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Cupule Petroglyphs in the Diablo Range, California

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CUPULE petroglyphs have been recorded throughout the world, and it is possible that they represent the oldest known form of rock art.¹ Such petroglyphs are especially numerous in California, where examples are found in most areas of the state (Heizer 1953a; Payen 1968; Fleshman 1975; Minor 1975; Hedges 1981; True and Baumhoff 1981). One area of the state, central California's Diablo Range, appears to be characterized by a relatively great number of cupule petroglyph sites. A recent archaeological study conducted in the northern portion of the Diablo Range resulted in the recording of additional petroglyph sites, and generated new ideas about the function of the petroglyphs.

The Diablo Range, a portion of the central Coast Ranges, extends from Mount Diablo in the north to a point about 300 km. south-southeast, at which point the Temblor Range begins (Fig. 1). It varies in width from about 30 to 50 km., with elevations from just above sea level to almost 1,600 m. Some of the major peaks include Mount Diablo (1,173 m.), Mount Hamilton (1,283 m.), and San Benito Mountain (1,597 m.). Like the rest of the Coast Ranges, the Diablo Range is characterized by rocks of the Franciscan Formation, and plants of the Chaparral, Grassland, Oak and Pine Woodland, and Riparian plant communities.

ARCHAEOLOGICAL AND ETHNOGRAPHIC BACKGROUND

Except for a few recent studies, relatively little archaeological fieldwork has

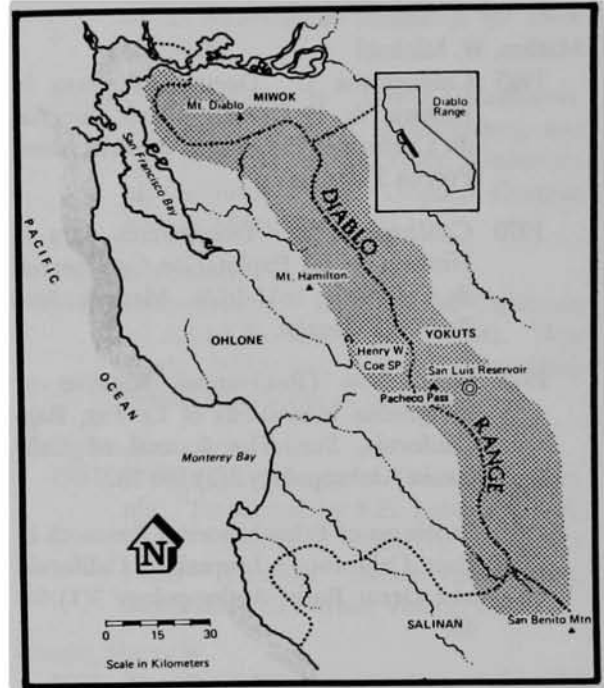


Fig. 1. Location of the Diablo Range.

been conducted in the Diablo Range, and the northern area appears to have been studied more than the southern area. The northern area, the subject of this paper, extends from Mount Diablo in the north, to just south of Pacheco Pass and San Luis Reservoir. In early historic times, this area was the territory of Bay Miwok, Northern Valley Yokuts, and Ohlone peoples.

In the Diablo Range, the Bay Miwok controlled Mount Diablo, and the Northern Valley Yokuts and Ohlone controlled the territory to the south of it (Bennyhoff 1977). Although the boundary line separating the Yokuts and Ohlone may have been the crest of the Diablo Range (Kroeber 1925:462;

Wallace 1978:462), it is possible that the line of separation occurred closer to the banks of the San Joaquin River. Working with mission records, Milliken (1982) observed that the suffixes on protohistoric native American women's personal names appeared in patterned geographic distributions, corresponding somewhat to the suggested distribution of particular aboriginal language groups. These data suggest that Ohlone territory extended eastward beyond the crest of the Diablo Range to the western edge of the Central Valley. The three tribes located between the crest of the range and the edge of the valley were the Tomoi, Locobo, and Cobo, whose people were taken to the missions at Santa Clara and Santa Cruz between 1800 and 1808. Women of these tribes had names more typical of those found in the Santa Clara and Livermore valleys, thus suggesting that they spoke Ohlone dialects (Milliken 1982:3, personal communications 1981-83). At some earlier time, Hokan groups are thought to have inhabited the Diablo Range, and to have been displaced later by successive waves of Penutian groups, the ancestors of the historic Miwok, Yokuts, and Ohlone (Levy 1978:486).

