

Archaeological Field Research by Los Angeles Museum: Channel Islands Biological Survey 1939–1941

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Abstract. Between 1939 and 1941, the Los Angeles Museum conducted the interdisciplinary Channel Islands Biological Survey, which included research on the natural and human history of the Channel Islands. Arthur Woodward, a curator at the museum, conducted archaeological survey and test excavations on San Clemente, San Nicolas, San Miguel, Santa Cruz, and Santa Rosa islands, as part of this project. Woodward and his crew visited, described, and made collections at a number of archaeological and historical sites on these islands, making extensive maps, notes, and drawings, along with archaeological collections. This early interdisciplinary project was cut short by World War II, and never resumed. This paper is a preliminary report on ongoing research by museum staff in the archives and collections of the Anthropology Section of the Natural History Museum of Los Angeles County. Previously unpublished photographs, maps, and descriptions of sites and artifacts provide new data on Channel Islands archaeology and on the history of scientific research on the islands.

Keywords: Archaeology; Channel Islands; Los Angeles Museum-Channel Islands Biological Survey; Arthur Woodward; San Miguel, San Nicolas, Santa Rosa, San Clemente, and Santa Cruz islands.

Introduction

Between 1939 and 1941, the Los Angeles Museum (now Natural History Museum of Los Angeles County) conducted an interdisciplinary survey of the California Channel Islands. Called the Los Angeles Museum-Channel Islands Biological survey, the goals of this project were to examine the life forms and ecological relationships of the islands, as well as to study their archaeology and geology (Comstock 1939). As originally conceived, the survey was to cover a 5-yr period. Research was conducted by an interdisciplinary team of museum curators, who were to work on all of the islands. The plan for the survey was approved by the museum's Board of Governors in December 1938, and the first field trip was conducted during February 1939. Twelve expeditions

were made over the course of the next 2 yr, before World War II cut short the survey.

One of the members of the survey team was Arthur Woodward, a curator of History at the museum (Fig. 1). Woodward had dropped out of college as an undergraduate, but he pursued a career in history and archaeology, focusing on California and the West. Prior to his work on the Channel Islands survey, he had been involved in archaeological fieldwork in San Luis Obispo, Ventura, and Los Angeles Counties, as well as in Arizona and Utah.

Woodward participated in 6 expeditions, including trips to San Clemente, San Nicolas, San Miguel, Santa Cruz, and Santa Rosa islands (Table 1). He conducted archaeological research and documented historical sites on these islands, excavating at several sites, including Big Dog Cave on San Clemente Island (Woodward 1941a), a site he called Dutch Harbor Site #1 (SNI-51) (Woodward 1941a) on San Nicolas Island, and Prisoners Harbor Site #1 on Santa Cruz Island. He made extensive notes, maps,

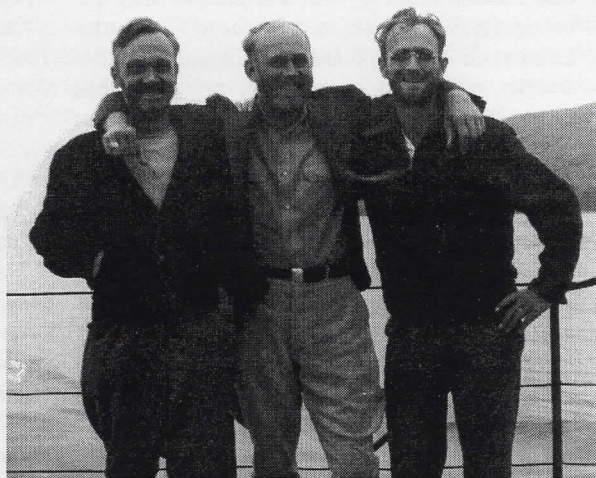


Figure 1. Arthur Woodward (center) and other members of the survey: George Kanakoff (left), unknown (right). LACMNH photograph S-172, courtesy of Arizona Historical Society, Tucson.

Table 1. Los Angeles Museum-Channel Islands Biological Survey expeditions 1939-1941 which included Woodward.

Expedition and dates	Island
First, February 18-19, 1939	San Clemente
Second, April 1-8, 1939	San Clemente
Fourth, July 21-28, 1939	San Nicolas
Fourth, July 28-August 4, 1939	San Miguel
Fourth, August 4-11, 1939	Santa Rosa
Fourth, August 11-19, 1939	Santa Cruz
Fifth, November 8-December 10, 1939	San Clemente
Eighth, April 10-28, 1940	San Nicolas
Tenth, November 23-December 12, 1940	San Nicolas
Thirteenth, November 8-December 14, 1941	Santa Rosa

Table 2. Los Angeles Museum-Channel Islands Biological Survey titles of transit books containing Arthur Woodward's field notes (originals located in Arthur Woodward Collection, Arizona Historical Society, Tucson).

