

A Red Ochre Cogged Stone from Orange County

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Abstract

The scientific/romantic appeal of cogged stones in Orange County prehistory develops from an amalgam of historic, geographic, and aesthetic factors and an enigma surrounding their function. The following article provides a description of a recently excavated specimen that extends knowledge regarding the range of manufacturing materials for cogged stones. Its unusual material, red ochre, offers further support for the hypothesis that similar artifacts functioned in nonutilitarian contexts.

Introduction

The scientific/romantic appeal of cogged stones in Orange County prehistory develops from an amalgam of historic, geographic, and aesthetic factors and an enigma surrounding their function. The special allure of these unusual artifacts is reflected in the fact that an entire issue of the *PCAS Quarterly* (1968:Vol. 4, No. 3) was once devoted to their study. One antiquarian attraction of cogged stones is their great age, well beyond the reach of ethnographic documentation. Time placement is unequivocally within the Millingstone Period (e.g., Eberhart 1961; Herring 1968:12; Dixon 1968:57; Salls 1980:58).

Their distribution is highly concentrated on the lower Santa Ana River drainage, with the majority of provenienced specimens attributed to two sites near the coast (Fig. 1), CA-ORA-58 and CA-ORA-83 (Eberhart 1961; McKinney 1968; Herring 1968; Dixon 1968; Koerper et al. 1996a). Cogged stones originated in Orange County (Eberhart 1961:361) where virtually all seem to have been manufactured. Continuous occurrence of these artifacts along the coast proceeds roughly from extreme southern Ventura County into San Diego County. Inland, cogged stones are reported from the southern side of the San Gabriel Mountains, barely into the southwestern corner of San Bernardino County, and penetrating the westernmost fifth of Riverside County (Eberhart 1961; McKinney 1968). Outlier finds include one specimen each from Fossil Falls, just north of Little Lake, Inyo County, and from Darwin, also in Inyo County (Eberhart 1961:365; McKinney 1968:40; Herring 1968:12). Helen Smith retrieved one example near Chandler, Arizona (McKinney 1968:45). Herman Strandt (1965:23) reported that O. T. Littleton exhumed a cogged stone near Goleta in Santa Barbara County, but there are reasons to be skeptical of any provenience offered by Littleton (see Lee 1993; Koerper and Chace 1995). Parenthetically, a possible exception to local manufacture is the lone cogged stone find from Fossil Falls (see Herring 1968:12).

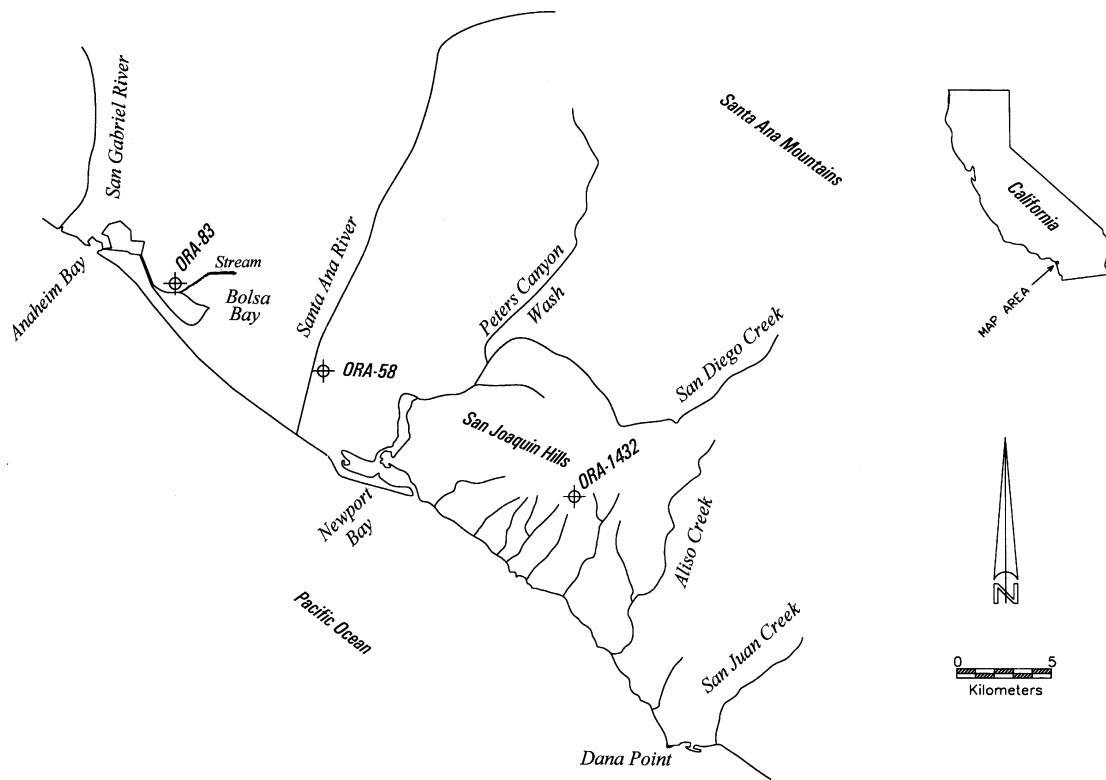


Fig. 1. Location Map.

