Journal of California and Great Basin Anthropology
Vol. 14, No. 1, pp. 85-93 (1992).

4,000 Years of Human Occupation on Santa Barbara Island, California

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CALIFORNIA'S Channel Islands contain an archaeological record of intensive and dynamic maritime adaptations that spans at least 10,000 years. Because of the richness of their archaeological resources, Channel Island sites have attracted antiquarians and archaeologists for well over a century. Of the eight Channel Islands, probably the least is known about the prehistory of Santa Barbara Island. Located about 60 km. off the California coast (Fig. 1), this small island is relatively isolated, difficult to access, and appears to contain few resources that might attract or sustain permanent settlement. Because it lies along logical travel routes between some of the larger Channel Islands, however, it may have been a stop-over point for maritime peoples for millennia.

A number of the Channel Islands have been reasonably well studied by archaeologists over the years. On Santa Barbara Island, however, research has been limited to a few surveys, surface collections, and small excavations. Nineteen sites have been recorded, but little is known about the chronology of island use, the ethnic affiliations of its occupants, and the larger role of the island in regional settlement and interaction networks. In fact, until recently not a single radiocarbon date was available to help place the archaeological sites of Santa Barbara Island into an absolute chronological framework. This was true despite the fact that Greenwood (1978:10) found that many sites on the island had been damaged by erosion and historical land use. Many continue to be impacted by wind scouring, sheet wash, gullying, and sea cliff retreat.

Over the years, the authors have been doing background research, survey, data recovery, and collections analysis related to the prehistory of Santa Barbara Island. In this paper, we present radiocarbon dates for six of the prehistoric sites on Santa Barbara Island and discuss the potential antiquity of its initial settlement. First, however, we provide a context for our discussion by summarizing the environmental setting and history of archaeological research on the island. In the following sections, all site designations follow Greenwood's (1978:7-42) trinomial system.

ENVIRONMENTAL SETTING

Santa Barbara Island is about 2.8 km. long by 2.1 km. wide, with an area of about 2.6 km^2. The highest point on the island reaches about 194 m. (635 feet) above sea level. As Glassow (1977) pointed out, Santa Barbara Island is located roughly midway between the northern and southern Channel Island groups. On a clear day it is visible from all the surrounding islands, with the possible exception of San Miguel (Dunkle 1950). Its nearest neighbors are Santa Catalina Island, located about 38 km. to the east, and San Nicolas Island 44 km. to the southwest.

