

# ***Three Archaeological Landscapes of the Mojave B Range, Naval Air Weapons Station, China Lake: Pilot Knob, Indian Spring, and North Eagle Crags***

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## **Abstract**

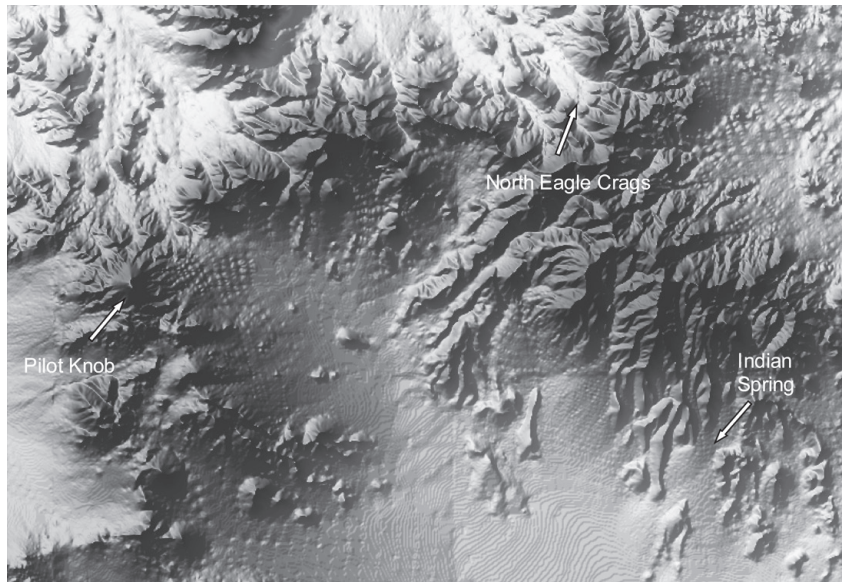
The lesser known South or Mojave B Range has tremendous capacity to tell us about the human past in the Mojave Desert and beyond. The protection provided by a long standing military presence stands out in a desert heavily impacted by looting, vandalism, off-road vehicles, and development. Arguably, the B Range may be our last best chance to answer some questions about the prehistory of the Mojave. It is the sort of place where you can be the first archaeologist since Malcolm Rogers to see a major complex of sites around a dependable spring.

## **Introduction**

When a California or Great Basin archaeologist thinks about China Lake, chances are good that the visions dancing in their head are of Coso petroglyphs, Emma Lou Davis's pre-Clovis lake-shore claims, or the unfathomable wealth of obsidian sources near Sugarloaf. All of these places are of course on the North Range. This paper offers evidence that the lesser known South or Mojave B Range also has tremendous capacity to tell us about the human past in the Mojave Desert and beyond. Here, too, the protection provided by a long standing military presence (and unlike adjacent Fort

Irwin, one that does not cater to armored battalions) stands out in a desert heavily impacted by looting, vandalism, off-road vehicles, and development. Arguably, the B Range may be our last best chance to answer some questions about the prehistory of the Mojave. It is the sort of place where you can be the first archaeologist since Malcolm Rogers to view a major complex of intact sites around a dependable spring.

The data and cultural resources discussed here were identified and gathered through a number of small projects that the author conducted with a few number of people on the B Range from 2003 to 2006. These projects were part of ongoing efforts by Epsilon Systems Solutions to manage the natural and cultural resources of China Lake, coordinated closely with the base's cultural resources program under Command Archaeologist Russell L. Kaldenberg. These surveys were, to borrow military terminology, mere reconnaissance missions or quick forays, designed to get some information on areas virtually unknown archaeologically, and then to get out quickly. Three such projects are discussed



*Fig. 1. Map Showing Locations of Pilot Knob, Indian Spring, and the North Eagle Crags Projects.*

here in turn: the southern slopes of prominent Pilot Knob, Indian Spring in the southeastern corner of the range, and a remote spring on the north side of the Eagle Crags Mountains (Fig. 1). General observations regarding the B Range and its potential are then presented. I, for one, see visions of intact archaeological landscapes in the B Range when I think of China Lake.

### **Pilot Knob**

Pilot Knob is one of the most distinctive landmarks in the western and central Mojave Desert (Fig. 2). Its flat top stands at 5,430 feet in elevation and it consists of colorful volcanic materials as it is part of the Miocene Eagle Crags Volcanic Field (Sabin, Monastero, and Snee 1993; Sabin 1994; Monastero, Sabin, and Walker 1997). Exposed formations of white to tan-colored volcanic tuff are significantly eroded by wind and water with numerous natural rock shelters and overhangs on the steep slopes of the mountain. On top of the tuff lies a massive andesitic flow represented by dense scatters of reddish-brown breccia boulders and cobbles. The result is a striking landscape, particularly given

Pilot Knob's height and flat top. On a clear day, it is visible from the very edge of the Mojave Desert at the base of the San Gabriel Mountains. There is one other place in the Mojave region to see this same volcanic geology—the Cudahy Camp Formation of Red Rock Canyon State Park, more on this below (Monastero, Sabin, and Walker 1997). Admittedly intuitive, Pilot Knob is one of those special places that probably always has had deep significance for humans in the Mojave Desert. Certainly it has over the past century and a half as it has guided borax wagon teams from Death Valley and as it currently serves as a massive “pylon” for Navy fighter pilots to circle.