Rock art research in the Diablo Range is relatively nonexistent, and little that has been accomplished has been reported. A few rock art sites have been discussed, including CCO-222 (Heizer and Clewlow 1973:94, Fig. 7a), SCL-48 (Heizer and Clewlow 1973:115, Fig. 288a; Elsasser 1985; Hotz 1986), and STA-33 (Heizer and Clewlow 1973:117, Fig. 298a, c). CCO-125 (also recorded as CCO-353), a large cupule petroglyph site with petroglyphs of a style termed Pecked Curvilinear Nucleated (PCN), similar to those occurring in Marin County sites (Hotz and Clewlow 1974), was discussed by Miller (1977: 22, Fig. 4), and, more recently, by Elsasser (1984). ALA-19 and ALA-51, two historic

non-Indian petroglyphs, were discussed by Elsasser and Contreras (1958), and Ritter (1982) discussed CCO-434, a native American pictograph site that may date from the early historic period. Finally, two Diablo Range sites, CCO-152 and SCL-48, have been the subject of newspaper coverage (*Oakland Tribune* 1933; *Berkeley Gazette* 1953).

During the 1960s, several archaeological sites were excavated prior to construction of San Luis Reservoir (Olsen and Payen 1969, 1982; Pritchard 1970, 1982; Riddell and Olsen 1965). Three of these sites, MER-15, -38 (often referred to incorrectly as MER-119), and -130, contained cupule boulders close to late protohistoric (Yokuts) occupation sites. Because of the geographic association between the cultural deposits of these sites and their cupule features, it was inferred that the two were contemporaneous (Olsen and Payen 1982:21), and that these data disproved Baumhoff's (1980) proposal concerning the antiquity of such features (Pritchard 1982:31). More recently, another Diablo Range cupule petroglyph site was excavated near San Francisco Bay. This site, ALA-60, is a large occupation site with numerous cupule boulders, in ethnographic Ohlone territory. It was excavated by California State University, Hayward, in 1979 (Miller 1982).

Interpreted ages derived from obsidian hydration rind measurements range from 415 to 4,097 B.P., and a single radiocarbon age of $3,295 \pm 500$ B.P. was derived from the lower deposit of the site (Miller 1982), suggesting that the place may have been used by Hokan-speaking people prior to the arrival of the Penutians. It was observed that some of the bedrock milling activity at the site appeared to postdate certain of the cupule petroglyphs (Parkman 1982), thus giving some credence to Baumhoff's (1980) proposal that cupule petroglyphs are an ancient Hokan element.

THE HENRY COE STATE PARK PETROGLYPH SITES

In 1982, an archaeological survey was conducted in Henry W. Coe State Park, a 27,000-ha. wilderness in the Diablo Range (Parkman et al. 1983). During the survey, eight cupule petroglyph sites were recorded (SCL-496, -499 to -503; STA-195 and -201). Since the 1982 survey, State Park staff and volunteers recorded three additional cupule petroglyph sites (SCL-594 and -595; STA-218). These eleven cupule petroglyph sites are described below.

SCL-496. A single Franciscan graywacke boulder, about 10 m. from a major spring, has six cupules arranged in what may be a nonrandom pattern (Fig. 2a).

SCL-499. A single Franciscan graywacke boulder has three cupules arranged in what may be a nonrandom pattern (Fig. 2b). The boulder is near a spring, and is in a grove of black oak (*Quercus kelloggii*). A sandstone bowl or mortar and an oval-shaped sandstone mano were observed within 40 m. of the cupule boulder, and small pieces of soapstone and serpentine littered the surface of a nearby field.

SCL-500. A single Franciscan graywacke boulder has three cupules and three bedrock mortars. Four other bedrock mortars are on two nearby boulders. A flake scatter occurs on the surface of the site, which is beside an intermittent stream.

SCL-501. Two Franciscan graywacke boulders have one cupule on each (Fig. 2c). The boulders are in the vicinity of a chert quarry/workshop, and are about 10 m. from a major spring.

