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## Journal of California and Great Basin Anthropology

### Title

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### Permalink

<https://escholarship.org/uc/item/2j79h6hb>

### Journal

Journal of California and Great Basin Anthropology, 12(1)

### ISSN

0191-3557

### Author

Arnold, Jeanne E.

### Publication Date

1990-07-01

Peer reviewed

# An Archaeological Perspective on the Historic Settlement Pattern on Santa Cruz Island

JEANNE E. ARNOLD, Dept. of Anthropology, Univ. of California, Los Angeles, CA 90024.

**R**ECENT archaeological investigations on Santa Cruz Island, the largest of the northern Channel Islands (Fig. 1) and a major population center for the Chumash and their predecessors through several millennia of prehistory, have focused on the intriguing cultural transformations of the prehistoric Middle to Late Period transition at ca. A.D. 1150-1300 (Arnold 1988a, 1990a). This research also has revealed, and not inconsequentially, much about the historic-era Chumash occupation of the island (ca. A.D. 1769-1825). Several key Late Period sites have yielded significant historic components, providing an ideal opportunity to document a great deal more about the placement of the historic native presence on the island than has been known previously.

This paper introduces new data pertaining to historic village locations and analyzes the quality of data we currently have regarding the distribution of the island's historic population. Use of the terms "Middle," "Late," and "historic" correspond generally with the chronology established by King (1981) for southern California. However, recent analysis of bead and microlith production data, representing two of the specialist products of the Channel Islanders, and a series of 25 new radiocarbon dates from several sites on Santa Cruz Island, together suggest that the onset of the Late Period occurred somewhat later than King had suggested, perhaps by about a century, or at ca. A.D. 1250-1300. That, nonetheless, is a

topic explored in depth elsewhere (Arnold 1990a).

I certainly concur with a date of inception for the intensive contact characteristic of the historic era sometime during the late 1760s to mid 1770s, although of course the protohistoric era for the Channel Islands began with Cabrillo's voyage in 1542. For most of the northern islanders, this brief historic period lasted only until the first decade or two of the 1800s, when the majority of those remaining alive were removed to mainland missions and island culture effectively came to an end.

## OBJECTIVES

A more complete understanding of the island's population distribution and settlement structure during the Historic Period will permit researchers to address several important questions. Our ability to analyze both the intensity and pattern of exchange systems within the Channel Islands and across the channel depends on our accurate assessment of village locations and population sizes. An understanding of the settlement contexts within which political and economic activities occurred is equally as important as knowing the specific nature of those activities. We can only evaluate production and goods associated with villages that specialized in manufacturing for external consumption when we know where those villages were located in relation to key resources. Informed analyses of the nature and intensity of social ties, including marriage relations, ritual connections, and economic