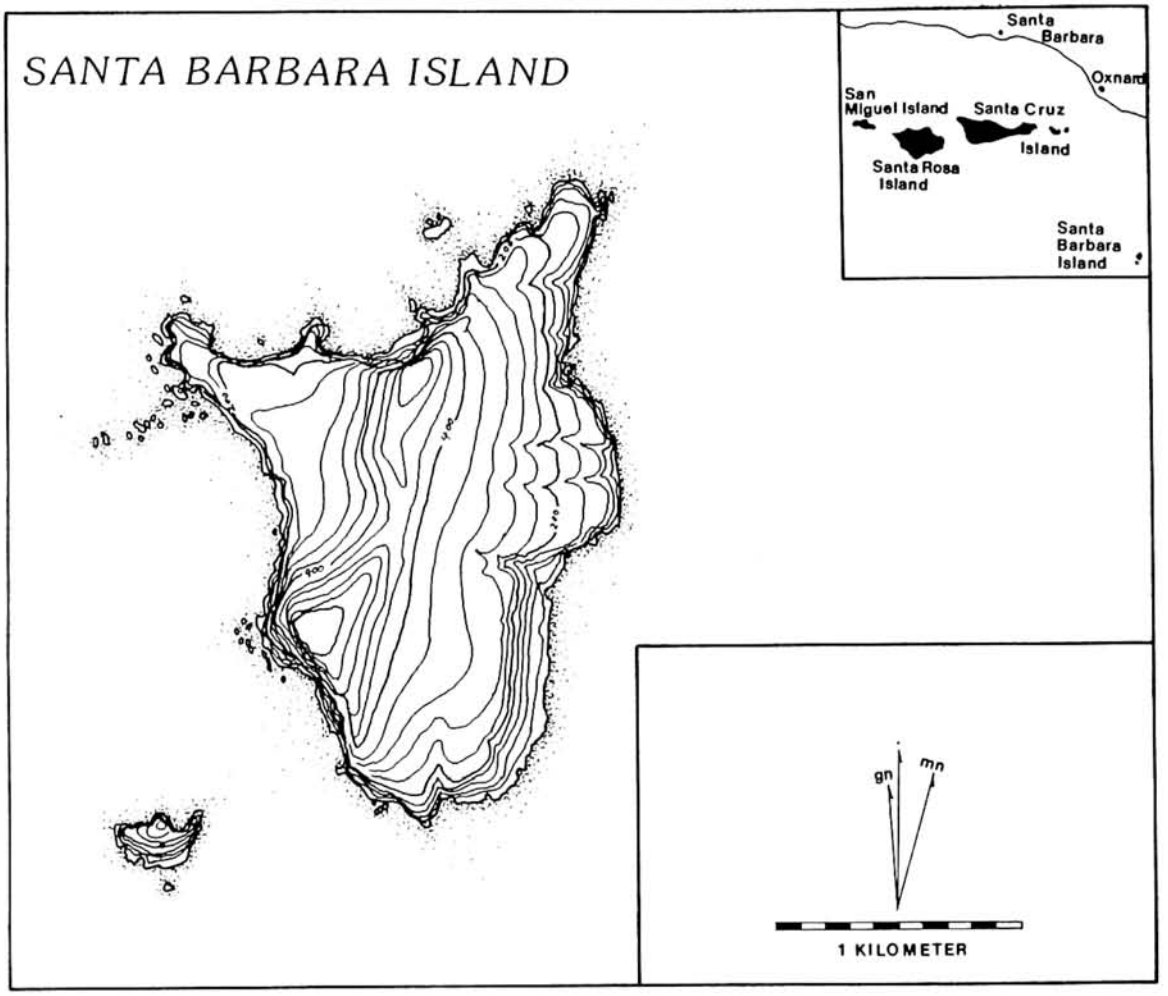

Fig. 1. Santa Barbara Island.

According to Dunkle (1950:270), Santa Barbara Island is made up largely of breccias and volcanic tuffs. Over much of the island, these have been truncated by marine terraces formed by high sea stands associated with Pleistocene interglacial periods. These terraces have been uplifted by tectonic activity and dissected by erosion. The coastline of Santa Barbara Island consists mostly of rocky shores and steep cliffs, punctuated by occasional pocket beaches. The rocky coastline, together with seas that are often rough, make access to the island by boat difficult. The only associated landforms of appreciable size are Sutil Island, about one km. off the southwest coast, and Shag Rock about 200 m. off the north coast (Glassow 1977:21).

Santa Barbara Island has few native land plants or animals, and no perennial fresh water source, but offers a wealth of marine resources. Before the Historic Period, land animals endemic to the island reportedly were limited to a single species of lizard, a small bat, and a deer mouse (Glassow 1977). In contrast, the island is home to up to 70 species of sea birds and its waters contain an array of sea mammals, fish, and shellfish.

PREVIOUS ARCHAEOLOGICAL RESEARCH ON SANTA BARBARA ISLAND

As mentioned earlier, little archaeological work has been done on Santa Barbara Island. Of the 19 sites recorded on the island, 18 appear to be prehistoric, and one is associated with the historic Hyder Ranch. Most of the prehistoric sites seem to be small and shallow, suggesting that the island has a relatively short occupational history or that it was used intermittently over a long span of time. Parts of the island are covered with dense ice plant (Swartz and Sutton n.d.; Greenwood 1978), however, which has interfered with identification and boundary definition for some sites. Glassow (1977) provided the most thorough history of archaeological research on Santa Barbara Island, a summary on which much of following discussion is based.

