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A Radiocarbon Chronology for the Arozena Site (CA-SBA-141), Eastern Santa Barbara County, California

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Located above Rincon Creek on the Santa Barbara coast, CA-SBA-141 produced an artifact assemblage that was important in the development of a cultural historical sequence for the Chumash region (Harrison 1964). This report documents the first radiocarbon dates for Harrison's collections, which suggest that the site was occupied at least twice, once at roughly 7,600 years ago and again around 5,000 years ago. What Harrison interpreted as an intermediate site dating to the Middle Holocene appears to have been a multicomponent site mixed by bioturbation, grading, and agricultural practices.

THE California coast contains one of the longest and best documented records of maritime hunter-gatherers in the Americas (Jones 1991; Lightfoot 1993; Erlandson 1994; Moss and Erlandson 1995). Although the archaeological record of California is extensive, many significant sites that have been excavated have never been radiocarbon dated, leaving substantial gaps in local and regional chronologies. Many of California's archaeological sites are stratigraphically complex, containing multiple components that have been subjected to a variety of taphonomic disturbances (Erlandson and Rockwell 1987). Radiocarbon dating, especially dating of individual artifacts, provides a useful technique to refine or confirm artifact chronologies based on seriation, to document technological and social developments, to place museum collections within a more secure chronometric framework, and to highlight potential site disturbances. Without careful radiocarbon dating, documenting most regional cultural

developments can only be accomplished with relatively low resolution.

The Arozena site (CA-SBA-141), located on a hillcrest west of Rincon Creek, is an important archaeological site that figured prominently in William Harrison's (1964) culture historical and ecological study of the archaeology of the Santa Barbara coast (Fig. 1). During salvage excavations at CA-SBA-141, Harrison (1964) recovered a unique assemblage of ground and chipped stone artifacts. Although Harrison was a pioneer in using radiocarbon dating in the Santa Barbara Channel area, he never obtained such dates for the Arozena site.

The Arozena site is located adjacent to CA-SBA-119 and CA-SBA-1, two sites that have also been significant in developing regional chronologies (e.g., Erlandson and Rick n.d.; Rogers 1929; Harrison 1964; Kornfeld 1980; King 1990; Erlandson 1991). The absence of radiocarbon dates from the site, however, has made it difficult to assess the relationship of these materials to broader cultural developments and regional sequences. This report discusses three radiocarbon dates recently obtained from Harrison's collection, which extend the initial occupation of the Rincon area by at least 1,000 years and demonstrate that CA-SBA-141 is a multicomponent site. The regional significance of these materials is also assessed.

SITE DESCRIPTION AND PREVIOUS RESEARCH

The Rincon area contains one of the most important complexes of archaeological sites along the Santa Barbara and Ventura county coasts. A number of antiquarians and archaeologists have worked at sites in the Rincon area, including CA-SBA-1, -119, -141, and CA-VEN-62, with a primary focus on CA-SBA-1 and -119 (e.g., Bowers 1884; Rogers 1929; Olson 1930; Harrison 1964; Evans et al. 1968; Kornfeld 1980). Unfortunately, according to King (1980:3-6), all of the recorded sites at Rincon have been referred

