 1987; Zeilik 1985a, 1985b). Very little has been written about the astronomy of small house communities that preceded the Classic Bonito phase. A new finding reported in this paper is that the December solstice sun rises over the center of Fajada Butte as viewed from the isolated Great Kiva (29SJ1253) in Marcia's Rincon. This appears to be the earliest example of direct observational astronomy in Chaco Canyon. A further conclusion of the paper is that the Fajada Gap community provided a seed for some of the ideological and ritual underpinnings of the subsequent Great House culture. **Editors Note: Bruce Huckell at UNM commented "This paper needs a short paragraph that presents its intent/purpose and organization" He made this comment on my paper too. If you could please accommodate this request, your efforts would be greatly appreciated. - Greg**

### The Symbolism of the Center

During the Classic Bonito Phase, AD 1040-1100, Chaco Canyon became the center for periodic festivals, pilgrimages, and trade fairs, which drew in participants

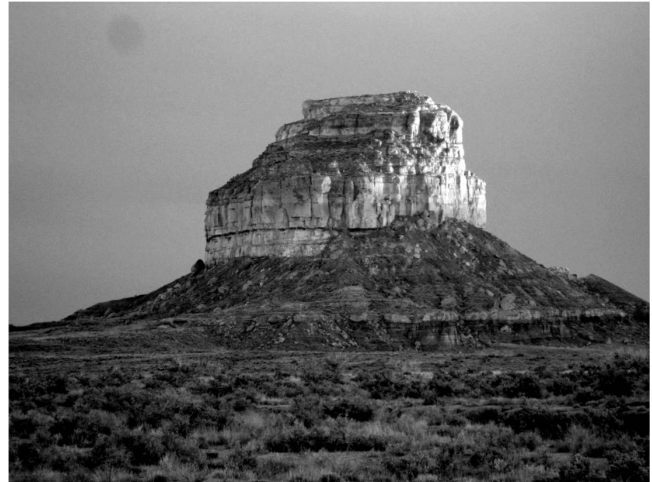


Figure 3.1 Fajada Butte from the north at sunset (photo by Robert Beehler)

from outlying communities in the San Juan Basin. It appears likely that these events were organized and orchestrated by powerful elites and ritual specialists who lived in the Great Houses of the canyon. The regional festivals probably took place near winter solstice when the agricultural fields were fallow, the San Juan River could be easily crossed, and the return of the sun after solstice would have been anticipated.

### Sacred Mountain

Before the onset of these regional festivals, which appear to have started in earnest during the period of rapid growth of construction of the Great Houses sometime between AD 1020 and 1040, more modest celebrations may have taken place at some of the early Great Houses and small house sites. In particular, Fajada Butte may have been an important element in early ceremonialism. It dominates the view as one approaches the canyon from the north or south (Van Dyke 2007) and has the quality of verticality that mythologies around the world associate with sacred mountains and the dwelling places of the gods (Eliade 1963:99). The sacred mountain lies at the center of the world in many eastern and western cultures. Temples, palaces, and royal cities – Beijing being a prime example (Meyer 1991) – were incorporated into the symbolism of the sacred mountain and became thereby the centers of their own cosmos. The axis of the universe, the *axis mundi*, passes through these versions of the sacred mountain, and each temple, palace, and city becomes a connection between the underworld, this world, and the heavens (Eliade 1963, 1972; Bernbaum 1998). That connection is used by

shamans as they climb or fly through the worlds. The axis, around which the cosmos revolves, is symbolic of the cycles of the heavens, the changing seasons, and renewal of life. Mt. Kailash in Tibet (Figure 3.2), the most sacred of all mountains in south Asia, is circumambulated but not climbed.



Figure 3.2 Mt. Kailash (photo by ?)

The superstructure of the Hindu temple, the *shikkara*, is an explicit metaphor of the cosmic mountain with a cave at its base, establishing the axis and center of the cosmos (Michell 1988). Often an illusion of height of the shikkaras is created by decreasing the spacing of higher features of the tower. The central tower of Angkor Wat (Figure 3.3) was apparently intended to be a representation of the Hindu sacred mountain and world center, Mt. Meru (Mannikka 1996). Its base is approached by a dramatic stairway containing 30 steps (throughout Angkor Wat, Mannikka finds solar and lunar numbers embedded in the structure). In the *Mahabharata*, Mt. Meru is described as a stick, a version of the *axis mundi*, used by the gods and demons to churn the cosmic ocean. The Buddhist temple of Borobudur is a cosmic mountain, which is climbed, and where, on the highest terrace, the devotee breaks through into another realm.



Figure 3.3 Angkor Wat, the central tower represents Mt. Meru (photo by Elineor Mannikka)

Temples, palaces, ziggurats, and even Chacoan Great Houses, with their emphasis on height, have been empowered by the symbolism of the cosmic mountain. Eliade (1964:384) describes the contradictory nature of the sacred center as “dialectic of paradoxes” a *coincidentia oppositorum*: accessible and inaccessible, unique and one of many, a place to be discovered and one that can be constructed. To the residents of Chaco Canyon Fajada Butte may also have viewed as a giant gnomon, casting a moving shadow across the floor of the canyon, which changed throughout the seasons.