The first systematic archaeological research on Santa Barbara Island appears to have been B. K. Swartz and C. J. Sutton's 1958 survey and limited excavation (Swartz and Sutton n.d.). They noted a dense cover of ice plant over much of the island and identified one site (now known as CA-SBI-16). In this heavily disturbed site, three 5 x 5-foot test pits were dug through a shallow (30 to 45-cm. thick) shell midden in the least disturbed area of the site. A "representative sample" of the materials found in the test pits was collected, material now housed at the Fowler Museum (Acc. No. 199) at the University of California, Los Angeles (UCLA). The 43 catalog entries consist mostly of quartzite and basalt flakes, a basalt "rub-bingstone" with asphaltum on it, a bone abalone pry bar, and unmodified shells and bones. The abundance of quartzite, basalt, and chert chipping debris led Swartz (1960:9) to propose that Santa Barbara Island was occupied "temporarily or by periodic visits, perhaps for quarrying manufacturing materials."

Archaeological research on Santa Barbara Island was sporadic and limited for the next several years. Late in the summer of 1958, Paul Schumacher visited Santa Barbara Island and recorded at least three additional sites, now known as CA-SBI-1, -2, and -13. Schumacher appears to have conducted no excavation or surface collection. In 1961, J. Nichols located one new site (CA-SBI-3), and made small surface collections at CA-SBI-1, -2, and -13. This collection of 33 catalog entries, now curated at the Fowler Museum at UCLA (Acc. No. 312), includes mortar and pestle fragments, a number of flake tools, and a fragment of a boat effigy. In 1964, Phil Orr of the Santa Barbara Museum of Natural History briefly visited the island with a group of scientists. Orr's notes refer to only one site, describing its location in an area yet to be correlated with any recorded site (Glassow 1977:33).

During three trips made between 1961 and 1964, a team led by Charles Rozaire surveyed the entire island, recording 15 sites (CA-SBI-1 through -15), including at least 10 that previously were unrecorded. Rozaire's team also excavated six 5 x 5-foot test pits at CA-SBI-9, one of the largest sites on the island and the one containing "the heaviest concentration of artifacts" (Rozaire 1978:7). The excavations penetrated a sparse shell midden deposit averaging about 30 cm. deep. A variety of artifacts was recovered from the site surface and test pits: mortar and pestle fragments, a steatite bowl, a digging stick weight, fragments of a side-notched and a shouldered projectile point, fish hooks and a fish hook blank, an abalone pry bar, bone awls, and a spire-removed *Olivella* shell bead. Faunal remains recovered include sparse shell fragments (i.e., abalone and limpet shells) and the bones of fish, several sea mammals (e.g., sea otter, sea lion, seals, dolphins), and birds (Rozaire 1978). Rozaire (1989) recently summarized the results of his research at CA-SBI-9 and other Santa Barbara Island

sites. Collections from Rozaire's CA-SBI-9 excavations and Santa Barbara Island survey are housed at the Los Angeles County Museum of Natural History.

In 1966, Marcia Bright (1966) conducted a brief reconnaissance on Santa Barbara Island. She found no new sites, made no collections, but recorded several isolated artifacts (Glassow 1977:37-38).

In 1978, Roberta Greenwood and Vance Bente visited the island for four days to relocate previously recorded sites and isolates, place datum stakes on the archaeological sites, assess the condition of various cultural resources on the island, and to establish some concordance among the confusion of previous site designations (Greenwood 1978). This work resulted in the combination of some previously recorded localities, the splitting of another, the recording of three new sites (including CA-SBI-18, the only historic site recorded on the island), and a coherent list of trinomial designations for the sites of Santa Barbara Island. Greenwood (1978:11) also recommended that archaeological test excavations, detailed constituent analyses, and radiocarbon dating be conducted at several sites (CA-SBI-1, -2, -3, -13, and -19) where erosion and public access threatened the continued existence of cultural resources.