In 2003 and 2004, a 1.0 by 0.3 kilometer portion (from 4,720 to 5,120 feet elevation) of the southern slopes of the rugged and steep formation was surveyed by systematic east-west transects (Allen 2004, 2005). Seven archaeological sites were recorded, including three rock shelters in the volcanic tuff. Rock shelters are all well and good, but what makes these particularly interesting is that inside each one is at least one surface circular rock feature composed of a pile of reddish-brown breccia



Fig. 2. Pilot Knob, view to the north from survey area. The distinctive light-colored tuff formation is overlain by reddish-brown breccia. Pilot Knob's coloration, height and flat top can be distinguished from far away. Photograph taken by author in August, 2003, at an elevation of approximately 4,800 feet.

cobbles. Two of them also have associated rock alignments. Few or no artifacts are present at these sites. The function or purpose of the rock piles and alignments are unknown, but because of a consistent pattern, some sort of ideological significance is a real possibility.

The first of the shelters, CA-SBR-11682, is located at 5,040 feet and consists of a natural rock shelter alcove situated along a steep slope. The alcove is 10.8 by 3.0 meters with a height of 1–2 meters. A line of tuff boulders each about 30 centimeters high is located along the eastern edge of the shelter. The alcove is supported by a natural tuff pillar about 2.5 meters wide at the base. The site has an excellent view to the northeast towards Seep Spring, one of the key dependable water sources in the entire B Range (Peck and Smith 1957, Walsh and Backes 2005). At the southern end of the alcove is a rock ring about 1.5 meters in diameter. This feature could have been used as a cache for protecting goods, but it could also be a burial, or simply a pile of reddish-brown breccia for some other purpose. No ash or charcoal was visible, suggesting that it was not a hearth.

CA-SBR-11685, located at 5,030 feet elevation, is a small rock shelter that faces nearly due south (Fig. 3). The maximum depth is 2.3 meters from the drip line to the rear of the shelter, the maximum width is 1.08 meters. It is 41 centimeters high in the back and 1.59 meters high at the entrance. Inside the shelter are two features, each with 20–30 reddish-brown breccia rocks stacked in a pile. One of these had a single jasper flake on the surface. A possible metate lies on a ledge east of the entrance, apparently *in situ*. Above the back (north) wall of the shelter are several cupules ground into the tuff.

The third rock shelter, CA-SBR-11686, is a bit lower at 4,830 feet. It measures 9.0 by 7.5 meters and consists of two features: Feature 1 is a small rock shelter approximately 2.0 by 1.75 meters and 1.3 meters high. It contains a cairn of brownish-red breccia rocks with one jasper core on the surface. Feature 2 is immediately adjacent to the rock shelter. It is an alignment of breccia rocks (four individual cairns) running east-west about 7.0 meters long on top of a light-colored volcanic tuff outcrop.



*Fig. 3. CA-SBR-11685 is one of several similar sites on the southern slopes of Pilot Knob. It is a natural rock shelter in volcanic tuff. Inside are two piles of reddish-brown breccia. Other sites on Pilot Knob also have piles or alignments of breccia lying in shelters or on top of tuff formations. Photograph taken by the author in July, 2004.*

Three other identified sites are rock alignments. In each case, they consist of reddish-brown breccia cobbles and boulders aligned or stacked on top of lighter colored volcanic tuff formations. The largest and most complex of these is CA-SBR-11687 at 4,810 feet elevation. It consists of several alignments and circles and one rock cairn on the western edge of the site. The site measures approximately 15.0 by 7.5 meters. Site CA-SBR-11681, elevation 4,720 feet, has two similar alignments. One has a distinct piece of breccia stacked on top of a pedestal of white tuff, and the western edge of the site is defined by a distinct rock alignment one course high that runs roughly north-south. Other clusters of volcanic breccia may also be cultural, but these are less obvious. The site measures approximately 7 meters in diameter. No artifacts were observed. The third alignment site, CA-SBR-11683 at 4,720 feet, consists of a circle of breccia rocks stacked on a tuff base. The alignment is 1–3 meters wide and about 4 meters long. This alignment, unlike the other two, did have a tool somewhat nearby—a mano fragment—36 meters nearly due north.