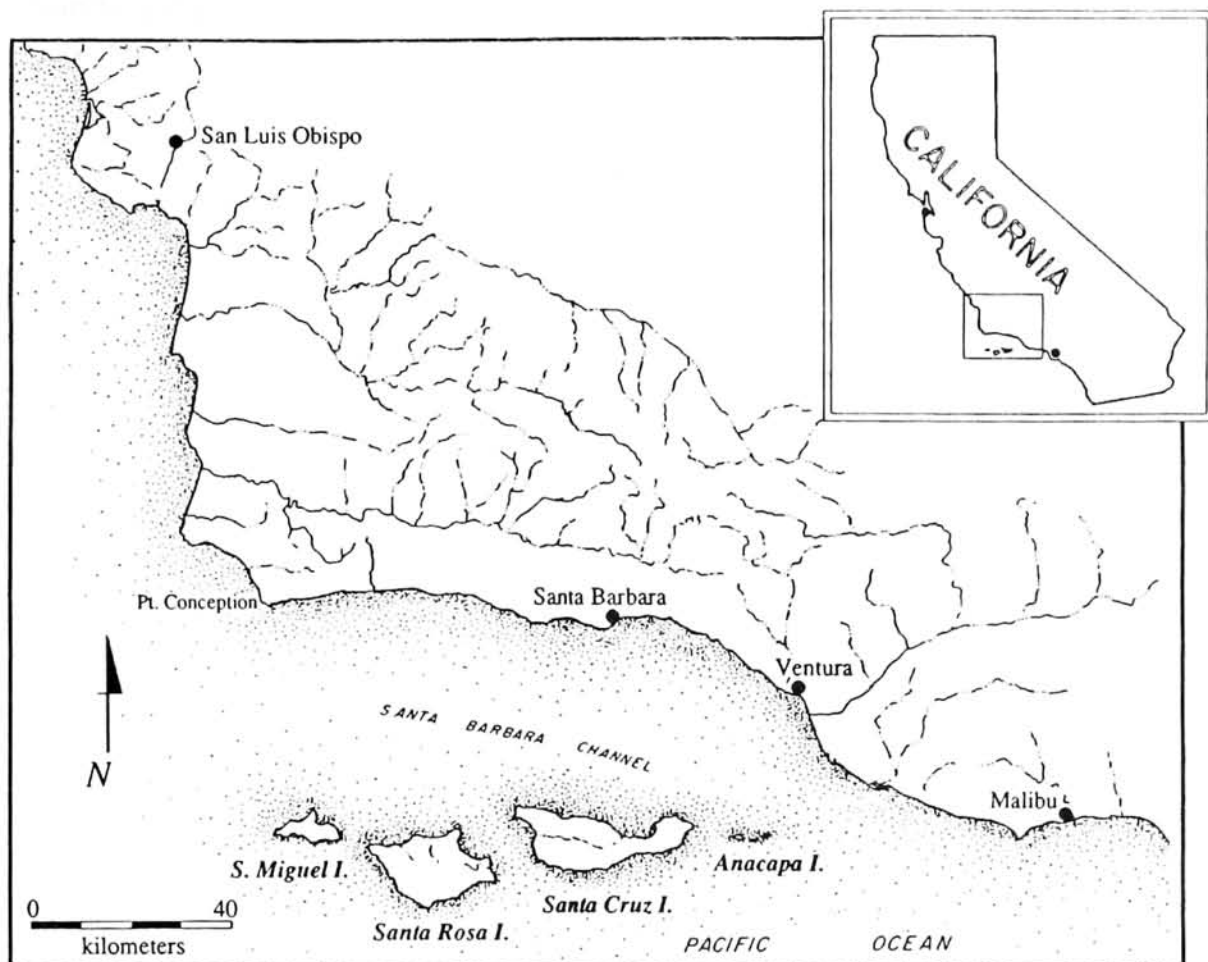


Fig. 1. The northern Channel Islands, California.

arrangements, also require basic information on the spatial patterning of villages. Certainly other kinds of demographic and geographic analyses of island Chumash lifeways may be facilitated by clarification of settlement patterns as well, and it is to these ends that data on village locations are presented.

Prior to the mid 1970s, various attempts to link the ten known historic Santa Cruz Island village names to specific places on the island or to precise archaeological localities exhibited little concordance and reflected no small amount of speculation. This was largely because these attempts were based only in part on the appearance of diagnostic historic artifacts from well-documented site contexts.

There was a tendency to assume that village names could be assigned to the biggest known archaeological sites at places where the best harbors are located by today's standards, with little regard to seeking confirmation of historic archaeological site contents or trying to ascertain what Chumash village location criteria might have been. Beginning with King (1975, 1981), and continuing with Johnson (1982) and Arnold (1983), identifications increasingly have been based on museum collections of historic materials from the sites, reanalysis of ethnohistoric interview data, and archaeological field investigations.

With current excavation and survey data from several Santa Cruz Island sites, it is now

time to reassess links between village names, descriptions of their locations by Chumash descendants, and firm ground-truth data. Available ethnohistoric data suggest that most Chumash villages consisted of rather closely knit clusters or rows of houses (Hudson and Blackburn 1983:323-331), each generally surrounded by significant amounts of discarded food debris. Such a pattern would result in highly visible archaeological village sites that should be easily distinguishable from temporary campsites and special activity areas; the latter site types, among other differences, would lack the defined house pits and intense generalized midden buildup of the main villages. Most of the village names and descriptions from interviews and historic documents seem to apply to very specific places (cf. Johnson 1982) rather than to long stretches of coastline or districts of anchorages or canyons. This too suggests that corresponding archaeological sites can be expected to be characterized by discrete boundaries, and one-to-one relationships between villages and archaeological sites should be possible to assign.

The expectation of rather well-defined village boundaries is largely met on Santa Cruz Island, as limiting factors such as availability of water and ease of access to the most productive shorelines left relatively few major localities that could support the kinds of intensive, year-round occupations that Late Period and historic-era islanders practiced. Most of the large coastal sites are easily classified and bounded and can readily be distinguished from surrounding nonsite and nonvillage areas, using criteria of site size, house pit presence or absence, deposit depth, and density of midden development.

It is beyond the scope of this paper to discuss Middle and Late Period settlement patterns on the island, but suffice it to say that there is, not surprisingly, considerable

continuity between Late and initial Historic village locations (since this chronological boundary represents a rather rapid imposition from the outside), but there is only partial continuity between Middle and Late village locations (Arnold 1990a). I attribute the rather abrupt changes in the pattern of some Middle to Late Period village placements in large part to the effects of oceanic warm water cycles, that probably prompted a number of village relocations at times when the marine resource base would have been stressed due to higher temperature/lower nutrient conditions (ca. A.D. 1150-1250). I suggest as well that the subsistence difficulties associated with oceanic warm water circumstances (off-shore current shifts and/or El Niño cycles) created an opportunity for emerging island elites, who orchestrated a significant economic redevelopment focused on microlith and bead craft production for export, marking the onset of the Late Period (Arnold 1990a). But no such changes marked the Late Period to Historic transition, and consequently, the Late, protohistoric, and early Historic (pre-Mission-era) site settlement systems appear to be relatively continuous.

At this writing, approximately 20% of Santa Cruz Island has been systematically surveyed, including roughly 80% of the occupiable coastal zone where there was fair to excellent access to marine resources. With one exception (described as likely to be erroneous by Johnson [1982]), all of the reported historic villages were directly situated in the coastal zone (almost certainly within a couple of hundred meters of the shore). Virtually all large coastal sites on the island have been noted or formally recorded for many years, so we can state with confidence that few areas of the island remain where unknown historic villages of any reasonable size could still await discovery. As described fully below, however, there are two

zones of some uncertainty, one on the northwest shore and the other on the east tip of the island, areas difficult to reach or unavailable for study until recently.

### HISTORY OF PREVIOUS RESEARCH

A summary of previous reflections about historic village location on Santa Cruz Island must begin with John Johnson's (1982) Master's thesis, in which he discussed ethnographic place names and descriptions recorded by Henshaw (Heizer 1955) and Harrington (1984) and coupled these with the assignments of village names to particular harbors, beaches, or points on the island by Kroeber (1925), Brown (1967), and King (1975). Johnson's Table 16 illustrates well the numerous differences of opinion about village placement between the two principal interviewees on this subject, Juan Estevan Pico and Fernando Librado, as well as among the later interpreters of their remarks.