San Clemente Island Fieldnotes April 1, 1939-April 8, 1939; November 8, 1939-December 9, 1939
Archeological Survey of the Channel Islands July-August 1939
(Untitled Notebook) Santa Cruz Island August 16-19, 1939
San Nicolas Island Fieldnotes April 10-28, 1940; November 23-December 12, 1940
Archeological Notes Santa Rosa Island November 22-December 1941

and sketches of the sites and of his excavations, as well as taking numerous photographs of the landscape, the buildings, and the archaeology of the islands he visited. The collections he made remain at the Natural History Museum of Los Angeles County.

Woodward and others were on the islands when Pearl Harbor was bombed on 7 December 1941. The survey ended, and most of the members, including Woodward, dedicated themselves to the war effort during the next several years. The survey was not resumed after the war, and except for 3 short communications to the News and Notes sections of *American Antiquity* (Woodward 1940; 1941a; 1941b), and his brief summary article on San Nicolas Island (Woodward 1957), most of Woodward's work remains unpublished and in many cases forgotten.

Woodward left the museum in 1953, taking with him most of the notes and photographs from work he had done on the islands. Over the next 3 decades, he allowed some researchers interested in his work sporadic access to these materials. After his death, these notes (see Table 2) and photographs were donated to the Arizona Historical Society, Tucson. Copies of additional photographs are located in the Channel Islands Archives at the Santa Barbara Museum of Natural History. These materials, combined with collections, maps, notes, photographs, and progress reports in the Anthropology Section Archives at the Natural History Museum of Los Angeles County, form the basis for ongoing research by museum staff on the collections and research Woodward carried out on the islands.

This paper summarizes some of the work Woodward did on the Channel Islands, as a preliminary step to reporting on the archaeology conducted on this early interdisciplinary project. Unless otherwise noted, descriptions of Woodward's research are based on his field notes (Woodward n.d.).

San Clemente Island

Woodward's first journey to the Island of San Clemente, in February 1939, was a reconnaissance effort to find a site for a field headquarters. During his second trip to the island, in April 1939, Woodward began archaeological survey and testing on the island. He made his third trip to San Clemente Island in November 1939 to conduct excavations.

Woodward's first archeological survey was 2 April-8 April 1939. During this short field season Woodward identified 21 sites, and discovered Big Dog Cave (Meadows n.d.a). As stipulated by the U.S. Navy, only the southern portion of the island was open to research because of military activities on the remainder. Woodward began by surveying the southern coastline of the island.

Woodward's methodology consisted mostly of walkover survey, although he also found sites through informants, including other members of the survey team. Although he was mainly interested in the archaeology of the island, Woodward also made notes on aspects of ecology that he thought would be important to the prehistoric occupation of the island. Woodward made sketch maps and surface collections of the sites he identified, and located them on maps of the island. He also took pictures of some of the sites as well as of natural and cultural features of the island. The results of the survey were summarized in the first progress report of the Channel Islands Biological Survey (Meadows n.d.a).

According to his notes, Woodward found several large sites that he identified as permanent occupations, as well as smaller sites he identified as temporary camps. The larger sites were often associated with good landing areas for canoes, and several were located on the northwest side of China Point on the terrace west of the signal light and at the Marine Camp area. Woodward numbered the sites he found on his map.

Woodward's Site 4 was a large area on the southwestern point of the island. Located on the crest of a dune on reddish subsoil, adjacent to a deep arroyo, the site was roughly 300 x 180 ft and was covered with ground stone. Woodward reported numerous broken mortars, metates, and pestle fragments, as well as a high density of hammerstones.

Smaller sites, which Woodward identified as semi-permanent campsites, were located mostly south of Horse Cove. Rockshelters with shallow deposits of midden debris were also present. Several of these were located

