

Five Crescents from Cardwell: Context and Chronology of Chipped Stone Crescents at CA-SMI-679, San Miguel Island, California

Jon M. Erlandson and Todd J. Braje

Abstract

Over the years, about 100 crescents have been documented from archaeological sites along the California Coast. The function of these enigmatic artifacts, generally believed to date to the Early Holocene, has been debated over the years. Roughly 30 percent of the known coastal specimens have come from the Channel Islands, most of them from Santa Rosa and San Miguel. Most of these island crescents were recovered by antiquarians during the early years of archaeological exploration along the California Coast. In this paper we describe a large deflated lithic scatter (CA-SMI-679) located near the east end of San Miguel Island where we have recovered five complete or fragmentary crescents. After briefly discussing the location, structure, and chronology of the site, we describe the recovered crescents. At CA-SMI-679, their association with abundant evidence for biface production, early projectile point types, and the maintenance of hunting equipment suggests that they were utilitarian in nature, possibly used by Early Holocene peoples for hunting birds.

Introduction

Chipped stone crescents are one of the most enigmatic and emblematic artifacts found in coastal California. Several different types of crescents have been recognized from coastal sites from Sonoma County to northern Baja California, including both ‘eccentric’ and non-eccentric varieties (Jertberg 1978; Fenenga 1984)—the latter being similar to crescents found in interior areas across much

of far western North America (Tadlock 1966). The function of these distinctive and diverse chipped stone tools has long been debated, with interpretations ranging from the utilitarian to the symbolic. Wardle (1913) and Heye (1921:72) suggested that Channel Island specimens were used as surgical tools, for instance, while others have described them as specialized scraping or cutting tools (Fenenga 1984). Still others, noting the zoomorphic nature of some varieties, argued that they served as amulets or animal effigies (Ruth 1936) used in “magico-religious activities” (Koerper, Langerwalter, and Schroth 1991:58). The latter includes a bear-shaped specimen that is the official artifact of the state of California (Koerper and Farmer 1987). Many other California scholars have followed the interpretations of crescents by Great Basin archaeologists, viewing them as transverse projectile points, possibly used in bird hunting (Tadlock 1966:672). Transverse projectile points, unlike traditional dart or arrow points, have a broad curved blade rather than a pointed tip. The wide arc or increased impact surface of transverse points would provide a greater margin of error when hunting elusive small game such as

birds (Wheeler 1978:30). Variation in the shape of crescents, however, especially when combined with their distribution over a broad area encompassing both coastal and interior locations, suggests that their function may have varied through space and time.

Whatever their function, crescents are generally thought to be diagnostic of terminal Pleistocene and Early Holocene occupations (Jertberg 1978, 1986; Fenenga 1984; Erlandson 1994). The chronology of their use remains poorly understood, however, as most specimens have come from surface contexts, museum collections lacking detailed provenience, or mainland sites where bioturbation and other sources of stratigraphic mixing prevent precise temporal assignment. Made primarily from coastal cherts, crescents can rarely be dated directly (i.e., obsidian hydration). Where they have been found with datable organic remains or other temporally diagnostic artifacts, however, they are strongly associated with occupations between about 12,000 and 7000 years old. A crescent found at Daisy Cave (CA-SMI-261) on San Miguel Island, for instance, came from a shell midden stratum securely dated between about 10,200 and 8500 cal BP (Erlandson 2005, 2007).

The last comprehensive synthesis of crescents in California was by Gerrit Fenenga (1984) more than twenty years ago. Fenenga presented data on 85 crescents from California, 26 (30%) of which were from the Channel Islands. Although no precise figures are available, somewhat more than 100 crescents have now been found in archaeological sites of the California Coast. In the last few years, we have found several crescents on San Miguel Island, including the Daisy Cave specimen and the five described in this paper. After Fenenga's synthesis, at least two more crescents were found along the western Santa Barbara Coast (Erlandson 1994:176; Erlandson, Rick, and Vellanoweth

2008) and at least two more were housed in the Lompoc Museum collections from northwestern Santa Barbara County (Roger Colten, personal communication, 1987). Macko (1998:104-105) also reported three eccentric crescents from his work at CA-ORA-64, and three more from other Orange County sites. Additional south coast specimens were reported by Koerper, Langenwaller, and Schroth (1991:53, 58) and Gallegos and Carrico (1984, 1985), and still others have undoubtedly been found in coastal California in recent years.

