United States Census Office
n.d. Manuscript population census records. Washington, DC.
Van Bueren, Thad M.
2002 *Archaeological Investigations for the Glass Beach Remediation Project in Fort Bragg, California.* Submitted to the Mendocino Land Trust, Mendocino. Copies available at the California Historic Resources Information System, Northwest Information Center, California State University, Sonoma.
2004 *Contemplating Household Transitions Investigations at the Carnduff Farm (CA-SMA-368/H) in San Mateo County California.* California Department of Transportation, Oakland. Copies available at the California Historic Resources Information System, Northwest Information Center, California State University, Sonoma.
Van Bueren, Thad M. (editor)
2002 Communities Defined by Work: Life in Western Work Camps. *Historical Archaeology* 36(3).
Van Wormer, Stephen R.
1988 *Even the Kitchen Sink: Archaeological Investigations of SDi-10,258, the 1908 to 1913 San Diego City Dump.* Submitted to W. Wolf Industries, Inc., San Diego. Copies available at the California Historic Resources Information System, South Coastal Information Center, California State University, San Diego.
Wentsch, Anne E.
1993 Working with Fill in San Francisco. In *Tar Flat, Rincon Hill, and the Shore of Mission Bay: Archaeological Research Design and Treatment Plan for SF-480 Terminal Separation Rebuild,* Volume 2, edited by Mary and Adrian Praetzellis, pp. 331–348. Submitted to the California Department of Transportation, Oakland. Copies available at the California Historic Resources Information System, Northwest Information Center, California State University, Sonoma.

The Antiquity and Significance of Effigies and Representational Art in Southern California Prehistory

Richard T. Fitzgerald and Christopher Corey
California State Parks, Archaeology History and Museums Division, 1416 9th Street, Suite 902 Sacramento, CA 95814

Abstract Zoomorphic and abstract effigies of the southern California mainland and the Channel Islands have long been thought to date to the late Holocene. However, a comprehensive review of radiocarbon dates from several sites containing effigies, along with findings from recent investigations, suggest that this representational art form began by at least the middle Holocene (ca. 3000 cal B.C.), if not earlier. The timing and point of origin of this uniquely Californian artistic tradition are critical to discerning potential interaction spheres, population dynamics, and linguistic patterns in coastal southern California prehistory.

Resumen Por mucho tiempo se pensó que las efigies zoomórficas y abstractas del sur del estado de California y las Islas de Santa Bárbara se elaboraron en el Holoceno Tardío, es decir, durante los últimos 1000 años. Una revisión global de las fechas ^{14}C de varios sitios con efigies, junto con los resultados de investigaciones recientes, sugiere una profundidad temporal más amplia para estos artefactos enigmáticos. Aparentemente, esta forma de arte representacional apareció por lo menos durante el Holoceno Medio (aprox. 3000 AEC), y quizá anteriormente. Por lo tanto, es crítico determinar el momento de aparición y el lugar de origen de esta tradición artística distintivamente californiana para identificar: las potenciales esferas de interacción, la dinámica poblacional y los patrones lingüísticos en la costa del Sur de California durante la prehistoria.

California Archaeology, Volume 1, Number 2, December 2009, pp. 183–204.

For more than a century, a wide variety of stone effigies has been reported from the southern California coast (Cameron 1983, 1988, 2000; de Cessac 1882; Desautels et al. 2005; Greenwood 1962, 1967; Hudson 1978; Hudson and Blackburn 1980; Koerper et al. 1995; Lee 1981; Lopez 2004; Rogers 1929). Forgeries notwithstanding (Gamble 2002; Hoover 1974a, 1974b; Lee 1993), the majority of these *objets d' art* appear to represent birds, sea mammals, and fish, while a few are "so abstract that their intent is unclear to the modern viewer" (Lee 1993:196). Generally carved from steatite quarried from Santa Catalina Island or mainland sources, these artifacts were also made of serpentine, diorite, basalt, bone, teeth, and pebbles from a variety of materials. Most are small enough to easily fit in the hand, and many are "strongly reminiscent of modern sculptural works" (Lee 1981:45). These expressive figures have long been viewed as products of the late Holocene, or approximately the last 1000 years of prehistory (Cameron 1988, 2000; Hoover 1974a; Hudson 1978; Lee 1981). This temporal assignment was based largely on limited ethnohistoric information gathered by Harrington (1942:14) and on a small number of specimens recovered from datable contexts. In a recent summary of southern California animal effigies, Cameron (2000:49) listed only two specimens that were directly associated with radiocarbon dates, both of which fell within the last 1100 years.

Although many effigies indeed appear to be products of the recent archaeological record (i.e., the Gabrielino, Chumash, and their immediate ancestors [Harrison 1964; Rogers 1929]), there are also older examples that call into question a recent origin for this portable art. Do these remarkable artifacts represent a sudden artistic florescence by a maritime culture one or two millennia ago, or do they have much greater antiquity? In this article, we re-examine key sites where effigies have been found and present new data that suggest that these artifacts appeared at least as early as the middle Holocene and possibly earlier. Our primary focus is on zoomorphic effigies, but we also discuss other forms of representational art that seem to have greater antiquity, including fired clay figurines and cogged stones, although our treatment of the latter is necessarily brief since they have a long history of research. In addition, we discuss recent linguistic data (Golla 2007) that seem to bear on the role of effigies in prehistoric interaction spheres, and on the population and linguistic dynamics of prehistoric southern California.

General Distribution of Zoomorphic Effigies

As summarized by other scholars (Cameron 1983, 1988, 2000; Hoover 1974a; Hudson and Blackburn 1980; King 1990), effigies are found over a wide area of the southern California coast and the Channel Islands (Figure 1). Unfortunately,

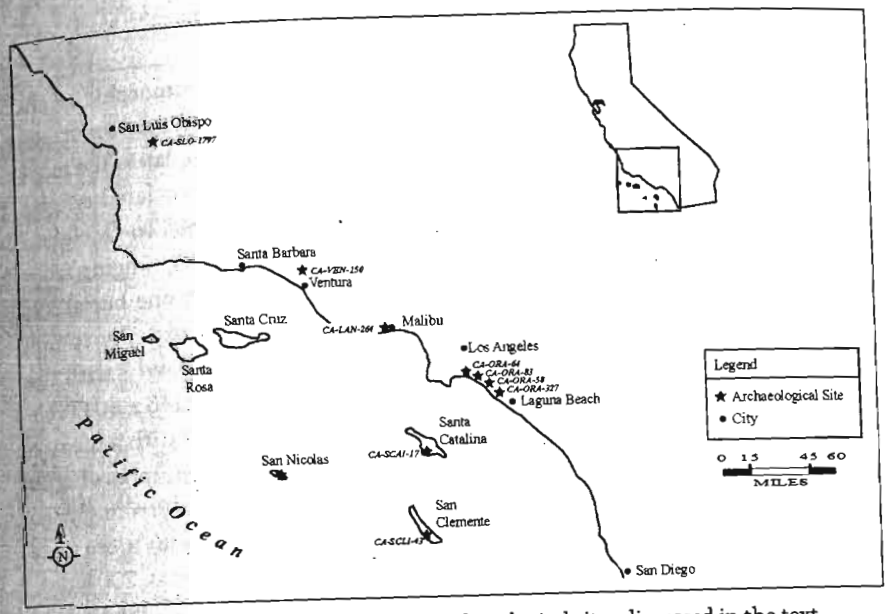

Figure 1. Location of areas and principal archaeological sites discussed in the text.

most lack accurate provenience data and are undated. Many are in museum collections obtained from private collectors, while others, such as those at the Smithsonian Institution, the Peabody Museum, and the Musée de l'Homme in Paris, were recovered by late nineteenth century collectors who "unceremoniously plundered scores of Chumash cemeteries" (Erlandson 1994:38) on the Channel Islands and the mainland.