The last site identified during the survey, CA-SBR-11684 (elevation 4,950 feet), is a cairn feature consisting of about a dozen small volcanic breccia rocks stacked on top of a large boulder which measures 120 by 90 centimeters and 90 centimeters high. Pack rat or other rodent nests are lodged within the feature. The area of the stacked rocks is approximately 60 by 50 centimeters, and is 25 centimeters in height. No artifacts were observed.

In sum, there seems to be more going on here than just a few random rock alignments. Extrapolating from this survey and a quick inspection of the summit by Kaldenberg (personal communication, 2004) which noted similar features, Pilot Knob has perhaps more than one hundred alignments or stacks of breccia inside rock shelters. It also seems that color or consistency of material is an important characteristic of these sites: reddish-brown breccia placed on light colored volcanic tuff is common, though at least one alignment of homogeneous white tuff boulders was also observed. Moreover, these Pilot Knob sites are not anomalies. Mark Faull (personal communication, 2004) noted similar archaeological features at Red Rock Canyon State Park in the

vicinity of Black Mountain. At Red Rock, geologists call this the Cudahy Camp Formation, and established that it was also produced by the Eagle Crags Volcanic Field during the Miocene. The spectacular formations of Red Rock are now 64 kilometers west of their origin due to sinistral offset from the Garlock Fault (Monastero, Sabin, and Walker 1997). Faull and the present author visited some comparable Red Rock Canyon sites in January, 2007, and confirmed rock shelters in light colored tuff formations with associated rock alignments and circular piles of homogenous rocks, just like at Pilot Knob. Thus, these two essentially identical geological landscapes have similar alignment and circular rock features associated with tuff rock shelters and terraces, for the most part void of artifacts. None of these sites in either area have been excavated yet. No chronological information is currently available other than a few flakes and an occasional groundstone artifacts. Interpretation of these sites will require due consideration of their context, the archaeology of color (Jones and MacGregor 2002, DeBoer 2005), and cognitive approaches (Mithen 1996, Renfrew and Scarre 1998).

### Indian Spring

About 16 kilometers east of Pilot Knob, Indian Spring is situated at 3,460 feet elevation in the middle of an alluvial fan. It is surrounded by a number of volcanic tuff ridges and hills which are, like Pilot Knob, part of the Eagle Crags Volcanic Field (Monastero, Sabin, and Walker 1997). The spring, located approximately 10 kilometers north of the Superior Lake playa, was visited by Malcolm Rogers in the fall of 1929, but he never published his observations (Rogers n.d.; Allen 2005, 2006). His notes, however, are on file in the San Diego Museum of Man and are fully transcribed in Allen (2006a). Under designation M-99, he describes a number of archaeological sites including two rather unusual sites he called Petroglyph Cave (CA-

SBR-724) and Zoo Cave (CA-SBR-11689). These and eight other sites were recorded in 2004 (Allen 2005, 2006a). In 2005, four additional rock shelters in the same tuff formation as Petroglyph Cave, and two sites in the alluvial fan (a rock enclosure and a site nearly adjacent to the spring with petroglyphs and lithic scatters) were recorded. In the area inspected thus far, within 500 meters or so of the spring itself, there is a wide variety of archaeological sites.

Systematic pedestrian survey of the entire area will doubtless reveal many more. Table 1 provides brief descriptions (full site details in, Allen 2005, 2006a). It should also be noted that in the late 1940s Agnes Bierman and Albert Mohr recorded and tested a number of small rock shelters in the ridges immediately to the south of Indian Spring (Allen 2005). They apparently did not work at the spring itself, or at the nearby sites noted by Rogers and discussed here.

Three of the Indian Spring sites are unique and warrant further description. The first of these, Zoo Cave (CA-SBR-11689) extends in front of and along the spine of a distinct volcanic tuff promontory that juts northwest from a ridge towards Indian Spring about 500 meters away. Our reconnaissance identified six loci. Locus A is a rock shelter located on the east face of the promontory with several bedrock milling features, groundstone artifacts, and historic etchings inscribed on the tuff. Additional etchings, lithic debitage, a metate, and some rough stone walls comprise Locus B at the base of the north face of the promontory. Locus C, on top of the promontory, is a 57 meters long undulating serpent-like rock alignment made with 20 separate cairns or individual lines of volcanic breccia rock on top of the promontory (Fig. 4). This is reminiscent of a 200 meters long serpent-like geoglyph scraped into a desert pavement noted by Kaldenberg (1981:81–83) at Denning Spring on the western edge of the

Table 1. Recorded Sites at Indian Spring.