Unusual shapes, some artistically rendered but others appearing casually executed, superficially resemble gear wheels of modern machinery, thereby inspiring the category label, cogged stone (also “cog stone” and “cog wheel”). Here, description of a recently excavated specimen extends knowledge regarding the range of manufacturing materials for cogged stones. Its unusual material, red ochre, offers further support for the hypothesis that similar artifacts functioned in nonutilitarian contexts.

Provenience and Description

The cogged stone illustrated in Figure 2 was recovered from CA-ORA-1432 during data recovery excavations for the San Joaquin Hills Transportation Corridor Project (Mason 1997). The site was located in the San Joaquin Hills near the divide between Bommer and Laurel Canyons. The cogged stone came from the 10–20 centimeter (cm) level of Unit 56. The site has two strata, but both strata appear to date to the Millingstone Period based on artifact types. In the part of the site where Unit 56 is located, only the upper component is present. One AMS date (Beta-87388) from a charcoal sample obtained from a rock feature in the lower stratum (Unit 68, 70–80 cm) is 6780 ± 50 B.P. (uncorrected). The conventional date is 6750 ± 50 B.P., and the calibrated age is 7546 B.P. with a one sigma range of 7607 to 7529 B.P. (Mason

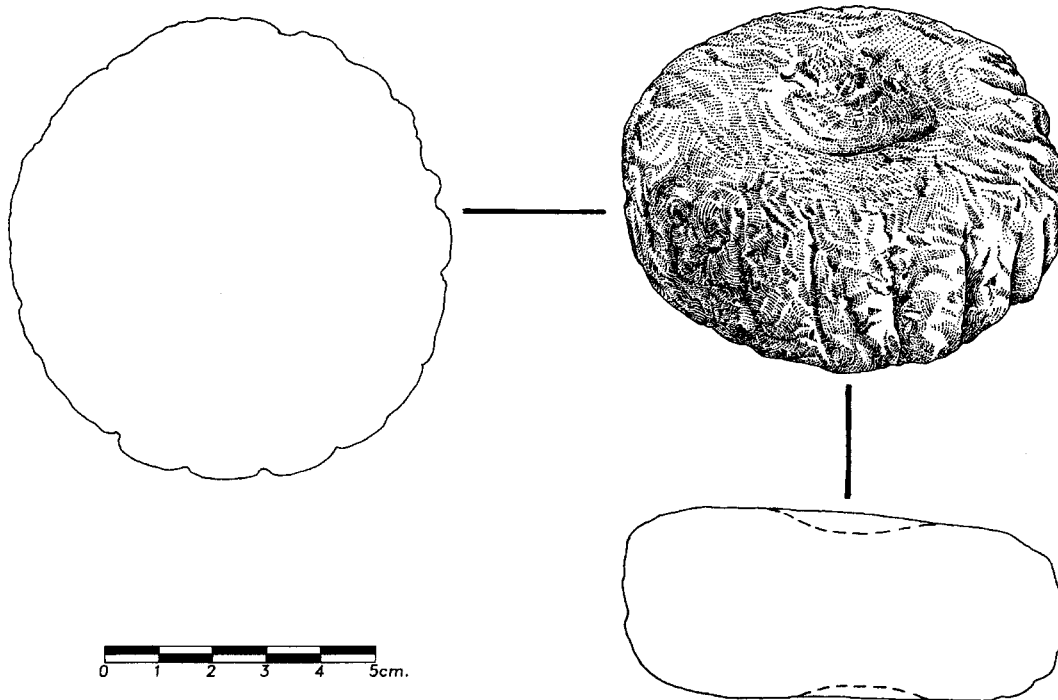
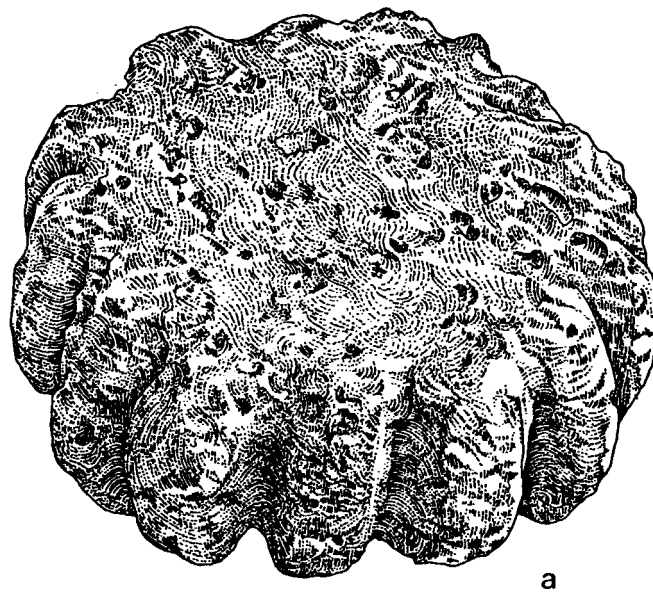