Zoomorphic effigies have been found as far south as the San Luis Rey River in northern San Diego County and as far north as Cross Creek in San Luis Obispo County. On the Channel Islands, the southern group (Santa Catalina, San Clemente, and San Nicolas) has produced the most animal effigies, while only a handful have been found on the northern islands, including one from San Miguel Island that was found by D. B. Rogers (Cameron 2000). Effigies have been found in isolated contexts, including one from San Diego County (Koerper and Labbé 1987) and an owl effigy from San Clemente Island (Hudson 1978). They are also found in groups either as grave items such as those found at CA-LAN-264 in Malibu (Gamble et al. 1996; Meighan 1976), or caches such as the seven "sea mammal figures" packed in a *Haliotis cracherodii* shell uncovered by a bulldozer in Palos Verdes (Wallace and Wallace 1974).

Temporal Parameters of Zoomorphic Stone Effigies

Until the last 10 to 15 years, there were few indications that zoomorphic or abstract effigies predated AD 1000. This assumption was based largely on stratigraphic inferences, cross-dating, and a few associated radiocarbon dates. The most frequently cited and clearly dated specimens were the burial-associated effigies recovered from CA-LAN-264, the ethnographic village of *Humaliwu* (Meighan 1976). Eight burials at this site in Malibu contained stone effigies, ranging from a single example in an individual interment to 21 specimens in one burial lot. Burials 35 and 36, a young female and male interred in close proximity to one another, had 24 effigies associated with them; 21 with the female and 3 with the male (Gamble et al. 2001). An uncorrected bone collagen date of 1246 ± 60 (Table 1) from the female burial was calibrated to cal A.D. 890-1010 (1σ) with a median probability of cal A.D. 930. Until recently, these were the only zoomorphic effigies directly associated with a radiocarbon date in southern California. Strikingly, 16 of the 21 effigies with the young female were clearly fish effigies, four more were possible fish effigies, and one was a pelican or bird stone (Gamble et al. 2001).

Further to the south, at Crystal Cove State Park, two buried bird effigies were recovered at CA-ORA-327. One was a very small "pelican type" (Cameron 1988:55) that was bracketed by a shell date of cal A.D. 360 and a charcoal date of cal A.D. 930 (Table 1). The second was found above a California mussel (*Mytilus californianus*) shell that returned a date of 180 cal B.C., which was considered to be inaccurate because it was believed to be too old. These were the only dates considered to be "directly" associated with the effigies (Cameron 2000), but there are hints of greater time depth elsewhere in the archaeological literature.

The first suggestion of a greater age for these artifacts was reported by Meighan (1959) based on his investigations at the Little Harbor site (CA-SCAI-17) on Santa Catalina Island. Meighan's excavations yielded a wide variety of artifacts (fishhooks, handstones, shell beads, mortars, projectile points), sea mammal bones, and 14 steatite effigies that he classified as types 1, 2, and 3, all of which were temporally anchored with only a single radiocarbon date of 2360 cal B.C. (Table 1).[1] The effigies apparently were made from steatite that was available about 6.4 km (four miles) from the site (Meighan 1959). They all were unusually shaped in forms vaguely suggestive of fish and/or sea mammals with elongated dorsal fins, which Meighan (1959:391-392) found to be "simple and unspecialized...[but possibly] the forerunners of the beautifully made whales, hook-shaped stones, and other effigy forms of the protohistoric Canaliño culture."[2]

This hint of greater age for effigies was overlooked in the intervening years, until a pelican-shaped bird carving of marine mammal bone from San Nicolas

Table 1. Radiocarbon Dates from Sites with Zoomorphic Effigies.

Site	Effigy Type	Laboratory Number	Dated Material	Unit/Depth (cm)	^{14}C Age (Years BP)	Calibrated Age Range (cal BC/AD)[a]	Source
ORA-327	Bird/hook	UCR-1913B	Shell	N1C/0-10	1350 ± 80[b]	450(360)280 AD	Cameron 1988
ORA-327	—[c]	UCR-1592	Charcoal	N1B/ 30-50	570 ± 70	1310(1370)1420 AD	Cameron 1988
LAN-264	Fish	UCLA-1886	Human collagen	Burial 35	1246 ± 60	890(930)1010 AD[d]	Meighan 1976
SNI[e]	Bird/hook	UCR-2456	Marine mammal	—	3480 ± 60	1240(1140)1030 BC	Koerper et al. 1995
SCAI-17	Type 1 (?)	M-434	Charcoal	U8 /61	3880 ± 250	2840(2360)1980 BC	Meighan 1959
SCAI-17	Type 1 (?)	UCLA-1880A	Shell	U1 /20	1220 ± 60	1320(1370)1470 AD	Kaufman 1976
SCAI-17	Type 1 (?)	UCLA-1928A	Shell	U1/ 40	4980 ± 60	3080(3070)2700 BC	Kaufman 1976
SCAI-17	Type 1 (?)	UCLA-1880B	Shell	U1/ 50	4780 ± 60	2890(2800)2600 BC	Kaufman 1976
SCAI-17	Type 2	Beta- 47273	Shell	U1/50-60	4890 ± 80	3080(2960)2710 BC	Raab 1995
SCAI-17	Type 3	Beta -47274	Charcoal	U2/50-60	5105 ± 60	3970(3880)3800 BC	Raab 1995
SCAI-17	Type 3	Beta -47275	Shell	U2/ 30-40	4760 ± 90	2890(2770)2640 BC	Raab 1995
SCAI-17	Type 1 (?)	Beta- 47276	Charcoal	U2 /30-40	1380 ± 70	1180(1240)1300 AD	Raab 1995
SCAI-17	Type 1 (?)	Beta- 47277	Shell	U3/40-50	4620 ± 80	2730(2610)2470 BC	Raab 1995
SCAI-17	Type 1 (?)	Beta-47278	Charcoal	U3/40-50	6860 ± 190	5980(5770)5620 BC	Raab 1995
SCLI-43[c]	Bird/hook	UCLA-2757D	Charcoal	TP1/80-120	2695 ± 120	1040(890)670 BC	Salls 1988
SCLI-43[c]	Dolphin	UCLA-2735A	Human collagen	Burial 3	3040 ± 70	1410(1290)1210 BC	Goldberg et al. 2000
VEN-150	Amphibian	AA 72721	Shell	N10/E90-?	3822 ± 35	1680(1540)1420 BC	Lambert 2009[d]
SLO-1797	—[e]	Beta-112549	Shell	U33/80-90	7500 ± 100	5900(5800)5680 BC	Fitzgerald 2000
SLO-1797	Fish[f]	Beta-106533	Shell	U33/140-150	9230 ± 50	7820(7740)7610 BC	Fitzgerald 2000

[a] Calibrated age derived from CALIB 5.0.2 with Delta R of 225 ± 35. [b] Date not corrected for $^{13}C/^{12}C$ in the lab, corrected for shellfish by adding 408 years per convention. Rounded calendar years include midpoint (in parentheses) and range at 1δ. [c] Lower radiocarbon date from below bird/hook effigy.
[d] Personal communication Patricia Lambert. [e] Upper radiocarbon date from top of Stratum 3Ab. [f] Lower radiocarbon date from bottom of Stratum 3Ab.