### Stairways

Stairs are common symbolic expressions of ascent of the sacred mountain and shamanic movement between worlds. Ziggurats of Mesopotamia were sacred mountains reaching to the heavens with processional staircases. Pyramids are symbolic mountains. Processional staircases leading to the summits of pyramids are common in the Americas. A very early example is Caral, Peru, where a staircase leads from a sunken circular plaza to the top of the Great Pyramid (Figures 3.4 and 3.5). The earliest radiocarbon date at Caral was obtained underneath the sunken plaza, 2627 years BC (Solis et al. 2001; Solis 2006). Occupation continued until about 2000 BC. The combination of the sunken plaza and the summit of the pyramid suggest symbolic movement from the underworld to the heavens. The floor of the sunken court is 3 m beneath the inner wall and has a diameter of 21.5 m, not too different from the Great Kivas of Chaco Canyon. For example, the isolated Great Kiva of Casa Rinconada in Chaco Canyon has a diameter of 20 m and a depth of 3.74 m. There is no evidence the sunken court at Caral was roofed. Each of the two staircases leading down into the court was framed by monoliths. The summit of the pyramid is 30 m high on the north side.

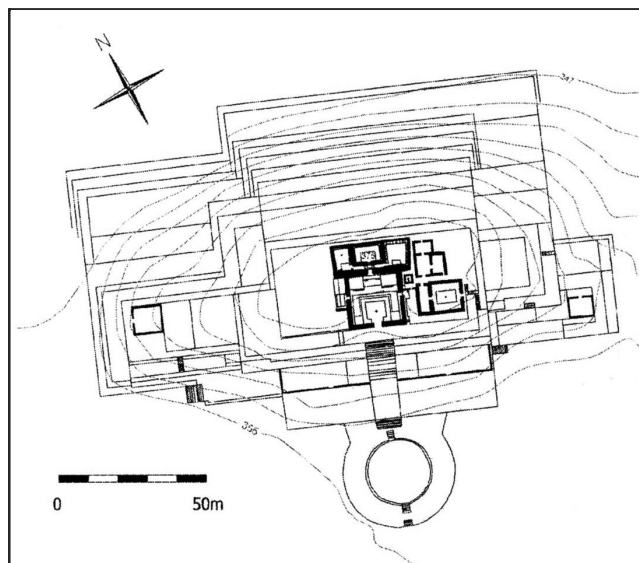


Figure 3.4 Great Pyramid of Caral (Solis 2006) Permission to reproduce?

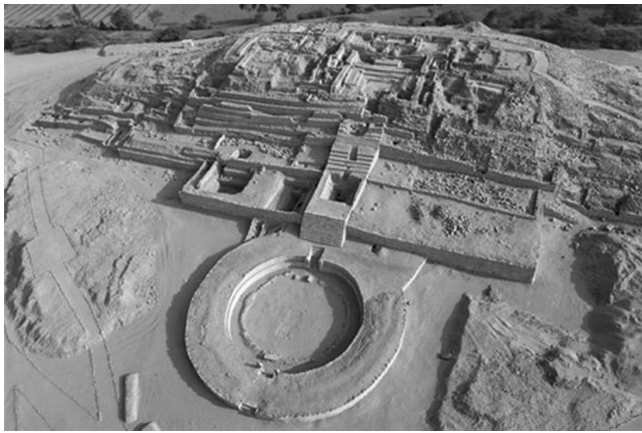


Figure 3.5 Great Pyramid of Caral (Peruvian Times) **Permission to reproduce?**

At Chavín de Huantar, Peru, ritual movement from the dark underworld to the heavens is expressed in stairs leading upward and downward in its dark labyrinthine interior, which contains the 4.5 m high carved granite Lanzón shaft, another expression of the *axis mundi*. Chavin is filled with images of shamanic transformation, shamanic flight, and movement between the worlds (Berger 1992). Occupation occurred between 1200 BC and 500 BC (Kembel 2008). The interior corridors connected by stairways show evidence of colored plaster, leading Kembel (2008) to infer an intentional symbolism of movement between different worlds, each designed by a different color.

To the west of Chavín in the Casma Valley is the extraordinary site of Chankillo, which contains a remarkable variation on the theme of movement between worlds. Like thirteen giant steps, the towers rise along the spine of a hill, gradually rotating into alignment with the solar axis of the site, running from the direction to December solstice sunrise to that of June solstice sunset (Figure 3.6). The towers have two stairways each, on their northern and southern sides. Movement southward and upward along the towers would have carried celebrants from the terrestrial realm to the celestial realms, ultimately leaving them in a position to face the rising sun on the December solstice or the setting sun on the June solstice sunset (Malville 2011).

Elsewhere in Andean culture, the most dramatic example of a ritual ascent of a cosmic mountain is found at Machu Picchu, where the summit of Huayna Picchu is reached by precipitous stairways on the northern and southern flanks of the mountain (Figure 3.7a). It is clear from the manner in which Huayna Picchu is framed in the major gateway to Machu Picchu that the peak was one of its most significant features of the area, a smaller version, perhaps, of the sacred mountain of Salcantay. The northern stairway ascends 390 m from the largest double jamb doorway of Machu Picchu. The doorway is adjacent to the cave known as the Temple of the Moon, which contains the most finely crafted niches for mummies in Machu Picchu. The northern stairway ap-



Figure 3.6 The Towers of Chankillo (photo by ?)