In this paper, we describe five crescents found on the surface of CA-SMI-679, a large lithic scatter recently identified at Cardwell Bluffs near the east end of San Miguel Island. At this time, this represented just the second instance where eccentric crescents found on the Channel Islands could be tied to a specific site or locality. Because no datable organic remains have yet been found at the site, the precise age of these crescents is uncertain, but other temporally diagnostic artifacts found with them support an Early Holocene or terminal Pleistocene age for the artifacts. Before describing the crescents from CA-SMI-679, we provide some background data on the location and nature of the site to help contextualize the artifacts and their possible function.

Location and Structure of CA-SMI-679

Located about 26 miles (42 km) off the Santa Barbara Coast, San Miguel Island is the northwesternmost of California's Channel Islands (Fig. 1). Less than 9 miles (14.4 km) long and 4.4 miles (7 km) wide, San Miguel has a land area of just 14 square miles (37 square kilometers) according to Schoenherr, Feldmeth, and Emerson (1999:261). Often enveloped in cool fog and buffeted by heavy winds, the island's terrestrial flora and fauna are relatively impoverished. For millennia, therefore, it appears to have been a

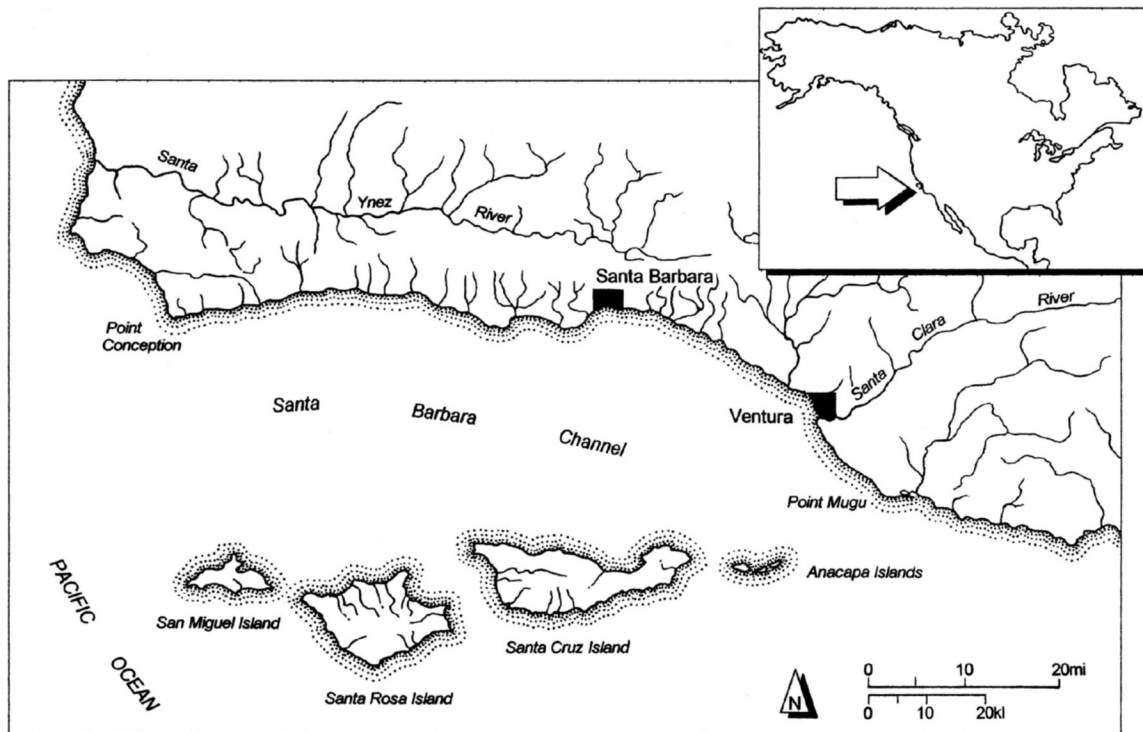


Fig. 1. Map of the Santa Barbara Channel area and San Miguel Island.

wealth of marine resources that was the major attraction for humans to the island. Strong coastal upwelling and extensive kelp forests provide nutrients to a marine ecosystem that is highly productive and remarkably diverse. Today over 150,000 pinnipeds of six different species breed or beach on the island, a variety of shellfish and fish are abundant in nearshore waters, and a diverse array of waterfowl and seabirds feed or breed in island waters.