Island was directly dated at 3480 ± 60 radiocarbon years before present (1140 cal B.C.) by Koerper et al. (1995). Unfortunately, this specimen was derived from the collections of the San Diego Museum of Man and its provenience information was limited to simply San Nicolas Island. Furthermore, Koerper et al. (1995) cautioned that late prehistoric artisans on San Nicolas Island may have used an old marine mammal bone to carve the effigy.

Since Meighan's excavations, there have been new investigations of the Little Harbor site by Kaufman (1976) and Raab et al. (1995) that have produced nine additional radiocarbon dates (Table 1) that clarify the age of the Little Harbor deposits and the odd-shaped effigies that Meighan recovered there. Of the nine new dates, one marks the Late Period (L1a and L1b, cal AD 1150-1400), one is from the Middle-Late Period Transition (cal A.D. 1000-1250), and seven fall within King's (1990) Early Period (6000-1500 cal B.C.). Of the latter, only one falls into the earliest phase (Ex, 6000-4500 cal B.C.), and the rest cluster between ca. 4000 and 2500 cal B.C.

Eliminating the oldest date, which Raab et al. (1995:295) called "provisional since no artifacts or faunal remains were found," the remaining six middle Holocene dates seem to reflect the age of the majority of the Little Harbor deposits. Furthermore, the effigies were found throughout the midden and at least five of them were recovered from the lowest levels of the deposit (see Meighan 1959:390), while the late Holocene dates are restricted to the upper half of the deposit. It is reasonable to conclude from these findings that the effigies date to the middle Holocene or about 3000 cal B.C., adding more credence to Meighan's assertion that these oddly shaped artifacts were the prototypes of the more naturalistic forms that came during the Late Period.

Additional evidence from the Little Harbor site for the manufacture of representational art in the middle Holocene was reported by Porcasi (1998:272), who "discovered 17 previously unrecognized fired clay objects" while she was analyzing faunal remains from an unreported 1973 UCLA excavation. These objects supplement two others that had been identified earlier from the same site (Drover 1978). Five of the 19 fired clay objects had projecting stems or the "general shape of a golf putter" (Porcasi 1998:273), an attribute they share with the stone effigies that Meighan had recovered earlier. Although Porcasi argued that they were not representational figurines, their general form and resemblance to the odd stemmed stone effigies was undeniable. More importantly, eight of the 19 clay objects were found in the "main midden" or Raab et al.'s (1995) Component 2, while three others were located even deeper within the midden. All of these areas of the deposit were confidently dated to the middle Holocene.

Additional evidence for middle Holocene antiquity of zoomorphic stone effigies comes from CA-SCLI-43c at Eel Point on San Clemente Island, where Cameron (2000) reported a dolphin effigy associated with a male burial that was directly dated to 1290 cal B.C., and a bird effigy dated stratigraphically to 890 cal B.C. (Cameron 2000; Goldberg et al. 2000). Fired clay objects have also been reported from the mainland, specifically from CA-ORA-64 (the Irvine site), where they date to at least 3000 B.C. (Drover et al. 1983). Recently, an anthropomorphic "Venus" fired clay figurine was reported from the San Joaquin Hills in Orange County at CA-ORA-1405-B. This small, complete figure, which was "artfully rendered" (Sawyer and Koerper 2006:14), was recovered from a deposit that yielded radiocarbon dates between ca. 7000 and 2500 cal B.C. These early fired clay items appear to be clearly distinct from later ceramic traditions of the Colorado or Sonoran deserts, including those in the interior of southern California such as the Cuyamaca Complex (True 1957, 1970). Although these ceramic traditions also include both anthropomorphic and zoomorphic figures, they are clearly a late phenomenon and are obviously linked to Southwestern influences from the Hohokam, Mogollon, and Yuman culture areas (True 1957).

Overall, chronological findings from the last decade or two indicate fairly clearly that zoomorphic effigies and fired clay objects were being manufactured on the southern Channel Islands and on the mainland as early as 5400 years ago.

Zoomorphic Stone Effigies, Cogged Stones, and the Millingstone Horizon

Four decades ago, Roberta Greenwood reported results of her investigations at the Browne site (CA-VEN-150) in the Ventura River Valley near the city of Ojai. Greenwood (1962:5) described the site as "large, unmixed, and highly productive." More than 435 m^3 of deposit were excavated at CA-VEN-150, revealing a cemetery, numerous rock features, and an enormous assemblage of ground stone tools, including 1525 manos and 208 milling stones (Greenwood 1969).

Of particular interest at the Browne site were two unusual stone effigies (Figures 2 and 3), which she described in two accounts (Greenwood 1962, 1967) prior to publishing the site report in 1969. Both specimens were described as "sculptures in-the-round" (Greenwood 1969:46) and both appeared to represent amphibians, one a toad or frog and the other a tadpole or similar intermediate evolutionary form. Both are sophisticated works of art with "formal perfection which cannot be surpassed" (Greenwood 1962:6).

The frog or toad (Figure 2) is made of dense igneous diorite with protruding "eyes" on the dorsal surface, and "pointed jaw, incipient chin and wide mouth" (Greenwood 1962:6). It was found *in situ* approximately 12 inches (30.5 cm) below the surface, at the same depth as numerous ground stone tools near the northern extent of the site away from the burial area. The "tadpole" (Figure 3) is also of dark

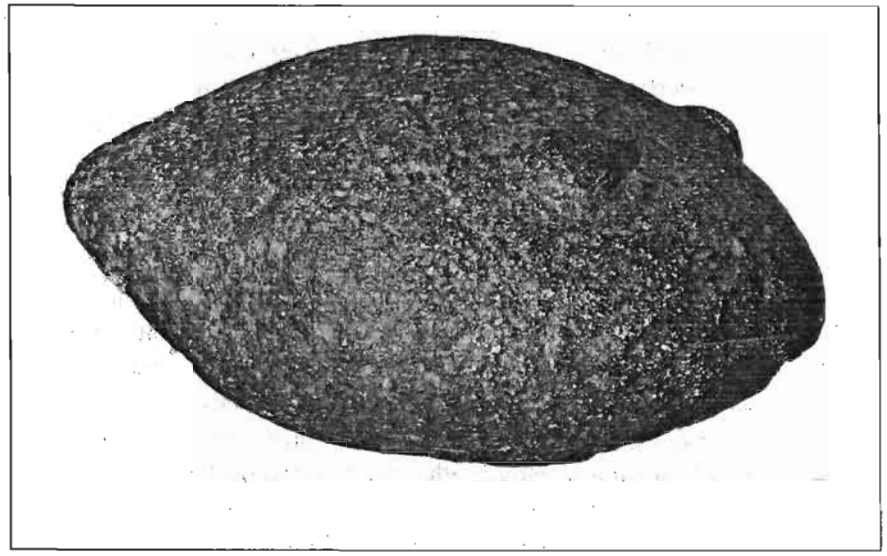

Figure 2. Frog effigy from the Browne site (CA-VEN-150).

diorite with protruding eyes that are enhanced by the artful incorporation of the natural banding in the raw material that runs parallel to the long axis of the piece, "with one broad stripe passing through each eye" (Greenwood 1969:47). The frog measures 16.5 cm in length, 11.8 cm in width at the widest point, and 7.5 cm in height, and weighs 2834 g. The "tadpole" is smaller, measuring 13.2 cm by 7.2 cm by 4.1 cm, and weighing 624 g.