Trinomial	Site Name	Description
CA-SBR-723	Indian Spring	midden around spring, dense vegetation cover
CA-SBR-724	Petroglyph Cave	rock shelter, 3 stone wall structures, habitation debris, petroglyphs
CA-SBR-11688		stone circle
CA-SBR-11689	Zoo Cave	rock shelters, petroglyphs, 2 rock alignments, mortars, possible cupules, some habitation debris
CA-SBR-11690		at least 8 stone circles, groundstone artifacts on surface
CA-SBR-11691	Rogers Geoglyph	geoglyph/rock alignment
CA-SBR-11692		bedrock milling feature
CA-SBR-11693		stone circle, cairn, bedrock milling feature
CA-SBR-11694		double enclosure with stone walls (likely historic)
CA-SBR-11695		petroglyph panels
CA-SBR-11696	The Richard and Russ Trail	trail leading from spring towards Zoo Cave promontory
CA-SBR-12266		small rock shelter in tuff, wall feature, groundstone
CA-SBR-12267		small rock shelter, 2 metates
CA-SBR-12268		small rock shelter, 3 metates, 1 mano
CA-SBR-12269		small rock shelter with possible stone circle, metate
CA-SBR-12270		stone circle, milling feature, cairn
CA-SBR-12271		5 petroglyph panels (weathered), cairn, lithic scatter

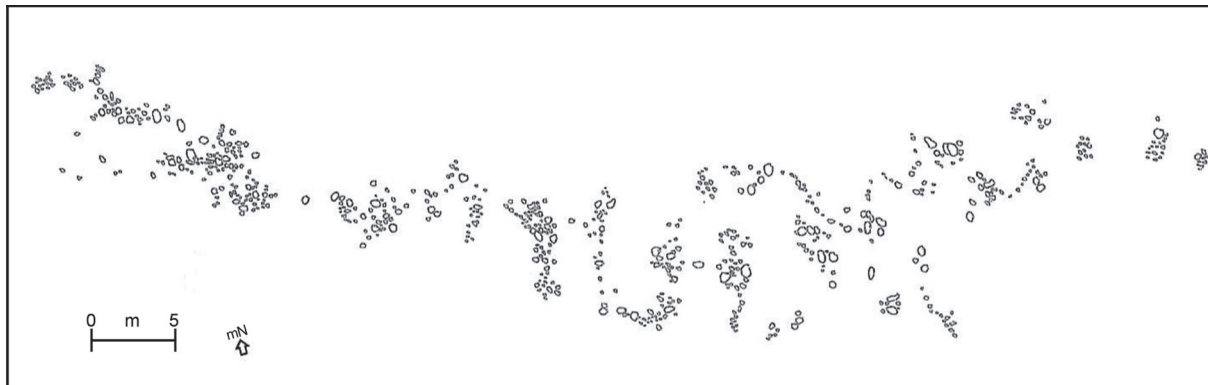


Fig. 4. Plan of Locus C at Zoo Cave (CA-SBR-11689). Lines and low cairns of stacked reddish-brown breccia comprise this linear feature. It undulates from east to west down the slope of a prominent volcanic tuff promontory which points towards Indian Spring.

Avawatz Mountains. Locus D, on the southwest edge of the promontory, is a concentration of 13–14 petroglyph panels in a basalt boulder field. Locus E is a rough line of 12 cupules or shallow bedrock mortars on top of the promontory. Finally, along the eastern edge of the site is Locus F, another alignment of numerous rock cairns 33.5 meters in length (north-south). Since no excavations were conducted at this site and no obvious diagnostic artifacts were observed on the surface, the age of these loci is thus far undetermined.

CA-SBR-724, though named Petroglyph Cave by Rogers, is actually a shallow rock shelter with numerous associated features and evidence of habitation. A sheer joy to record, Petroglyph Cave appears to be in nearly the same condition as described and photographed by Rogers in 1929. The main part of the site is a terrace 6–7 meters wide adjacent to a shelter or shallow cave in an exposed volcanic tuff face. The terrace is about 28 meters long, but the southern end has been disturbed by a major collapse of the tuff. Three contiguous stone circles, likely houses, lie in a row along this terrace, each partially sheltered by the natural cave. The site's namesake is a highly eroded petroglyph panel on a basalt boulder to the south and slightly down slope from the circular structures. A smaller and less elaborate petroglyph exists southwest of the terrace. Many pieces of groundstone are concentrated around the structures, and a fairly continuous scatter along the terrace includes several bifacial tool fragments (including likely projectile points), a green slate fragment, and debitage. Materials include chert, obsidian, basalt, and chalcedony. There is also a substantial amount of burnt large-mammal bone on the surface. The site extends down slope to the east. A number of artifacts were identified on the surface of this talus slope, just as Rogers noted. Much of this material has likely washed downhill from the terrace, but there may have been aboriginal use of this area as well. Rogers tested the site

and noted "Paiute" occupation a foot in depth, and "Amargosa" materials down to 30 inches below the surface. No evidence of his back dirt or slumped excavations were observed, though vegetation was fairly heavy on the terrace.