Fig. 2. Red ochre cogged stone from CA-ORA-1432.

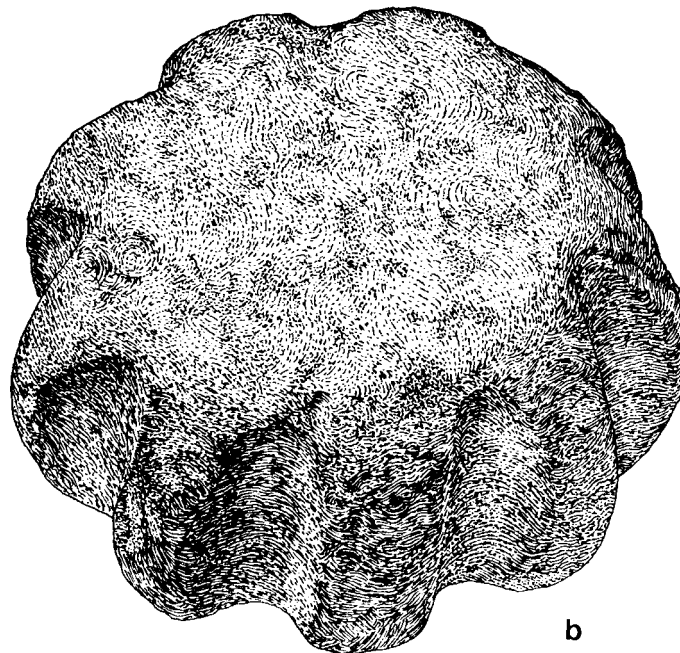
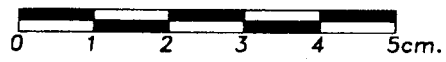
1997: Table 4.3). The age was calibrated by M. L. Peterson using the program CALIB, Rev. 3.03.A (Stuiver and Reimer 1993). An eccentric crescent, which has a similar date range (Koerper et al. 1996b), was found during the monitoring of grading near the location of the cogged stone find.

The CA-ORA-1432 artifact is 85 millimeters (mm) in diameter, 264 mm in circumference, 35 mm thick, and weighs 236.1 grams. There are nine grooves evident around 103 mm of the specimen's 264 mm circumference. These grooves define a progression of shallow "cogs" of irregular width. Damage from rodent gnawing has effaced an indeterminate number of "cogs." A round depression, 26 mm in maximum diameter and 5 mm in depth, is distinct on one face, while on the opposite side there is only the hint of a similar depression. Other double depression cogged stones have been recorded (McKinney 1968). While manufacture is extremely crude, the morphology is easily identified as of the land-and-groove type.

Land-and-groove cogged stones (Fig. 3) are ones for which the grooves are, through their length, either of equal depth or deeper at the ends than at the center point along the length (Eberhart 1961:362; see also Salls 1980). By contrast, with a fish-vertebra type (Fig. 4), the cogs are produced when hemispherical indentations are made around the edge of the artifact. Indentations do not obviously break into either top or bottom surfaces, so that in plan view, no distinctive cog-like projections are present (cf., Eberhart 1961:362). Eberhart also described



a



b

Fig. 3. Land-and-groove cogged stones: a) from Bolsa Chica Mesa; b) from CA-ORA-120.