The large number of grinding tools, along with the general lack of flaked stone tools, suggested that the deposit represented a Milling Stone site with "close parallels to the Topanga, Pauma, La Jollan, and Oak Grove assemblages"(Greenwood 1969:58). In addition to the ground stone tools, a fragment of a chert eccentric crescent was also recovered, further attesting to the antiquity of the site. Unfortunately, the chronology of the site could not be determined with any certainty due to a lack of datable material. Especially sparse were faunal remains of any type, including shellfish.

For the present study, we attempted, in collaboration with the Santa Barbara Museum of Natural History (the holder of the Browne site collection) to remedy this situation by submitting faunal material from the site for radiocarbon dating. Unfortunately, these efforts proved fruitless, as the material did not contain sufficient datable collagen. Another researcher (Patricia Lambert, personal communication 2009), however, was able to secure a date from one of the few pieces of shell found at the site. This date, first reported here in Table 1, returned an age

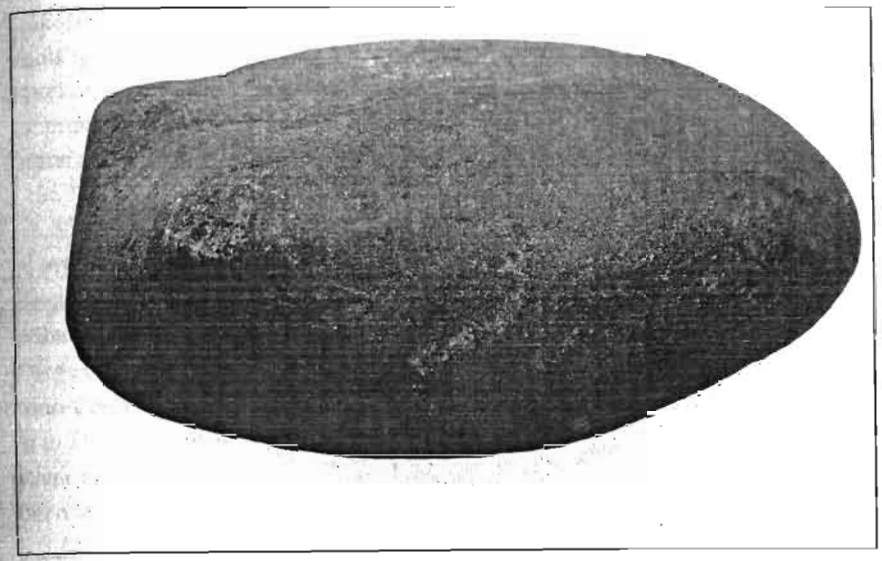

Figure 3. Tadpole effigy from the Browne site (CA-VEN-150).

of 3822 ± 35 radiocarbon years before present (1540 cal B.C.), the equivalent of King's (1990:28) M1 period.

The few obsidian artifacts recovered from the site (n = 4) were also measured for hydration and sourced in an attempt to further refine the site chronology. All specimens were identified as Coso glass, with a range between 5.03 and 7.15 microns, or roughly 1090 B.C. to A.D. 730 according to the hydration conversion rate established for the Coso Volcanic Field (Gilreath and Hildebrandt 1997). These data and the radiocarbon assay seem to reflect only minor, relatively late site components represented by a few hopper and cobble mortars and pestles. However, we feel, as does Roberta Greenwood (personal communication 2009), that the dates do not accurately reflect the age of the predominantly Milling Stone occupation of the site. Regrettably, these findings do nothing to clarify the age of the frog and tadpole effigies.

More firmly dated is a single fish effigy (Figure 4) from CA-SLO-1797, the Cross Creek site in central San Luis Obispo County (Fitzgerald 2000; Jones et al. 2002). Cross Creek is a stratigraphically discrete shell midden that contained features and a large assemblage of milling equipment and cobble core tools. A suite of 14 radiocarbon assays indicated that the majority of site materials (and all of those below 50 cm) date to the early Holocene (ca. 8350-7440 cal B.C.). Two radiocarbon dates from above 50 cm reflect minimal use of the site during the late Holocene.

The fish effigy, which fits easily into the palm of one's hand, was recovered from the 120-130 cm level of control unit 33. It measures 7.13 cm in length, 3.99

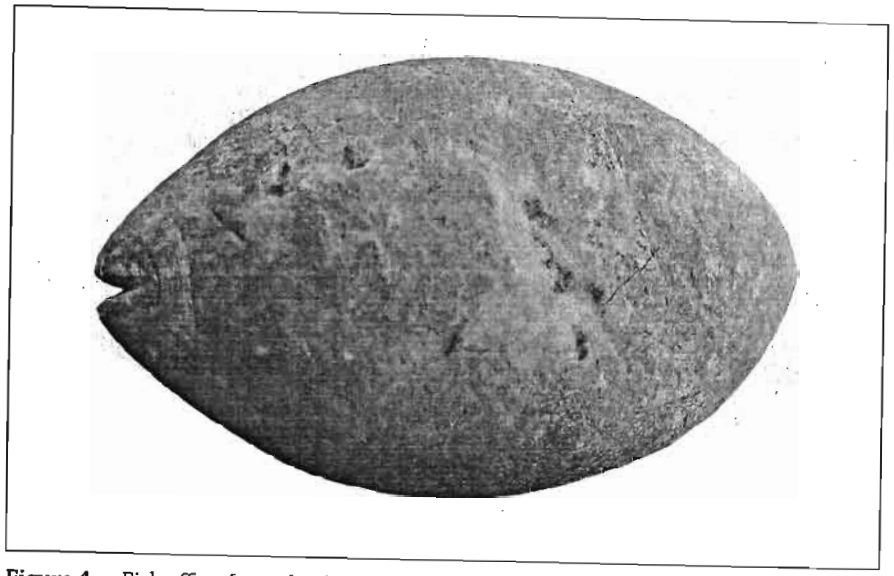

Figure 4. Fish effigy from the Cross Creek site (CA-SLO-1797).

cm in width, and 2.86 cm in thickness, and weighs 117.2 g. It was rendered from a quartzite pebble with an oblate ellipsoid shape, and upon first glance appears to be a notched stone or fishing weight. Closer examination, however, shows that the artifact displays delicate shallow incisions on both ends that are perpendicular to the long axis of the stone. These "slits," which measure approximately 6.6 mm, are far too small and shallow to have served any practical application and, as such, are more likely representative of a mouth. Also visible on one pointed end are very finely incised, concentric circles that encompass and highlight the incision. These delicately carved circles make a clear impression of the marking around the mouth of a fish. The heavily patinated figure appears to have been otherwise unmodified (e.g., pecked or ground) and bears no signs of use as a tool. The slightly flattened, football-shaped pebble from which this effigy was manufactured appears to have been carefully chosen for its natural zoomorphic profile, and thus needed little modification to form the abstract representation of a fish.