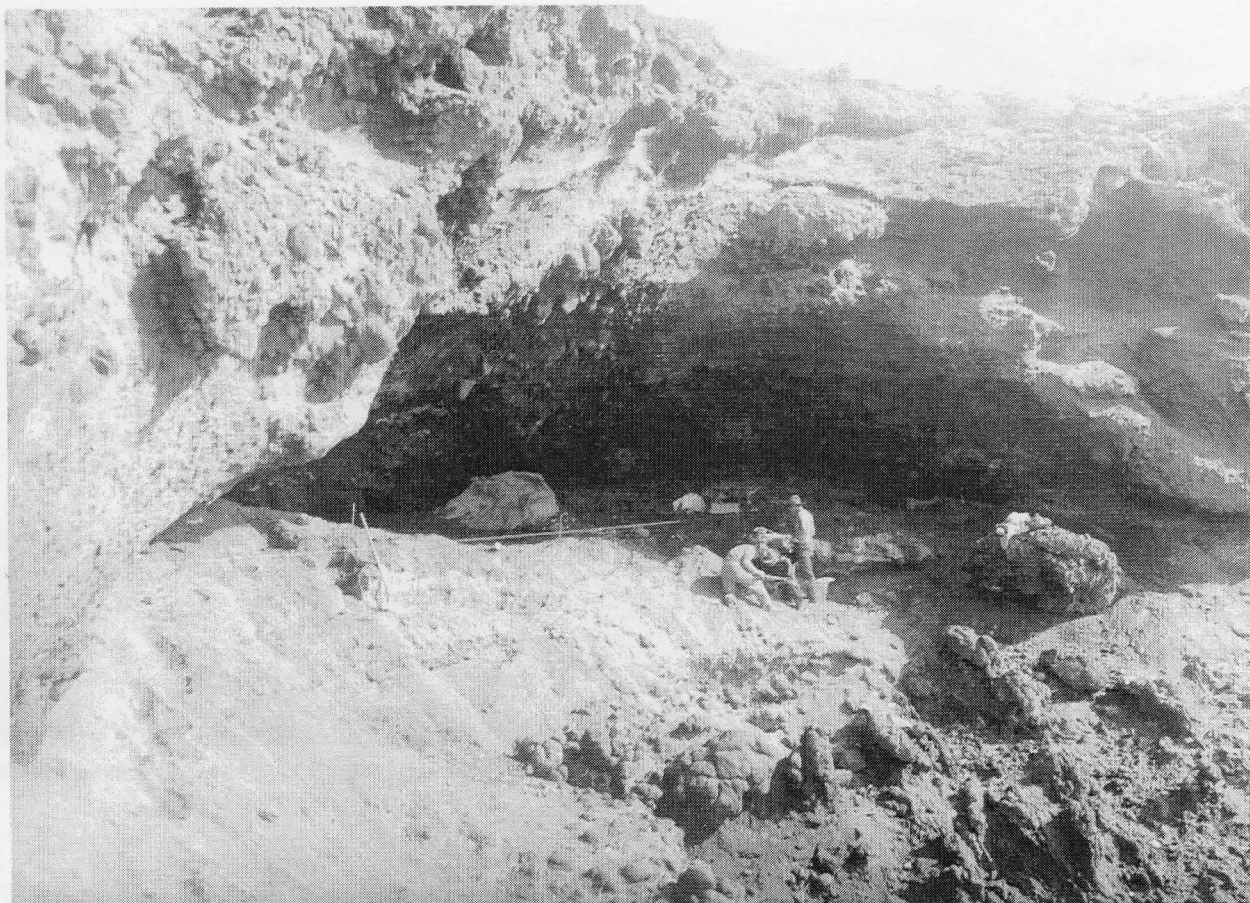


Figure 2. Big Dog Cave, San Clemente Island, 1939. LACMNH photograph S-51, from Anthropology Section Archives, Natural History Museum of Los Angeles County.

1.25 mi south of Pyramid Cove, and others were found on the second terrace 70-80 ft higher on a level bench area in scarp of the hill.

His survey along the coast revealed scattered sites to the northeast of Site 4. Woodward stated that sites were scarce in this region because of the rocky terrain. He believed that this kind of area would have been ideal for fishing and abalone hunting, but not for other activities.

Woodward conducted limited testing at a site on grass swale adjacent to the survey team's camp. Here he dug a test pit 60 x 70 in. across, and 26 in. deep. Twelve inches below the grass line he found a fishhook-making kit, consisting of 8 partially rounded abalone blanks, 3 broken fish hooks, 11 chert flakes, 1 cigar-shaped, ground-stone implement, a bone fishhook barb with tar on it, and 1 tarred, flat, irregular stone. Approximately 18 in. below the surface, he encountered a broken mortar, the pieces of which had been neatly stacked atop one another.

On 5 April, one of the most significant sites on San Clemente Island was discovered. A mammalogist on the survey team, Jack von Bloeker, had been told by a Marine stationed on the island about a large cave that contained a population of bats. When von Bloeker visited the cave, he

found no bats, but extensive evidence of human occupation. Woodward was notified of this find, which he soon decided was an important site (Fig. 2). Woodward began excavation, recovering the skeleton of what he called a dog, human remains, 2 bird burials (one wrapped in fur and the other in cloth) and textile fragments. He named the site Big Dog Cave because of the canine skeleton. Woodward suggested after his initial work that the site represented the "post Mission" period of Native American occupation, dating it to the late eighteenth century or early nineteenth century, based on the presence of mission cloth (Comstock 1939).

During his third visit to San Clemente Island, Woodward focused on the complete excavation of Big Dog Cave, which he felt was an extremely important site because of its historic date. Unfortunately, the discovery and excavation of the site had attracted the attention of some of the Marine personnel on the island, who dug up portions of the site after the survey team left. Upon returning to the site during the latter part of 1939, Woodward discovered to his dismay that his original grid system had been disturbed. He set up a new grid and conducted a complete excavation of the site.