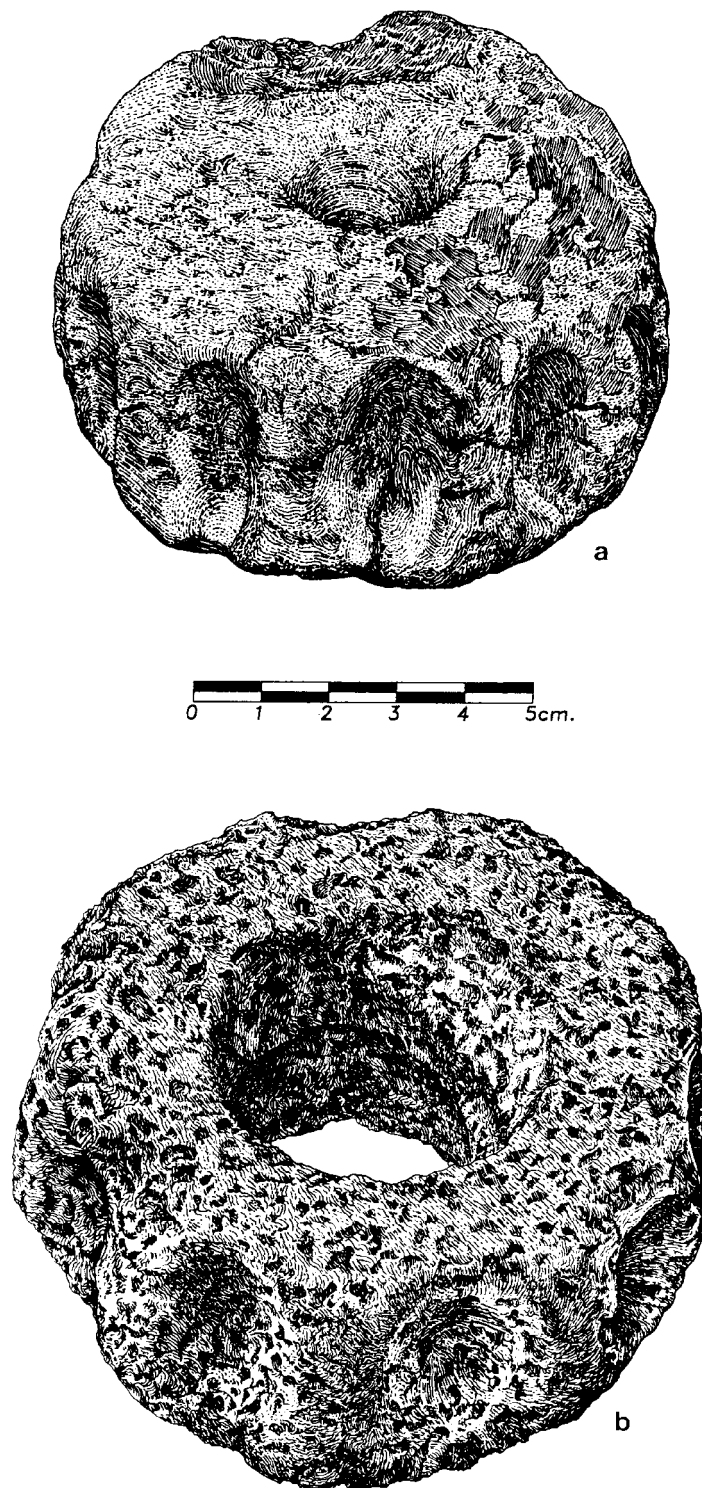


Fig. 4. Fish-vertebra cogged stones: a) from CA-ORA-58; b) from CA-ORA-662.

two types intermediate between land-and-groove and fish-vertebra styles, one perforated and the other not. Indentations or grooves around the edges are deeper at their centers, but they break into the surfaces so that “cogs” are obvious when the artifact is viewed from either the top or bottom (Eberhart 1961:363). Some intermediate types, then, more closely resemble fish-vertebra specimens, but others may more closely approximate land-and-groove cogged stones.

While the genre is basically circular in plan, some cogged stones have been broken and subsequently reworked into unusual shapes (see McKinney 1968:49). Figure 5a is one such example from the Plante collection. Some broken cogged stones have been mended using asphaltum (Winterbourne in Eberhart 1961:367; McKinney 1968:43; Salls 1980:56). Only rare examples appear to have been fashioned into unconventional (noncircular) shapes. Desautels (1968) reports one such exception, and Figure 5b illustrates a “rectangular” example from CA-ORA-83 (Plante collection). An especially unusual shape is seen in the oddity