Unlike the previously described fish and sea mammal effigies, the stone effigy from Cross Creek was found within a firmly documented archaeological context near the bottom of a buried midden deposit. The level from which the effigy was recovered (120-130 cm) is bracketed by two dates; one from the 80-90 cm level (5800 cal B.C.) and one at a depth of 140-150 cm (7740 cal B.C.). These findings suggest that, at a minimum, this effigy is 7750 years old, and perhaps as old as 9600 years, making it one the oldest pieces of representational art in western North America. Equally

important is the fact that this artifact was found in close association with grinding tools typical of the California Milling Stone Horizon. Although it is only a single specimen, we consider its presence in an early Holocene Milling Stone deposit to be an important clue as to the possible age and origins of this form of representational stone art. Few would have considered such a time depth possible, but Greenwood (1969) keenly recognized this possibility 40 years ago.

If the enigmatic cogged stones may be considered a form of representational art, as suggested by Apodaca (2001), then they too are an example of Milling Stone-aged artistic expression. In California, cogged stones have a geographic distribution ranging from the Ventura-Los Angeles county line in the north to San Diego County in the south, and inland to the southwestern corner of San Bernardino County (Koerper and Mason 1998). Their highest concentration, however, is in Orange County and particularly at two sites: CA-ORA-58 on the Santa Ana River and CA-ORA-83 (the Bolsa Chica site), where hundreds of examples have been found (Eberhart 1961; Herring 1968; Martz 2004).

Although there remains some disagreement on their antiquity, most archaeologists believe that cogged stones date to the Milling Stone Horizon (Koerper and Mason 1998; Moratto 1984; Wallace 1978). In southern California, the Milling Stone Horizon dates to at least 7000 cal B.C. (Rosenthal and Fitzgerald 2009). Despite their ubiquity in Orange County, however, few well-dated examples exist. One exception is from CA-ORA-183 where a cogged stone was dated between 3460 and 3206 cal B.C. (Cottrell and Del Chario 1984). An earlier but less securely associated date of 5560 cal B.C. was reported from CA-ORA-1432 for a cogged stone made of red ochre (Koerper and Mason 1998). This early Holocene date compares well to dozens of uncorrected radiocarbon assays from the Bolsa Chica site that range between 6020 and 5040 cal B.C. (Martz 2004). Evidence of cogged stone manufacture has also been found at Bolsa Chica, prompting Martz (2004:11) to assert that the site served as a distribution center "and the focus of an Early Holocene ceremonial complex that extended along the coast."

Representational Art, the Southern Santa Barbara Channel Islands, and the Middle Holocene Western Nexus

During the past 15 years, the archaeology of the southern California bight has experienced a number of important research advances (Byrd and Raab 2007). Numerous large-scale projects on the mainland and the southern Channel Islands have resulted in the formulation of new theories about old problems. Most prominent among these theories are new ideas about the timing of Uto-Aztecan language expansion in southern California. It has long been acknowledged that the

Southern Channel Islands and adjacent mainland were occupied by Takic-speaking peoples (e.g., Kroeber 1907, 1925). It has also been assumed that the tradition of stone effigies and other art forms that arose was associated with the intrusion of Takic-speakers (the "Shoshonean Wedge" of Uto-Aztecan languages) into southern California (Salls 1988).

The question of when this intrusion occurred is a matter of considerable debate, with estimates ranging from cal A.D. 600 to as early as 3500 cal B.C. (Moratto 1984; Sutton 2009). Most linguists argue for a relatively late arrival of Takic speakers into southwestern California based upon their internal diversity, which is "roughly comparable to that of the Romance languages" (Golla 2007:75), or approximately within the last 2000 years. Other scholars have introduced a somewhat different scenario based largely on the distribution of the relatively rare *Olivella* grooved rectangular (OGR) beads. Based on direct dating of specimens from southern California and the northwestern Great Basin, this bead type has been assigned to a narrow window of time between ca. 3550 and 2550 cal B.C. (Jenkins and Erlandson 1996; Vellanoweth 2001), and some scholars believe that the distribution of this type represents a Uto-Aztecan interaction sphere between the Great Basin and the southern coast and islands at this time.

According to various researchers, this sphere represents an ancient migration route and/or trade between linguistically linked yet distant populations some 5000 years ago (Byrd and Raab 2007; Howard and Raab 1993; Kennett et al. 2007). If true, it places Uto-Aztecan speakers on the south coast and southern Channel Islands considerably earlier than linguistic analysis (e.g., Golla 2007) suggests, but this interpretation is based largely upon the limited geographic distribution of OGR beads (i.e., the southern Channel Islands and adjacent mainland, and the northwestern Great Basin). The known range of OGR beads, however, has been expanded beyond the ethnographic distribution of Uto-Aztecan languages, with examples appearing notably in historic Chumash territory (King 1990), the San Francisco Bay Area (Rosenthal and Meyer 2004), and the southwestern and central San Joaquin Valley (Bethard and Basgall 2000), an area traditionally assigned to the Penutian-speaking Yokuts (Kennett et al. 2007). That *Olivella* beads were widely traded very early in California and beyond is well established (Davis 1961; Fitzgerald et al. 2005), which makes assumptions on population movements based solely upon the presence or absence of bead types less than credible.

As Porcasi (1998) pointed out, some of the locations that have produced OGR beads have also yielded fired clay objects (e.g., the Irvine, Encino Village, and Eel Point sites). The co-occurrence of these artifacts suggests a general fluorescence of artistic creativity on the mainland and on the southern Channel Islands beginning around 5000 years ago.

Following the lead of Howard and Raab (1993), Porcasi (1998), Jenkins and Erlandson (1996), and Kennett et al. (2007) have suggested that OGR beads may mark an interaction sphere between widely separated Uto-Aztecan speakers that forms a cultural boundary between them and the proto-Chumash people of the northern Channel Islands and the Santa Barbara mainland. Sutton and Koerper (2009:1) supported the concept of this interaction sphere and have renamed it the "Middle Holocene Western Nexus." They also expanded the trade items to include spherical or stone balls, large obsidian bifaces, and lozenge stones that are purportedly distinct from typical southern California charmstones (Sutton and Koerper 2009). While the utility of these three other artifact types as markers of an interaction sphere between southern California and the northwestern Great Basin remains to be seen, their proposal that materials and ideas were "accomplished by small groups of travelers moving between the major centers" (Sutton and Koerper 2009:21) is a reasonable one. They differ significantly from Howard and Raab (1993) and Kennett et al. (2007), however, on the identity of the interacting parties in these two regions during the middle Holocene.