The third site worth special mention is a geoglyph consisting of a cleared surface in the alluvial fan not far from the spring. The Rogers Geoglyph Site, measures 10 by 7.5 meters, and is a complex rock alignment formed with reddish-brown breccia cobbles. At CA-SBR-11691, the rocks form a half-circle or oval to the north adjoined to a line of rocks which has a single curve halfway along its course. This feature appears to be undisturbed since 1929 as it matches a sketch made by Rogers. One metate is present at the northern end. Some possible scratching is present on a rock on the west edge.

Besides these three sites, there are numerous other rock art sites, trails, and habitation sites (including stone circles which are likely house foundations) in the vicinity of the spring. In addition, groundstone is commonly encountered as components of sites or as isolated artifacts. The work of Rogers, Bierman, and Mohr, together with the results of this reconnaissance established Indian Spring as a remarkably well-preserved archaeological landscape. Although chronometric data are thus far extremely limited, diagnostic artifacts such as Desert Series projectile points and ceramics (observed by Rogers, but not by our crew) that the area was utilized during the Late Prehistoric Period (from 700 to 200 BP). Earlier components are likely present given the occurrence of basalt artifacts, as these have been shown at nearby Fort Irwin to be consistently associated with older time periods (Allen 1998, Basgall and Hall 1992). Rogers (n.d.) also had this impression. His identification of intact stratigraphy at Petroglyph Cave, and apparently projectile points (unfortunately, he provides no details in his notes on these) led him to conclude that Indian Spring

was utilized at least as early as the Mid-Holocene (i.e., the Pinto Period, ca. 7,000–4,000 BP). To get tighter chronological control than this, excavations at Indian Spring are critical. Along with testing, a systematic survey of the entire area needs to be conducted. Detailed recording of the sites, features, and artifacts in this area will likely yield a very large number of sites and should permit detailed analysis of how this landscape was utilized during prehistory.

Nevertheless, it is clear from present evidence that this set of cultural resources provides an opportunity to examine diachronic changes in subsistence patterns, technology, resource extraction, social organization, and ideology. Most importantly, this is an outstanding opportunity to examine the context of trails, plant processing areas, habitation areas, and places with spiritual or some other kind of ideological significance. Zoo Cave, the Rogers Geoglyph, and numerous petroglyphs point to this being a special landscape in the past. In particular, Zoo Cave represents a unique opportunity to provide insights into prehistoric ideology given its prominence in the area, the complex set of features, and especially the large-scale rock alignments.

### North Eagle Crag

In May of 2005, I led a small team to conduct archaeological investigations in the vicinity of

Pink Hill Spring on the north side of the Eagle Crag—only about 10 kilometers north of Indian Spring as the buzzard flies, but what would be an arduous hike over the Crag (Fig. 1). The project involved the intuitive examination of likely locations for archaeological sites, and the recording of sites previously identified by NAWS personnel. A total of six new sites and an isolate were recorded (Table 2). The sites include four rock shelters (one with several individual shelters), a possible hunting blind, and an historic can dump. The sites are located in two areas: near Pink Hill Spring and on either side of a north-south wash southeast of the spring. The largest site (CA-SBR-162) was the only one previously recorded in the area. It is a midden and lithic scatter associated directly with Pink Hill Spring at 3,330–3,520 feet elevation. No features were noted during the brief inspection. Two sites were subjected to limited test excavations, and are summarized below. For full details, see Allen (2006b).

Site CA-SBR-12273/H, known as Corey's Cave after the NAWS employee (Mr. Corey Wincn) who reported it, is a conspicuous rock shelter or small cave (measures 4.9 by 4.0 by 1.5 meters). It is located on the steep slope of a ridge immediately south of Pink Hill Spring at 3,680 feet elevation. Three artifacts were visible on the surface inside the shelter: an obsidian flake, a chalcedony biface fragment, and a bifacial metate fragment. A 1 by 1 meter test

Table 2. Archaeological sites recorded during examination of Pink Hill Spring vicinity in May, 2005.

Site Trinomial/Name	Description	Test Excavations
CA-SBR-162	large midden at spring	no
CA-SBR-12272	possible hunting blind	no
CA-SBR-12273/H (Corey's Cave)	rock shelter/midden	yes (one 1 by 1 meter unit)
CA-SBR-12274	rock shelter	no
CA-SBR-12275	rock shelter/midden	no
CA-SBR-12276H	historic can dump	no
CA-SBR-12277 (Skull Cave)	6 rock shelters (Loci 1-6)	yes (two 1 by 1 meter units)