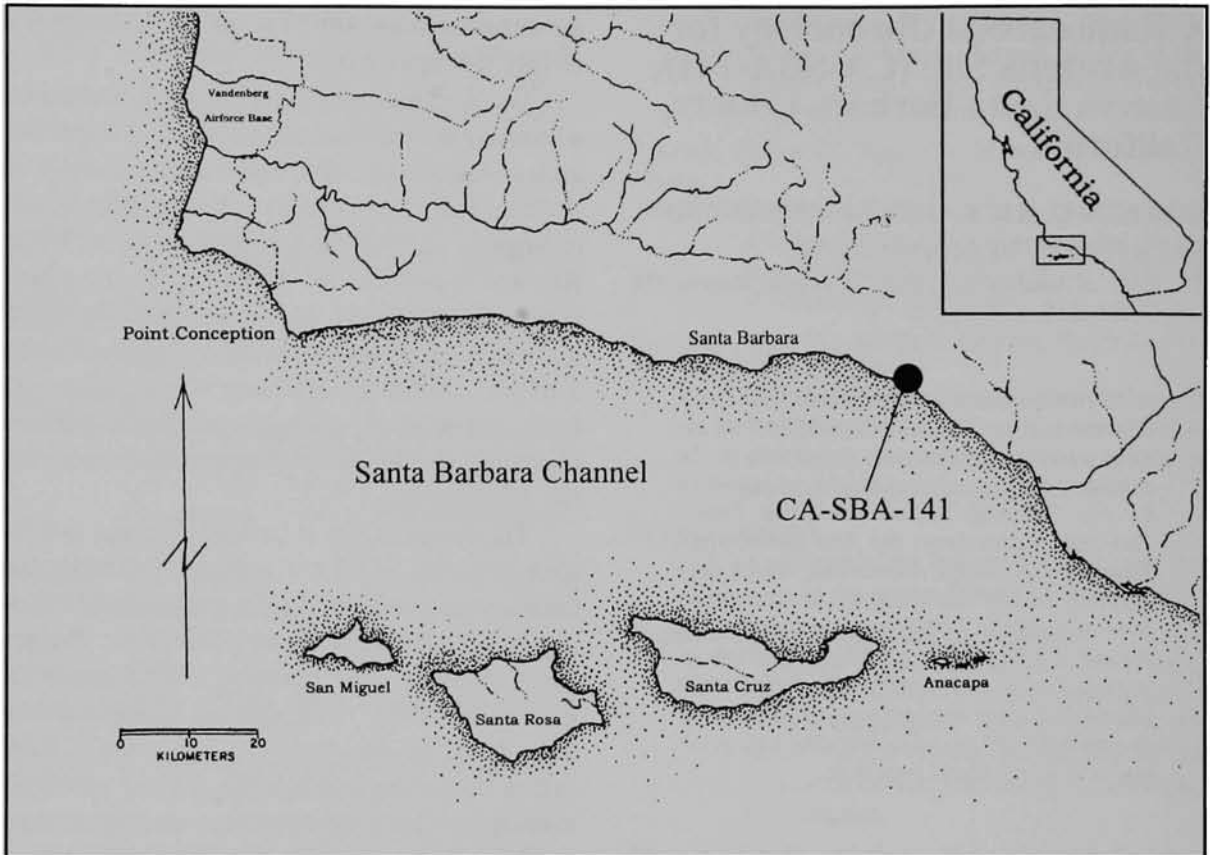


Fig. 1. The location of CA-SBA-141 and the Santa Barbara Channel region.

to as CA-SBA-1 at one time or another, making it difficult to determine exactly where some researchers worked. The earliest work at CA-SBA-141 may have been conducted by Bowers at the end of the nineteenth century (Benson 1997: 113-114). Benson (1997:113) suggested that an area where Bowers excavated, termed "the stage road on the mesa," was probably CA-SBA-141, but the precise location of Bowers' excavations is unknown and may also include nearby CA-SBA-119. Bowers recovered 158 artifacts from this general area and postulated that it was probably a very old burial place. Artifacts collected by Bowers from the mesa included mortars, pestles, manos, net sinkers, knives, and other artifacts similar to those recovered by Harrison at CA-SBA-141 and CA-SBA-119 (see Benson 1997: 114).

The next documented removal of artifacts from CA-SBA-141 was by the Arozena family who, during the construction of their home, leveled a large portion of the site (Harrison 1964). Subsequently, Harrison initiated salvage excavations in the intact remnants of the Arozena property. It is impossible to determine the original extent of the site, but Harrison (1964:180) argued that it may have been up to 350 by 250 ft. (107 by 76 m.) in area, with a depth of roughly a meter. The southern margin of the site was reported to be located only about 10 m. uphill from the western margin of the Eakin's site (CA-SBA-119), with a similar geological setting and sandy loam soils (Harrison 1964:127). Harrison's (1964:181) excavations included an area about 9 x 10 ft. (2.7 x 3.0 m.) adjacent to the location of a burial excavated by the Arozenas during con-

struction activities. In general, the site was relatively shallow (< 30 cm.), as much of the upper deposits had been graded away. Consequently, Harrison excavated the site as a single component, keeping only limited depth records. Due to time constraints, all excavated materials were screened through 1/4-in. mesh, undoubtedly biasing aspects of the faunal and artifact assemblage towards larger constituents.

Nonetheless, Harrison (1964) described 401 artifacts from CA-SBA-141 (Table 1), noting that the majority were collected by the Arozenas during construction of their house. From Harrison's artifact descriptions, it is not always clear whether they were recovered during archaeological excavations or during construction activities. Many artifacts were also given away by the Arozenas before Harrison could analyze them. Artifacts from CA-SBA-141 included scrapers or utilized flakes, projectile points, blades (bifaces), hammerstones, manos, metates, stone vessels, pestles, abraders, anvils, bolas, pendants, and worked bone (Harrison 1964). Due to the reliance on 1/4-in. screen, no quantified faunal remains were presented, but a diverse assemblage was identified, including estuarine and open coast shellfish, as well as fish, sea mammal, and bird bone. Harrison (1964:197-198) also encountered two burials that were fragmented and contained few artifacts.