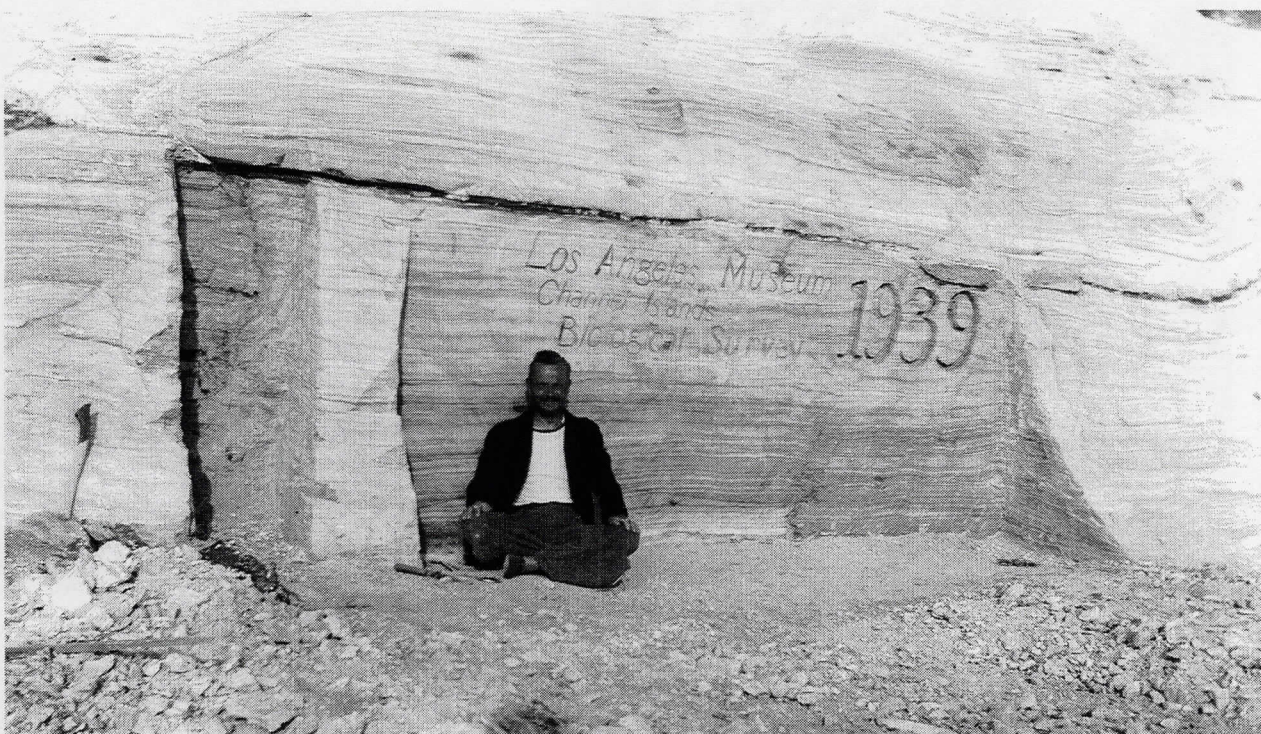


Figure 3. George Kanakoff sitting in front of his inscription commemorating the 1939 survey, "Camp Cholla," San Clemente Island 1939. LACMNH photograph courtesy of Arizona Historical Society, Tucson.

Notable remains recovered from Big Dog Cave included mission cloth, fur robes, canoe planks, canoe-making tools, basketry, fishing materials, historic shoe parts, china, a metal knife, a black glass scraper, and a harpoon. Brief descriptions and illustrations of some of the objects were eventually published by McKusick and Warren (1959). Upon completion of his excavations, Woodward argued that there were 2 occupations of the cave; the first during the prehistoric period, and the second during historic times. Woodward suggested that refugee Gabrielino might have used the cave during the second occupation.

The museum party commemorated a successful season on San Clemente Island in a permanent manner. George Kanakoff, a member of the survey team, cut the following inscription into a bluff approximately 50 yd from camp: Los Angeles Museum-Channel Islands Biological Survey 1939 (Fig. 3).

San Nicolas Island

Woodward visited San Nicolas Island as part of the fourth, eighth, and tenth expeditions of the Channel Islands Survey, during the summer of 1939, spring of 1940, and winter of 1940. On San Nicolas, Woodward conducted more surface survey and some limited testing. He divided the island into quadrants according to the cardinal directions, assigning site numbers to the more

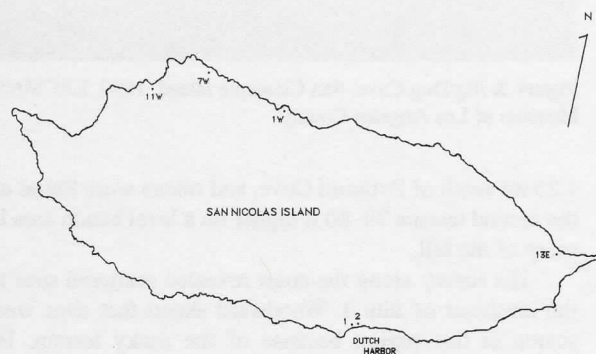


Figure 4. San Nicolas Island, from Woodward's map, showing locations of sites 11w, 7w, 1w, 13e and Dutch Harbor 1 and 2 that he surveyed. Anthropology Section Archives, Natural History Museum of Los Angeles County.

notable sites he encountered in each quadrant, for easier reference (Fig. 4). For example, 6w is the sixth site he numbered on the west side of the island. The ranch house that served as headquarters for the survey marked the base point for assigning site numbers (S. Schwartz 1994, pers. comm.).