Juan Pico's statements regarding village locations, evaluated by Johnson as considerably more reliable than Librado's, are mostly geographically descriptive in relation to the first mentioned village, *kaxas*, or "el puerto principal," which is firmly and convincingly linked by Johnson (1982) to the modern principal harbor on Santa Cruz Island, Prisoners Harbor. *Mashchal*, the next village on Pico's list, is described as "en direccion al oeste" (to the west) from *kaxas*; then the next, *l'alale*, is linked with Punta del Diablo (Diablo Point on the north shore), and the rest are listed in relation to these around the perimeter of the island.

Fernando Librado's statements about village location are quite different from those of Pico, and in some cases are considerably more specific. He described the village of *lu'upsh*, for example, as being located on the south shore opposite *kaxas*, and in addition said that the old people told him it might be

at Valley Anchorage. Such specificity might be seen to lend considerable credibility to Librado's descriptions, but indeed Johnson (1982) pointed out that Librado appeared to be quite uninformed about most island village locations. The above description is illustrative of his misinformation: recent archaeological survey and augering work at Valley Anchorage (Arnold 1989) demonstrated that the two major sites on the seacliff there are mostly Middle Period in age. One is Middle to late Middle in age, and the other apparently was abandoned soon after the onset of the Late Period. This suggests that no supporting evidence for Librado's historic village at this location is likely to be forthcoming. Johnson (1982) noted a multitude of problems with Librado's statements about this and various other villages.

Interpretations of village locations by Kroeber (1925) and Brown (1967) were based relatively uncritically on informant statements and difficult-to-interpret and occasionally conflicting historic references, perhaps combined with unconfirmed notions of where it was favorable to live on the island, and where good boat landings/harbors were located. Kroeber (1925:Pl. 48) in fact shows quite clearly that he had only marginal faith in his placement of villages on Santa Cruz Island, listing them all as "Chumash villages approximately located," and Brown (1967:19) simply followed Kroeber's village assignments. King (1975) was among the first to base his assignments of village placements more directly on his knowledge of demonstrably historic collections from specific archaeological sites. (The reader is referred to Johnson [1982] for tables listing Kroeber's, Brown's, and King's village assignments; these are not duplicated here.)

Johnson's (1982) discussion is well-informed by archaeological information current at that time, including the discovery



in 1981 that the archaeological site SCRI-306 at China Harbor had a historic component (Arnold 1983). We were able to determine that this site could be linked to the named village of *lu'upsh* (Arnold 1983, 1987).

Table 1 lists the island's ten known village names (following Johnson's orthography), Johnson's (1982) conclusions about which place on Santa Cruz Island matches each village, and my assignments of places and sites to villages, based largely on newly available archaeological evidence. Figure 2 illustrates these village locations, as justified in the discussion below. Some of the villages are matched with considerable confidence by both Johnson and myself, while others are determined to correspond to different sites; only one (*l'alale*) has not been confirmed by archaeological fieldwork. In the following pages, I discuss pertinent extant archaeological information and some of the data recovered during recent archaeological investigations on Santa Cruz Island which support these assignments.

## ARCHAEOLOGICAL DETERMINATIONS

### *kaxas*

In the group of villages previously determined with some confidence, Johnson (1982) convincingly argued for the placement of *kaxas* at Prisoners Harbor, based on several lines of evidence. A major village site (SCRI-240) located there has yielded glass beads and other historic objects (Olson's unpublished notes [1927-28]; Spaulding's unpublished artifact catalogs [1974]), and Pico placed the village at the main port of the island. Consequently, there seems to be little doubt about the connection between this name and specific site (Fig. 2). This is very important because all of Pico's village place attributions are based on where *kaxas* is located. The surface of this site was heavily vegetated and was disrupted before the number of house

depressions could be recorded, but Father Tapis (1805), noted a population of 124 adults for this very important village. Johnson (1982:111) estimated the full population, including children, to have been about 224 in 1782, prior to the effects of disease and cultural disruption. Furthermore, one of the island chiefs, or *capitanes*, lived at *kaxas* (Johnson 1982:116), marking this village as one of the island's most important.

The population figures used in the analysis below, however, are those acquired from the baptismal records of the mission registers in the region, including Santa Barbara, San Buenaventura, and Santa Inés (Johnson 1982). Father Tapis provided his population estimates of adults for only three of the ten villages on the island, so his figures could not serve as the basis for population estimates across the island. While there are some serious deficiencies with the baptismal population data that we do have, they do at least include numbers from all ten villages and consequently represent the best available record. Mission record data are discussed more fully in sections to follow.

Small-scale archaeological testing of the upper component of the Prisoners Harbor village site (Arnold 1990b) confirmed the presence of historic-era artifacts, principally glass trade-beads of various types. This site retains excellent potential to address many questions regarding historic production, exchange, and social and political processes on the island.