Drawing upon an exhaustive review encompassing linguistics, the archaeological record, anthropometric and osteometric data, and ancient DNA analysis, Sutton (2009) proposed a model of Takic expansion in which he asserted that Northern Uto-Aztecan speakers who had settled in the southern Sierra Nevada and western Mojave areas about 5000 years ago began to migrate in a southwestern direction by 1500 cal B.C. According to Sutton (2009:65, 67), southward migrating Penutian groups and inland Chumash pushed the proto-Gabrielino/Cupan speakers toward southern California, who in turn "replaced the existing Millingstone (Hokan, proto-Yuman) populations [that were] either forced to move south or east or were eliminated." Sutton (2009:67) then proposed that "by about 3,200 BP, the proto-Gab/Cupan pushed out onto the southern Channel Islands...and replaced the biologically Chumash-like populations there."

This more linguistically defensible view of the Takic expansion into coastal southern California comes on the heels of the recent recognition that the Chumashan family of languages is not a derivative of the Hokan superfamily but rather a linguistic isolate (Golla 2007). This linguistic isolation is presumed to denote great antiquity, which for the pre-Yukian language has been estimated as early as 8500-8000 cal B.C. (Moratto 1984). An equal antiquity may be assigned to the proto-Chumashan languages, taking into consideration the now well-documented terminal Pleistocene occupations of the northern Channel Islands (Erlandson et al. 2007). Although it is difficult to reconcile linguistic reconstructions with archaeological complexes of great antiquity, it appears that a greater time depth for the proto-Chumash language is harmonious with the notion of an ancient archaeological presence along

the southern California littoral. As summarized by Jones and Klar (2007:310), it is "tempting to speculate that the Millingstone Culture also represents an adaptive outgrowth in southern and central California by Paleo-Coastal speakers of a pre proto-Chumashan language."

Summary and Discussion

This review of the distribution and chronology of zoomorphic effigies, cogged stones, and fired clay objects was presented in order to demonstrate that these compelling items have a much greater time depth than has previously been assumed. It is apparent that these artifacts were present by at least 3000 cal B.C. on both the southern Channel Islands and the mainland. A fish effigy found at the Cross Creek site on the central coast that may date to 9600 years ago suggests a deep connection between this art form and the Millingstone Horizon. The "frog and tadpole" effigies from the Browne site are problematic in that, despite their association with an extremely large assemblage of milling slabs and handstones (a widely recognized signature of the Milling Stone Horizon), they may only date to ca. 1540 cal B.C. Nevertheless, this time frame exceeds the dates assigned to most other effigies on the mainland by at least 2000 years. Cogged stones, on the other hand, seem firmly associated with the Milling Stone Horizon, dating at minimum to the latter part of the early Holocene (ca. 5500 cal B.C.).

The fired clay objects found at the Little Harbor site, the Irvine site, and elsewhere appear to be an indigenous middle Holocene development rather than products of contact with late prehistoric cultures of the American Southwest. As for the identity of the makers of these items, it is unlikely that during the middle Holocene these people were Uto-Aztecan speakers. Rather, the "Middle Holocene Western Nexus" interaction sphere was more likely between Penutian-speakers who were moving into central California from the north and east, and resident Hokan-speakers (Sutton and Koerper 2009). That the Hokans were proto-Chumashan speakers remains a possibility.

There are problems with this interpretation, however. If by the middle Holocene all of the Channel Islands were occupied by a single proto-Chumashan group, it would be expected that more zoomorphic effigies of this time frame would be present on the northern Channel Islands (see Blackburn and Hudson 1980). Also problematic is the absence of OGR beads from the northern Channel Islands. Instead, it appears that there were two distinct socioeconomic interaction spheres during the middle Holocene, one on the southern Channel Islands and adjacent coast from Los Angeles south, and the other on the northern Channel Islands and the Santa Barbara Channel mainland as suggested by Howard and Raab (1993). Differences in the distribution of zoomorphic effigies are consistent with this division for the late Holocene when the Takic speakers were clearly in place, but less so for earlier times.

Other possible explanations for the middle Holocene creation and distribution of effigies and OGR beads include the presence of a now-extinct Hokan-speaking people (Laylander 2007:6), or perhaps a non-Hokan presence on the southern islands and coast based upon an apparent substratum of borrowed words in Uto-Aztecan that are neither Chumash or Yuman, as suggested by Bright and Bright (1976:202). That an early Holocene culture was present on the southern Channel Islands is well documented at Eel Point on San Clemente Island (Cassidy et al. 2004). It may well be that during the early Holocene, successive waves of linguistically unrelated people passed through Channel Islands, leaving little behind until a more permanent presence was established ca. 3500-3000 cal B.C.

No matter what their linguistic identity was, these early coastal people seemingly were assimilated by Gabrielino/Cupan speakers who remained on the southern Channel Islands and the adjacent mainland in Orange County until historic contact. This process likely took a considerable amount of time, and as noted by Golla (2007), the "Shoshonean Wedge" was not a single event but a series of non-synchronous population movements throughout southern California. Laylander (2007:6) seemingly agreed with Golla's opinion on the nature of the population replacement, stating that the Shoshonean Wedge "may be too firmly wedged into the archaeological literature to be easily withdrawn, but 'Takic Expansion' would be a better designation for the event."

Although the exact timing of the arrival of the Takic-speaking Gabrielino remains in question, ultimately they did share many similarities with their northern Chumash neighbors. They both exhibited a complex sociopolitical organization and both used the plank canoe for travel and trade. They were both, as Heizer and Elsasser (1980:47) reported, "the most skilled in the arts." The likenesses between the two are especially pronounced when it comes to the subject matter of this article, the manufacture and style of zoomorphic stone effigies. These parallels do not appear to be random or accidental but rather a conscious cultural transmission by artisans from one generation to the next. This development of a recognizable style is apparently deeply rooted in time and in the beliefs of the supernatural and the spirit of the animal rendered as art. The level of artistic expression perhaps best embodied by the Browne site zoomorphic effigies represents an original and creative stoneworking innovation unique in prehistoric western North America. As such, these compelling talismans are survivors of an ancient art form that is uniquely Californian.

Acknowledgments

The authors thank John Johnson, Raymond Corbett, and Jan Timbrook, all of the Santa Barbara Museum of Natural History, for allowing the authors access to and assistance with the Browne site collection. We also extend our thanks to Patricia Lambert of the Anthropology Department at Utah State University for sharing her radiocarbon date from the Browne site. We also thank Roberta Greenwood for contributing her personal photographs of the frog effigy and her insight on the Browne site itself. We also thank John Edwards for translating our abstract into Spanish. Thanks also go out to Tim Carpenter and Richard Hughes for their obsidian hydration and sourcing analysis. Lastly, we thank Lynn Gamble, Mark Raab, an anonymous reviewer, Allika Ruby, and the *California Archaeology* editors for their constructive comments and encouragement in completing this article. Any omissions or errors in this publication remain the sole responsibility of the authors.

Notes

1. Meighan did not assign specific traits to his three types of effigies he found at the Little Harbor site (CA-SCAI-17). A general description of the three types is as follows: Type 1 has a bulbous end similar to a golf club with a single long flattened fin like appendage. Type 2 are elongated or pointed ovals that have a generic fish form, and Type 3 are simply long flattened and somewhat pointed specimens that Meighan thought were the broken tips of Type 1 effigies (1959:395).
2. It is unlikely that Meighan (1959:392) was referring to suspected modern forgeries when he suggested that the effigies recovered from the Little Harbor site were "the forerunners of the beautifully made whales, hook shaped stones, and other effigy forms of the protohistoric Canaliño culture."