Woodward was interested in defining settlement patterns, particularly with respect to the distribution of natural resources and the relative location of areas where shellfish and other marine resources might be exploited. He found more sites on the west end of the island, and argued that the bulk of the prehistoric population would

have lived there. At least 2 sites that he found along ridges behind the beaches (Sites 7w [SNI-11] and 11w) contained the remains of whalebone huts, leading him to conclude that these had been habitation sites.

Woodward also located numerous sites that he defined as middens. He described midden sites on San Nicolas Island as having a characteristic structure, consisting of layers of carbon, chiton plates, red abalone shell, black-abalone shell, and mussel shells interspersed at intervals with layers of sea-urchin remains. Turban shells were also present, in large quantities at some sites. Land-snail remains were also found, but Woodward believed these had been deposited naturally, and not due to human use of these animals.

Woodward selected several sites on San Nicolas Island for excavation. The most notable of these, a site he called Dutch Harbor #1, had been called to his attention by Roy Agee, who leased land on the island. Agee had informed Woodward that there was a site on the west side of Dutch Harbor that contained grass cordage and textiles. This site was a mounded midden located on the south side of San Nicolas Island at the west end of Dutch Harbor on a small knoll about 100 yd east of the only north-south fence line that bisects the island. This is the site now designated as SNI-51, which was later tested by Rozaire (1959; see Schwartz and Martz 1992).

Woodward described the outer surface of the mound as being covered with a thick crust of hardened yellow sandy soil, 4-13 in. thick. On his first trip to San Nicolas, Woodward excavated into the mound an area about 10 x 12 ft long and between 2 and 3 ft deep. He was interested in defining occupational surfaces, and he traced what he believed were 4 separate occupations from this excavation. The stratigraphy of the site consisted of layers of sand, sea-urchin remains, red abalone, and mussel shells that were capped by a layer of burned shell, charcoal, and ash. Woodward states that much of the red abalone was heavily burned, while the urchin remains were unburned.

One layer, approximately 20-24 in. below the surface, was particularly noted for the textiles and floral remains Woodward found sandwiched between layers of sand and shell. He recovered a number of remarkably well-preserved grass textiles from this level, including the remains of skirts, woven mats, mats of unwoven seagrass, and bunches of unworked grass. Woodward stated that the probable source of the sea grass was the reef that juts out at the west end of Dutch harbor and can easily be accessed at low tide. One piece of 2-ply cord from this layer was 50 in. long.

Woodward returned to Dutch Harbor Site #1 during the latter part of 1940, hoping to locate more of the grass textiles previously found. During this field season, Woodward set up a baseline and grid system to help assign provenance to the material he was uncovering. Several large grass textiles were uncovered during this excavation, including 1 partial skirt measuring 2 ft 8 in. x 2 ft. Another

find was a grass mat 2 ft 10 in. long and 2 ft 8 in. wide. The remains of a tarred water bottle were also recovered, along with several small bunches of seagrass found under inverted abalone shells.

Non-textile artifacts consisted of a cache of fishhook blanks, abalone rim implements, bone implements, a large donut stone with incised ornamentation, and hundreds of tarring pebbles. One group of 108 small tarring pebbles was found in an abalone shell. Other artifacts included a whalebone implement with the asphaltum impression of a wooden handle and a large abalone shell containing the bones of 3 or 4 sea otter pups and some decayed seagrass matting.

Woodward tested several additional sites on San Nicolas Island during the survey, including 13e and 1w. He discovered burials at each of these sites, which are described in some detail in his notes. He was interested in artifacts found with burials, but he often re-buried the skeletons and collected only artifacts.

At site 13e, Woodward uncovered a cremation burial in a grave approximately 16 in. deep and 40 in. across. Associated with the cremation were 2 stone pipes, 4 calcined blades, and some beads. Approximately 10-11 in. below these items, still in the pit, were a quantity of uncooked mussel shells resting on a yellow sand layer. Woodward believed that the mussels had been placed in the bottom of the pit, and then the cremated remains with the pipes, beads, and blades were laid on top.

During subsequent excavations at site 13e, in 1940, Woodward uncovered 2 burials between 8 and 12 in. below the surface. The first burial included 2 small steatite vessels, a small pestle, a mortar with a grooved rim, a bone implement, and fragments of 3 donut stones. A second burial, located east of the first, was found facedown in a flexed position; the skull was missing. Three pendants accompanied this, as well as a bone whistle, pieces of burned whalebone, and flat stones. The body was covered by a small, thin slab of rock, and donut-stone fragments. Scraps of whalebone were scattered throughout the earth above the bodies, and they were surrounded by dark midden soil that contained stone and shell debris. The burials lay on top of a cultural level containing fish bones, mussel shells, and pieces of red ochre. Woodward reinterred both of the skeletons in his back dirt.

