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Title

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Journal

Journal of California and Great Basin Anthropology, 15(1)

ISSN

0191-3557

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Publication Date

1993-07-01

Peer reviewed

A 9,500 Year-Old Human Burial from CA-SRI-116, Santa Rosa Island

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SCHOLARS have long debated the antiquity of a human presence in California. A key line of evidence in this debate has been radiocarbon dates on human bone from California sites. In recent years, a number of well-known skeletons (e.g., Calaveras, Del Mar Man, Laguna Woman, Los Angeles Man, the Yuha burial) claimed to be more than 15,000 years old have been redated using techniques designed to minimize the contamination problems associated with bone samples. With two possible exceptions—Arlington Man (Orr 1962, 1968; Berger and Protsch 1989) and one or more of the Haverty skeletons (Brooks et al. 1990)—redating of California's "Pleistocene" human skeletons has found none likely to be more than middle Holocene in age (e.g., Bada et al. 1984; Stafford et al. 1984; Taylor et al. 1983, 1985, 1992).

Since the 1950s, Santa Rosa Island has played a prominent role in the debate about California's earliest human settlement. Orr (1968) summarized the controversial evidence for a Pleistocene occupation of the island, including possible associations between mammoth bones, fire areas, stone tools, and other remains (see also Berger 1982). Few scholars have accepted the evidence presented so far for associations between humans and mammoths, but Orr described a number of other intriguing early sites that may place humans on Santa Rosa

Island by the terminal Pleistocene.

For several years, we have been studying these and other early Santa Rosa Island sites. We have yet to find evidence for a Pleistocene occupation of the island (Erlandson and Morris 1992), but several early Holocene sites offer evidence for the settlement of the island prior to 8,000 years ago (Erlandson 1992). One of these is an isolated human burial at CA-SRI-116, a large shell midden located near the mouth of Lobo Canyon on the northeast coast of the island (Fig. 1). In this paper, we report on a suite of radiocarbon dates for CA-SRI-116 and describe the available data on the stratigraphic context of the burial, its position, and its artifact associations.

A BRIEF HISTORY OF RESEARCH AT CA-SRI-116

CA-SRI-116 was recorded in 1968 by Phil Orr of the Santa Barbara Museum of Natural History. Orr noted on his survey form that the site was a large shell midden "observed from the hill top but not visited." The Lobo Canyon burial first came to the attention of archaeologists in late 1982 when a Vail and Vickers Ranch foreman guided a National Park Service study team to it. The antiquity of the burial was established in 1985, after a small bone sample was submitted for radiocarbon dating via accelerator mass spectrometry (AMS).

Subsequently, plans were made to assemble a team of archaeologists, physical anthropologists, and Native Americans to salvage the burial before it eroded into the sea. During the consultation process, members of the local Chumash Indian community objected to the salvage plans. According to their wishes, it was decided to leave the Lobo Canyon burial in place. As part of the NPS mission of active resource manage-