References Cited

Apodaca, Paul
2001 Cactus Stones: Symbolism and Representation in Southern California and Seri Indigenous Folk Art and Artifacts. *Journal of California and Great Basin Anthropology* 23:215–228.

Bethard, Kenneth R., and Mark E. Basgall
2000 *Archaeological Investigations at CA-MER-295: An Early Period Cemetery and Residential Area on the San Joaquin River Merced California* (Draft). Manuscript on file at Cultural Heritage Section, California Department of Parks and Recreation, Sacramento, California.

Bright, William, and Marcia Bright
1976 Archaeology and Linguistics in Prehistoric Southern California. In *Variation and Change in Language*, by William Bright, pp. 189–205. Stanford University Press, Stanford, California.

Byrd, Brian F., and L. Mark Raab
2007 Prehistory of the Southern Bight. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 215–227. Altamira Press, New York.

Cameron, Constance
1983 Birdstones of Orange County. *Masterkey* 57:63–67. Southwest Museum, Los Angeles.
1988 Birdstones and Their Associations. *Pacific Coast Archaeological Society Quarterly* 24:54–62.
2000 Animal Effigies from Coastal Southern California. *Pacific Coast Archaeological Society Quarterly* 36:30–52.

Cassidy, Jim, L. Mark Raab, and Nina A. Kononenko
2004 Boats, Bones, and Biface Bias: The Early Holocene Mariners of Eel Point, San Clemente Island, California. *American Antiquity* 69:109–130.

Cottrell, Marie G., and Kathleen Del Chario
1984 Archaeological Investigations of the Tomato Springs Sites. *Pacific Coast Archaeological Society Quarterly* 20:1–76.

Davis, James T.
1961 Trade Routes and Economic Exchange Among the Indians of California. *Reports of the University of California Archaeological Survey* 54. University of California, Department of Anthropology, Berkeley.

de Cessac, Léon
1882 *Observations sur des fétiches de Pierre sculptés en forme d'animaux découverts a l'Île de San Nicolas (Californie)*. Revue d'ethnographie 1:30–40. (Translated by Nancy E. Heizer and reprinted in University of California Archaeological Survey Reports 12:1–5, 1951. Berkeley.)

Desautels, Nancy A., Henry C. Koerper, and Jeffrey S. Couch
2005 A Birdstone and Phallic Pestle Cache from CA-ORA-365. *Journal of California and Great Basin Anthropology* 25:109–118.

Drover, Christopher E.
1978 Prehistoric Ceramic Objects from Catalina Island. *Journal of California Anthropology* 5:78–83.

Drover, Christopher E., Henry C. Koerper, and Paul E. Langenwalter II
1983 Early Holocene Human Adaptation on the Southern California Coast: A Summary Report of Investigations at the Irvine Site (CA-Ora-64), Newport Bay, Orange County, California. *Pacific Coast Archaeological Society Quarterly* 19:1–84.

Eberhart, Hal
1961 The Cogged Stones of Southern California. *American Antiquity* 26:361–370.

Erlandson, Jon M.
1994 *Early Hunter-Gatherers of the California Coast*. Plenum Press, New York.

Erlandson, Jon M., Torben C. Rick, Terry L. Jones, and Judith F. Porcasi
2007 One If By Land, Two If By Sea: Who Were the First Californians? In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 53–62. Altamira Press, New York.

Fitzgerald, Richard T.
2000 *Cross Creek: An Early Holocene Millingstone Site*. The California State Water Project, Coastal Branch Series Paper No. 12. San Luis Obispo County Archaeological Society, San Luis Obispo, California.

Fitzgerald, Richard T., Terry L. Jones, and Adella Schroth
2005 Ancient Long-Distance Trade in Western North America: New AMS Radiocarbon Dates from Southern California. *Journal of Archaeological Science* 32:423–434.

Gamble, Lynn H.
2002 Fact or Forgery: Dilemmas in Museum Collection. *Museum Anthropology* 25:3–20.
Gamble, Lynn H., Phillip L. Walker, and Glenn S. Russell
2001 An Interactive Approach to Mortuary Analysis: Social and Symbolic Dimensions of Chumash Burial Practices. *American Antiquity* 66:185–212.
Gamble, Lynn H., Glenn Russell, Chester King, and Jean Hudson
1996 *Distribution of Wealth and Other Items at the Malibu Site, CA-LAN-264*. American Indian Studies Center and Institute of Archaeology, University of California, Los Angeles.
Gilreath, A. J., and W. R. Hildebrandt
1997 *Prehistoric Use of the Coso Volcanic Field*. Contributions of the University of California Archaeological Research Facility No. 56, Berkeley.
Golla, Victor
2007 Linguistic Prehistory. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 71–82. Altamira Press, New York.
Goldberg, Carol, Michelle Titus, Roy Salls, and Rainer Berger
2000 Site Chronology on San Clemente Island, California. *Pacific Coast Archaeological Society Quarterly* 36:31–40.
Greenwood, Roberta S.
1962 A Stone Carving from the Browne Site. *Masterkey* 26:4–7, 38. Southwest Museum, Los Angeles.
1967 A Second Stone Sculpture from the Browne Site. *Masterkey* 41:84–87. Southwest Museum, Los Angeles.
1969 *The Browne Site: Early Milling Stone Horizon in Southern California*. Memoirs of the Society for American Archaeology No. 23.
Harrington, John P.
1942 Cultural Element Distributions: 19, Central California Coast. *University of California Anthropological Records* 7:1–146.
Harrison, W. M.
1964 *Prehistory of the Santa Barbara Coast, California*. Ph. D. dissertation. Department of Anthropology, University of Arizona, Tucson.
Harrison, W. and E. Harrison
1966 An Archaeological Sequence for the Hunting People of Santa Barbara. In *UCLA Archaeological Survey Annual Report* 8, pp. 1–89. Department of Anthropology, University of California, Los Angeles. Reference not in text
Heizer, Robert F., and Albert B. Elsasser
1980 *The Natural World of the California Indians*. University of California Press, Berkeley.
Herring, Alika K.
1968 Surface Collections from ORA-83, A Cogged Stone Site at Bolsa Chica, Orange County. *Pacific Coast Archaeological Society Quarterly* 4:3–38.
Hoover, Robert L.
1974a Some Observations on Chumash Prehistoric Stone Effigies. *Journal of California Anthropology* 1:33–40.
1974b An Unusual Stone Effigy from Southern California. *Masterkey* 48:32–34. Southwest Museum, Los Angeles.
Howard, William C., and L. Mark Raab
1993 *Olivella* Grooved Rectangular Beads as Evidence of a Mid-Holocene Southern Channel Islands Interaction Sphere. *Pacific Coast Archaeological Society Quarterly* 29:1–11.
Hudson, Travis
1978 An Unusual Stone Effigy from San Clemente, California. *Journal of California Anthropology* 5:262–266.
Hudson, Travis, and Thomas C. Blackburn
1980 *The Material Culture of the Chumash Interaction Sphere*. Vol. IV, Ceremonial Paraphernalia, Games, and Amusements. Ballena Press and Santa Barbara Museum of Natural History, Santa Barbara, California.
Jenkins, Dennis L., and Jon M. Erlandson
1996 *Olivella* Grooved Rectangle Beads from a Middle Holocene Site in the Fort Rock Valley, Northern Great Basin. *Journal of California and Great Basin Anthropology* 9:214–231.
Jones, Terry L., and Kathryn A. Klar
2007 Colonization, Culture, and Complexity. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 299–315. Altamira Press, New York.
Jones, Terry L., Richard T. Fitzgerald, Douglas J. Kennett, Charles H. Miksicek, John L. Fagan, John Sharp, and Jon M. Erlandson
2002 The Cross Creek Site (CA-SLO-1797) and Its Implications for New World Colonization. *American Antiquity* 67:213–230.
Kaufman, T. S.
1976 Environmental Analysis of the Little Harbor Archaeological Site, Santa Catalina Island, California. Unpublished Master's thesis, Department of Anthropology, University of California, Los Angeles.
Kennett, Douglas J., Brendan J. Culleton, James P. Kennett, Jon M. Erlandson, and Kevin G. Cannariato
2007 Middle Holocene Climate Change and Human Population Dispersal in Western North America. In *Climate Change and Cultural Dynamics: A Global Perspective on Mid-Holocene Transitions*, edited by David G. Anderson, Kirk A. Maasch, and Daniel H. Sandweiss, pp. 531–557. Academic Press, New York.
King, Chester D.
1990 *Evolution of Chumash Society: A Comparative Study of Artifacts Used for Social System Maintenance in the Santa Barbara Channel Region Before A.D. 1804*. Garland Publishing, New York.
Koerper, Henry C., and Armand J. Labbé
1987 A Birdstone from San Diego County, California: A Possible Example of Dimorphic Sexual Symbolism in Luiseño Iconography. *Journal of California and Great Basin Anthropology* 1:110–119.
Koerper, Henry C., and Roger D. Mason
1998 A Red Ochre Cogged Stone from Orange County. *Pacific Coast Archaeological Society Quarterly* 34:59–72.
Koerper, Henry C., Armand J. Labbé, Christine Prior, and R. E. Taylor
1995 An Accelerator Mass Spectrometer (AMS) Radiocarbon Assay on a Bone "Hook Stone." *Journal of California and Great Basin Anthropology* 17:121–125.
Kroeber, Alfred L.
1907 Shoshonean Dialects of California. *University of California Publications in American Archaeology and Ethnology* 4:65–165.
1925 *Handbook of the Indians of California*. Smithsonian Institution, Bureau of American Ethnology Bulletin 78.