unit revealed a midden to about 50 centimeters deep with a light density of prehistoric artifacts. The midden is highly disturbed by rodents and birds nesting in the cave who also have apparently contributed some historic textiles. The test unit revealed a possible hearth cut into the bedrock at a depth of 45–50 centimeters below the surface. Recovered artifacts included a light density of debitage (obsidian and chert), a chert uniface, a chalcedony biface fragment (possibly a projectile point), several pieces of quartzite, and a single piece of rawhide twine. In addition, 76 pieces of bone were recovered. They represent a wide variety of animals (Reynolds 2006): wood rat (*Neotoma*), kangaroo rat (*Dipodomys*), pocket mouse (*Perognathus*), black tailed hare (*Lepus*), desert tortoise (*Gopherus agassizi*), lizard (Lacertilia), collared or leopard lizard (cf. *Crotophytus*), mountain sheep (*Ovis canadensis*), rattlesnake (*Crotalus*), cottontail rabbit (cf. *Sylvilagus*), and chuckwalla (*Sauromalus obesus*). Some of the faunal remains were burnt. A considerable quantity of burned wood and charcoal was also recovered. A single radiocarbon date on charred wood from the base of the midden yielded a conventional radiocarbon age of  $350 \pm 40$  BP, calibrated to AD 1450–1650 (Beta-206885). A single obsidian artifact from 20–30 centimeters had a hydration rim of 5.1 microns and was sourced to the Coso Volcanic Field. A second obsidian artifact from the surface did not yield a measurable rim, but was identified geochemically as Joshua Ridge, a subsource within the Coso volcanic field.

The evidence from the test unit suggests that Corey's Cave was used episodically during late prehistory. At least one of these uses involved cooking and consuming animal resources. The prey included large mammals, small mammals, reptiles, and tortoise. The site was too small for a significant occupation, but as a sheltered location near water and likely game trails it offered excellent vantages to the north and east.

The other tested site in North Eagle Crags is Skull Cave (CA-SBR-12277). This site complex was first identified by Command Archaeologist Russell L. Kaldenberg. It consists of six rock shelters, with evidence of prehistoric cultural activity. Each shelter faces to the west, some have a clear line of sight to the area north of Pink Hill Spring, and they range from 3,600 to 3,750 feet in elevation. From a distance, several together resemble the eye sockets and mouth of a skull—hence Skull Cave (Fig. 5). The site is situated on the western edge of a hill directly east of the major wash that runs north-south through this region. Besides the six shelters with obvious cultural activity, there are numerous other small rock shelters in this craggy exposed formation of breccia and crumbling andesite.

Locus 1 is approximately 8 by 7 meters and consists of two natural rock shelters (Features 1 and 2) and a cultural midden between them with a low density of artifacts. Surface artifacts include a metate and a chert flake. A 1 by 1 meter test unit was placed inside Feature 1. The 0–10 centimeter level yielded two chert unifaces and a few pieces of debitage. However, just above decaying bedrock, the 10–20 centimeter level identified a distinct concentration of over 65 chert flakes in the southwest corner of the unit which probably represent a single reduction event. A chert uniface was also recovered from this level.

Locus 2 is a 7 by 12 meters shallow rock shelter with a maximum height of 2.2 meters and a narrow flat terrace in front. There is a distinct drop-off from this terrace to the west. Three features are evident. Feature 3 is a stacked wall of stones placed on top of a large boulder on the south side of the terrace. This effectively acts as a blind for that direction, or it may simply be to block winds from the south. It has a maximum height of 2.5 meters above the ground surface. Feature 4 is a rock art panel with five elements. Four of these are red ochre picto-