SCL-502. Six cupules and one bedrock mortar are on two Franciscan graywacke boulders near a spring. The mortar and five of the cupules are on one boulder, with a single cupule on the other. The two boulders are adjacent to one another, and appear

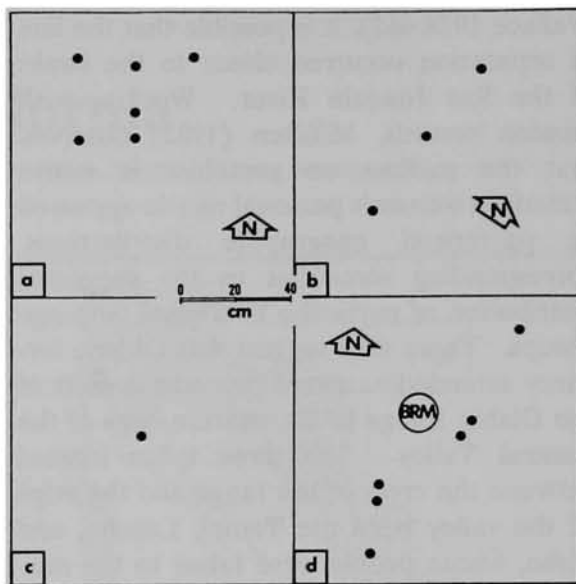


Fig. 2. Arrangement of cupules at four sites in Henry W. Coe State Park; a, SCL-496; b, SCL-499; c, SCL-501, d, SCL-502.

to once have been a single rock, having broken apart after the manufacture of the cupules. The cupules appear to represent a nonrandom arrangement (Fig. 2d).

SCL-503. A large glaucophane schist boulder with several Pecked Curvilinear Nucleated petroglyphs and evidence of quarrying activity occurs near a spring. One large vertical face of the boulder is covered with numerous cupule-like depressions and angular incisions that may or may not be of cultural origin. At least one visitor to the site has noted that these cupule and incision-like markings are natural (Robert Mark, personal communication 1983; Newman and Mark 1986:193, Fig. 4), the result of tectonic emplacement process observed elsewhere on blocks of metamorphic rocks in the Franciscan assemblage (Bailey et al. 1964). A second schist boulder, much smaller than the first, is just downhill, and has a large cupule carved into a vertical face. A quartz biface, and several battered rocks were observed on the surface about the site.

SCL-594. Four Franciscan graywacke boulders with 17+ cupules and five bedrock mortars located on them are beside a perennial stream. A midden and possible house pit are adjacent to the boulders.

SCL-595. Two blue schist boulders adjacent to an intermittent stream have 40+ cupules on them. There also are at least eight incised lines and grooves on one of the boulders.

STA-195. A large Franciscan graywacke boulder beside an intermittent stream has four cupules and eight bedrock mortars.

STA-201. Six limestone boulders in the bed of an intermittent stream have three cupules and 18 bedrock mortars on them.

STA-218. A large glaucophane schist boulder has 40+ cupules, 14 bedrock mortars, and several possible incised petroglyphs. The boulder is beside an intermittent stream.

DISCUSSION

At least 76 recorded cupule petroglyph sites are in the Diablo Range (Table 1). Here, as elsewhere in central California, cupules occur in a variety of environmental settings, the only apparent common denominator being the availability of a rock outcrop.

One of the more interesting traits characterizing the cupule sites in Henry Coe State Park is their proximity to water sources. Five of the sites are adjacent to springs, while the other six are in streambeds or beside streams. This appears to be a characteristic common to Diablo Range cupule petroglyph sites, especially those in the Pacheco Pass area (i.e., Merced, Santa Clara, and Stanislaus counties). On and about Mount Diablo, cupule sites also occur near water sources, often on or near ridges just above springs (Parkman MS; Porter et al. 1980; Sampson 1985). As the Diablo Range is a relatively arid region, water sources

would have been important during prehistoric times. The association of cupule petroglyphs and water sources, especially springs, may have been more than coincidental.