Laylander, Don
2007 Linguistic Prehistory and the Archaic-Late Transition in the Colorado Desert. Manuscript on file, ASM Affiliates, Inc., Carlsbad, California.
Lee, Georgia
1981 The Portable Cosmos: Effigies, Ornaments, and Incised Stone from the Chumash Area. *Anthropological Papers* No. 21. Ballena Press, Los Altos, California.
1993 Fake Effigies from the Southern California Coast? Robert Heizer and the Effigy Controversy. *Journal of California and Great Basin Anthropology* 15:195–215.
Lopez, Robert
2004 A Unique Artifact Type From Rancho Attilio, Ventura County. *Journal of California and Great Basin Anthropology* 24:289–294.
Martz, Patricia
2004 National Register of Historic Places Registration Form, Cogged Stone Site ORA-83/86/144, Orange County, California. Manuscript on file, Office of Historic Preservation, Sacramento, California.
Meighan, Clement W.
1959 The Little Harbor Site, Catalina Island: An Example of Ecological Interpretation In Archaeology. *American Antiquity* 4:383–405.
1976 Stone Effigies in Southern California. *Masterkey* 50:25–29. Southwest Museum, Los Angeles.
Meighan, Clement W., and Hal Eberhart
1953 Archaeological Resources of San Nicolas Island, California. *American Antiquity* 19:111–125. reference not in text
Moratto, Michael .J.
1984 *California Archaeology*. Academic Press, New York.
Porcasi, F. Judith
1998 Middle Holocene Ceramic Technology on the Southern California Coast: New Evidence from Little Harbor, Santa Catalina Island. *Journal of California and Great Basin Anthropology* 20:270–284.
Raab, L. Mark, Katherine Bradford, Judith F. Porcasi, and William J. Howard
1995 Return to Little Harbor, Santa Catalina Island, California: A Critique of the Marine Paleotemperature Model. *American Antiquity* 60:287–308.
Rogers, David Banks
1929 *Prehistoric Man of the Santa Barbara Coast*. Santa Barbara Museum of Natural History.
Rosenthal, Jeffrey S., and Jack Meyer
2004 *Landscape Evolution and the Archaeological Record: A Geoarchaeological Study of the Southern Santa Clara Valley and Surrounding Region*. Center for Archaeological Research at Davis Publication 14. University of California, Davis.
Rosenthal, Jeffrey S., and Richard T. Fitzgerald
2009 *The Paleo-Archaic Transition in Western California. In On the Brink: Transformations in Human Organization and Adaptation at the Pleistocene-Holocene Boundary in North America*, edited by C. Britt Bousman and Bradley J. Vierra. Texas A&M Press, College Station. In press.
Salls, Roy A.
1988 Prehistoric Fisheries of the California Bight. Unpublished Ph.D. dissertation,
Sawyer, William A., and Henry C. Koerper
2006 The San Joaquin Hills Venus: A Ceramic Figurine from CA-ORA-1405-B. In *Contributions from Orange County Presented in Remembrance of John Peabody Harrington*, Henry C. Koerper, ed., pp. 13–34. Coyote Press Archives of California Prehistory, Number 53. Coyote Press, Salinas, California.
Sutton, Mark Q.
2009 People and Language: Defining the Takic Expansion into Southern California. *Pacific Coast Archaeological Society Quarterly* 41(2&3):31–93.
Sutton, Mark Q., and Henry C. Koerper
2009 The Middle Holocene Western Nexus: Interaction Sphere Between Southern California and the Northwestern Great Basin. *Pacific Coast Archaeological Society Quarterly* 41(2&3):1–29.
True, Delbert L.
1957 Fired Clay Figurines from San Diego County, California. *American Antiquity* 22:291–296.
1970 Investigation of a Late Prehistoric Complex in Cuyamaca Rancho State Park, San Diego County, California. Monograph of the Archaeological Survey. *Department of Anthropology University of California Los Angeles*.
Vellanoweth, René L.
2001 AMS Radiocarbon Dating and Shell Bead Chronologies: Middle Holocene Trade and Interaction in Western North America. *Journal of Archaeological Science* 28:941–950.
Wallace, William J.
1978 Post-Pleistocene Archaeology, 9000 to 2000 B.C. In *California*, edited by R. F. Heizer, pp. 25–36. Handbook of North American Indians. Vol. 8. W. C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.
Wallace, William J., and Edith Taylor Wallace
1974 Palos Verdes Carved Stone Effigies. *Masterkey* 48:59–66. Southwest Museum, Los Angeles.