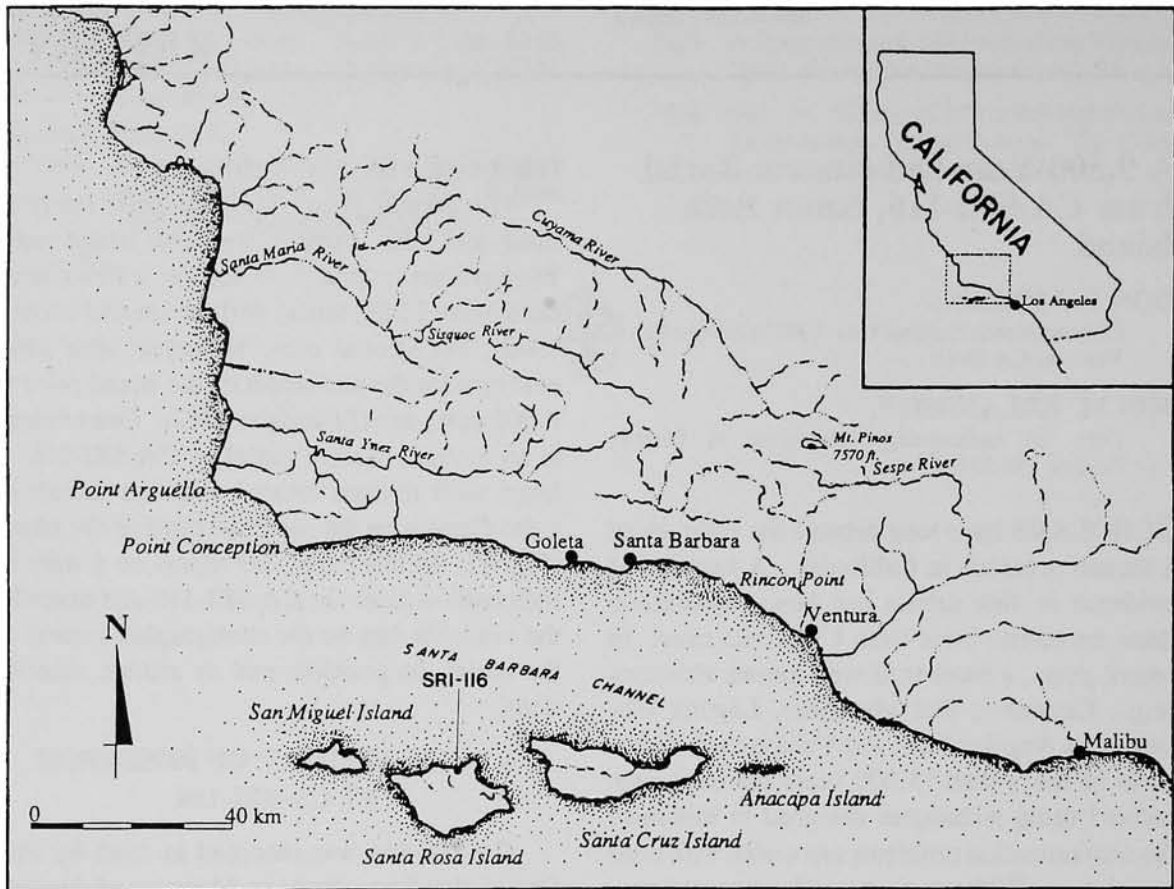


Fig. 1. CA-SRI-116 and the Santa Barbara Channel.

ment and conservation, however, the condition of the burial has been monitored periodically by Channel Islands National Park archaeologists. During these site visits, data have been collected through sensitive and nonintrusive monitoring of the locality.

THE LOBO CANYON BURIAL

Context and Position

During the 1982 visit, Morris noted that a human skeleton protruded from the sea cliff about two meters below the ground surface and about 1.2 m. below the base of the shell midden at CA-SRI-116. Sheet wash off the organic-rich midden overlying the skeleton stained parts of the cliff face with a veneer of dark midden soil,

but it was apparent that the burial rested in fine-grained tan dune sand. The tight clustering of the exposed bones, along with the close juxtaposition of leg bones with ribs and vertebrae, suggested that the individual was interred in a tightly flexed position. Displaced bone fragments also lay on the talus slope below the burial. The density of this bone suggested that they were partly mineralized and that the burial might be of considerable antiquity (Morris 1987).

Traces of a possible burial pit were noted on the left side of the skeleton. These traces did not extend upward into the overlying midden and there was no sign of midden debris mixed into the clean sand surrounding the burial. This suggested that the midden was deposited after the human skeleton was buried in a coastal dune.

Radiocarbon Dating

Because marine erosion and slope wash were destroying the Lobo Canyon burial, a few displaced bone fragments were collected from the talus slope below the burial (Morris 1987). These were sent to the University of Arizona, where W. Birkby confirmed that the bone fragments were human, and they were dated at the Laboratory of Isotope Chemistry. Three separate collagen extracts were made from the bone sample.¹ A bone gelatin extracted from a purified acid (pH 2.5) solution yielded an AMS date of $8,615 \pm 115$ RCYBP (AA-251A). Another sample of purified gelatin extracted from a pH 2.0 solution was dated to $8,705 \pm 140$ RCYBP (AA-251B). Finally, a purified amino acid extract from a dilute-HCl insoluble fraction was dated to $8,815 \pm 140$ RCYBP (AA-251C).

Based on these statistically similar results, Gillespie and Jull (personal communication 1985) suggested that the best estimate for the age of the Lobo Canyon burial was about $8,700 \pm 80$ RCYBP. According to Stuiver and Reimer (1986), this date is equal to about 9,600 calendar years (cal) B.P. after calibration via curves for terrestrial samples. Since island peoples of this time period must have consumed some marine foods, however, the actual age of the burial may be slightly younger.