The most recent archaeological research on Santa Barbara Island was carried out in 1986 by a team of University of California students directed by Pandora Snethkamp. Working with Don Morris, Snethkamp's team conducted additional reconnaissance and surface collections, and excavated single 50 x 100-cm. test pits at CA-SBI-2, -3, -9, -12, and -16. These materials are housed at the Museum of Anthropology at University of California, Santa Barbara (UCSB), where analysis has yet to be completed.

RADIOCARBON DATES FROM SANTA BARBARA ISLAND SITES

Six radiocarbon dates from Santa Barbara Island are now available, one each from six separate sites (Table 1). All six dates are based on the analysis of marine shell. It is commonly assumed by archaeologists that wood or charcoal samples produce the most reliable radiocarbon dates. When properly selected and processed, however, marine shells generally produce reliable dates in the Santa Barbara Channel area. Dating marine shell also avoids some hazards potentially associated with dating charcoal or wood samples: contamination by asphaltum, charcoal deposited by wildfires, and the "old wood problem" (Schiffer 1986). Like virtually all organic materials, however, there are unresolved questions about the effects of processes like upwelling that may contribute to errors in radiocarbon dating marine shell. Consequently, archaeologists should use caution in interpreting and comparing radiocarbon dates within and between sites.

To avoid or minimize the problems associated with stratigraphic mixing, we dated single shell fragments where possible. Five of the dated samples came from test pits excavated in shell midden areas, while a sixth sample came from disturbed sediments at CA-SBI-1. In the following paragraphs, we present uncorrected dates, dates adjusted for isotopic fractionation, and estimated calendar ages for each sample. Presenting all three values for each of the six dates allows the correlation of the Santa Barbara Island series with a variety of published radiocarbon dates from elsewhere in California and surrounding regions. Calibrating radiocarbon ages is an important step in standardizing radiocarbon dates, especially dates derived from the analysis of materials (shell, charcoal,

Table 1
RADIOCARBON DATES FROM SANTA BARBARA ISLAND ARCHAEOLOGICAL SITES[a]

Site (SBI-)	Provenience Unit:level (cm.)	Laboratory Number	Uncorrected RCYBP Date	Adjusted RCYBP Date	Estimated CAL BP Date
1	Trench 2	Beta-52008	3,580 ± 60	4,030 ± 60	3,730 ± 100
2	Unit 1:29-32	Beta-30634	3,630 ± 80	4,060 ± 80	3,800 ± 120
3	Unit 1:20-25	Beta-30635	1,540 ± 110	1,930 ± 110	1,260 ± 100
9	Unit 4/5:15-31	UCLA-2796	2,470 ± 185	2,890 ± 190	2,330 ± 250
12	Unit 1:11-16	Beta-30636	940 ± 90	1,370 ± 90	670 ± 100
16	Pit 3:0-15	Beta-42605	840 ± 70	1,280 ± 70	630 ± 80

[a] All samples were marine shell; calibration follows Stuiver and Reimer (1987). RCYBP = radiocarbon years before "present" (A.D. 1950); CAL BP = calendar years before A.D. 1950. The adjusted age of UCLA-2796 is based on a +420 year estimated correction for isotopic fractionation.

bone, etc.) that require different corrections. Direct comparison of uncorrected, $^{13}C/^{12}C$ adjusted, and calibrated ages can result in significant errors in chronological reconstructions.