### *liyam*

Repeated historic references that identify *liyam* as a very important village in a number of respects suggest it was in a rather "central" location on the south shore. The village should be identified by a large south coast site. Indeed, the presence of a major archaeological site, SCRI-1, with a substantial

Table 1  
HISTORIC VILLAGE NAMES ON SANTA CRUZ ISLAND AND PROBABLE  
LOCATIONS/ARCHAEOLOGICAL SITES TO WHICH THEY CAN BE LINKED

Chumash Name	Johnson (1982)	Probable Location	Site
<i>kaxas</i>	Prisoners Harbor	Prisoners Harbor	SCRI-240
<i>mashchal</i>	Orizaba Cove	Orizaba Cove	SCRI-434 <sup>a</sup>
<i>l'alale</i>	East Diablo Point	?Cueva Valdaze area	possibly SCRI-436 <sup>a</sup>
<i>l'akayamu</i>	?Northwest shore or Forneys Cove	Just south of Forneys Cove	SCRI-328 and -330
<i>ch'oloshish</i>	?Forneys Cove or Christy Ranch	Christy Ranch	SCRI-236
<i>shawa</i>	?Willows	Morse Point	SCRI-192
<i>liyam</i>	Coches Prietos	Coches Prietos	SCRI-1
<i>nanawani</i>	Smugglers Cove	Smugglers Point	SCRI-506
<i>swaxil</i>	Scorpion Anchorage	Smugglers Cove	SCRI-504
<i>lu'upsh</i>	China Harbor	China Harbor	SCRI-306 and complex of 5 small sites

<sup>a</sup> John Johnson (personal communication 1990)

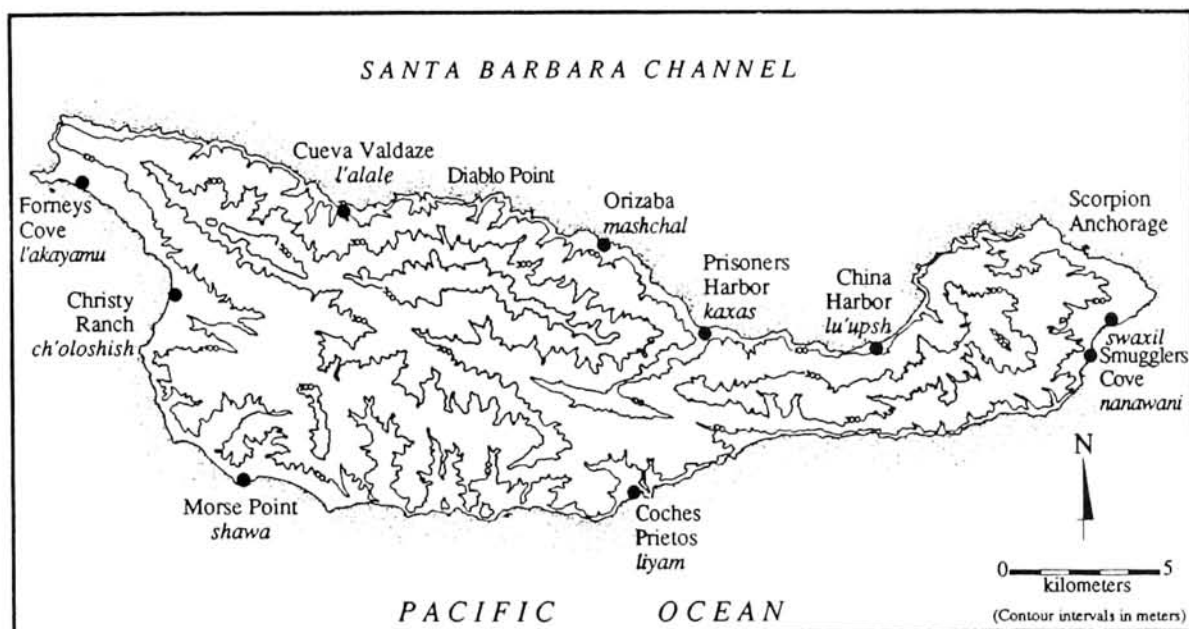


Fig. 2. Historic villages on Santa Cruz Island.

historic component (Olson 1927-28; Glassow 1977) at south-centrally located Coches Prietos, matches Pico's description and suggests that this attribution is solid. Father Tapis (1805) listed 122 adults at this village, and Johnson (1982:111) estimated a 1782 population of 220 persons. This village is sometimes referred to as the capital village of

the island, and it reportedly was home to a Chumash "princess" (Hudson et al. 1977) and to another of the island's chiefs, José "Sudon" *kamuliyatset* (Johnson 1982:117).

#### *lu'upsh*

Our archaeological test excavations at SCRI-306 (China Harbor) in 1981-82 (Arnold

1983) first led to the assignment of the village name *lu'upsh* to this site. The determination was based on the occurrence of glass trade-beads in *in situ* contexts, coupled with Johnson's ethnohistoric research that suggested *lu'upsh* should be a north-shore village east of Prisoners Harbor. Subsequent fieldwork at this site in 1985 and 1988 confirmed the presence of additional small numbers of historic artifacts. This village, we can state with considerable confidence, probably along with four or five companion villages in the immediate vicinity (SCRI-392, -416, -420, -421, -422), constituted the *lu'upsh* complex. The village has a very interesting history of early abandonment, directly attributable to the craft specialization of its inhabitants and their subsequent economic devastation via the introduction of glass beads and steel needles, as described by Arnold (1987:250). This small village (population probably not in excess of 50-60 adults) is not expected to yield large numbers of historic items because of its early date of abandonment. In its heyday, it exhibited a demonstrable economic emphasis on microlith production.

As this research into historic village locations commenced, I shared Johnson's (1982) confidence that the above three village names were quite firmly linked to the three noted sites. I further agree with Johnson's assumption, based on his careful analysis of the remaining seven villages, that two should be located at the east end of the island, two on the north shore west of *kaxas*, and the rest distributed between West Point and Coches Prietos. Further research into Olson's unpublished field notes and recent archaeological fieldwork, suggest several differences in particular placements from those given by Johnson. Nonetheless, proposed village/site linkages neither violate his assumptions nor contradict the information in the historic documents and interviews he cited.