Berger and Protsch (1989:59-60) also published a conventional radiocarbon date of $7,650 \pm 580$ RCYBP (UCLA-1973) for bone collagen extracted from a human long bone fragment collected by Berger and others from a burial near the mouth of Lobo Canyon. It is unclear if this sample came from the Lobo Canyon burial or a separate interment. The relatively large error associated with the UCLA date, however, leaves open the statistical possibility that the four dates all came from a single individual. Given the relative dearth of terrestrial food sources on the Channel Islands, it is interesting that the burial reported by Berger and Protsch (1989:60) had a $^{13}\text{C}/^{12}\text{C}$ ratio (-22.7)

that suggests "little dependence on marine resources."

In 1991, a single Washington clam (*Saxidomus nuttalli*) shell was removed from near the base (70 to 80 cm. below surface) of the shell midden that caps CA-SRI-116. This 47.7-g. shell was sent to Beta Analytic, Inc. where analysis of the sample produced an uncorrected date of $5,430 \pm 50$ RCYBP (Beta-56702). After adjustment for isotopic fractionation ($5,860 \pm 50$) and dendrocalibration, this shell date is equal to about $6,000 \pm 100$ years ago (Stuiver and Reimer 1986). Thus, there seems to be little question that the Lobo Canyon burial was interred several millennia prior to the deposition of the overlying shell midden. This stratigraphic sequence is consistent with other localities on the north coast of Santa Rosa Island, where a period of active dune building occurred during the early Holocene and many coastal dunes are capped by shell middens of middle Holocene age.

Artifact Associations

No artifacts were observed with the Lobo Canyon burial in 1982. In 1991, however, five small *Olivella biplicata* beads were observed in the thorax area of the burial. Four of these were well enough preserved to be measured and described (Table 1), and all appear to have been made from whole *Olivella* shells with the spires removed. The four measurable specimens were relatively small, averaging only 5.8 mm. (ca. 1/4 in.) long. The exteriors of two of the beads, both somewhat more weathered than the others, have reddish-brown stains that suggest that they may have been painted or dusted with red ochre (hematite or Fe_2O_3) or some other pigment.

DISCUSSION AND CONCLUSIONS

The Lobo Canyon burial is one of the earliest well-documented interments yet discovered on the southern California coast. Radiocarbon dates for human skeletons of roughly equal or somewhat greater antiquity

Table 1
DESCRIPTIVE DATA FOR THE *OLIVELLA*
BEADS FOUND WITH THE LOBO CANYON
BURIAL, CA-SRI-116^a

Specimen	Max. Length	Max. Width	Hole Width	Spire Removal	Notes
1	6.0	4.1	1.1	ground?	--
2	6.2	4.4	1.8	ground?	ochre?
3	5.0	3.5	1.7	ground?	--
4	6.1	4.0	1.5	ground?	ochre?
Mean	5.8	4.0	1.5		

^a All measurements are in mm.

have been reported at several sites, including CA-SRI-173 at Arlington Springs (Orr 1962, 1968), CA-SLO-1 at Diablo Canyon (Greenwood 1972), CA-LAN-159 at La Brea Tar pits (Ho et al. 1969), CA-LAN-171 (Brooks et al. 1990), and CA-SDI-4669 (Kennedy 1983). Charcoal and bone collagen samples from Arlington Springs, where scattered human bones were found about 11 m. deep in arroyo fill sediments, have been dated to about 10,000 RCYBP (Orr 1968; Berger and Prostch 1989: 59). Arlington Man does not appear, however, to have been buried intentionally (Orr 1968:91). At the other localities the presence of intentional burials is clear, but the antiquity of La Brea Woman (CA-LAN-159) might be questioned due to contamination, and the Haverty (CA-LAN-171) burials produced an anomalously wide range of dates for skeletons from a single cemetery.

Despite such uncertainties, what we know about the Lobo Canyon burial seems consistent with other data for early Holocene burial and artifact patterns from the southern California coast (see Erlandson 1992). Most early burials, for instance, appear to have been interred in flexed positions. Traces of ochre and other red pigments have been found with a number of early burials in California (e.g., Orr 1968:122) and elsewhere in the New World (Roper 1991). Clear artifact associations with the earliest burials are relatively uncommon, few in number, and lack diversity. As with CA-SRI-116, the

artifacts most commonly found with burials appear to be spire-removed *Olivella biplicata* shell beads (King 1990:106).

Given the available data, it is unclear if the Lobo Canyon burial was an isolated interment, a burial associated with a somewhat dispersed cemetery, or if it was related to a midden site of equal antiquity which has since eroded into the sea. It should be noted that at the time of its interment about 9,500 years ago, the Lobo Canyon burial must have been located some distance from the open coast. The 20-m. isobath, for instance, roughly approximating the position of the shoreline at this time (Erlandson 1988:52), is located about one kilometer from the site today.