In recent years, two sources of relatively high-quality chert have been identified near the east end of San Miguel Island: the Cico chalcedonic chert source located at Fish Ridge on the northeast coast (Erlandson et al. 1997) and Tuqan Monterey chert located on the bluffs overlooking Cardwell Point (Erlandson, Braje, and Rick 2008). The Tuqan source, a raised beach deposit that also contains

small cobbles of Cico chert, contains cobbles of Monterey chert very similar to mainland varieties found along the western and northwestern coasts of Santa Barbara County. Both these San Miguel Island cherts appear to have been used extensively by islanders for 10,000 years or more.

Situated on the Cardwell Bluffs adjacent to the Tuqan Monterey chert source (Fig. 2), CA-SMI-679 is a large lithic scatter that offers proximity to high-quality chert cobbles and a commanding view of the east end of San Miguel Island and western Santa Rosa Island. Today, fresh water is available at least seasonally to the south in Cactus Canyon and to the west and northwest in Willow Canyon (Fig.2). CA-SMI-679 is most visible in two shallow and heavily eroded basins where blowing winds and running water have left an extensive scatter of chipped stone tools and tool-making debris lying atop a rugged

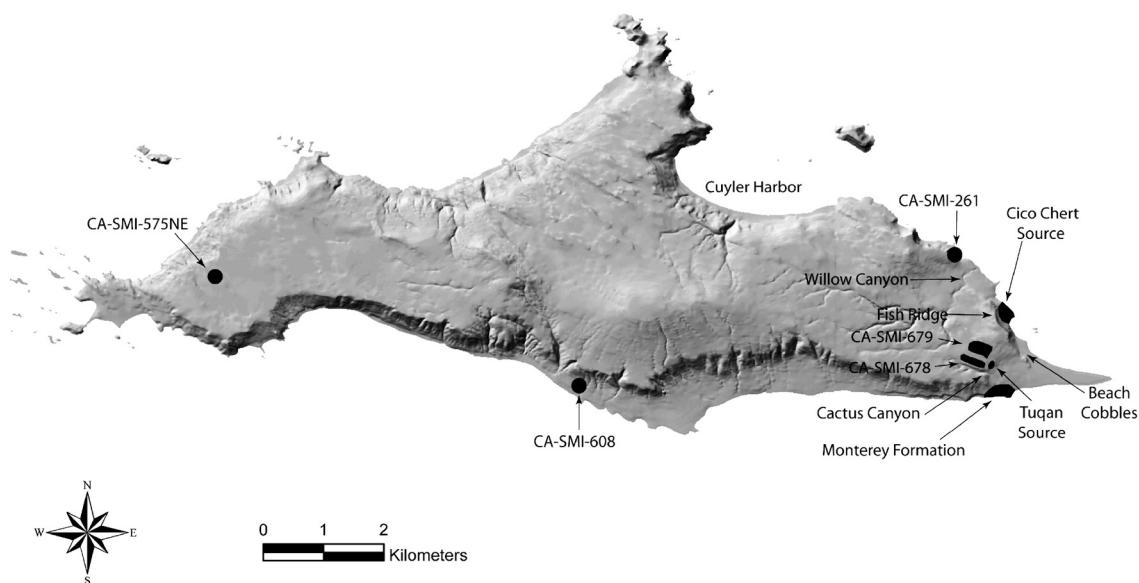


Fig. 2. Map of San Miguel Island showing the Cardwell Bluffs area and other features discussed in the text.

and scoured caliche surface. A few small remnants of intact, artifact-bearing soil are still present within the confines of these basins, showing that the artifacts clearly eroded from this surface soil.

The site is bounded on the east by a steep escarpment leading down to the coast and on the north by a broad, shallow swale. Artifacts can also be found on deflated surfaces to the west and in actively eroding soil escarpments along the southeast margin of the site. Our surface surveys suggest that the site extends for at least 200 meters from east-to-west and 150 meters north-to-south. The full size of the site is not known because heavy vegetation and sedimentary cover limit surface visibility along the southern site margin. It may well be contiguous with a similar site (CA-SMI-678) located on the rim of Cardwell Bluffs and Cactus Canyon to the south, immediately above a primary outcrop of Tuqan chert cobbles. If the two sites are contiguous, they would form a very large lithic scatter extending about 500 meters north-to-south and roughly 250 meters east-to-west.