The ethnographic record of northern California suggests two reasons aboriginal peoples made cupule petroglyphs. The first, taken from the Pomo, associates the cupules with a "fertility" ritual in which certain rocks were carved on by couples wishing to have children (Aginsky 1939:214; Heizer 1953a:35-36; Loeb 1926:247-248). These "baby rocks" tend to be elaborately carved with both cupules and incised lines (Hedges 1983a, 1983b).

The second reason for cupule use is suggested by data from the Shasta National Forest, where cupules were associated with a ritual in which certain rocks were carved on by shamans wishing to control the weather (Heizer 1953a). In this ritual, the production of cupule-like depressions produced wind and rain, while the making of straight parallel grooves produced snow (Heizer 1953a:35). To stop the snow from falling, an incision was made across the parallel lines, whereas to stop the rain, the rock had to be covered. Such "rain rocks" also are thought to have been used by the Hupa, Karok, and Tolowa of northwestern California. One such Karok occurrence may be the "Shouting Rock" of Amaikiaram, the sacred village in which the Jump Dance (a world renewal ceremony) and the First Salmon ceremony traditionally occurred (Winter and Heffner 1978). From atop Shouting Rock, during the First Salmon ceremony, warnings were "shouted" out so that the Karok tribal members might avoid seeing the priest or the smoke from his ceremonial fire. Inspection of Shouting Rock has shown it to be covered with incised petroglyphs and at least 10 cupule petroglyphs (Keter and Maniery 1977; Winter and Heffner 1978). It is not clear what use was made of the Amaikiaram cupule petro-

Table 1
CUPULE PETROGLYPH OCCURRENCES IN THE DIABLO RANGE

Site No.	Elevation (ft.)	Topography	Vegetation	Water (Dist.)	Lithology	Association	Cupules
ALA-60	240	Canyon/Streamside	Oak Woodland and Riparian	Stream (20 m.)	Sandstone	Large Occupation Site	149+
ALA-339	640	Canyon/Streamside	Oak Woodland and Riparian	Stream (10 m.)	Sandstone	Occupation Site	10+
ALA-398	1,400	Ridge crest	Grassland	Stream (5 m.)	Sandstone	Milling Station (?)	6+
ALA-400	1,160	Canyon/Streamside	Oak Woodland and Riparian	Stream (5 m.)	Sandstone	Milling Station	2
ALA-412	325	Ridge crest	Oak Woodland	Stream (80 m.)	Sandstone	None	5
ALA-418	700	Ridge	Oak Woodland and Grassland	Stream (300 m.)	Sandstone	Milling Station	2
CCO-9	500	Streamside	Oak Woodland	Stream (Nearby)	Sandstone	Milling Station	8
CCO-21	3,200	Canyon	Oak Woodland	Spring (250 m.)	Sandstone	None	2
CCO-125	160	Canyon/Streamside	Riparian	Stream (20 m.)	Chlorite Schist	Occupation Site	256+
CCO-152	200	Canyon/Streamside	Riparian	Stream (20 m.)	Chlorite Schist	Quarry (?)	200+
CCO-320	600	Canyon/Streamside	Oak Woodland and Riparian	Stream (20 m.)	Sandstone	Occupation Site	Many
CCO-369	720	Canyon/Streamside	Riparian	Stream (20 m.)	Basaltic Greenstone	Milling Station	1 (?)
CCO-375	1,500	Canyon	Oak Woodland	Spring (50 m.)	Sandstone	Milling Station	7+
CCO-382	1,640	Canyon	Oak Woodland	Spring (100 m.)	Sandstone	Milling Station	5
CCO-383	1,600	Canyon	Oak Woodland	Spring (100 m.)	Sandstone	Milling Station	2
CCO-384	1,640	Canyon	Oak Woodland	Spring (100 m.)	Sandstone	Milling Station	1
CCO-394	380	Canyon	Oak Woodland	Stream (75 m.)	Sandstone	None	1
CCO-395	1,600	Canyon	Oak Woodland	Spring (100 m.)	Sandstone	Milling Station	5
CCO-416	1,640	Canyon	Oak Woodland	Stream (35 m.)	Sandstone	Milling Station	8+
CCO-424	2,050	Canyon/Streamside	Oak Woodland	Stream (20 m.)	Sandstone	None	1+
CCO-428	940	Ridge crest	Grassland	Spring (Nearby)	Sandstone	None	20+
CCO-429	1,640	Ridge	Oak Woodland	Stream (100 m.)	Sandstone	Milling Station	3
CCO-430	1,980	Ridge crest	Grassland	Stream (400 m.)	Sandstone	None	1
CCO-450	560	Canyon/Streamside	Grassland and Riparian	Stream (at Site)	Sandstone	Milling Station	?
CCO-462	580	Hillside	Oak Woodland	Stream (50 m.)	Sandstone	Milling Station	15+
CCO-469	410	Hillside	Savanna	Stream (30 m.)	Sandstone	None	6+
CCO-482	1,720	Ridge crest	Oak Woodland and Grassland	Spring (150 m.)	Sandstone	None	1
CCO-486	1,720	Ridge saddle	Oak Woodland	Spring (100 m.)	Sandstone	None	1
CCO-487	1,600	Ridge saddle	Oak Woodland	Spring (100 m.)	Sandstone	Milling Station	13