#### *nanawani and swaxil*

Until June 1990, modern archaeological work had not been possible on the eastern tenth of Santa Cruz Island. The owners of this sector of the island had long been unreceptive to scientific archaeological research, and so the last major recorded fieldwork took place there during the late 1920s (Olson 1927-28; Rogers 1929). Now that Channel Islands National Park has established a presence on this end of the island, we were afforded an opportunity to examine major coastal archaeological sites there and sought to link the village names, *nanawani* and *swaxil*, most often attributed to that area, to specific sites.

Even prior to this fieldwork, however, further research I carried out using Olson's field notes revealed that there are two sites, SCRI-506 and -504, with confirmed historic artifacts on this end of the island.<sup>1</sup> Sites SCRI-506 and -504 are at Smugglers Point and Smugglers Cove, respectively, the former about 850 m. south of the latter. The site at Smugglers Cove had long been recognized as containing an historic component (Hoover 1971; Johnson 1982), but only Olson's unpublished field notes reference two glass beads from burial contexts at the Smugglers Point site, SCRI-506.

Based on this evidence alone, we could tentatively link *nanawani*, the smaller village, to SCRI-506 at Smugglers Point, and *swaxil*, a major village (with 203 baptisms, the largest island village population to be recorded at the missions), with site SCRI-504. Although Johnson (1982) suggested that Smugglers Cove was the site of *nanawani*, it seems that his argument in support of that location for the village may be applied equally well to Smugglers Point. He presented compelling baptismal and marriage data for an east-end location, and, furthermore, Pico's description



of the location matches extremely well. Historic artifacts were recovered in 1928 in excavations by Olson at both sites, with especially impressive numbers of glass beads, plus needles, steel knives, copper items, and a small bronze or copper statuette, among other artifacts, coming from burial and midden contexts at SCRI-504, Smugglers Cove. It is consistent with other lines of data that this larger collection and burial population would be linked with the much larger village of *swaxil*.

My argument that *nanawani* is SCRI-506 was greatly strengthened by field investigations in June, 1990, when surface reconnaissance clearly confirmed the presence of historic materials at this site at Smugglers Point. A relatively brief surface inspection of perhaps 5%-10% of SCRI-506 resulted in the observation of five cobalt blue, light blue, and turquoise glass beads. The site is a moderately large, multi-component village, with Middle, Late, and Historic periods all well-represented (based on microliths and beads observed), and at least four house depressions are visible on the surface.

Baptismal population sizes, marriage ties, and the logic of Pico's geographically oriented list also support these assignments nicely. Clearly, the two villages should be near one another, given the seven intervillage marriages noted by Johnson (indeed, this is the second largest number of intervillage marriages recorded on any of the islands, and this placement would make them the two spatially closest historic villages on the island). The burial population is much larger for *swaxil*/SCRI-504 than for *nanawani*/SCRI-506 (Olson 1927-28) and at least six house depressions were sketched by Olson at *swaxil*, versus four at *nanawani*. This suggests that *swaxil* should have been the more populous village, consistent with baptismal information (Johnson 1982).

Furthermore, the historic village at Smugglers Cove may have included both site SCRI-504 and its nearly contiguous neighbor SCRI-505 (SCRI-B-137), directly across the streambed to the south. The latter site was recorded but apparently not tested by Olson in 1928. It was inspected in June, 1990, and was found to have Middle and Late Period artifacts, but surface visibility was poor and potentially hampered observation of small items such as glass beads. None were found, and at this stage we can only speculate that this site may have been part of the historic village of *swaxil*. If it was, the spatial extent of this village could be expanded another 750 m.<sup>2</sup>, to a total of 7,050 m.<sup>2</sup> This figure of more than 7,000 m.<sup>2</sup> does not include the areas between the sites that are now scoured creekbed, plus the large but unknown extent of site volume lost to shoreline and stream erosion on both sides of the creek, and a 2,500 m.<sup>2</sup> low-density deposit on the south end of SCRI-504. Such a large size certainly would be consonant with the large population attributed to *swaxil*. Father Tapis (1805) listed this village as having 145 adults in 1804, the largest adult population noted on Santa Cruz Island. Johnson (1982:111) estimated the population would have been 262 in the year 1782. One island chief made this village his home (Johnson 1982:116).

Finally, according to Pico, *swaxil* should be east and/or north of *nanawani*, near the eastern point of the island (Johnson 1982), and indeed this is fully consistent with the spatial relationships between SCRI-506 and SCRI-504 and various landforms.

Until recently, *swaxil* was linked by some to a known site location at the large and relatively protected Scorpion Anchorage (Johnson 1982:Table 16). However, field investigations in 1990 confirmed expectations based on earlier collections analysis that the site at Scorpion Anchorage (SCRI-507 or

SCRI-B-141) has a Middle Period occupation with abundant Middle Period microblade industry materials. There are no demonstrated historic materials from this location and few Late Period indicators. Indeed, since *lu'upsh* to the northwest and *liyam* to the southwest are rather firmly identified, only these two village names (*nanawani* and *swaxil*) can be assigned to east-end and these can be linked most logically to the two sites in the vicinity of Smugglers Cove. It should be noted, however, that there do remain some tracts of coast between Smugglers Cove and Scorpion Anchorage that have not been formally surveyed, so we cannot reject the possibility that another major historic village could exist in this area. Accordingly, if such a village were ever found, we would have to recognize that the number of major historic occupations on the island exceeded the ten recorded.