The most remarkable feature of CA-SMI-679 is the number of complete or broken bifaces found across the site surface. More than 200 bifaces have been collected from the site surface, a highly unusual number for sites on San Miguel Island. These bifaces are made primarily from Monterey cherts, with smaller numbers made from Cico chert. They range from very crude biface preforms to finished projectile points and everything in between.

Also, found on the site surface are numerous large percussion flakes that appear to be associated with core reduction and biface production, as well as occasional hammer stones. Few other formal or expedient chipped stone tools, no ground stone artifacts, and no dense shell midden debris or burned rock usually associated with residential occupations, have been found. We have not yet conducted excavations at CA-SMI-679 to document the full range of cultural materials present in intact site areas, but the nature of the redeposited artifacts on the site surface and the proximity to known chert sources suggest that the site functioned primarily

as a lithic workshop area for the manufacture and maintenance of hunting-related equipment. If this is true, the site may be a palimpsest of numerous occupations over time. As described in this paper, however, these occupations appear to have occurred primarily, if not entirely, during the Early Holocene.

Description of the Crescents

Among the roughly 200 whole or broken bifaces we collected from the surface of CA-SMI-679 are at least five crescents. Several additional artifacts may be crescent preforms or small fragments of crescents. So far, crescents have not been found in clusters, rather they were scattered widely across the surface of the site. In the descriptions that follow, we generally follow Fenenga's (1984) suggested terminology for the morphology of 'eccentric crescents' in California (Fig. 3). All the specimens contain either 'legs' or projections created through lateral notching or other pressure flaking (Fenenga 1984:1-2), but also all are similar to non-eccentric varieties described by Tadlock for a broader area of the western United States.

Two of the five crescents appear to be variants of Fenenga's Type 1b. Specimen #SMI-679-39 is a nearly whole crescent made from gray Monterey chert (Fig. 4). This biface is finely and completely flaked on both sides, with no visible remnant of cortex or the original flake surfaces. Missing only one "leg" (Jertberg 1978) or first lateral projection (Fenenga 1984), this crescent is thin and flat in cross-section and highly symmetrical in outline. It has a relatively broad and shallow axial notch, small 1st lateral notches, and a broad and only slightly convex axial blade. Judging from the degree of finish and symmetry, this appears to be a finished crescent discarded after one leg or lateral stem projection was broken off, probably during use. Maximum length is 4.64 millimeters, with an estimated maximum width of 22.1 millimeters, and a thickness of 6.0 millimeters. Roughly 85 percent complete, the specimen weighs 4.82 grams.

Made from a dark grey or black mottled Monterey chert, specimen #SMI-679-67 is also finely and completely flaked on both faces. This specimen is essentially whole, missing only a small corner of the axial blade and the very end of one "leg" or