Table 1 (continued)
CUPULE PETROGLYPH OCCURRENCES IN THE DIABLO RANGE

Site No.	Elevation (ft.)	Topography	Vegetation	Water (Dist.)	Lithology	Association	Cupules
CCO-530	1,560	Ridge crest	Oak Woodland	Spring (Below Site)	Conglomerate	None	2
CCO-531	1,580	Ridge crest	Oak Woodland	Spring (Below Site)	Sandstone	None	5
KIN-15	1,200	Canyon/Streamside	Grassland	Stream (Nearby)	Sandstone	Occupation Site	10+
MER-14	250	Valley Streamside	Grassland	Stream (at Site)	?	Occupation Site	Many
MER-15	550	Canyon/Streamside	Oak Woodland	Spring (Nearby)	Basalt	Occupation Site	Many
MER-19	525	Canyon/Streamside	Grassland	Stream (Nearby)	Sandstone	Occupation Site	2+
MER-21	575	Canyon/Streamside	Oak Woodland	Stream (at Site)	?	Occupation Site	?
MER-24	450	Canyon/Streamside	Oak Woodland	Stream (at Site)	Sandstone	Occupation Site	4+
MER-38	230	Rolling hills	Grassland	Stream (50 m.)	Sandstone	Large Occupation Site	200+
MER-130	600	Canyon/Streamside	Oak Woodland and Grassland	Spring (at Site)	?	Occupation Site	?
MER-186	1,860	Hillside	Oak Woodland	Spring (at Site)	?	Milling Station	?
MER-192	1,900	Canyon/Streamside	Oak Woodland	Spring (Nearby)	Andesite	Milling Station	44
MER-195	1,480	Canyon/Streamside	Oak Woodland and Grassland	Stream (at Site)	Andesite	None	1
SBN-10	2,550	Knoll top rockshelter	Chaparral	Stream (600 m.)	Conglomerate	Occupation Site	3
SBN-21	960	Hillside	Oak Woodland	Stream (200 m.)	?	None	2
SBN-29	1,400	Rockshelter	Oak Woodland	Stream (Nearby)	Rhyolite	None	2
SBN-42	860	Canyon/Hillside	Oak Woodland	Stream (at Site)	?	None	Many
SBN-43	770	Canyon/Streamside	Oak Woodland	Stream (at Site)	?	Large Occupation Site	60+
SBN-47	2,750	Meadow	Oak Woodland	Stream (75 m.)	?	Milling Station	1
SCL-40	1,250	Canyon/Streamside	Riparian	Stream (20 m.)	?	Milling Station	10+
SCL-43	2,250	Canyon/Streamside	Oak Woodland	Stream (20 m.)	?	Milling Station	4+
SCL-48	2,500	Hillside	Oak Woodland	Stream (Nearby)	Basalt	Occupation Site nearby	?
SCL-50	2,000	Canyon	Oak Woodland	Spring (at Site)	?	Large Occupation Site	Many
SCL-100	440	Hillside	Grassland	Spring (100 m.)	Basalt	None	9+
SCL-373	2,000	Ridge	Oak Woodland	Stream (200 m.)	Granite (?)	Milling Station	1
SCL-404	1,540	Canyon	Oak Woodland	Stream (5 m.)	Sandstone	Milling Station	Many
SCL-408	880	Canyon	Oak Woodland	Stream (50 m.)	?	None	?
SCL-451	2,060	Canyon	Oak Woodland	Stream (Nearby)	?	Occupation Site	<12
SCL-496	2,280	Canyon	Riparian	Spring (10 m.)	Franciscan Graywacke	None	6