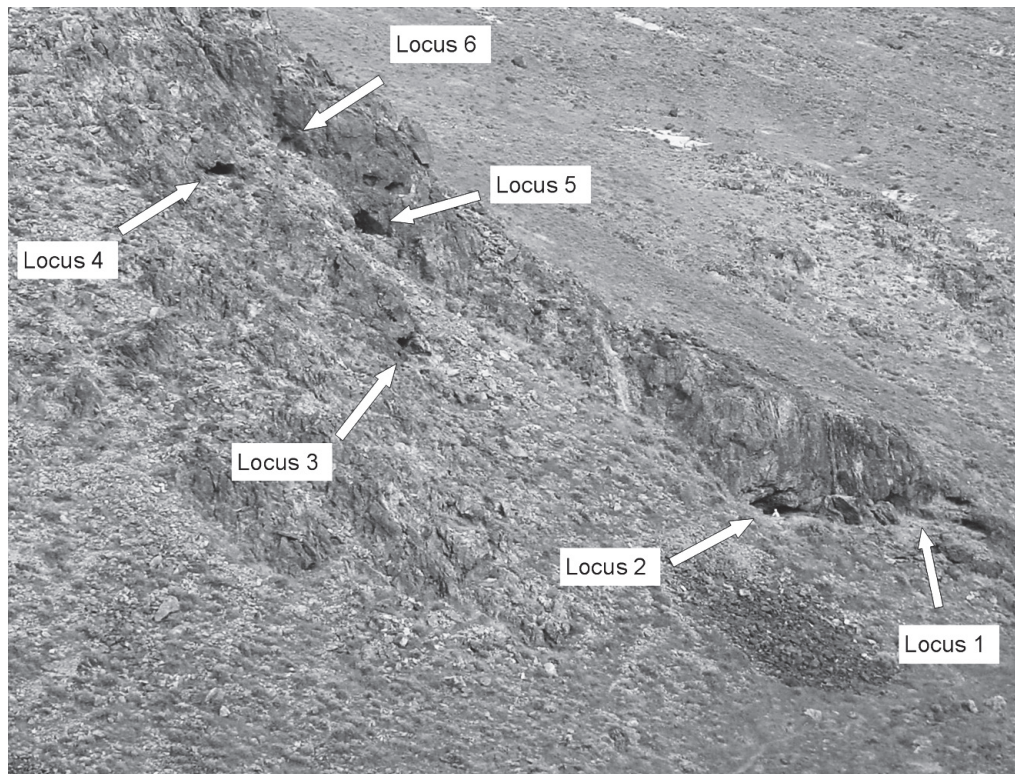


Fig. 5. Skull Cave Site (CA-SBR-12277), view to the southeast. At least six shelters (Loci 1-6) in the andesite formation have evidence of human activity. The site's name comes from shelters that together resemble a skull's eye sockets and mouth. For scale, a crew member is visible at Locus 2. Photograph taken by the author in May, 2005.

graphs (one circle, two abstract designs, and one linear design) done in red ochre and the fifth is a small petroglyph. These occur on the back wall of the shelter, at a height about 1 meter above the ground. Feature 5 is a line of mostly small rocks that adjoin the south wall of the shelter and continue for about 4 meters north. Two biface fragments, a heat-treated uniface, a core, two metates, and debitage were visible on the surface.

Test Unit 2 was a 1 by 1 meter square placed inside Locus 2, adjacent to the two surface metates. This unit revealed a much deeper midden than in Locus 1. Sterile soil was reached roughly 40 centimeters below the surface. A considerable quantity of artifacts was recovered, including over 300 flakes

(mostly chert and chalcedony, with three pieces of obsidian, and a few flakes of other material including jasper and basalt). Recovered tools included two biface fragments, a uniface, two manos, and a metate fragment. An incised green slate fragment and two cores were also present. No features were identified in the unit, but there were several distinct stratigraphic layers evident). Recovered faunal remains (Reynolds 2006) include: round-tailed ground squirrel (*Spermophilus tereticaudus*), leopard lizard (*Crotaphytus wislizenii*), desert wood rat (*Neotoma lepida*), and mountain sheep (*Ovis canadensis*). A charcoal sample (Beta-206884) from the bottom of the midden (40–50 centimeter level) yielded a conventional radiocarbon age of 240 ±40 BP, but with a wide range of calibrated ages. Three

obsidian hydration rim measurements (3.0, 1.5, 4.0 microns) also suggest a fairly late date for the midden. All three artifacts were from the Coso Volcanic Field.

Four other rock shelters had indications of use but were not tested. Locus 4 shows definite use during the prehistoric period. It measures 2 by 3 meters with a maximum height of 1.2 meters. In the southeast corner there is a shallow depression cleared of rocks, unlike the rest of the floor. In addition, there is a small pile of cobbles along the north wall of the shelter, near the mouth. On the surface were three large mammal bone fragments, a primary utilized chert flake, a chert biface fragment, and a piece of chalcedony shatter. This locus was not excavated, but likely has at least a shallow midden. This locus offers a good view of Pink Hill Spring to the northwest. The faunal remains include one metatarsal from a mountain sheep (*Ovis canadensis*) which was affected by heat (Reynolds 2006).

This area north of the Eagle Crags Mountain Range is clearly an important one for cultural resources. Fortunately, its remote location deep in the heart of the B Range and the lack of any destructive military activity in the area have resulted in outstanding preservation. It appears that prehistoric sites date to the last 1500 years based on the few radiocarbon assays, obsidian hydration measurements and diagnostic artifacts encountered. A wide range of site types are present as well, including middens, blinds, rock shelters, and rock art. North Eagle Crags is conceivably one of the few well-preserved series of sites around springs in the western and central Mojave Desert. As such, it has a high potential for shedding light on cultural processes such as economic practices (hunting, use of spring vegetation communities), settlement patterns (types of sites and their locations), and ideology (in particular the pictographs at Skull Cave).