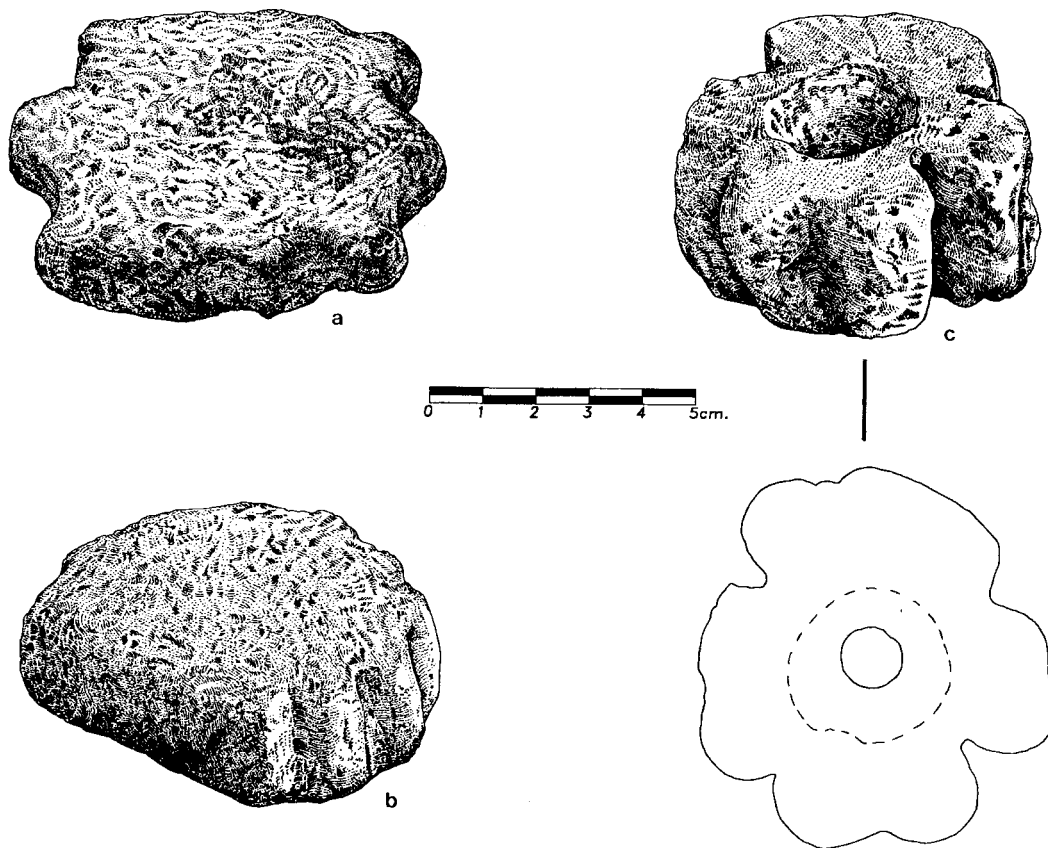


Fig. 5. Cogged Stones: a) Broken and subsequently reworked specimen; b) “Rectangular” specimen; c) “Four leaf clover” specimen. All three specimens are from Bolsa Chica Mesa.

of Figure 5c which incorporates land-and-groove, fish vertebra, and intermediate elements. This strange hybrid from CA-ORA-83 (Plante collection) has previously been described as having a four leaf clover design (McKinney 1968:44). Other oddities are published (e.g. Herring 1968:16, no. 455).

The CA-ORA-1432 specimen is crafted of red ochre. Here, “ochre” refers to a mixture of iron oxide (the colorant) and clay. The artifact is relatively soft (softer than talc) and is uniformly a red color (Munsell 10YR 4/6). To our knowledge, this is the only known example of an ochre cogged stone. Parenthetically, with regard to another kind of sacred object, the bird/hook stone, there is one specimen reported of yellow ochre (Lee 1986:48).

Extrusive igneous rock (vesicular basalt, basalt, andesite, lava, dacite, dolerite, pumice, and granite), often highly weathered, provided the preferred material although sedimentary and metamorphic stone accounts for approximately a third of all cogged stones. The origins for most of the igneous materials are probably the Santa Ana Mountains, especially the El Modena area (east Orange), and the southern San Joaquin Hills (McKinney 1968:42; Salls 1980:57).

Discussion

Samuel Cary Evans, one time state senator and mayor of Riverside, compiled a list of 35 or more proposed uses for cogged stones (Langenwalter and Brock 1984:77). Evans' cogged stone collection together with other study documentation is now available to scholars. S. W. Evans has recently donated materials related to his father's cogged stone study to the Riverside Municipal Museum (Chris Moser, personal communication 1997).

Herman Strandt (1965:23), noting the varied forms, suggested several utilitarian possibilities: 1) to manufacture rope, 2) to manufacture fish line, 3) to crush nuts and seeds; and 4) to provide lighting as lamps “with talc and wick.” Other proposals include employment as weapons and equipment for games (Eberhart 1961:369; Moriarty and Broms 1971; Smith 1950). In discussion outside of the literature, a recurrent suggestion is that cogged stones were net sinkers. The odd shape of one cogged stone inspired the suggestion of a combined utilitarian and ceremonial function—incense burner (Desautels 1968:67).