Table 1 (continued)
CUPULE PETROGLYPH OCCURRENCES IN THE DIABLO RANGE

Site No.	Elevation (ft.)	Topography	Vegetation	Water (Dist.)	Lithology	Association	Cupules
SCL-499	600	Hillside	Oak Woodland	Spring (100 m.)	Franciscan Graywacke	None	3
SCL-500	1,950	Canyon/Streamside	Oak Woodland	Stream (5 m.)	Franciscan Graywacke	Milling Station	4
SCL-501	1,600	Hillside	Oak Woodland	Spring (5 m.)	Franciscan Graywacke	Chert Quarry	2
SCL-502	2,050	Hillside	Oak Woodland	Spring (150 m.)	Franciscan Graywacke	Milling Station	6
SCL-503	2,070	Hillside	Oak Woodland	Spring (Nearby)	Glaucophane Schist	Schist Quarry	?
SCL-594	1,560	Canyon/Streamside	Oak Woodland	Stream (10 m.)	Franciscan Graywacke	Occupation Site	17+
SCL-595	1,680	Hillside	Oak Woodland	Stream (5 m.)	Blue Schist	None	40+
STA-33	1,025	Canyon	Oak Woodland	?	?	Occupation Site	Many
STA-118	344	Hillside	Grassland	Spring (at Site)	Sandstone	Occupation Site	?
STA-127	650	Canyon/Streamside	Oak Woodland	Stream (Nearby)	?	None	?
STA-129	550	Canyon/Streamside	Oak Woodland	Stream (Nearby)	?	Occupation Site	?
STA-134	300	Mesa top	Grassland	Stream (700 m.)	Sandstone	Milling Station	10+
STA-135	300	Mesa face rockshelter	Grassland	Stream (500 m.)	Sandstone	Milling Station	1+
STA-136	300	Mesa face rockshelter	Grassland	Stream (500 m.)	Sandstone	Milling Station	3
STA-137	300	Mesa face rockshelter	Grassland	Stream (500 m.)	Sandstone	Milling Station	1
STA-195	1,150	Canyon/Streamside	Oak Woodland	Stream (5 m.)	Franciscan Graywacke	Milling Station	4
STA-201	960	Canyon/Streamside	Oak Woodland	Stream (5 m.)	Franciscan Limestone	Milling Station	3
STA-218	1,200	Canyon/Streamside	Oak Woodland	Stream (5 m.)	Glaucophane Schist	Milling Station	40+

glyphs, although it might be assumed that they were associated with weather control and/or some aspect of the First Salmon ceremony.

The association of cupule-like designs and petroglyphs with concepts of fertility and water occur not only in California, but elsewhere in the world, including Australia and India (Grieder 1982). Based on this relationship, it has been hypothesized that “. . . the cup mark everywhere refers to the vulva of the female earth from which all creation emerges, especially water and the souls of human babies” (Grieder 1982:43). Although this interpretation does seem plausible for

the ethnographic “baby rocks” and “rain rocks” of northern California, it does not seem likely that it would hold true for all of the many cupule sites found throughout the state.

The cupule style of petroglyph is a very basic and easily produced design. For this reason, it seems unlikely that any one explanation can ever be given for its use. Indeed, this style of petroglyph may have been produced by a variety of activities, and for a variety of purposes. Meighan (1981) offered a number of possible explanations for California rock art sites. Although they primarily were intended to explain picto-

graphs and petroglyphs other than cupules, many of Meighan's suggested explanations might also be applied to the interpretation of cupule sites. Of the various explanations, three seem especially well-suited for explaining some of the Diablo Range cupule petroglyphs:

1. Boundary markers or representations of group symbols having territorial significance.
2. Clan or personal symbols representing the "I was here" message.
3. Supplication, exemplified by the so-called "rain rocks" or "baby rocks" consisting of boulders with many drilled pits--marks made by individuals to accompany a prayer or request for some benefit [Meighan 1981:16].