In 1966, Patrick Finnerty, working for the University of California, Los Angeles (UCLA), during mitigation studies for a major renovation of Highway 101, appears to have excavated several 1 x 2 m. units at CA-SBA-141 (King 1980: 3-5). Unfortunately, this investigation was never reported, and thus far efforts to confirm the excavations and to locate the collections at either UCLA or the University of California, Santa Barbara (UCSB), have been unsuccessful. In 1982, a survey and limited testing program was conducted at CA-SBA-141 by archaeologists from the Office of Public Archaeology at UCSB. This investigation resulted in a small collection of

Table 1
ARTIFACTS FROM CA-SBA-141^a

Artifact Type	Harrison/Arozena Collection
mano	136
metate	42
pestle	13
grinding stone	13
stone vessel	7
anvil stone	12
abrading stone	6
rubbing stone	63
discoidal with red ochre	1
net sinker (bolas stone)	9
asphaltum covered stone	1
undiff. ground stone	44
projectile point	8
scraper	19
blade	9
hammer	13
steatite object	1
pendant	1
hollowed pebble with asphaltum	1
bone awl/needle	2

^a Data adapted from Harrison (1964).

artifacts and faunal remains primarily from heavily disturbed archaeological deposits. More recent work at CA-SBA-141 involved monitoring the removal of fill and other soils from the site (Macfarlane 1989, 1990). Due to heavy disturbance of the deposits, no datable materials were recovered. However, an intact cache of manos and a limited amount of chipped stone were recovered, leading Macfarlane (1989, 1990) to conclude that the site was probably Middle Holocene in age.

Similarities between the Eakin's and Arozena sites prompted Harrison (1964:198) to conclude that the sites may have been part of the same settlement or were occupied close in time. Three radiocarbon dates from the Eakin's site imply an Early Period occupation between approximately 3,300 and 3,600 RCYBP, although Harrison (1964:364) suggested that the Arozena

site may have been occupied slightly earlier, between about 3,500 and 4,000 RCYBP. The presence of shallow basin metates, manos, projectile points, and well-crafted mortars and pestles are a few of the similarities Harrison noted between the sites. Curiously, both sites exhibited characteristics that Harrison (1964:335-336) felt had primary aspects of all three of Rogers' cultural sequences; Oak Grove People, Hunting People, and Canaliño. Oak Grove sites have generally been attributed to the Early Holocene, Hunting People sites to the Middle Holocene, and Canaliño sites to the Late Holocene. Based on the presence of manos and metates, King (1980:3-22) estimated that CA-SBA-141 probably had a major occupational component dating to Phase Ex, the initial phase of his Early Period (ca. 6,000 to 8,000 B.P.), which was followed by another occupation somewhat later during the Early Period. Harrison's (1964:194-195) description of significant amounts of estuarine shell at CA-SBA-141 also suggest that an Early Holocene component was present at the site (see Erlandson 1991, 1994).

THE AROZENA SITE RADIOCARBON DATES

Since the Arozena site had been heavily disturbed, dating it was somewhat problematic. Harrison (1964) excavated the site with only minimal provenience, and very little material suitable for radiocarbon dating remains in the collection. However, three unmodified shells suitable for radiocarbon dating were obtained from Harrison's collection. To avoid problems with stratigraphic mixing, individual shell fragments were dated, each representing a single depositional event. To maximize the potential for identifying discrete occupational components, shells were selected from different habitats, as coastal environments are known to have changed significantly along the Santa Barbara coast during the Holocene (Erlandson 1994, 1997). These samples came from Test Area A, where Harri-

son's (1964) excavations were concentrated. No depth information is available for these specimens. Each shell was washed in tap water and stored in a sealed plastic bag. The samples were then sent to Beta Analytic, Inc., where they were pretreated with an acid bath to remove the outer shell layers most susceptible to contamination. The samples were then measured for isotopic fractionation, and calibrated via CALIB 4.1.2 using a ΔR of 225 ± 35 years (Stuiver et al. 1986; Stuiver and Reimer 1993). Results of the radiocarbon analyses are summarized below and in Table 2.