### *l'akayamu*

Until recently, three village names have proven more difficult to link directly to site locations on the western and southern shores of the island. These are *l'akayamu*, *ch'oloshish*, and *shawa*. In 1974, Stephen Horne (Glassow 1977) carried out test excavations at SCRI-328, south of Forneys Cove, near the northwestern tip of the island. It was demonstrated clearly that this site has a major historic component, but there has been disagreement about whether this is the village of *l'akayamu* or *ch'oloshish* (Johnson 1982). New information supports the linkage of this site (and an adjacent site) with *l'akayamu*.

During the 1989 field season, we tested one of the complex of sites at this unnamed cove south of Forneys Cove. This site, SCRI-330, adjoins SCRI-328, the demonstrably historic site tested by Horne during his study of protohistoric/historic depopulation and

adaptation (Glassow 1977:136). Both sites should be linkable to a named historic village, and new data from our excavations, including more glass beads from the uppermost levels at SCRI-330, help to substantiate claims that *l'akayamu* probably is that village. If the villages of *mashchal* and *l'alale* are the only two on the north shore west of Prisoners Harbor (i.e., there is no north-shore village more westerly than Cueva Valdaze [*l'alale*]), then SCRI-328/330 almost certainly is *l'akayamu*.

The large number of highly visible house depressions at these two sites (at least 19 total) and the total spatial extent suggest a good-sized village population. However, mission baptismal records show that just 49 people from *l'akayamu* were baptized. This is a puzzling discrepancy in light of the fact that other island villages smaller in area had many more people baptized (Johnson 1982: Table 8), but Johnson noted that at Mission Santa Inés the recording of baptisms was very poor. This mission absorbed most of the populations from west-shore and some south-shore Santa Cruz Island villages; regrettably, the populations of these villages probably were systematically under-represented by numbers of recorded baptisms, and most likely should not be compared directly to baptismal numbers from sites elsewhere on the island.

### *ch'oloshish*

During both the 1988 and 1989 field seasons, some augering or testing work was done at all three of the sites in the Christy Beach area that were candidates for the possible historic village *ch'oloshish*. These are sites SCRI-191, -236, and -257 (Olson and Rogers' numbers SCRI-B-82 and -B-83). Johnson (1982:137) wrote that Olson found pottery at SCRI-B-83, which is equivalent to SCRI-191 and -257 (Olson considered them

the same site), yet this is quite unexpected since neither site has an archaeologically visible historic component according to our recent testing programs. I am unable to find reference to the recovery of pottery in Olson's field notes, so I suspect that the ceramic(s) must be linked with this site in the collections themselves. Olson actually may have found pottery at this site but failed to record it in his notes, although that would be rather extraordinary considering how rare pottery is in Chumash sites.

Extensive testing during recent fieldwork at SCRI-191 revealed that this site is Middle to mid-Late Period in age (Arnold 1989), while SCRI-257 appears to be almost exclusively Middle Period in age, with a short-lived early Late Period component and no known historic component. SCRI-191 may have a historic house depression, if an otherwise anomalous radiocarbon date (Beta 32101) is proven to be accurate, but no historic artifacts have been recovered from the site by any modern archaeological investigations.

The best candidate for a notable historic presence at the Christy Ranch locality is instead SCRI-236. This site has a lengthy Late Period occupation that, based on our recent investigations, appears to include the latter portion of the Late Period, and it has an impressive array of well-defined house depressions on its surface. Rogers (1929:320) clearly stated that historic artifacts were found at one of the Christy Ranch sites. Regrettably, his description of the site location where historic objects were found is rather ambiguous, but enough clues are provided that I am confident his reference is to the SCRI-236 location. Thus far, no historic artifacts have been recovered from 11 auger units placed in SCRI-236 during the 1988 and 1989 field seasons (Arnold 1988b, 1989). However, a small sample of glass beads was recovered at

SCRI-236 during testing of one of the house depressions by UCSB in 1970 (cf. Johnson 1982:137). At the Christy Ranch area, then, we do have archaeological confirmation of historic occupation at SCRI-236.

### *shawa*

During the 1989 field season, we tested the important Late Period site SCRI-192, in the vicinity of Morse Point on the southwestern shore of the island. The upper component of the site yielded, from small-scale testing, a very interesting historic assemblage, consisting of glass trade-beads, needle-drilled *Olivella* wall beads, and production detritus associated with needle-drilled beads (Arnold 1989). The site had not been identified previously as historic, nor had it been linked to one of the village names.

I propose that SCRI-192 is the historic village of *shawa*, based on the described position of *shawa* in relation to *liyam* (Coches Prietos), which Pico said should be to the east of *shawa*, and in relation to *ch'oloshish* (Christy Ranch), which Pico said should be to the north of *shawa*. Indeed, all of these geographic relationships are correct if SCRI-192 is *shawa*. This is a large, well-preserved village with 11 house depressions and abundant historic material.

### *mashchal and l'alale*

The villages of *mashchal* and *l'alale* reportedly are located on the north shore of the island west of Prisoners Harbor (Johnson 1982). This area has not received a great deal of recent attention from archaeologists, largely due to logistical problems in reaching it by land, but during sporadic field visits in the late 1980s, John Johnson (personal communication 1990) recorded an important site at Orizaba Cove, SCRI-434 (originally SCRI-B-158), that yielded a number of clearly historic needle-drilled *Olivella* wall beads. This site has

approximately 11 house depressions and is quite extensive. It appears to match well with the suggested historic location of the village *mashchal*. This village reportedly was home to the fourth Santa Cruz Island chief (Johnson 1982:116).