Regardless of its broader context, the Lobo Canyon burial provides supporting evidence that humans occupied the northern Channel Islands by at least 9,500 years ago. Along with evidence from Arlington Springs (CA-SRI-173), Daisy Cave (CA-SMI-261) on San Miguel Island, Eel Point (CA-SCLI-43B) on San Clemente Island, and many early coastal sites on the mainland (see Erlandson 1992), CA-SRI-116 adds further evidence for the existence of one of the earliest well-defined maritime traditions in the New World.

NOTE

1. We made several unsuccessful requests for a quantitative statement about the total amount of intact collagen present in the bone samples submitted to the Arizona AMS facility. Generally speaking, accurate radiocarbon dates can be obtained on collagen samples extracted from archaeological bone samples if the meticulous chemical purification techniques used at the Arizona lab are followed. Written correspondence, along with the careful cross-checking of the age of three separate collagen extracts, suggests that adequate collagen samples were obtained. In a subsequent study of a bone sample from the Arlington Man skeleton, the Arizona laboratory staff advised against AMS dating due to insufficient collagen content.

ACKNOWLEDGMENTS

An earlier version of this paper was presented by Morris (1987) at the Third California Islands Symposium at the Santa Barbara Museum of Natural

History. The paper was revised by Erlandson and Morris following a 1991 visit to CA-SRI-116. Our research on Santa Rosa Island has been supported by the Channel Islands National Park, the University of Oregon, the Santa Barbara Channel Carbon Dating Funds at the University of California, Santa Barbara, and the Santa Barbara Museum of Natural History. The technical expertise of R. Gillespie, A. J. T. Jull, and W. Birkby (University of Arizona), and M. Tamers and J. Stipp (Beta Analytic, Inc.) was critical to our study. Finally, we thank M. Q. Sutton, two anonymous reviewers, and the staff of the *Journal* for assistance in reviewing, editing, and production of this paper.

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On the Subsistence Ecology of the "Late Inland Millingstone Horizon" in Southern California

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THE assumption that milling tool technology (manos/metates and mortars/pestles) was used primarily to process plants is pervasive in California archaeology and it is always the case that such artifacts recovered from archaeological sites are used to demonstrate the processing of plants at those sites. This line of reasoning is central to the ecological interpretation of those archaeological cultures in southern California in which it appears that millingstones constituted the primary food processing technology. These "Millingstone Horizon" cultures are viewed as having been heavily dependent on plant foods; the general paucity of vertebrate animal remains or of hunting-related technology generally reinforcing that interpretation.

The fact that there is ethnographic evidence that manos and metates were used to process animals (see review by Yohe et al. [1991:659-660]) has done little to enlighten archaeologists of that possibility. However, with the development of techniques to detect protein residues (Hyland et al. 1990; Kooyman et al. 1992; Newman et al.

1993) on archaeological specimens, there is now evidence from a number of prehistoric sites in southern California that animals were processed on milling tools (e.g., de Barros and Schneider 1989; Yohe et al. 1991; Newman 1992).

Thus, ecological models dependent on the "millingtools equals plants" assumption are in need of testing and perhaps revision. One such model involves the Late Inland Millingstone Horizon defined by Kowta (1969) in the San Bernardino Mountains of southern California (Fig. 1) where a dependence on yucca, coupled with a de-emphasis on animal resources, was hypothesized. Macrofloral, macrofaunal, and protein residue data from the nearby Siphon Site (CA-SBR-6580; Sutton et al. 1993) suggest the opposite: that yucca was little used and that a variety of animals formed a major aspect of the diet.

THE "MILLINGSTONE HORIZON"

The temporal and/or cultural unit commonly called the Millingstone Horizon in southern California has so far evaded clear definition. Various archaeological cultures and complexes have been attributed to it (Pauma, La Jolla, Topanga, Zuma Creek, Malaga Cove, Oak Grove, and Sayles) and both coastal and inland aspects have been designated. In spite of the designation "horizon" implying primarily a spatial continuity of traits and assemblages (Willey and Phillips 1958:33), the common usage of the Millingstone Horizon concept has expanded to include both temporal and ecological meanings, i.e., that it equates to a particular ecological adaptation within a broad span of time.

Wallace (1955:219) defined the Millingstone Horizon (his Horizon II; ca. 8,000-2,500 B.P.) as reflecting an increase in vegetal resource exploitation (from Horizon I times) marked by the abundant occurrence of milling equipment. Artifacts typically associated with this horizon include manos, metates, scraper planes, choppers, core tools, and few projectile points. The