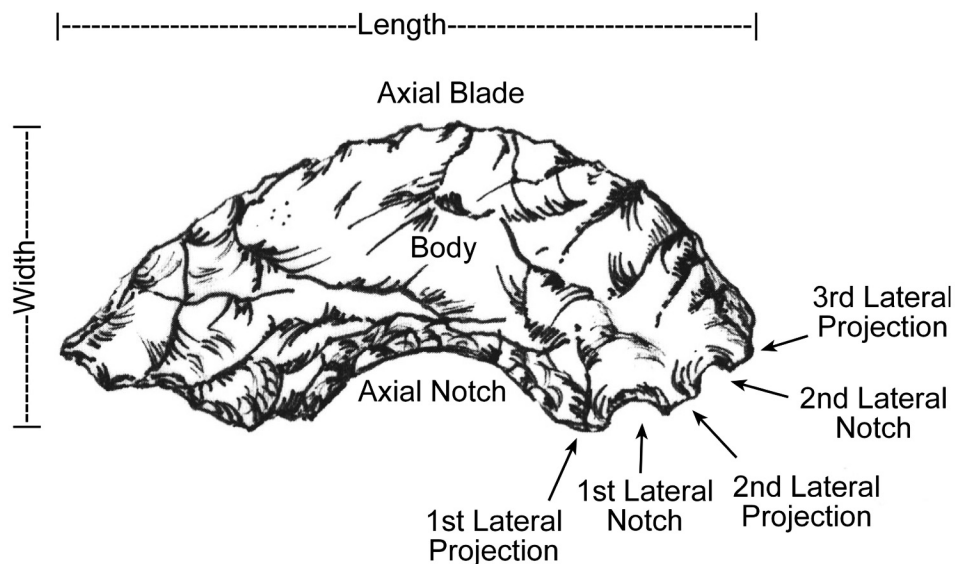


Fig. 3. Terminology for the morphology of chipped stone crescents (adapted from Fenenga 1984).



Fig. 4. Photo of chipped stone crescents from CA-SMI-679. Photo taken by J. M. Erlandson.

first lateral projection. This crescent has a nearly flat axial blade approximately 31.8 millimeters long and lacks any lateral notches. In this sense, it resembles some crescents from the Great Basin, especially Tadlock's (1966:667) illustrated Type III specimens. As a result, SMI-679-67 might best be considered a non-eccentric crescent, but comparison of Tadlock's and Fenenga's typologies shows considerable overlap between eccentric and non-eccentric forms. It is also possible that this specimen was originally an eccentric crescent, with the lateral notches and projections removed through reworking. The maximum length of this specimen

is 36.4 millimeters, with an axial blade length of approximately 31.8 millimeters. Maximum width is 20.2 millimeters and maximum thickness is 5.8 millimeters. Essentially whole, this crescent weighs 4.26 grams. Finally, this specimen has what appears to be two small potlids or heat-crazed fractures on one face that truncate fine pressure flakes, suggesting that it was either heat-treated after completion or burned after deposition.

The three other crescents described here all probably fall into Fenenga's Type 3, although one partial specimen could conceivably have been a

Type 6 variant. Specimen #SMI-679-5 is clearly a complete Type 3A crescent, with a broadly convex axial blade and a series of three small notches and four small projections on either side of a very shallow axial notch. This crescent is manufactured from a marbled and banded grayish-brown Monterey chert, with small remnants of either cortex or siliceous shale inclusions still visible on the surface. A lesser degree of symmetry and finish, including a thicker and less flat cross-section, suggest this crescent may have been a preform discarded before it was completed. The lack of any fractures—suggesting that it was never used—may support this idea. This specimen is 61.3 millimeters long, 21.5 millimeters wide, 6.9 millimeters thick, and weighs 8.1 grams.

Specimen #SMI-679-38 consists of roughly one half of a Type 3A crescent. It appears to be made from a dark gray translucent Cico chert, although it could also be made from Santa Cruz Island chert. It is finely and continuously flaked on both surfaces, with a convex axial blade ending in a small graver-like projection, and has three similar projections formed by three small notches adjacent to what appears to have been a shallow axial notch. This crescent appears to have broken roughly down the center of the axial blade, where a relatively straight hinge fracture is oriented perpendicular to the long axis of the artifact. Given the finished quality of this tool, this fracture seems likely to have occurred during use as the result of an impact. However, the fracture also may have resulted from misdirected flaking during the final stages of production and the creation of the axial notches. Broadly similar to #SMI-679-5 in outline, the estimated length of this specimen is roughly 70 millimeters, with a probable width of 23.8 millimeters, a thickness of 7.2 millimeters, and a projected weight of roughly 11 grams (actual weight=5.2 grams).

Specimen #SMI-679-68 is made from a mottled and banded Monterey chert that is gray and black

in color. Consisting of roughly half of a complete crescent, this specimen is broken down the long axis of the artifact with the entire axial blade missing. This makes it impossible to be certain that it is one of Fenenga's Type 3 crescents and not a Type 6 crescent which is characterized by a concavity in the center of the axial blade. Type 6 crescents are relatively rare, however, with only three specimens identified by Fenenga—two from the Lake Mojave area in the interior, the third from San Miguel Island. What is represented of SMI-679-68 is extremely finely made: very thin and flat, with continuous flaking on both surfaces. It has a broad and shallow axial notch flanked by three shallow notches and lateral projections on one side and at least one notch and two lateral projections on the other. The length of this artifact was more than 55.7 millimeters, with a width of at least 21.0 millimeters, and a probable maximum thickness of 4.8 millimeters. Given the degree of finish and the nature of the complex fracture, it seems very likely that this crescent was broken during use, possibly by an impact fracture.