Johnson also suggested a site in the Cueva Valdaze vicinity that has indicators of Late Period occupation and eight house depressions (SCRI-436; formerly SCRI-B-189) is a good prospect for the location of the historic village *l'alale*. No historic materials have yet been recovered from this site. This placement is only an approximate match with Pico's description of the village of *l'alale*; he equated its location with Diablo Point, and Cueva Valdaze is several kilometers west of Diablo Point. However, systematic field investigations have not yet been conducted along this remote shoreline of the island, and at present we do not know whether *other* candidates for assignment to this historic village name may exist there. It is appropriate to leave this identification as probable but unconfirmed at this point.

### ANALYSIS

In this section, we will evaluate the nature of the correlation between *estimated site size* (using early field notes and maps plus recent field data) and *estimated village population* (using Johnson's baptismal totals obtained directly from the mission records). The objectives here are twofold: (1) to assess the utility and integrity these figures have for study of historic presence on the island; and (2) specifically, to examine the predictive value either has for the other; if we know one, can it be called upon to reliably predict the other?

Several studies have considered the relationships between human population and house and site sizes, with expressions of these relationships usually quantified in the form of

regression models or other types of formulae (e.g., Cook and Heizer 1965, 1968; LeBlanc 1971; Naroll 1962; Wiessner 1974). Archaeologists generally attempt to reconstruct prehistoric population size from measurable site attributes such as house diameters or total site area, using models developed from ethnographic or historic information. Employment of reliable archaeological data on house sizes, floor area, site diameters, etc., or use of accurate population figures from historic or ethnographic observations, permit the formulation of quantified relationships that may be reasonably meaningful.

Cook and Heizer (1968:115) focused on California data in their research, concluding that site size was indeed correlated with human population within specific cultural territories, expressed through a logarithmic relationship. Although that study was relatively convincing, and was consistent with the general conclusions reached by Naroll, Wiessner, and others, the particular data they employed, including overly large estimates of site sizes for the Santa Barbara Channel area, are subject to question. Even the largest village sites on the Channel Islands are smaller than the reported "mean area of village" for the channel region (Cook and Heizer 1968:90-91); a much better figure for mean village size would be about 40%-50% of their figure. This problem no doubt skewed their results, and they acknowledged this in citing the more informed analysis carried out by Brown (1967) for the Santa Barbara area, to be discussed further below. Neither Cook and Heizer's nor Brown's study benefited from the kinds of reliable data sets that are really needed to develop accurate regression formulae for the Chumash area. We still do not have adequate estimates of house sizes and total site area for some of these sites, in part because some houses were destroyed or obscured decades before archaeologists could



make these observations. My approach is conservative, suggesting that a better way to look at the population/site size relationship is a rank order correlation analysis. This avoids placing undue reliance on the quality of these channel-area data. Such an analysis attempts to establish whether a ranking of archaeological sites by size or number of houses is correlated with a ranking of villages by known historic population figures.

Population data are derived from baptismal records from the southern California missions in the late 1700s and early 1800s. These actually indicate the places of birth of the neophytes brought into the fold, not necessarily their village of habitation (Johnson 1982), but they comprise the best data set available to use as approximate indicators of village population sizes in the region. Johnson (1982) provided a detailed justification for the use of baptismal totals as a rough indicator of population. In Table 2 are listed numbers of baptisms in mission records for each named Santa Cruz Island village, and approximate site areas and numbers of houses (if known) for the corresponding archaeological sites.

Archaeological site sizes were calculated from base maps of varying quality, including our 1988 and 1989 transit-generated maps and rough sketch maps by Olson (unpublished field notes) or Hoover (1971). Several of the latter do not show a correct scale, but most were adjusted for this problem by a site revisit. If the proposition is supported that baptismal number can be employed as a useful indicator of archaeological site size, then this exercise could assist with some of the linkages between place names and site locations.

However, there is a distinct lack of correlation between the baptismal totals and approximate site sizes as shown in Table 2. A Spearman's rank-order correlation coeffi-

cient was calculated using the nine village/site combinations for which number of baptisms and site size are available (leaving out *l'alale*). Spearman's  $r$  shows a correlation of  $r = 0.3333$  when comparing the rank order based on site size to the rank order based on number of baptisms. (*Nanawani* was arbitrarily ranked before *lu'upsh* for the baptismal rankings, where both have a count of 61; reversing this rank has a negligible effect on the calculated result.)

Such a low value for Spearman's  $r$  indicates there is an extremely weak, nonsignificant relationship between the two variables of baptismal number and site size. The critical value of  $r$  at  $\alpha = 0.05$  with  $n = 9$  is  $r_s = .600$ . The observed correlation is much smaller than this figure, so we conclude that there is not a statistically significant correlation.