Calendar age estimates for each sample were derived using a computerized calibration program (CALIB 1.3) developed by Stuiver and Reimer (1987) and based on a data set for calibrating organic samples of marine origin (Stuiver et al. 1986). For marine samples, the CALIB 1.3 program includes a correction (ca. 400 years) for the global reservoir effect, to compensate for the delay between the production of radiocarbon in the atmosphere and its transfer into the global ocean. Following Stuiver et al. (1986), we also included a correction (225 ± 35 years) for the regional reservoir effect, caused by regional variation in the effects of upwelling. Upwelling effects may have varied locally through both space and time, but recent dating of marine shells of known age generally supports the figure of Stuiver et al. (1987) for the Santa Barbara Channel area.

CA-SBI-16

Situated on the east coast of the island, this shell midden encompasses an area of about 55 x 90 m., and is located near the sea cliff about 40 m. above sea level. From the Fowler Museum collections, Erlandson obtained 22.2 g. of mussel (*Mytilus californianus*) and limpet (*Lottia gigantea*) shell from the uppermost level (0 to 15 cm. or 0 to 6 in.) of Swartz and Sutton's Pit 3. The sample comes from the upper one third of the midden, which reached a depth of 45 cm. in Pit 3. The shell sample produced an uncorrected date of 840 ± 70 RCYBP (Beta-42605). Comparing this date to King's (1990) Santa Barbara Channel chronology, which is based on uncalibrated radiocarbon ages, suggests that CA-SBI-16 was occupied near the end of the Middle Period. Correcting for the effects of isotopic fractionation ($^{13}C/^{12}C = +1.6$) adjusted this date to 1,280 ± 70 RCYBP. Dendrocalibration suggests that the later occupation of CA-SBI-16 occurred about 630 ± 80 cal B.P. (A.D. 1280 to 1405). Since this sample con-

tained multiple shell fragments, this date should provide an average age for the composite sample. If the site contains multiple components, the earliest occupation of the site could have been considerably earlier than this date. Unfortunately, the midden at CA-SBI-16 appears to have been destroyed (Greenwood 1978:34).

CA-SBI-12

CA-SBI-12 is located in the south-central part of the island, about 350 m. from the coast, at an elevation of about 85 m. Glassow (1977: 31) depicted the site area as covering about 40 x 60 m. Greenwood (1978:28) described CA-SBI-12 as "a shell scatter with at least one large broken basaltic cobble, but no visible lithic artifacts or other workshop debris." The shell at the site reportedly was dominated by small black abalones (*Haliotis cracherodii*) and limpets (*Lottia gigantea*). An uncorrected date of 940 ± 90 RCYBP (Beta-30636) was obtained by Morris for a fragment of abalone shell from the 11 to 16-cm. level of Snethkamp's Unit 1. Correcting for isotopic fractionation adjusted the date to 1,370 ± 90 RCYBP ($^{13}C/^{12}C$ ratio = +0.6) and calibration suggests that this small midden was occupied about 670 ± 100 cal B.P. (ca. A.D. 1190 to 1320). Like CA-SBI-16, CA-SBI-12 appears to have been occupied near the end of King's (1990) Middle Period.

CA-SBI-3

Located near the geographic center of the island, this site is located roughly equidistant (ca. 500 m.) from the west, north, and east coasts, in a topographic saddle about 150 m. above sea level. This is one of the largest sites on the island, encompassing an area of about 140 x 200 m. Greenwood (1978:15) described this site as "an extensive scatter of artifacts and lithic workshop debris within a shell midden." Artifacts collected or reported by Nichols, Rozaire, and Greenwood include several mortars and pestles, a metate, a steatite bowl, a "boat-shaped object," several scraper planes, and a chopper. The midden appears to have been dominated by small black abalone shells. Morris obtained an uncorrected date of 1,540 ± 110 RCYBP (Beta-30635) for a 13.5 g. fragment of abalone shell from the 20 to 25-cm. level of Snethkamp's Unit 1, near the base of the midden deposit. This date suggests that the site first was occupied during Phase 3 of King's (1990:29) Middle Period. A $^{13}C/^{12}C$ ratio of -1.3 adjusted this date to 1,930 ± 110 and calibration suggests that CA-SBI-3 first was inhabited about 1,260 ± 100 cal B.P. (between about A.D. 590 and A.D. 790).