Figure 3.7a Machu Picchu with Huayna Picchu in the background. Portions of the stairway are visible on the facing (southern) ridge. (photo by Tore Lomsdalen)



Figure 3.7b Temple of the Jaguar at Tikal (photo by Robert Beehler)

pears to be an explicit metaphor for movement from the underworld to the upper realms. On certain occasions, the primary route for ritual ascent of the mountain may have been this northern stairway, starting at the Urubamba River, and thereby bypassing Machu Picchu itself. One of the major shrines (huacas) of Machu Picchu, the Torreón with a rock illuminated by the June solstice sun and niches for mummies underneath, may have been viewed as a miniature cosmic mountain.

The great temples of the Mayan world, such as the Temple of the Jaguar at Tikal with its steep stairway (Ferguson and Rohn 1990) are further expressions of symbolic ascent of a cosmic mountain (Figure 3.7b). The interior burial chambers of these temples provided

the symbolism of the underworld.

The great mounds of Cahokia with their processional stairways provide evidence for ritual ascents of cosmic mountains, which are contemporaneous with the Pueblo II period of Chaco Canyon. The largest of the 120 mounds, the 30 m-high Monks Mound, has a southern stairway leading toward a ceremonial plaza. Its base is as large as the Great Pyramid of the Giza Plateau. Other mounds are oriented also to the cardinal directions as well as to the position of the rising sun at the December solstice. The interiors of many mounds contain layers of black earth, white gravel, and red or yellow soil, perhaps associated with the three levels of the cosmos. Ascent of the mounds would thus have carried one through the cosmos. One of the elite burials of Cahokia in Mound 72 was of the so-called falcon warrior, laid out on a bed of beads in the shape of a falcon. Bird symbolism is frequently found at Cahokia. Radio-carbon dates of AD 950-1000 for Mound 72 place it in the time frame of early Pueblo II and occupation of the Fajada Gap community. The presence of upright marker posts sometimes built on the top of the pyramids suggests shamanic ritual movement between the three worlds (Pauketat 2008; Pauketat and Emerson 2008).

Pauketat suggests a transformation of Cahokia culture may have been triggered by astronomical phenomena such as the supernovae of AD 1006 and 1054 and the appearances of Halley's Comet in AD 989 and 1066. The supernova of AD 1006 was the brightest stellar event in recorded human history, reaching a magnitude of -7.5, some four times brighter than the AD 1054 supernova. It would have been the third brightest object in the sky behind the sun and full moon (Malville 2008). At its brightest the AD 1006 supernova was visible in the day sky and reportedly (reported by whom?) cast a shadow. It first appeared in low the southern constellation of Lupus around May 1, lasting at its brightest for 3 months, faded, and then reappeared around December and continued to be visible for some 18 months. At the latitude of Chaco, the supernova reached only 15.5° above the southern horizon and would have been invisible for those living in the bottom of the canyon. The top of Fajada Butte would have been an excellent place for observing it, as would the elevated early Great House of Kin Nahasbas.

In the Hohokam Classic period (AD 1150-1450) earthen platform mounds were built in southern Arizona, which appear to symbolize sacred mountains that were the source of rain (Bostwick et al. 2010). These platforms with north-south orientations may have represented the *axis mundi* of the Hohokam universe. The symbolism of ascent from the underworld to the heavens may have been expressed by nearby semi-subterranean ball courts (Gregory 1987).

In Chaco Canyon, there are some 140 stairways that are associated with Pueblo occupation (Hayes 1981: 47). Many do not seem to serve practical pur-

poses. In the words of Hayes, "Stairways are commonly associated with roads, but in many cases, rather elaborate arrangements for getting up or down a cliff were found where no other evidence of a road was found either above or below." It is possible that some of these stairways are further examples of ritual ascent or descent, intended for ritual movement rather than for movement of people or trade goods into or out of the canyon. The well-known Jackson staircase (Figure 3.8), for example, was not designed for the transport of loads into the canyon.

If Fajada Butte was once viewed as a cosmic mountain, ritual ascents on its southwestern ramp could have taken place starting in the AD 900s. Less than 2 km to the northwest at the edge of Marcia's Rincon, the isolated Great Kiva, 29SJ 1253, provided the ritual counterpoise to the high butte, wherein the journey to the summit could be initiated underground.

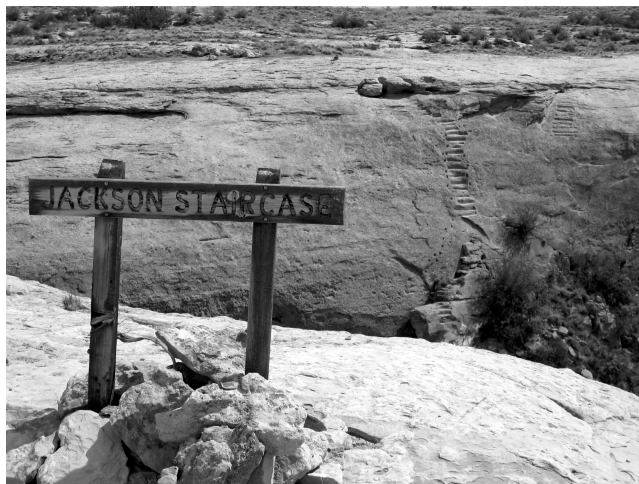


Figure 3.8 Jackson Staircase (photo by Robert Beehler)

### Feathers and Scarlet Macaws

Symbolic ascents involving mountains, trees, ladders and bird-like flight are well-known aspects of shamanism throughout the world (Eliade 1972:156 and 177). In Chaco Canyon Scarlet Macaws (*Ara macao*) and their feathers may have been important carriers of the shamanic powers of transformation and flight (McKusick 2001). Macaws were not down-the-line trade items since they needed to be fed and transported by their handlers (Creel and McKusick 1994; McKusick 2003). According to McKusick (2003) young macaws, which hatch in March, must be removed from the nest when seven weeks old and "fed every few hours on chewed hominy, often directly from the keeper's mouth." They develop strong attachments to their keeper, but they are often vicious to strangers.