Cogged stones are generally regarded as nonutilitarian and probably ideotechnic artifacts (Anonymous 1937b; Smith 1950; Wallace, Taylor and others 1956:16; Treganza and Bierman 1958; Eberhart 1961:361; Ashby and Winterbourne 1966; Desautels 1968; Herring 1968:11; Dixon 1968:57; Moratto 1984:150; Chartkoff and Chartkoff 1984:108, 138). Dixon (1968:57) also offered the hypothesis that they were ritual paraphernalia of a religion having its center in the lower Santa Ana River drainage.

Suggestions of ceremonial and/or symbolic use rest on observations that either argue against utilitarian purpose or indicate ritual behavior. Such observations include the following: 1) lack of patterned use–wear; 2) manufacture of some specimens from soft lithic materials presumed unsuitable for many utilitarian purposes; 3) great effort required to produce the majority of specimens, versus economic behavior that is not cost effective with regard to either archaic level extraction or maintenance activities; 4) some associations with burials; and 5) some contexts that allow the reasonable inference that cogged stones were cache objects—e.g., patterned grouping of cogged stones, associations with artifacts considered to be magico–religious items, and other circumstances allowing the reasonable inference of purposeful burial.

Herman Strandt (1965:23-24) reported that the lessee of the CA-ORA-58 property found eight cogged stones and six discoidals piled one on top of the other and associated with a burial. In the following year, Strandt recovered a cogged stone from the chest of a male skeleton.

Excavations by State Emergency Relief Administration and Works Progress Administration archaeology crews at CA-ORA-58 provided additional documentation for cogged stones (Anonymous 1937a, 1937b, 1938; Strandt 1965:24; see also Koerper et al. 1996a) and grouped cogged stones (Anonymous 1937a, 1938, Winterbourne 1968; Dixon 1968:65; see also Eberhart 1961:368). Further, excavations by student crews from California State College at Long Beach provided data to indicate that CA-ORA-58 cogged stones were “part of a complex of ceremonial caches” that included other kinds of artifacts with probable religious association purposefully buried on or near the sterile layer (Dixon 1968:59, 63-65). Also, in 1930, seven cogged stones and four discoidals were found stacked one upon the other in Long Beach at Rancho Los Cerritos (Dixon 1975). Recent excavations at CA-ORA-83 have documented a cache of six cogged stones (Scientific Resource Surveys, Inc. 1996). Discoidals are likely to have been either ceremonial objects and/or gaming pieces (see Herring 1968:8).

Applying the CA-ORA-1432 cogged stone to utilitarian purposes could have imperiled the morphological integrity of the artifact. The surface of the specimen is readily scratched using a talc rock such as provided in a mineral hardness test kit. This extreme case of soft material supports the hypothesis of nonutilitarian function.

It is uncertain whether any consideration of color symbolism influenced the artisan’s choice of red ochre, but as a point of interest, recurrent associations of the color red with ritual and ceremonial contexts is well documented in the archaeological and ethnographic literature. For instance, the great majority of references to ochre statewide in Moratto’s *California Archaeology* (1984) involve funerary associations. Reddish materials associated with disposition of the dead may have included minerals other than ochre. For example, the bones of an infant from CA-ORA-58 (Koerper et al. 1996a) were coated with what appears to be cinnabar (mercuric sulfide). Parenthetically, there are reports that reddish colorant was also obtained from iron

oxide recovered from spring waters impregnated with iron (Sparkman 1908:209; see also Boscana 1978:142-143).

Rare Late Prehistoric stone discs almost certainly of ritual function and known from Orange County, Riverside County and northern San Diego County often have red pigment coating their surfaces (Irwin 1978:91-92; Chace 1972). The iconographic content of these steatite chlorite schist and siltstone artifacts probably reproduces the concentric organization of symbols in sacred Luiseño ground paintings. The paintings describe the structure of the cosmos (Irwin 1978; Applegate 1979:80).

Red, white, and black were the colors incorporated into these paintings (DuBois 1908:88). These same colors were used for the facial painting associated with Luiseño puberty rites of passage (Strong 1929:298; see also Kroeber 1908:177; Sparkman 1908:210). For instance, red, white and black were applied by a Luiseño chief's wife to the faces of girls during a female rite of passage, and the pigments would subsequently be scraped from their faces to paint certain designs on rock (DuBois 1908:96). White and black pigments were likely prepared from kaolin and charcoal respectively (Harrington 1942:18; see also Harrington 1934:16-17). Red pigment for face painting was often ochre (Reid 1852; Harrington 1942:18). Further, ceremonial sticks used in the Luiseño male puberty rites were red (Strong 1929:311).