Astraea undosa

Dating of this sample ($4,580 \pm 80$ RCYBP [Beta-131921]), a 13.3 g. fragment of wavy turban shell (*Astraea undosa*), confirmed a Middle Holocene occupation for CA-SBA-141, suggesting that Harrison (1964) was at least partly correct in his assumption of a Hunting Period occupation. The uncorrected date, however, is roughly 500 to 1,000 years older than Harrison (1964:364) estimated. A $^{13}\text{C}/^{12}\text{C}$ ratio for isotopic fractionation produced an adjusted date of $5,000 \pm 80$ RCYBP. Calibration of this date produced an intercept of 5,020 B.P., with a range between 5,220 and 4,870 B.P. at one sigma.

Chione undatella

This large fragment (28.8 g.) of estuarine Venus clam shell (*Chione undatella*) was radiocarbon dated to $6,950 \pm 70$ RCYBP (Beta-131920). After adjustment for isotopic fractionation, a date of $7,360 \pm 80$ RCYBP produced a calibrated intercept of 7,600 B.P., with a range between 7,670 and 7,550 B.P. at one sigma. This sample confirmed the occurrence of an Early Holocene occupation of the Arozena site, validating King's (1980) assertion that the site was occupied during Phase Ex of the Early Period. It also indicated that there are at least two components at CA-SBA-141, one dating to the Early Holocene and one to the Middle Holocene.

Table 2
RADIOCARBON DATES FROM RINCON POINT

Site	Lab No.	Material	¹⁴ C age	¹³ C/ ¹² C Adjusted ^a	Calendar Age (B.P.) ^b
CA-SBA-141	Beta-131921	wavy turban shell	4,580 ± 80	5,000 ± 80	5,220 (5,020) 4,870
	Beta-131920	Venus clam shell	6,950 ± 70	7,360 ± 80	7,670 (7,600) 7,550
	Beta-131922	butter clam shell	7,040 ± 130	7,460 ± 130	7,820 (7,680) 7,570
CA-SBA-119	A-0323 ^c	abalone shell	3,270 ± 250	3,700 ± 250	3,640 (3,350) 3,030
	A-0324 ^c	abalone shell	3,420 ± 130	3,850 ± 130	3,680 (3,520) 3,360
	A-0340 ^c	Pismo clam shell	3,530 ± 60	3,960 ± 60	3,730 (3,640) 3,570
	Beta-55644 ^d	marine shell	3,730 ± 100	4,160 ± 100	4,070 (3,900) 3,780
	Beta-127333 ^c	OGR bead ^f	4,530 ± 70	4,940 ± 70	5,040 (4,940) 4,840
CA-SBA-1	Beta-33993 ^g	Pismo clam shell	2,820 ± 100	3,250 ± 100	2,900 (2,770) 2,710
	Beta-31845 ^g	Venus clam shell	4,480 ± 70	4,910 ± 70	5,000 (4,870) 4,820
	Beta-31846 ^g	Venus clam shell	5,830 ± 80	6,260 ± 80	6,550 (6,440) 6,350
CA-VEN-62	Beta-031203 ^h	Pismo clam shell	--	2,370 ± 80	1,830 (1,720) 1,610

^a For the CA-SBA-119 and CA-SBA-1 samples, an average ¹³C/¹²C adjustment of 430 years was added.

^b Calibrated using Calib 4.1.2 (Stuiver and Reimer 1993), range is one sigma standard error.

^c From Harrison (1964).

^d From Freeman et al. (MS).

^e From Vellanoweth (n.d.).

^f OGR bead = *Olivella* grooved rectangle bead.

^g From Erlandson (1991).

^h From Breschini et al. (1996).

Saxidomus nuttallii

This small estuarine butter clam shell fragment (*Saxidomus nuttallii*), which was radiocarbon dated to 7,040 ± 130 RCYBP (Beta-131922), weighed 8.4 g. and thus required extended counting. A ¹³C/¹²C ratio adjusted this date to 7,460 ± 130 RCYBP, producing a calibrated intercept of 7,680 B.P. and a range between 7,820 and 7,570 B.P. at one sigma. This date corroborated the existence of an Early Holocene component at CA-SBA-141, suggesting that a fairly extensive occupation of this site occurred at roughly 7,600 to 7,700 B.P.

DISCUSSION

These radiocarbon dates confirm and refine King's (1980) proposed chronology for CA-SBA-141, which was based on the analysis of artifacts recovered and/or reported by Harrison (1964).