Scarlet Macaws are symbolically connected with the sun, the rainbow, corn maidens and *Mayingwu*, the Germinator, the underworld lord of crops (Tyler 1964, 1979). In Mesoamerica, Scarlet Macaws were sacrificed to Quetzalcoatl at the time of spring equinox

when their brilliant plumage matured (McKusick 2003). The presence of 45 macaws in Chaco Canyon reveals their special importance in that culture. Lekson (2008:140) suggests the political importance of macaws in Chaco: “At Chaco, macaws signified power; they were confined to and controlled by the Great Houses.” Initially they must have been valued more for use in shamanic-like ritual than politics. Macaws in particular were viewed as guardian spirits when the shaman transforms into a bird and flies through the spirit world. In South America, the macaw was understood to be a shaman who takes a hallucinogenic drug and transforms into a jaguar (Eliade 1972). The floor of Room 38 of Pueblo Bonito contained a 10-inch thick layer of bird droppings as well as the remains of 12 macaws: strange treatment of such valuable birds! In addition, two macaws had been ceremonially buried under the floor (Pepper 1920). Elsewhere in Pueblo Bonito, macaws were found in child burials, perhaps as symbols of rebirth and renewal. Of the approximate 45 macaws found in Chaco Canyon, 37 were found in Pueblo Bonito (Mathian 2003). At Arroyo Hondo, two macaws appear to have been plucked and sacrificed in the three months bracketing spring equinox (Lang and Harris 1984), perhaps as offerings preceding agricultural activity.

### The Fajada Gap Community

In the 10<sup>th</sup> century AD three Great Kivas were constructed in the area that has been identified as the Fajada Gap community, at the Great Houses of Kin Nahasbas (Mathien and Windes 1989) and Una Vida (Gillespie 1984), as well as in Marcia’s Rincon (Windes 1993). These three early Great Kivas were all inter-visible and, as viewed from each of them, Fajada Butte would have been a dominant feature of the landscape. Windes (1993: 358) suggests that “... Fajada Butte might be envisioned as the center of the community area, perhaps in a sacred sense...” For the period AD 975-1050, Windes (1993) estimates that the Fajada Gap community contained a total of 216-544 rooms. It was primarily a community of small houses to the north and northwest of Fajada Butte. Based upon tree ring dates, the community was contemporaneous with the two early Great Houses of Una Vida and Kin Nahasbas, which had a total of 40 rooms.

The majority of the structures of the community were in Marcia’s Rincon (Truel 1986). Near its center was largest residential site the Fajada Gap community (29SJ627) with 25 rooms, constructed as early as the 8<sup>th</sup> century AD (Truel 1992). Based on the eastern orientation of room blocks, Windes (1993) believes it was initially only seasonally occupied. By the 10<sup>th</sup> century AD it was a permanent residence and became the longest occupied site in the community, spanning some 300

years. Another excavated site in Marcia’s Rincon, 29SJ 629, known as the Spadefoot Toad Site, contained nine rooms and appears to have been occupied for 150 years starting around AD 900. The site became a major center for the manufacture of turquoise beads and thus probably was involved in trade network coming up from the south.

The unexcavated Great Kiva of Marcia’s Rincon (29SJ 1253) is the second largest of the 21 Great Kivas to have been built in Chaco Canyon (Van Dyke 2007). Its diameter of 20 m is more than a standard deviation beyond the mean size of all the Great Kivas in the canyon, which is 15.8 m. The particular location of the Great Kiva (29SJ 1253) places it within the shadow cast by Fajada Butte at sunrise on December solstice (Figures 3.9 and 3.10). Celebrants emerging from the Great Kiva at dawn would have observed the sun rising over the summit of Fajada Butte. Fires may have been lighted in the two fireboxes at sunrise. Had the Great Kiva been located 120 feet to the northeast of its position, sunrise would not have appeared over the butte. Considering the synergistic power of Fajada Butte combined with winter solstice sunrise, it seems likely that the Great Kiva was intentionally placed in the western edge of Marcia’s Rincon in order to achieve this astronomical alignment. The surface ceramics of the site are dominated by Red Mesa Black-on-white, which dates from the AD 900s to early 1000s. This is one of the earliest of the Great Kivas in Chaco Canyon, and it also provides evidence for the earliest direct observational



Figure 3.9  
Sunrise over Fajada Butte, December 16, 2011 from the Great Kiva (29SJ1253) in Marcia’s Rincon. Chacra Mesa is in the background. (photo by GB Cornucopia)

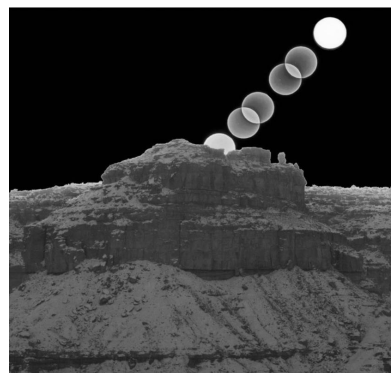


Figure 3.10  
Sunrise over Fajada Butte, December 24, 2011 from the Great Kiva (29SJ1253) in Marcia’s Rincon. (Multiple filtered images by John Ninne-mann)

astronomy in the canyon.