In Luiseño territory, the dominant coloring for pictographs is red, from "deep brick reds" to "faded orange tints" (True 1954:68-71). Indeed, Southwestern California has been described as an area replete with red painted rock art (Fenenga 1949).

In our article, we have described a cogged stone unique, we believe, for its unusual material. We have offered a cursory overview regarding study of the genre, focusing particularly on the issue of functions. Consensus supports a sacred rather than profane employment of cogged stones, and the CA-ORA-1432 specimen persuades us no differently. Its soft material is unsuitable for any conceivable utilitarian task. Speculatively, the choice by a Millingstone Period artisan to fashion a cogged stone out of red ochre may have been motivated, at least in part, by an association of the mineral and its color with ritual behavior and mythology, possibly implicating the CA-ORA-1432 artifact in ceremonial activities.

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References Cited

Anonymous

- 1937a Daily Notes on Banning Excavation and Osteological Report. August 17, 1936-April 14, 1937 WPA Anthropological Project #4465. Typed Manuscript on file at UCI Library Special Collections.
- 1937b Daily Notes for the Banning Site. November 17, 1937-December 17 or 20, 1937 WPA Anthropological Project #7680 (Bound with Anonymous 1937a). Typed Manuscript on file at UCI Library Special Collections.
- 1938 Daily Notes for Banning Site. WPA Anthropological Project #7680 December 21, 1937-February 10, 1938. Typed Manuscript on file at UCI Library Special Collections.

Applegate, Richard B.

- 1979 The Black, the Red, and the White: Duality and Unity in the Luiseño Cosmos. *Journal of California and Great Basin Anthropology* 1(1):71-88.

Ashby, G. E. and John W. Winterbourne

- 1966 A Study of Primitive Man in Orange County and Some of Its Coastal Areas. *Pacific Coast Archaeological Society Quarterly* 2(1):3-52.

Boscana, Gerónimo

- 1978 Chinigchinich: A Revised and Annotated Version of Alfred Robinson's Translation of Father Gerónimo Boscana's Historical Account of the Belief, Usages, Customs and Extravagancies of the Indians of this Mission San Juan Capistrano called the *Acagchemem* Tribe [Annotations by John P. Harrington]. Malki Museum Press, Banning, California.

Chace, Paul G.

- 1972 Incised Discs: Depictions of the Chinigchinich Universe? Paper presented at the 1972 joint annual meetings of the Society for California Archaeology and the Southwestern Anthropological Association, Long Beach.

Chartkoff, Joseph L. and Kerry Kona Chartkoff

- 1984 *The Archaeology of California*. Stanford Press, Stanford, California.

Desautels, Roger J.

- 1968 An Unusual Cogged Stone from LAn-283. *Pacific Coast Archaeological Society Quarterly* 4(3):67-68.

Dixon, Keith A.

- 1968 Cogged Stones and Other Ceremonial Cache Artifacts in Stratigraphic Context at Ora-58, a Site in the Lower Santa Ana River Drainage, Orange County. *Pacific Coast Archaeological Society Quarterly* 4(3):57-65.
- 1975 New Evidence for the Most Important Archaeological Discovery in Long Beach: The Cogged Stones and Discs of Rancho Los Cerritos. *Los Fierros* 12(2):20-31.

Du Bois, Constance Goddard

- 1908 The Religion of the Luiseño Indians of Southern California. *University of California Publications in American Archaeology and Ethnology*, Vol. 8, No. 3. Berkeley.

Eberhart, Hal

- 1961 The Cogged Stones of Southern California. *American Antiquity* 26(3):361-370.

Fenenga, Franklin

- 1949 Methods of Recording and Present Status of Knowledge Concerning Petroglyphs in California. *Reports of the University of California Archaeological Survey*, No. 3. Berkeley.

Harrington, John P.

- 1934 A New Original Version of Boscana's Historical Account of the San Juan Capistrano Indians of Southern California. *Smithsonian Miscellaneous Collection*, Vol. 92, No. 4. Washington, D.C.
- 1942 Culture Element Distributions: XIX. Central California Coast. *University of California Anthropological Records*. Vol. 7, No. 1. Berkeley.

Herring, Alike K.

- 1968 Surface Collections from Ora-83, a Cogged Stone Site at Bolsa Chica, Orange County, California. *Pacific Coast Archaeological Society Quarterly* 4(3):3-37.

Irwin, Charles N.

- 1978 A Material Representation of a Sacred Tradition. *Journal of California Anthropology* 5(1):90-94.

Koerper, Henry C. and Paul G. Chace

- 1995 Heizer, Strandt, and the Effigy Faking Controversy. *Journal of California and Great Basin Anthropology* 17(2):in press.