Other Associated Artifacts

Along with the crescents described above, other diagnostic artifacts recovered from CA-SMI-679 include several stemmed Channel Island Barbed points (a.k.a. Punta Arena or Arena points) that have recently been recognized as Early Holocene time markers. These projectile points, generally small and finely made, have relatively long contracting stems and well-developed barbs (Fig. 5; Justice 2002; Erlandson et al. 2005; Erlandson and Braje 2007; Glassow, Paige, and Perry 2008). Glassow (2006) first identified these distinctive points in stratified Early Holocene contexts at the Punta Arena site (CA-SCRI-109) on Santa Cruz Island, but Rozaire (1976:Plate 14) illustrated a similar specimen found deep in the stratified sequence at Daisy Cave (CA-SMI-261) on San

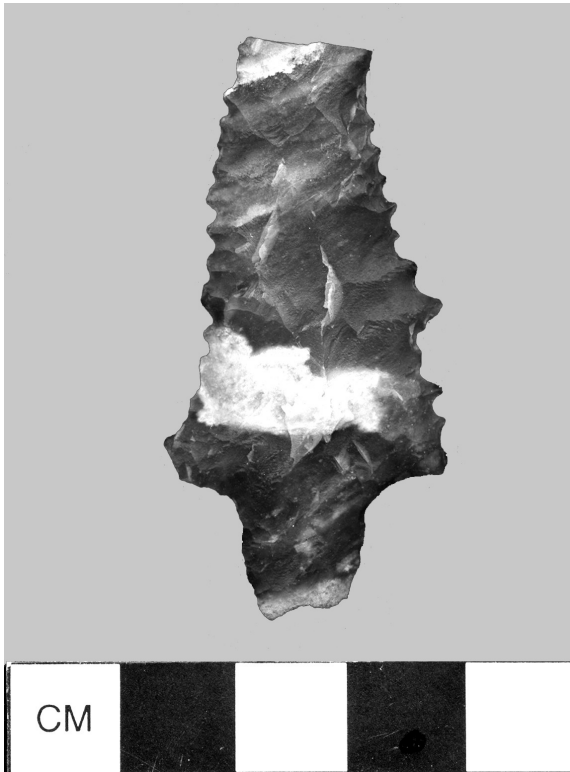


Fig. 5. A stemmed and serrated Channel Island Barbed point fragment from SMI-679.

Miguel Island. More recently, we also recovered five Arena points at a small shell midden (CA-SMI-575NE) on northwestern San Miguel dated to ca. 8400 cal BP (Erlandson and Braje 2007) and another at CA-SMI-608, a more substantial shell midden on the south coast of the island dated between about 8700 and 9600 years ago (Erlandson et al. 2005). Thus, the discovery of several Arena points at CA-SMI-679 provides strong support for an Early Holocene age of the site.

Other chipped stone artifacts observed on the site surface appear to be dominated by debitage from core reduction and biface production, with numerous broken biface preforms in various stages of production. Many of the crescents and other

points recovered appear to have been broken during use, including several proximal point fragments that appear to have been discarded during retooling. The tool-making debris is dominated by large flakes made from Monterey chert, with lesser quantities of Cico chert, and much smaller amounts of metavolcanic rock and quartzite. A few hammer stones were also observed on the site surface, along with several spalls from metavolcanic cobbles that may represent hammer stone fragments. These artifacts all suggest a strong emphasis on biface production at CA-SMI-679, including the manufacture of crescents and Channel Island Barbed points.

Equally instructive regarding the age and function of CA-SMI-679 were those artifacts and cultural materials not observed at the site: we found no ground stone tools, no dense shell midden debris (despite its preservation in similar soils nearby), and no burned rock typical of residential occupations on San Miguel Island. We also found no artifacts commonly found in Channel Island sites dating to the Middle and Late Holocene—no mortars or pestles, large side-notched dart points, shell or bone tools, beads, microblades, or Chumash-style arrow points—suggesting that CA-SMI-679 was utilized primarily, if not entirely, by Paleo-coastal peoples. When combined with the proximity of the site to Monterey and Cico chert sources, these characteristics suggest that CA-SMI-679 was used primarily as a quarry and workshop area, where knives, bifaces, and projectile points were produced and hunting equipment was repaired. Unfortunately, most of the stone artifacts from CA-SMI-679 have been sandblasted and use-wear analysis has been unproductive. If our inferences about the function of the site are correct, however, it seems very likely that the crescents recovered from CA-SMI-679 served a utilitarian function, probably as transverse projectile points.