The dates suggest that an initial occupation of the site took place about 7,700 years ago, with a later occupation roughly 5,000 years ago. There may have been a hiatus of as much as 2,500 years between these two occupations. Although the radiocarbon chronology is limited by the small number of dates, heavy disturbance to the site, and limited sample provenience, it is essentially consistent with the artifact and ecofact assemblage recovered by Harrison. While grading activities and the limited nature of the investigations could have obscured evidence for later occupation at the site, the lack of artifacts or other traits typical of Late Holocene sites support the proposed chronology. The one possible exception is a large contracting-stem dart point illustrated by Harrison (1964:201), a type more common in sites occupied after about 4,500 years ago.

The ground stone assemblage of manos and metates, with relatively few mortars and pestles,

also supports an Early and Middle Holocene chronology. The initial appearance of mortars and pestles in the Santa Barbara Channel region has been difficult to determine, but it has been suggested (e.g., Erlandson 1997:106; Glassow 1997:86) that they may have first appeared during the Middle Holocene between about 5,000 and 6,000 years ago. Large ground stone artifacts may also sink deeper into site strata after they are deposited (Erlandson and Rockwell 1987; Johnson 1989), further complicating chronological interpretations. Unfortunately, some of the other artifacts recovered (e.g., pendants and net weights) are either undiagnostic or have a poorly documented chronological occurrence.

Despite the lack of quantitative faunal data, the abundance of estuarine shell at CA-SBA-141 is consistent with general changes in the paleogeography of the Santa Barbara coast. Outside the major estuarine basins (e.g., Goleta Slough), many Early Holocene sites appear to have been located adjacent to estuaries, which formed in canyon mouths flooded by rapidly rising post-glacial seas (Erlandson 1994). After sea levels stabilized during the Middle Holocene, smaller estuaries filled with silt and gradually disappeared (Erlandson 1997:104). At Rincon, the combined data from CA-SBA-141, CA-SBA-119, and CA-SBA-1 are consistent with these general shifts, where estuarine shell is relatively abundant in deposits occupied before about 6,000 years ago, while open coast species (e.g., Pismo clam, California mussel) dominate later deposits (see Harrison 1964; Kornfeld 1980).

On a regional level, the radiocarbon dates from CA-SBA-141 extend occupation of the Rincon area by over 1,200 years and add yet another Early Holocene site to an impressive Santa Barbara sequence. The cultural sequence on the border of Santa Barbara and Ventura counties now spans a period of roughly 7,700 years, terminating in the historical era. Given the environmental productivity of the Rincon area and the number of undated sites within it, we would ex-

pect that earlier occupation occurred in the area. Interestingly, the Middle Holocene component at CA-SBA-141 is roughly contemporary with a 5,000-year-old *Olivella* grooved rectangle (OGR) bead found at the Eakin's site (CA-SBA-119) (Erlandson and Rick n.d.; Vellanoweth n.d.). Other radiocarbon dates from CA-SBA-119 range in age between 3,300 and 3,800 RCYBP, suggesting that the bead was placed with a later burial or that there was an older occupation of the site (Vellanoweth n.d.). Given the close proximity of the two sites, it is possible that the OGR bead may be associated with the occupation of CA-SBA-141.

CONCLUSIONS

The radiocarbon data presented above do not solve all of the chronological problems of CA-SBA-141, but they do confirm that there were at least two occupations corresponding to King's (1980, 1990) chronology based on radiocarbon-correlated artifact seriation. Moreover, our analysis clarifies earlier assertions by Harrison (1964) that the Arozena site was probably a transitional site dating to the Middle Holocene. Like several other key sites in the Chumash area (e.g., CA-SBA-142 and CA-VEN-1; see Erlandson et al. [1988]; Erlandson [1994:226-228]), CA-SBA-141 contained an amalgamation of materials from at least two discrete occupations, one during the Early Holocene and one during the Middle Holocene.

These results should serve as an important caution for any archaeologist working in disturbed deposits. Archaeological sites on the California coast (and elsewhere) are often heavily mixed through bioturbation and other disturbance processes, which complicates the construction of regional chronologies and hinders our understanding of cultural changes through time. Radiocarbon dating of individual artifacts or ecofacts provides a means to study these disturbances, however, and to construct relatively high-resolution chronologies despite these problems. Estab-

lishing basic chronological information is also an important archaeological survey tool, one that helps to clarify regional aspects of prehistory, to document the age of sites for management and conservation purposes, and to refine regional cultural sequences (Erlandson and Moss 1999). If we are to better interpret cultural and environmental changes along the California coast, we must continually refine our chronologies. Using seriation in conjunction with careful radiocarbon dating, it is possible to more fully grasp the age of archaeological materials, as well as to understand broad cultural changes.

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