Another important site of the Fajada Gap community is 29SJ 1360, which is the closest group of structures to Fajada Butte (McKenna 1984; Stuart 2000). Approximately 100 m upslope from the site, the sun disappears behind and then reappears above Fajada Butte around noon of the December solstice (Figure 3.11). First established in the period between AD 875 and 925, the site is of particular interest because pithouse B contained the remains of two women, three children, and their dogs, all of whom apparently had died of asphyxiation during the winter, possibly between AD 1020 and 1040. One of the women had the longest strand of beads (3,889 beads) ever found outside a Great House in Chaco (McKenna 1984), indicating an individual of high status. An indication of the unusual nature of this site has been provided by Akins (1986), who compared the crania found in Pueblo Bonito, 29SJ 1360, and another small house site, Bc 59, adjacent to Casa Rinconada. She found evidence that there are two distinct populations buried in the two burial clusters of Pueblo Bonito. Those of the northern cluster (rooms 32, 33, 53, 56) appear to be related to residents of the Fajada Gap at 29SJ1360 and nearby 29SJ299, while those in western cluster (rooms 320, 326, 329, 330) appear to be re-



Figure 3.11 Fajada Butte viewed near 29SJ 1360, December 21, 2011, 12:40 pm (photo by James Walton)

lated to residents of Bc 59.

The only remains of a Scarlet Macaw ever located in a small house in Chaco Canyon were found in this site (McKenna 1984). There also is evidence of a pen for holding macaws or parrots. Can it be pure coincidence that the only macaw (perhaps symbolizing flight upward to the summit of Fajada Butte) found outside of a Great House was at the base of Fajada Butte? A high-status cylinder jar sherd (McKenna 1984) found at 29SJ1360 further suggests ceremonialism normally associated with the elite residents of the Great Houses such as Pueblo Bonito, where more than 110 such jars

were found cached in room 28 (Pepper 1920; Washburn et al 2011).

The decline of the Fajada gap community occurred just at the start of the building boom of Great Houses. It was probably due to drought and poor agricultural conditions in that part of Chaco Canyon in the period between AD 990 and 1040 (Windes 1993).

### The Fajada Ramp

The three sections of the ramp rise a total of 280 vertical feet (85 m). The lowest section of the ramp follows an erosional ridge spine, the uniformity of which suggests it that it was culturally modified (Figure 3.12 and 3.13). Larger boulders may have been cleared away and some dirt may have been imported. The manner in which the spine is aligned with the lower fire pit and with masonry structures of the middle section of the ramp suggests intentional design (Figure 3.14). The middle and upper sections of the ramp involve a mixture of retaining



Figure 3.12 The Lower Ramp viewed from the south (photo by ?)



Figure 3.13 Looking up the Lower Ramp. The Upper Ramp continues on carved steps to the skyline (photo by ?)

walls, a core and veneer wall, masonry stairs, carved hand and toe holds, carved stairs, beam sockets for a possible scaffold, and the upper fire pit (Ford 1993). The presence of Red Mesa Black-on-white pottery on the Fajada ramp indicates that it was constructed in the AD 900s and early 1000s (Figure 3.15). The fire pit at the base of the lower ramp is on or near the Chacra Face Road, which passes near the Great Kiva of Marcia's Rincon. The road and the Red Mesa pottery ties the design and construction of ramp to the occupation of the Fajada Gap community (Ford 1993). The ramp provides remarkable evidence that this early small house community was capable of engaging in a cooperative

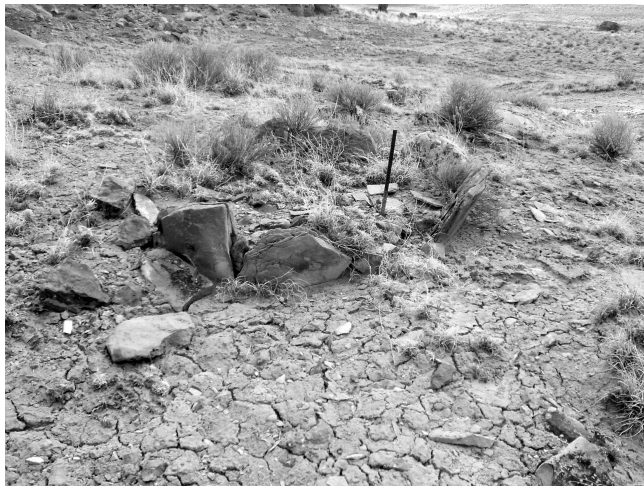


Figure 3.14 Firepit (29SJ294) near the base of the lower ramp (photo by ?)