Koerper, Henry C., David Earle, Roger D. Mason, and Paul Apodaca

- 1996a Archaeological, Ethnohistoric, and Historic Notes Regarding ORA-58 and Other Sites Along the Lower Santa Ana River Drainage, Costa Mesa. *Pacific Coast Archaeological Society Quarterly* 32(1):1-36.

Koerper, Henry C., Margaret E. Newman, Paul E. Langenwalter

1996b A "Stemmed Butterfly" Eccentric Crescent and a Lunate Crescent from the Christ College Site, Orange County. *Pacific Coast Archaeological Society Quarterly* 32(2 and 3):110–124.

Kroeber, Alfred L.

1908 Appendix II: Notes on the Luiseño. In, *The Religion of the Luiseño Indians of Southern California*, by Constance G. DuBois, pp.174–186. *University of California Publications in American Archaeology and Ethnology* 8(3). Berkeley.

Langenwalter, Paul E. and James P. Brock

1984 The Samuel Evans Cogged Stone Research. *Pacific Coast Archaeological Society Quarterly* 20(2):77–80.

Lee, Georgia

1986 The Portable Cosmos: Effigies, Ornaments, and Incised Stone from the Chumash Area. *Ballena Press Anthropological Papers*, No. 21, Socorro, New Mexico.

1993 Fake Effigies from the Southern California Coast? Robert Heizer and the Effigy Controversy. *Journal of California and Great Basin Anthropology* 15(2):195–215.

Mason, Roger D. (editor)

1997 San Joaquin Hills Transportation Corridor: Results of Data Recovery at CA-ORA-1370 and CA-ORA-1432. MS on file at the South Central Coastal Information Center, UCLA Institute of Archaeology.

McKinney, Aileen

1968 Cogged Stones in Private Collections. *Pacific Coast Archaeological Society Quarterly* 4(3):39–55.

Moratto, Michael

1984 *California Archaeology*. Academic Press, Inc., San Francisco.

Moriarty, James R. and Robert Broms

1971 The Antiquity and Inferred Use of Stone Discoidals in the Southwest. *Anthropological Journal of Canada* 9(1):16–36.

Reid, Hugo

1852 Indians of Los Angeles County. *Los Angeles Star* 1(41)-2(11) 21 February-24 July. (reprinted, *The Indians of Los Angeles County: Hugo Reid's Letters of 1852*, edited and annotated by Robert F. Heizer, Southwest Museum, Los Angeles, 1968).

Salls, Roy A.

1980 The La Brea Cogged Stone. *The Masterkey* 54(2):53–59.

Scientific Resource Surveys, Inc.

1986 Archaeological Evaluation of CA-Ora-83: The Cogged Stone Site on Bolsa Chica Mesa, Orange County, California. Vol. I. [MS principal author N. Whitney–Desautels]. MS on file at South Central Coast Information Center, UCLA Institute of Archaeology.

1996 Compendium of Themes and Models Volume I; Research Design for Analysis. Draft MS submitted to the Koll Company.

Smith, Gerald A.

1950 *Prehistoric Man of the San Bernardino Valley*. San Bernardino County Historical Society, Redlands.

Sparkman, Philip Stedman

1908 The Culture of the Luiseño Indians. University of California *Publications in American Archaeology and Ethnology*, Vol. 8, No. 4. Berkeley.

Strandt, Herman F.

1965 Life and Customs of the Southwestern Coast Indians in Prehistoric Times, Part 3, Peculiar Artifacts. *Pacific Coast Archaeological Society Quarterly* 1(4):22–25.

Strong, William Duncan

1929 Aboriginal Society in Southern California. *University of California Publications in American Archaeology and Ethnology*, Vol. 26, No. 1. Berkeley.

Stuiver, M. and P. J. Reimer

1993 Extended 14C Data Base and Revised CALIB 3.0 14C Age Calibration Programme. *Radiocarbon* 35:215–231.

Treganza, A. E. and A. Bierman

1958 The Topanga Culture: Final Report on Excavations, 1948. *University of California Anthropological Records* 20(2):45–86. Berkeley.

True, Delbert L.

1954 Pictographs of the San Luis Rey Basin, California. *American Antiquity* 20(1):68–72.

Wallace, William J., E. S. Taylor, Roger J. Desautels, H.R. Hammond, Heriberto Gonzales, James Bogart, and John P. Redwine

1956 The Little Sycamore Shellmound, Ventura County, California. *Archaeological Research Associates, Contributions to California Archaeology* 2, Los Angeles.

Winterbourne, John W.

1968 Orange County California Historical Research Project: Report of Banning Estate Excavation (Norris Property). *Pacific Coast Archaeological Society Quarterly* 4(2):10–17.