At site 1w [SNI-8], a mounded midden, Woodward uncovered the remains of 8 dogs and a young seal that he believed had been intentionally buried. Associated with the dog remains was a disarticulated adult human burial, the bones of which were badly broken and partially charred. The part of the skeleton nearest the surface was charred; those deeper in the ground were not. The burial was accompanied by a small deposit of whole and fragmentary olivella shells located 10 in. from the skull. The cranium rested in a large, badly disintegrating abalone shell.

Art Woodward's best published activity on San Nicolas Island was his search for the hut of the "Lone Woman of San Nicolas Island," Juana Maria (Woodward

1941b, 1957; Morgan 1979), which he found by locating landmarks identified by George Nidever in the 1850s. Woodward's flair for the dramatic emerged as he reconstructed the whalebone hut and photographed it with one of the crew members, Marion Hollenbach, playing the role of Juana Maria (Fig. 5).

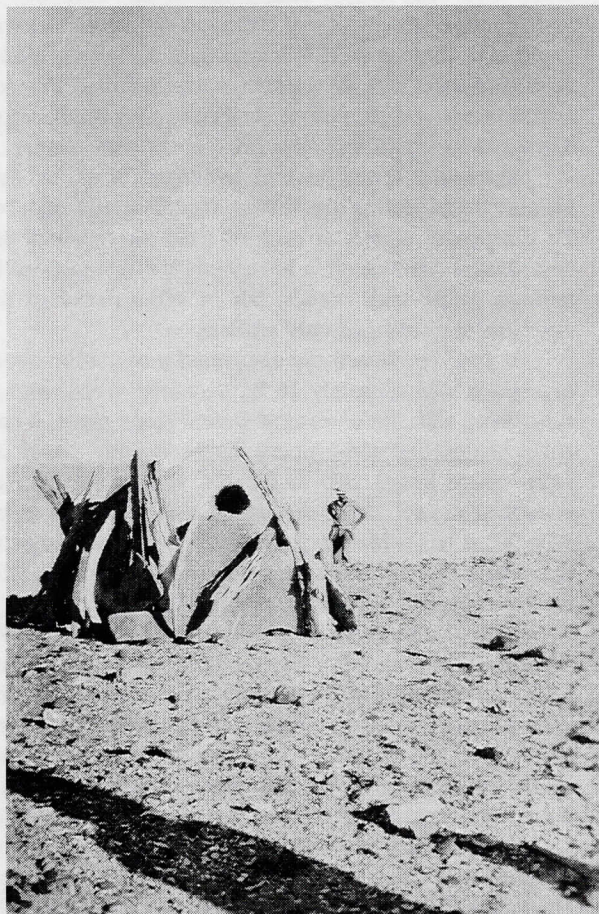


Figure 5. Reenactment of Nidever's encounter with Juana Maria. Chris Henne in background and Marion Hollenbach inside of reconstructed whalebone hut. LACMNH photograph S-340, Anthropology Section Archives, Natural History Museum of Los Angeles County.

San Miguel Island

Woodward visited San Miguel Island during the fourth Channel Island expedition, 28 July 28–4 August 1939. Here he conducted site surveys, numbering sites sequentially according to the order in which he found them. He recorded several sites on this short trip, including Site 7, which he identified as a workshop for mortar production, located on the crest of ridge near an outcrop of large stones, and a looted cemetery site (Site 4). Unfortunately, Woodward's brief work on the island is not recorded in later summaries of research on the island, making correlations with present site numbers difficult.

Woodward described his Site 4, at Cuyler Harbor, as

“a very good site.” It contained a cemetery that A. R. Sanger, a local pothunter, had “vandalized as usual” according to Woodward. Woodward noted scattered skeletal fragments and screened back dirt with a fine screen to recover what he hoped would be a representative sample of beads, pendants, and points from the burials. He also found 16 small drills that were part of a bead-making complex similar to one Walker (1937) had reported recently. Woodward also found olivella shell beads in various stages of manufacture, as well as broken abalone pendants, blister pearl beads, and tarring pebbles. Woodward photographed the site, planning to lobby the U.S. Navy to stop Sanger's looting of this and other sites on the islands.

In addition to island archaeology, Woodward was also interested in the historical aspects of San Miguel and the other islands. For a time during the San Miguel survey, he tried to locate Cabrillo's grave, but after an unsuccessful search concluded that it had probably washed into the sea. He also reported on Rancho Rambouillet, a structure built during the 1880s and 1890s from salvaged shipwreck lumber (Fig. 6). The structure was triangular in shape, with an inner courtyard and porthole windows along the outward-facing walls. Inside the Rancho were living quarters, a forge, workshops, storage rooms, and a small museum. At the time of Woodward's visit, its only occupants were Herbert S. Lester and his family. Woodward also located the remains of the Nidever adobe built in the 1850s, but only 1 wall of that structure was still standing.