In Henry Coe State Park, a few cupule boulders may represent boundary or ownership markers. The sites include SCL-496, -499, and -501 to -503. The first four sites have cupule boulders adjacent to or very near springs, while the fifth has a cupule boulder adjacent to both a spring and a source of glaucophane schist. Three of the sites (SCL-496, -499, and -502) are characterized by boulders with cupules in nonrandom arrangements (Fig. 2). The other two sites have boulders with single cupules each.

In aboriginal California, territorial boundaries and natural resources might have been marked for various reasons. It is a habit that we continue even today. Writing about California Indians in the early 1870s, Stephen Powers noted that ". . . the boundaries of all tribes are marked out with the greatest precision, being defined by certain creeks, canyons, boulders, conspicuous trees, springs, etc., each of which has its individual name" (Heizer and Elsasser 1980:204). The use of boulders as markers is recorded in the ethnography of several northern and southern California Indian tribes.

Such markers were used by the Luiseño of southern California (Minor 1975:15). Songs in the migration legends of these people mention the travels of their ancestors and the landmarks left by them. According to a Luiseño legend:

When the people scattered from Ekvo Temeko, Temecula, they were very powerful. When they got to a place they would sing a song to make water come there, and would call that place theirs; or they would scoop out a hollow in a rock with their hands to have that for their mark as a claim upon the land. The different parties of people had their own marks [DuBois 1908:158].

In one song, the Luiseño make reference to a rock left by their ancestors in order to "claim the land which was theirs" (DuBois 1908:115). In reference to the Luiseño, Strong (1929:285) noted that "in the old days each family (clan) had a territory marked by rocks and they killed all trespassers."

In northern California, territory boundary markers are often thought of as "cornerstones." The Spyrock Road petroglyph boulder (MEN-1912) is still used by the Cahto as a cornerstone marking their interior boundary (Foster 1983:51). The Bell Springs petroglyph boulder (MEN-433) probably represents a similar site. Both boulders are covered with petroglyphs, including numerous cupules. Among the Pomo, such cornerstones are thought of as "mountain baby rocks" (Peri et al. 1978:204), a term that refers to their "spiritual power which guides, protects, and regenerates the earth" (Peri et al. 1978:204). Mabel McKay, a prominent Pomo/Patwin Indian doctor, noted that one such place, Geysers Rock, was an important religious place where young people were brought for training as doctors, singers, and dancers (Peri et al. 1978:204). In

reference to Geysers Rock, it was further noted that:

the area was a "dead spot" due to the disturbance of the ground by present geothermal activities, and that "the spiritual power had moved further down the mountain." She [Mabel McKay] also indicated that spiritual places need to be used and prayed for in order to thrive. When its mountain sanctuaries are disturbed, "the spirit" moved down to protected locations along waterways. As new locations become "polluted," the spirit continues its downward course following the creeks and rivers eventually entering the ocean. "When the ocean water is disturbed that will be the last days" [Peri et al. 1978: 204].

In Wappo territory, two large boulders were considered sacred, and the home of spirits (Heizer 1953b:246). Each passerby would leave an offering, usually a stone, stick, or bead (Heizer 1953b:239, 246-247). Goddard (1913) presented information concerning similar sites in northwestern California.

In addition to possibly representing boundary or ownership markers, the cupule petroglyphs found at some of the sites in Henry Coe State Park may represent clan or personal symbols. A particular symbol or cupule pattern could indicate ownership of a resource by an individual or group. Water resources, such as springs, and food resources, such as groves of oak trees around springs, are things that might have been marked by cupule boulders. Many cupule sites in the Diablo Range are close to such resources. Three sites in the state park (SCL-496, -499, and -502) seem particularly well-suited to such an explanation. At each, cupules occur in what appear to be nonrandom patterns (Fig. 2). The ethnographic record of northern California contains various

references to ownership marks on arrows and oak trees. The same held true for face tattoos. For example, among the Maidu:

Tattoo is placed on the face as a guide or mark of identification in the future state. It is a travel mark . . . Tattoo was a family or kin mark, used by the living to identify a person and by the dead to be identified in future life, so its owner could be placed with his dead kin. All these various tattoos were known in a tribe or stock very much as the stock men know the various brands of cattle, and when a dead body of a person was found his people were at once notified [Hudson MS:42, 48].