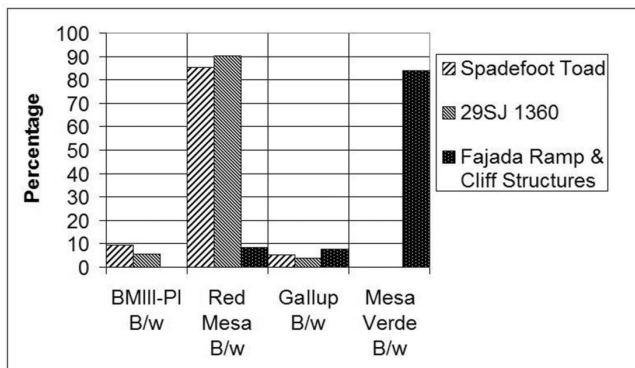


Figure 3.15 Comparison of ceramics from the Spadefoot Toad Site (29SJ626), 29SJ1360, and the ramp and cliff structures of Fajada Butte (29SJ296 and 297). Red Mesa B/w covers early PII, before the Classic Bonito Period. Gallup B/w includes Chaco B/w and covers the Classic Bonito Period. Mesa Verde B/w includes McElmo B/w and covers the late period. Note that the figure compares ceramic analyses from excavations (1360 and 626) with surface field analyses from the Fajada ramp and structures. The latest ceramics often dominate the earlier ones in surface assemblages but do not necessarily reflect greater use. **Source of graph? Permission to reproduce?**

project of substantial proportions. Late Pueblo II ceramics and Mesa Verde Black on white ceramics indicate that the ramp continued to be used during the Classic Bonito Phase and late Pueblo III times. December solstice sunrise may have been marked by the lighting of ceremonial fires in the two fire pits during occupation of the Fajada Gap community. Ritual ascent of the ramp may have been a prototype for ceremonies on other precipitous stairways in Chaco Canyon, such as the Jackson Staircase.

### The Rooms at the Top

Two remarkable sites of the Fajada Gap community are the rooms on the upper terraces of Fajada Butte, (29SJ296 and 29SJ297) (Figure 3.16). Initially, these terraces may have been visited at winter solstice sunrise by ritual specialists from the Fajada Gap community to light a ceremonial fire at the top of the ramp and celebrate the rising of the sun. The much greater percentage of Pueblo III pottery compared to that of the Classic Bonito Period suggests substantial use of the rooms in the AD 1200s (Ford 1993). A word of caution in interpreting Figure 3.16 is in order. It is misleading to compare percentages of ceramics from analysis of surface assemblages over time because the latest ceramics often dominate the earlier ones. Perhaps during the late PIII the ledges served as a refuge from threatening violence below in the canyon. The ledges (sites 29SJ296 and 29SJ297) contain some 30-35 rooms including one circular kiva. The presence of manos, utility ware, burned corncocks, and hearths indicate these remote rooms had

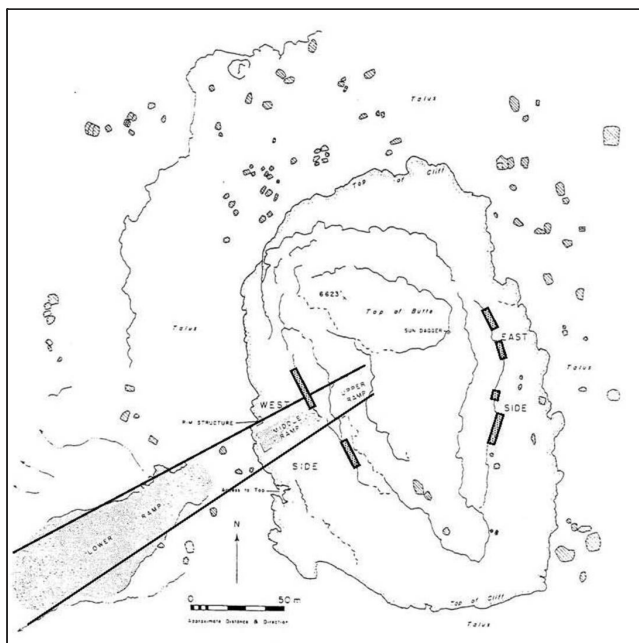


Figure 3.16 The Fajada Ramp. 29SJ296 and 297 are shown on the west and east sides respectively (adapted from Ford 1993:480) **Permission to reproduce?**

been used as temporary residences (Ford 1993).

The masonry of the sections of the walls (Figure 3.17) is not characteristic of Great House construction during the Classic Bonito Phase. Ford (1993:474) describes the wall construction as “compound and simple/double masonry...Mortar joints contain both chinking and leveling stones, but do not appear to have been placed in a decorative pattern. None of the walls in the cliff structures are core-veneer construction, primarily because they are single story and had to support only a



Figure 3.17 Wall in 29SJ297 (photo by GB Cornucopia)  
part of the roof weight.”

The rooms appear to be refuges of the late Pueblo III period, identified as “pinnacle structures” by Stein and Fowler (1996:120). These rooms may have provided safe havens for residents of the nearby Gallo Cliff Dwelling from which maize cobs have been dated to AD 1180s (Benson et al. 2009). All of the rooms utilize the cliff face for their back walls. Ford (1993:474) reports that most of the rock art of the upper ledges was accessed by the roofs of the rooms. If the rooms had been built in the late Pueblo III period, it is likely that the rock art dates to that later time and not to the Classic Bonito Period.

During the late 13<sup>th</sup> century AD, the climate was getting drier and colder, and crops were failing. Famine and competition for scarce resources led to social instability and violence (Kuckleman 2006; Varien 2006). Sometime around AD 1280, some 41 men, women, and children were violently killed at Castle Rock Pueblo, north of Cortez, Colorado. Castle Rock had been built soon after AD 1256 around a small butte. The members of its 15 households may have hoped that

the butte would have provided protection. Kohler and Kramer (2006) have provided further evidence based upon comparison of sex ratios at Chaco Canyon, Mesa Verde, and Aztec for warfare and the kidnapping of women in the 13<sup>th</sup> century, perhaps to become slaves. Martin and Akins (2001) report disrespectful burials of women in the La Plata River Valley that exhibit cranial and other forms of osteological trauma. They interpret these burials as evidence of an “indentured subclass” (Martin and Akins 2001:244) possibly acquired through raiding, abduction, or immigration. It would certainly not be surprising if women and children living in Chaco in the Pueblo III Period retreated occasionally to the upper ledges of Fajada Butte for protection.