Santa Cruz Island



Figure 6. Rancho Rambouillet, San Miguel Island, 1939. LACMNH photograph S-340, courtesy of Santa Barbara Museum of Natural History, Channel Island Archives.

Woodward visited Santa Cruz Island between 11 and 19 August 1939, making several observations regarding the history and prehistory of the island. The most notable archaeological sites he described were those he called Prisoners Harbor #1 and the Willows Site. He also described several historical buildings.

Prisoners Harbor Site #1 (Fig. 7) was a midden site, approximately 350 x 225 ft, located along the mouth of the creek at Prisoners Harbor. Unfortunately, Justinian Carie,



Figure 7. Prisoners Harbor Site #1, and unidentified survey crew member, Santa Cruz Island, 1939. LACMNH photograph S-92, courtesy of Arizona Historical Society, Tucson.

a former resident of the island, had changed the course of the creek so that it now flowed through an eastern portion of the midden. The creek had exposed several burials that Woodward decided to excavate. The midden consisted of layers of burned shell, mostly abalone and mussel, and dark layers of earth, charcoal, and fish and mammal bone. This site is probably the same site Orr excavated in 1950 (see Glassow 1977).

Woodward began by laying out a baseline that he used as his main horizontal reference during excavation and documentation of the site. He cleaned and cut the profile exposed by the creek, and encountered 6 burials within a short distance of each other, between 1 and 2 ft above the current water level. He excavated these, describing and sketching them, and then reinterred the skeletons, collecting only artifacts. This seems to have been his practice in most cases when he encountered burials.

Burial 1 was not described in Woodward's notes. Burial 2 was associated with a few beads and a chert drill. Burial 3 was accompanied by 2 abalone shells plugged with asphaltum; one was covered with red ochre, and the other was inverted over the remains of a human infant. Burial 5 had a portion of a porpoise skull resting against its back.

Burial 4 contained the skeleton of an adult male lying flexed on its side. Woodward described the burial furniture and its context in some detail: 13 in. above the burial was a slab of whalebone 13.5 in. wide, which Woodward states was a grave marker; 3 in. below the slab was a small, red

stone bead. Directly above the burial was a layer of stream cobbles. A donut stone and a harpoon barb were found in association with the skeleton, and a sea-otter bone was found near the head. The body had multiple strands of olivella shell beads and strands containing both olivella and black stone beads around the neck. A cylindrical serpentine bead was located under the chin, and on the left side of the throat, was another similar serpentine bead. Lying near the jaw were abalone-shell pendants that formed part of a neck ornament. Clapsed in the right and left hands was a steatite bowl with olivella-bead inlay. The exterior of the bowl was stained red. The wrists had bracelets of olivella shell beads, and other strands of olivellas were found under right forearm. Near the legs of the skeleton, Woodward found evidence of olivella shells imbedded in red-stained earth.

Woodward also recovered "innumerable" cores and flakes of chert at Prisoners Harbor Site #1. Some of these cores he felt were heat treated. They were evidently from the midden, and not associated with the burials.

Another site on Santa Cruz Island that Woodward tested was one he called the Willows Site, which was located at the mouth of a stream near an old fishing shack. Woodward noted that this site had been dug into by pot hunters. A midden, composed of mussel shell and abalone along with sea lion and otter bones, appeared to be at least 48 in. deep. Thirty-three inches from the surface of this site, Woodward recovered 2 fragmentary blades and blue-green trade beads he dated at ca. 1769-1810. He also



Figure 8. Justinian Carie Home, Santa Cruz Island, 1939. LACMNH photograph S-165, courtesy of Arizona Historical Society, Tucson.

recovered a few shell beads and some asphaltum caulking.

As usual, Woodward noted several buildings on the island. One was the ranch settlement he described as having been built by Justinian Carie during the 1860s. Carie's first home on the island was a small adobe built in 1869 with the help of Indian labor. As he prospered, he built a 2-story, 9-room, adobe, brick, and stone Spanish-style structure complete with ornamental ironwork on the windows and a balcony on the front of the house (Fig. 8). All lumber used in the house was milled. A flower garden outlined with abalone shells completed the structure. According to Woodward's research, all of the ironwork and the bricks were made on the island. The Caries moved from this structure into a wooden frame house in 1911.

Other buildings at the ranch included a small chapel complete with a bell tower and cross, as well as stained-glass windows, a brick garage, and housing for the ranch hands. A large brick winery was also constructed by the Caries to make wine from their vineyards. At one time, the vineyards produced 20,000 gal of Zinfandel. The ranch even had a wooden watch tower complete with telescope to watch for the arrival of approaching ships. A wooden wharf, corral, and a large water tower completed the ranch settlement. At the time of Woodward's survey, the Caries had left the Island; a family called Stanton now lived there.