Summary and Conclusions

The discovery of at least five crescents from a single site on San Miguel Island is extraordinary given the relatively small number of crescents found previously on the Channel Islands and the California Coast. The crescents from CA-SMI-679 are basically lunate forms that can be accommodated within previous typologies for crescents in California (Jertberg 1978; Fenenga 1984) and western North America (Tadlock 1966). One of the specimens (SMI-679-67) is similar to some of Tadlock's Type III crescents from the Great Basin, while three others are similar to some of Tadlock's Type II crescents. However, all the CA-SMI-679 specimens have clearer axial notches, possibly to facilitate hafting (Fenenga 1984), and the lateral projections and notches on the bases of the Type III crescents are more pronounced than most Great Basin specimens.

To us, the similarities between the San Miguel Island specimens, many other Type 3 'eccentric' crescents from various areas in California, and the "non-eccentric" crescents from the western Great Basin appear to be more important than the differences. The similarities suggest that some of the major types of crescents from the Northern Channel Islands share close typological, functional, and possibly cultural affinities with crescents found in coastal and lacustrine settings across a large expanse of the western United States—not unlike some of the early projectile points common to early peoples who lived in the same region.

Although some of the more zoomorphic eccentric crescents from the southern California Coast may have had ritual functions, the context of the few San Miguel Island crescents associated with known sites suggests that they had a more utilitarian function. The idea that they served as transverse projectile points could be consistent with the relatively large

number reported from San Miguel Island, which contains a wealth of sea and shore birds whose bones were used by Paleocoastal peoples for making bone gorges and other artifacts (Erlandson 1994; Rick, Erlandson, and Vellanoweth 2001). Why and when crescents ceased to be made on California's Channel Islands is a topic beyond the scope of this paper, but their disappearance is unlikely to be due to the explanation used by some archaeologists working in the Great Basin (e.g., Tadlock 1966): increased aridity and the drying of freshwater lakes during the Middle Holocene.

Acknowledgements

Field work at CA-SMI-679 was conducted in 2005, 2006, and 2007, with financial support from the National Park Service, the National Science Foundation, and the University of Oregon. In the field we were assisted by Erik Erlandson, Tracy Garcia, Doug Kennett, James Kennett, Torben Rick, and Jack Watts. In the lab, a variety of assistance was provided by Casey Billings, Erik Erlandson, Jena Rizzi, Grant Snitker, and Robert Snowden. We are also grateful to Kelly Minas, Ann Huston, and Ian Williams at Channel Islands National Park for their logistical and administrative support over the years. As always when it comes to California crescents, the work of Gerrit Fenenga was very helpful in interpreting our results.

References Cited

- Erlandson, Jon M.
 1994 *Early Hunter-Gatherers of the California Coast*. Plenum Press, New York.
 2005 An Early Holocene Eccentric Crescent from Daisy Cave, San Miguel Island, California. *Current Research in the Pleistocene* 21:45-47.
 2007 Sea Change: The Paleocoastal Occupations of Daisy Cave. In, *Seeking Our Past:*