CA-SBI-9

Located on the northwest coast of the island about 90 m. above sea level, CA-SBI-9 is about 250 m. from both the north and west shores of Santa Barbara Island. Rozaire (1978) described CA-SBI-9, covering an area about 50 x 100 m., as one of the primary villages on Santa Barbara Island. Its occupation was thought to be relatively late, possibly post-dating A.D. 1000 (Greenwood 1978:25). Rozaire obtained an uncorrected date of 2,470 ± 185 RCYBP (UCLA-2796), however, for abalone (*Haliotis* spp.) shell fragments from the 15 to 30-cm. (6 to 12-in.) level of pits 4 and 5. The midpoint of this age estimate falls within Phase 2a of the Middle Period. Calibration of the uncorrected date, including an estimated adjustment of +420 years to compensate for the effects of isotopic fractionation, suggests that CA-SBI-9 was occupied as early as 2,330 ± 250 cal B.P., or between about 130 and 630 B.C. Additional occupations also may have taken place at the site.

CA-SBI-1

Located on the west coast of the island about 50 m. above sea level, Greenwood (1978: 12) described this 40 x 50 m. wide site as one of the most concentrated shell middens on Santa

Barbara Island. Greenwood also noted that Rozaire (1978) found hammerstones, cores, scraper planes, flake tools, and basalt debitage at the site. An uncorrected date of 3,580 ± 60 RCYBP (Beta-52008) was obtained by Erlandson and Morris for a 27 g. fragment of wavy top turban (*Astraea undosa*) shell collected from the walls of Snethkamp's Trench 2, which was excavated through the central site area. This date suggests that CA-SBI-1 was occupied near the end of Phase Y of King's (1990) Early Period. A $^{13}C/^{12}C$ ratio of +2.1 produced an adjusted age of 4,030 ± 60 RCYBP, calibrated to about 3,730 ± 100 cal B.P. (ca. 1680-1880 B.C). This sample came from a disturbed context, but the single shell should provide a reliable estimate for an occupation of the site. Further dating will be required to determine if additional occupations took place at this heavily disturbed site.

CA-SBI-2

Located on the north coast of the island between about 80 and 120 m. above sea level, CA-SBI-2 may be as much as 300 m. long and 150 m. wide. Greenwood (1978:13) described the site as a "vast scatter of shell . . . with a very light component of fractured basalt and white quartz." Shell at the site reportedly was dominated by *Astraea undosa* and *Haliotis cracherodii*. Nichols appears to have collected a pestle fragment, a mano fragment, and an anvil fragment from the site surface, and Rozaire (1978) noted the presence of a pestle-mano, a stone bead, and two scraper planes. An uncorrected date of 3,630 ± 80 RCYBP (Beta-30634) was obtained by Morris for a 37.8 g. fragment of abalone shell from near the base (29 to 32 cm.) of the midden exposed in Snethkamp's Unit 1. Thus, CA-SBI-2 also appears to have first been occupied during Phase Y of King's (1990:29) Early Period. A $^{13}C/^{12}C$ ratio of +1.1 adjusted this date to 4,060 ± 80 RCYBP. Calibration suggests that this midden stratum was deposited about 3,800 ± 120 B.P. (between about 1730 and 1970 B.C.).

DISCUSSION AND CONCLUSIONS

The nature of prehistoric land use on Santa Barbara Island remains uncertain, but it seems clear that prehistoric settlement was much less intensive than it was on the larger Channel Islands. Given the available data, it seems likely that the prehistoric sites of Santa Barbara Island result from a variety of land use patterns. The small size and relatively low density of some sites suggest that they were occupied relatively briefly, perhaps by voyagers resting or taking refuge from inclement weather. The larger and denser sites may have been occupied for longer periods, however. Glassow (1977: 47) suggested that the presence of mortars and pestles at some sites may indicate that more sustained occupations also took place. During the rainy season, for instance, Santa Barbara Island may have been used as a seasonal base to hunt, fish, and forage in habitats not subject to the more intensive exploitation pressures of a permanent population. During wetter periods of southern California prehistory, the island also may have supported a year-round occupation. Carefully designed archaeological research will be required to establish the nature of the occupation (or occupations) at each site.