Santa Rosa Island

Woodward surveyed and tested several sites on Santa Rosa Island, during 4–11 August 1939 and then again between 8 November and 14 December 1941. One of his research goals was to locate the site of Nidever's cave, where a battle supposedly took place in the 1830s between Nidever and several Native Americans (Ellison 1937). After searching the island for several days in 1939, Woodward had finally located the site he believed to be the Nidever cave. This cave was about 20 ft wide, 35 ft long, and 15 ft high at the entrance. It had been used as a dwelling by shepherders who had enclosed the front of the cave with wood and installed a door. In front of the cave was a duck pond.

Woodward records that the middens on Santa Rosa Island were characterized by mussel, abalone, and Pismo clam shell; fish and sea-mammal bones were also present. Cultural material consisted of hammerstones, chert cores, and chert flakes. A common tool he found was a chopper made by chipping an edge on a beach pebble. Knives and blades are often are just "small retouched sections on flakes."

Woodward located what he called a bead-manufacturing site (14e) on a mound site measuring 100 x 50 yd (Fig. 9). The site was covered with thousands of micro-drills, as well as complete and partially finished olivella-shell beads. He tested this site by marking 3 random squares measuring 1 x 1 yd and then collecting all of the artifacts from each square, in order to collect a complete

sample of drill and bead sizes from this site. This method resulted in a large collection of microdrills and olivella beads in various stages of manufacture, along with broken and unused portions of the shell. In addition to artifacts associated directly with bead making, Woodward recovered projectile points, larger drills, and knife blades.

Upon testing site 14e, Woodward noted that the bead making area was separate from the living area of the mound. No bead-making equipment or remains of olivella shells were encountered in the mound, which consisted mainly of midden debris such as fish bones, mussels shells, sea-urchin remains, charcoal, and ash. He believed that the bead makers sat and made the beads outside of the regular living area of the site.

Another bead-making area, site 17e, was located about 150 yd northwest of 14e. According to Woodward, this site was not as densely covered with bead-production debris, and he only recovered a few drills and olivella debris.

Aside from these sites, Woodward located a midden site in Lobo Canyon. This midden consisted of charcoal, bone, mussel, broken stone, and a large quantity of abalone shell. He believed that this was an ideal site for a camp, since it was near shell fish, permanent water, and shelter from the wind. There were also several rockshelters in Lobo Canyon that showed evidence of permanent and temporary occupation. Woodward did not test any of these.

Woodward visited Santa Rosa Island one more time during the latter part of 1941. His efforts consisted of more

survey and some limited test excavations. Surface survey and collecting on sites west, south, and east of Skunk Point, which yielded scrapers, choppers, blades, points, drills bone awls, and harpoon barbs (Comstock 1946). One site near Skunk Point had several heaps of tarring pebbles. However, there was little evidence of shell fish-hooks.

Based on earlier reconnaissance, a midden (site 5e) at Beecher's Bay was chosen for excavation during this phase of the fieldwork. At about 4 ft below the present surface of the midden, they struck large pieces of whalebone that Woodward believed were remains of a whalebone hut (Comstock 1946). The midden proper consisted of burned shell, charcoal, sea mammal, fish, and bird bone. This excavation yielded tarring pebbles, bone awls, beads, and harpoon barbs.

Conclusion

The work of the Channel Islands Biological Survey was interrupted by the bombing of Pearl Harbor on 7 December 1941, and U.S. entry into World War II. Aside from a few brief reports regarding the natural history of the islands, much of the data gathered during the Channel Islands Biological Survey remained unpublished. None of the archaeology was ever formally reported, and Woodward's notes, photographs, and collections became scattered.

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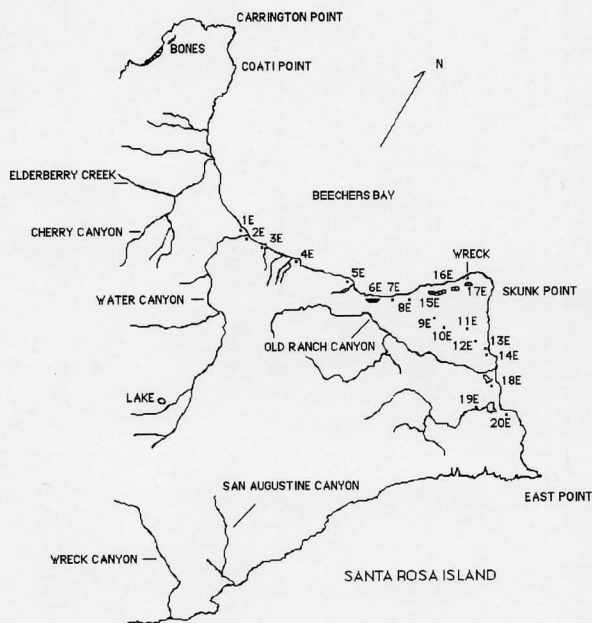


Figure 9. Map of eastern Santa Rosa Island, from Woodward's map showing locations of sites he surveyed, including sites 5e, 14e, 17e, and others surveyed by Woodward. Anthropology Section Archives, Natural History Museum of Los Angeles County.

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