- An Introduction to North American Archaeology*, by S. W. Neusius and G. T. Gross, pp. 135-143. Oxford University Press, Oxford.
- Erlandson, Jon M., and Todd J. Braje
2007 Early Maritime Technology on California's San Miguel Island: Arena Points from CA-SMI-575-NE. *Current Research in the Pleistocene* 24:85-86.
- Erlandson, Jon M., Todd J. Braje, and Torben C. Rick
2008 Tuqan Chert: A "Mainland" Monterey Chert Source on San Miguel Island, California. *Pacific Coast Archaeological Society Quarterly* (this issue).
- Erlandson, Jon M., Todd Braje, Torben C. Rick, and Jenna Peterson
2005 Beads, Bifaces, and Boats: An Early Maritime Adaptation on the South Coast of San Miguel Island, California. *American Anthropologist* 107(4):677-683.
- Erlandson, Jon M., Douglas J. Kennett, Richard J. Behl, and Ian Hough
1997 The Cico Chert Source on San Miguel Island, California. *Journal of California and Great Basin Anthropology* 19(1):124-130.
- Erlandson, Jon M., Torben C. Rick, and René L. Vellanoweth
2008 *A Canyon Through Time: Archaeology, History, and Ecology of Tecolote Canyon, Santa Barbara County, California*. University of Utah Press, Salt Lake City.
- Fenenga, Gerrit L.
1984 A Typological Analysis of the Temporal and Geographic Distribution of the Eccentric Crescent in Western North America. Unpublished report, Department of Anthropology, University of California, Berkeley.
- Gallegos, Dennis R., and Richard Carrico
1984 Windsong Shores Data Recovery Program for Site W-131, Carlsbad, California. WESTEC Services, Inc. San Diego.
1985 The La Costa Site SDi-4405 (W-945), 7000 Years Before Present, Carlsbad, California. WESTEC Services, Inc., San Diego.
- Glassow, Michael A.
2006 Michael Glassow's Homepage. <http://www.anth.ucsb.edu/faculty/glassow/RAMP/Masterpage.html>, accessed December 20, 2006.
- Glassow, Michael A., Peter Paige, and Jennifer Perry
2008 *The Punta Arena Site and Early and Middle Holocene Cultural Development on Santa Cruz Island, California*. Santa Barbara Museum of Natural History, Santa Barbara (in press).
- Heye, George G.
1921 Certain Artifacts from San Miguel Island, California. *Museum of the American Indian, Heye Foundation, Indian Notes and Monographs* 7(4):1-211, New York.
- Jertberg, Patricia M.
1978 A Qualitative and Quantitative Analysis of Relationships of the Eccentric Crescent and Its Value as an Indicator of Culture

- Change. Masters thesis, Department of Anthropology, California State University, Fullerton.
- 1986 The Eccentric Crescent: Summary Analysis. *Pacific Coast Archaeological Society Quarterly* 22(4):35-64.
- Justice, Noel D.
2002 *Stone Age Spear and Arrow Points of California and the Great Basin*. Indiana University Press, Bloomington.
- Koerper, Henry C., and Malcolm F. Farmer
1987 A Bear-Shaped Crescentic from Northern San Diego County, California. *Journal of California and Great Basin Anthropology* 9:282-288.
- Koerper, Henry C., Paul E. Langenwalter II, and Adella Schroth
1991 Early Holocene Adaptations and the Transition Phase Problem: Evidence from the Allan O. Kelly Site, Agua Hedionda Lagoon. In, *Hunter-Gatherers of Early Holocene Coastal California*, edited by J. M. Erlandson and R. H. Colten, pp. 43-62. University of California, Los Angeles.
- Macko, Michael E.
1998 Executive Summary of Mitigation Measures Implemented Pursuant to the Operation Plan and Research Design for the Proposed Newporter North Residential Development. Macko Inc., Huntington Beach.
- Rick, Torben C., Jon M. Erlandson, and René Vellanoweth
2001 Paleocoastal Marine Fishing on the Pacific Coast of the Americas: Perspectives from Daisy Cave, California. *American Antiquity* 66:595-614.
- Rozaire, Charles E.
1976 Archeological Investigations on San Miguel Island, California. Report on file, Los Angeles County Museum of Natural History.
- Ruth, Clarence
1936 Research among the Ancient Chumash Village Sites of Northwestern Santa Barbara County. Department of Archaeology, University of Southern California. Ms. on file, Central Coast Archaeological Information Center, University of California, Santa Barbara.
- Schoenherr, Allan A., C. Robert Feldmeth, and Michael J. Emerson
1999 *Natural History of the Islands of California*. University of California Press, Berkeley.
- Tadlock, W. Lewis
1966 Certain Crescentic Stone Objects as a Time Marker in the Western United States. *American Antiquity* 31(5):662-675.
- Wardle, H. Newell
1913 Stone Implements of Surgery from San Miguel Island, California. *American Anthropologist* 15:656-660.
- Wheeler, S. Sessions
1978 *Nevada's Black Rock Desert*. Caxton Press, Black Rock Desert, Nevada.