Given a need for identification, it is possible that rocks might have been "tattooed" to mark ownership of nearby resources. The cupules might have been painted from time to time to make them more visible, and the cupule boulders may have been marked in some way to draw attention to them.

Meighan's (1981:16) third suggested explanation for rock art, that it represents "marks made by individuals to accompany a prayer or request for some benefit," might also explain some of the Diablo Range cupule sites. Some of these sites appear similar to the "prayer" sites noted for the Sacramento Valley (Merriam 1955:11). Two of the Diablo Range sites, CCO-430 and -482, are on ridge crests, along what may have been an aboriginal route to the summit of Mount Diablo. Each has a single cupule atop a small upright boulder, in an area with a commanding view of the surrounding countryside. Mount Diablo played a very important role in local Penutian mythology, and was without doubt considered a sacred mountain by many of the local people (Kroeber 1925:472). It seems likely that individuals or groups would have made pilgrimages to the summit of Mount

Diablo to obtain power, for vision quests, and for similar purposes. Sites such as CCO-430 and -482 may represent places where people stopped to offer prayers. The cupule at each site may have been used as a receptacle, in which the climber placed an offering, such as eagle down, native tobacco, or shell beads. Harrington (1942:41) noted that the local Ohlone made use of trail offering-places, and such places have been recorded elsewhere in northern California (Goddard 1913; Heizer 1953b; Merriam 1955).

In addition to the suggested use of certain cupule sites as trail offering-places, some of the Diablo Range sites may represent "destination" sites, or places where individuals went to conduct a particular ceremony. Such activity may have involved hunting magic, fertility enhancement, weather control, or initiation. Gayton (1930:399) noted that the Yokuts and Western Mono believed that "Springs of water frequently made people ill, by sending sickness in the form of a water insect." Perhaps cupule boulders adjacent to springs and streams represent some former ceremonial activity aimed at maintaining or restoring the purity of the particular water source.

CONCLUSION

The Diablo Range is an area with many cupule petroglyph sites. The area has received relatively little archaeological inspection, and likely more cupule sites will be found in further field studies. Some of the Diablo Range cupule sites appear to be associated with springs and streams, perhaps serving either to mark the water or affect it in some way. Several boulders have cupule arrangements that appear nonrandom. Perhaps these cupule patterns symbolically "marked" the ownership of nearby resources (such as water). Many other cupule sites

contain boulders with cupules in apparent random arrangement. Perhaps some of these cupules were produced in connection with ritual activity intended to affect the weather, fishing and hunting ventures, and individual or group fertility. These same sites may have played a role in initiation ceremonies. Although accounts of cupule use are reported from northern and southern California, no such uses are described in the ethnographic record for the Diablo Range. In part, this absence may be due to the quality of the regional ethnographic record. Or it may indicate that the cupule sites were used prior to the arrival of the Penutians, upon whom the ethnographic record of the Diablo Range is based.

NOTE

1. For the purpose of this paper, a bedrock depression is considered a "cupule" if it occurs on a vertical rock surface or, if found on a horizontal surface, it has a depth of 4 cm. or less. In the Diablo Range, most cupule features tend to be 4 cm. or less in depth, and 10 cm. or less in diameter. However, since large cupules do intergrade with small mortars on horizontal surfaces, it is likely that some of the cupules discussed in this paper are in fact small mortars, and vice versa. For this reason, Table 1 should be viewed cautiously, since some of the cupule sites listed thereon may be bedrock milling stations. In this same regard, I should note that I have personally inspected less than half of the sites listed in Table 1. For the remainder, I have had to rely on site records on file at the Office of Historic Preservation (as of 1982), and the California Archaeological Inventory's Northwest Information Center (as of 1986). Many of the site records, especially those compiled prior to the 1970s, are tenuous at best, and are of limited value for archaeological study. In some of these latter cases, the records list "pitted boulders" or "rain rocks" among the site characteristics. In other cases, however, I have inferred the presence of cupules from references to "very small" or "incipient" bedrock mortars. Several of the earlier site records reference

bedrock mortars, while the accompanying measurements place the features in the cupule category.

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