The radiocarbon dates now available from Santa Barbara Island's archaeological sites are a significant advance in building a chronology for the prehistory of the island. It is dangerous to rely on a single date to define the age of a site, however, and more dates are needed to clarify the history of occupation at these and other Santa Barbara Island sites. The available data suggest that human settlement of the island began at least 4,000 years ago, and probably continued, perhaps sporadically, into the protohistoric or early historic periods. At least two sites (CA-SBI-1 and CA-SBI-2) appear to have

been occupied towards the end of the Early Period, during a time when little is known about the broader patterns of cultural evolution among Santa Barbara Channel populations (see King 1990:29). Calibrated dates from two more sites (CA-SBI-12 and CA-SBI-16) fall near the end of what Arnold (1992:66) has called the Middle to Late Period transition (A.D. 1150 to 1300). This is a key period in the evolution of southern California's maritime societies, and the contents of these two sites might prove valuable in resolving current questions about the development of political and economic complexity on the Channel Islands (see Arnold 1987, 1992; King 1990).

It is also worth noting that Santa Barbara Island may well have been occupied considerably earlier than 4,000 years ago. Most of the Channel Islands have prehistoric sequences known to span the past 7,000 to 10,000 years (Erlandson and Colten 1991; Jones 1991). Since Santa Barbara Island is visible from nearly all of these larger islands, there is little reason to doubt that early maritime peoples visited Santa Barbara Island as well, at least occasionally. Due to its strategic location, it would have been a convenient way-station or refuge for seafarers travelling between islands or from certain islands (i.e., San Nicolas and Santa Catalina) to various points on the mainland. The earliest occupations of Santa Barbara Island may have been relatively ephemeral, however, and may be difficult to identify. Early sites also may have been destroyed by thousands of years of shoreline erosion (Glassow 1977:40).

With only six of Santa Barbara Island's 19 recorded sites dated, and due to the limited amount of archaeological excavations conducted at these, much more research is needed to establish the antiquity and nature of human settlement on the island. For now, our radiocarbon dates provide a minimum age for the occupation of the island and the beginnings of a chronological framework for Santa Barbara Island prehistory. We hope our research will stimulate further study of the antiquity and nature of the maritime occupations of Santa Barbara Island.

ACKNOWLEDGMENTS

J. Stipp and M. Tamers (Beta Analytic, Inc.) and R. Berger (UCLA) provided technical support in dating our radiocarbon samples. Funds were provided by Channel Islands National Park and the Santa Barbara Channel Carbon Dating Fund at UCSB. The Los Angeles County Museum of Natural History and the University of Oregon also supported our research. Roger Colten (UCLA) helped obtain shell samples from CA-SBI-16 and other data on Santa Barbara Island collections housed at the Fowler Museum. Roy Salls helped select and submit the CA-SBI-9 sample. Roberta Greenwood's (1978) discussion of Santa Barbara Island sites was an important source of background data for our paper. Figure 1 was drafted by Mark Tveskov at the University of Oregon. We are grateful to Jeanne Arnold and Mark Raab for their critical review and constructive comments, and to Mark Q. Sutton and the editorial staff of the *Journal* for help in the editing and production of the paper. Finally, our special thanks go to Pandora Snethkamp, who excavated samples from CA-SBI-2, -3, and -12, assisted in selecting shell samples for dating, and reviewed this paper. This is Publication No. 4 of the Santa Barbara Channel Carbon Dating Funds.

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