Haas and Creamer (1996: 207) describe five similar elevated and defensible sites in Long House Valley, one of which is Organ Rock Pueblo,

...located on top of an isolated sandstone block with sheer walls rising up over 150 m. Access is only by way of a single crack in the rock by a combination of stairs and hand-and-toe holds. Like Fajada Butte, there is no cultivable land on top and no water. It makes no sense for people to live up there unless they were absolutely convinced of the need for protection.

Haas and Creamer (1996) describe similar defensive pinnacle sites in the Kletthla and Kayenta valleys. These valleys initially appeared to have significant reductions in population in late Pueblo III period. However; Haas and Creamer (1996: 208) state that

The reason these valleys looked abandoned is that the sites were almost all pueblos of 50-200 rooms perched on the top of inaccessible rocks and mesa tops. ...one of the best indicators of site location was when the survey crews were unable to find an access route to the top of a particular topographic feature. In each such case, a second effort revealed a skinny crack in the rock or a steep trail up the cliff side, and a pueblo on top invariably dating to A.D. 1250 to 1300.

The residents of Mesa Verde and the Great Sage Plain north of Cortez in the late AD 1200s built their villages in defensible locations next to water sources,



sometimes surrounded by protective walls. Settlements such as Yellow Jacket, Cliff Palace, Hovenweep, Sand Canyon, and Goodman Point pueblos provide evidence that astronomical ritual continued to be important during dangerous times (Malville 2008). The Great Kiva and great tower of Yellow Jacket align with December solstice sunrise (Malville 2006). Built in the latter half of the 13<sup>th</sup> century and surrounded by defensive walls, Sand Canyon and Goodman Point contain nearly identical ceremonial structures; each has a D-shaped bi-wall and Great Kiva. Sand Canyon survived a number of attacks before it was finally abandoned sometime after AD 1277 (Kuckleman 2010). Before the final attack, the majority of the residents had emigrated elsewhere, leaving only a few to defend the village. Those who remained apparently died in the final attack, many suffering violent deaths. Similar to Castle Rock and Sand Canyon, there is evidence of violence near the time of abandonment of Goodman Point pueblo.

Another possible case of defensive walls during the late Pueblo III Period is the Sun Temple of Mesa Verde National Park. In this case, the walls would have protected a sacred site rather than a residential population. With an area of 660 m<sup>2</sup>, the D-shaped Sun Temple is the largest exclusively ceremonial structure on the mesa and, quite possibly, the largest ceremonial structure of the Ancestral Pueblo region. Construction of the Sun Temple probably occurred during the Mesa Verde phase (AD 1150-1300) when many residents were moving into cliff alcoves partly out of concern for their safety. Some of the mesa top dwellings were dismantled for construction materials for alcove structures. During the AD 1200s the security of the Sun Temple must have been a matter of increasing concern for the communities of Cliff and Fewkes canyons. Recently Munson (2011) has estimated the heights of walls of the Sun Temple using a photograph of its interior taken by Nordenskiöld in 1891 before any excavation of the site. Using the estimated volume of rubble in the photograph, he estimated the heights of the double exterior walls to be approximately 4.2 m. These high walls suggest a great concern for protection of its interior. It is not clear what needed to be protected inside. Its D-shape suggests it may have been a miniature copy of the great house of Pueblo Bonito. As in house societies studied by Levi-Strauss (1988), it may have been viewed as a living entity, maintained by a series of rituals performed on its walls and in its interior spaces, which commemorated and linked the community to ancestors and the powers of the heavens. In any case, the walled enclosure of the Sun Temple suggests a concern for safety during dangerous time, similar to that expressed by cliff dwellings,

pinnacle sites, the towers of Hovenweep, and the walled pueblos of Sand Canyon and Goodman Point.

### **The Three-Slab Site of Fajada Butte**

The three slabs near the rooms of Fajada Butte appear to be another case of astronomy inspired by stress and danger. Geologists who have inspected the site conclude that the three slabs and the alcove behind them are the result of a natural rock fall, similar to other sets of slabs in Chaco Canyon (Newman et al. 1982) due to exfoliation of sandstone initiated by a seep at the base of the alcove (Bradley 1963). There are many examples in Chaco Canyon of natural rock falls that resulted in slabs similar to those of the three-slab site of Fajada Butte (Figure 3.18).



Figure 3.18 Examples of natural rock fall at the base of Fajada Butte (photo by ?)

On June solstice, the shaft of light produced by two of the three slabs passes onto the alcove wall behind the slabs for only 14 minutes, starting at 11:07 A.M. local time. Anyone who had climbed the butte wishing to greet the sun at dawn would have missed the event altogether. The fleeting appearance of the shaft of light near noon suggests that the phenomenon was discovered serendipitously by people living near the top of the butte around the days of summer solstice. The preponderance of Mesa Verde Black-on-white on the upper ledges suggests that the effect was discovered by people

who were temporarily living on the upper ledges during the late Pueblo III times. Information of the date of June solstice was probably transmitted to the three-slab site from Piedra del Sol, which is directly visible from the slabs. The spiral petroglyph of Piedra del Sol has a diameter of 43 cm with 13 or 14 turns. A triangular shadow passes through its center two weeks before June solstice. An observer standing in front of the spiral could make direct observations in anticipation and confirmation of the June solstice. The spiral behind the three slabs on Fajada Butte is smaller, 24 cm by 36 cm, and could have been placed after the light and shadow effects had been discovered serendipitously by the temporary residents of the upper ledges. No adjustment of the slabs would have been necessary to position the spiral petroglyph so that the shaft of light passed through its center.