## The Big Picture

The projects described here obviously are not lone cries in the wilderness of the B Range. A recent records search and survey of the collections from the B Range formerly held by the San Bernardino County Museum revealed over 50 specific area survey and/or excavation reports, nearly 400 recorded prehistoric sites, over 40 historic sites, and well over 100 isolates (Schroth and Kearney 2007). Some important recent projects include a survey of many small areas in the B Range (Deis and Underwood 2004), and a study of Seep Springs (Walsh and Backes 2005). However, as brief reconnoiters at Pilot Knob, Indian Spring, and North Eagle Crags demonstrate, there is more work to be done here in the “South Forty.”

Ideally, the well-preserved cultural resources of the B Range will be brought to bear on some of the key research problems of the archaeology of the Mojave, Great Basin, and beyond. Some of these issues are put forth in the most recent synthesis of the high desert region (Sutton et al. 2007). One major call to arms is sub-regional studies focused intensively on particular landscapes. Sutton et al. (2007) argue that these studies will permit identification of variations as well as similarities across various environments within the Mojave during different time periods. The brief discussion of several B Range localities here shows the potential of such an approach. Site complexes a day’s walk from one another are extremely different, yet similar sites are found at Pilot Knob and Red Rock Canyon State Park, arguably because of shared geology and topography. This is why landscapes protected on military reservations are particularly crucial—the context of sites, features, artifacts, and the environment is generally superior to open lands.

One major topic of current archaeological research in the Mojave Desert is the study of ethnic groups

and prehistoric population movements. For the past two decades or so, archaeologists, ethnographers, and ethnohistorians have focused on the origin, and spread of the Numic speaking peoples during the past fifteen hundred years or so, but the topic encompasses other issues and time periods as well. Moreover, it leads to other theoretical problems: it ties directly into the traveler-processor model (Bettinger and Baumhoff 1982, Bettinger 1999) that has been very popular among Great Basin archaeologists. They argue that major changes were afoot by 1500 BP as sedentism, population, subsistence intensification (particularly in the form of storage and seed processing), and logistical organization all increased. Competition is an integral part of this model, most forcefully argued by Sutton (1986) to include outright warfare. Others have argued for much more cooperative scenarios (Eerkens 1999). Climatic changes, such as increased drought and aridity seem to have been an underlying cause for most of these changes (Jones et al. 1999; Sutton 1994, 1996; Gardner 2006; Sutton et al. 2007). The B Range and adjacent areas such as Fort Irwin and the western Mojave are key places to examine these ideas since the Numic expansion is often argued to have rolled right through the area from an origin point somewhere in the southern Sierra Nevada or Tehachapi Mountains.

The recovery of big horn sheep remains at several different locations in the North Eagle Crags region along with identification of possible hunting blinds is highly relevant to another current debate. Recent publications (Hildebrandt and McGuire 2002, McGuire and Hildebrandt 2005, McGuire, Hildebrandt, and Carpenter 2007) have argued for a sharp rise of big game hunting in western North America during the Middle Archaic (3500 to 1350 BP), followed by a steep decline through the remainder of the prehistoric period. Most recently, this has led to a lively exchange of ideas about the role of prestige hunting and costly signaling during

the Middle Archaic (McGuire, Hildebrandt, and Carpenter 2007 for references and latest discussion). The crux of this argument is to what extent young men diverted wasteful amounts of energy into bagging big game in order to enhance their personal status. It has been argued that these enthusiastic youths, armed with the bow and arrow after about 1500 BP, essentially killed off the golden goose to the extent that artiodactyls were on the edge of extirpation in some localities.

In contrast, the Corey's Cave and Skull Cave sites certainly seem to be cases where late prehistoric hunters did score big horn sheep on occasion. Likewise, Allen (2007, in prep.; and this issue) argues for big game hunting during the Late Prehistoric Period (700–200 BP) or early historic period at Red Mountain some 45 kilometers to the west. Similar arguments have been made for other sites that seem to have been used since the Mid-Archaic. Perhaps certain areas did not see such a drastic drop off in these resources. Alternatively, it is possible big game populations recovered in areas of low human population density. Regardless, the B Range is an appropriate place to further examine this issue given the number of rock shelter sites likely to contain intact deposits of faunal remains from contexts which can be reliably dated.

Naturally, discussion of big horn sheep at China Lake leads to petroglyphs and archaeological research focused on ideology. The B Range seems to offer a different picture from the dense concentrations of petroglyphs in the Coso Range (Garfinkel 2006 for references). It certainly has petroglyphs aplenty, but it also offers at least several sites or features consisting of sometimes large-scale rock alignments and even complex shapes. Cairn features are also suggestive in terms of their spatial patterning and lack of obvious pragmatic function in many cases. Some of these were described here; others have been recorded in the nearby Christmas

Canyon area (Walsh and Clewlow 2006). And as noted at Skull Cave, there are also pictographs in the B Range. Perhaps most impressively, Pilot Knob stands out as a landscape with some sort of significance. The outstanding preservation of the B Range may well make it one of the most important locations in the Mojave where ideology of the past can be teased out.

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