A diagonal line crosses the center of the spiral. The line has a different quality of pecking than the spiral, suggesting that it was placed at another time than the spiral, and that the function of the site developed over time. The diagonal marks the edge of the shadow of the sun at sunrise some 35 days after June solstice. In the spring, the shadow is parallel with the pecked diagonal close to May 14-15, which may have been close to a spring planting festival (Carlson 1987; Malville 2008; Zeilik 1985a, 1985b).

A considerably less likely interpretation of the diagonal line that crosses the center of the spiral is that it marks a shadow produced by the moon at the time of minor standstill of the moon (Sofaer 2008). The minor standstill is a very subtle phenomenon, only revealed after a detailed knowledge of the full 18.6 year standstill cycle of the moon. There is no evidence that Chacoans had acquired the knowledge or the mathematical skills that would have been necessary to predict the behavior of the minor standstill moon. Once the June solstice light and shadow effect had been initially discovered, it would have required a program of monitoring the site for years to establish the lunar standstill cycle and the effects of shadow casting by the moon. The chance of a minor standstill occurring during the same year that the shaft of light was first discovered is slight, about 0.16 (3/18.6). Furthermore, the northern standstill moon is not visible in June, and it does not become bright enough to produce a significant shadow line across the spiral until mid-September, when the moon rises near midnight. Discovery of this effect would have required the unlikely presence of observers throughout the night. Month by month the phase of the moon at its northern standstill increases until December when the full moon rises at sunset. During the months of January through

May, the northern standstill moon is in the sky only during daylight hours and any shadow produced by the moon would be barely perceptible. People would have to make systematic observations of the changing effects of lunar shadows for 19 years, summer and winter, to catch the effects of the full standstill cycle. In contrast, the shadow produced by the sun within 35 days of solstice is by far the more likely interpretation of the diagonal line crossing the spiral.

### Summary and Conclusions

Prior to the Classic Bonito Period and the massive construction projects that commenced in the first few decades of the 11<sup>th</sup> century AD, the initial ritual and symbolic center of Chaco Canyon may have been Fajada Butte. The butte, together the dramatic landscape of the canyon itself, may have played a seminal role in the transformation of the place into ritual center.

Clearly, ritual activities and events were an extremely important component of Chacoan life; even the physical space the Chacoan inhabited was transformed by them into a highly designed, almost certainly symbolic landscape (Sebastian 2006: page #?).

Ritual movement by members of the Fajada Gap community from the Great Kiva along the southwestern ramp to the summit of Fajada Butte may have been perceived as a symbolic ascent across the three worlds, proceeding from the underworld to the heavens. The presence of macaw remains at the small house at the base of Fajada Butte (29SJ1360) is consistent with a ritual of shamanic ascent. The carrying of fire from the lower to the upper firebox at sunrise of winter solstice would have been a powerful ceremony when witnessed from the neighborhood of the Great Kiva. Although first established by members of the Fajada Gap community, the ceremony may have continued during winter solstice festivals by the residents of the Great Houses during the Classic Bonito Period. This juxtaposition of the butte and the subterranean Great Kiva is an echo of the symbolism of the cosmic mountain and underworld, connected by the axis mundi, which is present in the Americas at places such as Caral, Chavín de Huantar, Machu Picchu, Tikal, and Cahokia. This is not necessarily evidence for cultural diffusion, but at the very least, these examples are further revelations of a theme that has roots deep in the symbolic landscapes of human experience. Of these places, Cahokia is the most likely to have been engaged with Chacoan populations.

It was contemporaneous with the development of Pueblo II settlements in the canyon, had a population in the range of 10,000 and, like Chaco, was the destination for traders and pilgrims at the time of seasonal celebrations. With its 120 mounds, Cahokia was a built-up sacred landscape, a forest of constructed cosmic axes. Chaco was set in a landscape that already contained an axis of the universe and hence was evocative of the themes of centrality and cosmic ascent. Cahokia was blessed with great agricultural potential, while Chaco was not. Both places appear to have been the homes of ritual specialists who hosted compelling ceremonies that must have been perceived as beneficial to the participants. Astronomy appears to have played a ceremonial role in both places. Perhaps, as suggested by Pauketat and Emerson (2008) the heavens provided the “big bang,” the transformative event of something like the supernova of AD 1006.

Judging from the surface ceramic analysis, it seems likely that there was substantial occupation of the rooms on the upper ledges of Fajada Butte during late Pueblo III. They may have been temporary shelter from dangerous conditions in the canyon. The unusual light and shadow effects at June solstice in the three-slab rock fall were most likely discovered by temporary residents of the upper ledges in the late Pueblo III period. There is no substantial evidence that lunar standstills were observed or marked at Fajada Butte or at any other place in Chaco Canyon (Malville and Munro 2011). The most significant astronomical event associated with Fajada Butte prior to the Classic Bonito Phase may have been the rising of the December solstice sun over the summit of the Butte and its celebration at the Great Kiva in Marcia’s Rincon .

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