These results suggest three possibilities. First, the simplest and most elegant possibility must be considered: that the number of baptisms is an inadequate indicator of village population size and functions as a very poor predictor of site areal extent. In addition to the fact that the recorded village from a baptismal record is indicative of village of birth more than village of residence, I must add that many factors may intervene to affect reported baptismal numbers for different villages, including differential rates of exposure to epidemics in premissionization years, and substantial differences in the quality of recording at the various missions. It is worth repeating, as Johnson (1982) noted, that Mission Santa Inés was particularly poor in its recording procedures, and many of the west- and south-shore Santa Cruz Island villages whose baptismal totals seem strikingly small very probably were associated with this specific mission. Any kinds of population analyses based on these baptismal numbers alone must be evaluated with this very



Table 2  
BAPTISMAL TOTALS FROM MISSION RECORDS,  
ARCHAEOLOGICAL SITE AREAS, AND NUMBER OF OBSERVABLE  
HOUSE DEPRESSIONS

Village Name	Number of Baptisms <sup>a</sup>	Site	Area (m. <sup>2</sup> ) <sup>b</sup>	Number of Houses <sup>c</sup>
<i>kaxas</i>	130	SCRI-240	6,000	unknown
<i>mashchal</i>	69	SCRI-434	ca. 9,000	11
<i>l'alale</i>	5	?SCRI-436	unknown	?8
<i>l'akayamu</i>	49	SCRI-328 and -330	8,600	19-20
<i>ch'oloshish</i>	28	SCRI-236	5,400	15
<i>shawa</i>	9	SCRI-192	5,600	11
<i>liyam</i>	116	SCRI-1	6,580	unknown
<i>nanawani</i>	61	SCRI-506	3,800	4
<i>swaxil</i>	203	SCRI-504	6,300	6
<i>lu'upsh</i>	61	SCRI-306 + 5 sites	3,000	4-6

<sup>a</sup> From Johnson (1982:Table 6).

<sup>b</sup> Sources for *kaxas* are Spaulding's (1974) unpublished site map and Hoover's map (1971:214; Hoover's scale is incorrect); source for *mashchal* and *l'alale* is John Johnson (personal communication 1990); sources for all others are Arnold (1988b, 1989).

<sup>c</sup> Sources for *l'akayamu* are UCSB site records and Arnold (1989); source for *swaxil* is Olson's (1927-28) unpublished field notes; sources for all others are Arnold (1988b, 1989).

important deficiency in mind.

Brown (1967:65, 71) carried out a similar analysis focusing on site area and baptismal numbers using 14 mainland Chumash villages. He concluded that comparisons of site size and baptismal number exhibit only slightly positive correlations within each of three different geographical zones on the mainland coast. Without providing an explanation for this observation, Brown suggested that historic populations used their village lands in quite different ways, primarily as a function of where they were situated on the coast. He concluded that generalizations cannot be made about site size as a correlate of baptismal number or, indirectly, population, for the Santa Barbara Channel area (Brown 1967:1, 65).

Returning again to the analysis of island historic villages, Table 2 presents numbers of baptisms, site size, and also the number of known house depressions at the sites; the latter has been suggested as another useful correlate of population (see Brown 1967:57, 64). The number of observable house depressions in this data set, however, does not

correlate positively with the number of baptisms. The assessment of correlation between number of houses and site size is hampered by the unknown values, although the available figures do suggest a positive linear relationship.

A second possible explanation for the notable disparities between baptismal numbers and site sizes is that some of the proposed village name/archaeological site linkages are simply incorrect. If this argument is justified, perhaps an exercise which overlooks details of Pico's and Librado's statements and other historic descriptions, but does not violate their fundamental logic, will permit us to assign different village name/site associations that make more sense from a population size framework.

This exercise was laborious and unproductive. Because a few of the place names are so well anchored to obvious geographic features, especially *kaxas* to Prisoners Harbor and *l'alale* to the Diablo Point region, any attempt to reorder the names and places produced nonsensical results from a geographical standpoint (cf. Pico's geographical approach

to the village locations). Villages known to be east must move west or south and so on. The village name/site associations described in Table 1 seem to represent our best-justified ordering, given presently available information.

A third possibility is that basic anthropological assumptions concerning the effectiveness of settlement size as a correlate of, or predictor for, population size (or the reverse) may be questioned. However, it seems abundantly clear that this would be unjustified considering the problems with this particular data set. It is more reasonable by far to support one of the above arguments rather than critique the cross-culturally useful indices developed by Naroll (1962), Wiessner (1974), and others. The particular problems with the Chumash baptismal record data set for resolving pure population problems are obvious, and some have been described above and by Brown (1967). Johnson (1982, 1988) and others, of course, have made productive use of these data in other interpretive applications.

With a reasonably solid rationale for rejecting the second and third arguments above, the evidence supports the proposition that baptismal numbers are not effective predictors or indicators of archaeological site size, and *vice versa*. Clearly, a large baptismal number associated with a village name suggests that the village population was relatively large, but the converse may not be true. In other words, a small baptismal number may not indicate a small village, either in population size or areal extent. Poor recording, epidemics, or other unknown factors may have resulted in few persons from any given village of birth being recorded for posterity at one of the missions.

#### SUMMARY

Each of the ten named historic villages on

Santa Cruz Island has been assigned to an archaeological site and/or specific geographical location, based on new evidence from ongoing archaeological fieldwork. This represents some tangible progress achieved during the past decade or so of active archaeological field research on the island. Nine of the ten villages are placed with considerable confidence, based largely on a convergence of firm historic archaeological data and Pico's geographically descriptive assignments. The other village awaits final archaeological confirmation, but matches Pico's description fairly well and is fully consistent with Johnson's (1982) analysis of marriage ties and other social relationships among the island's historic villagers.

A discussion of Santa Cruz Island historic village site size, number of house depressions, and baptismal record numbers illustrated several difficulties with interpretation of these data. There is an absence of clear correlation between site sizes and house counts on the one hand and baptismal counts on the other, revealing various flaws in both mission recording procedures and archaeological observations over the years. It is important to recognize as well that archaeological investigations could eventually reveal *more than* ten sites with at least some evidence of historic occupation on Santa Cruz Island. Some small village here or there could have been ephemerally occupied, never noted by historic references, but today found to yield small numbers of historic artifacts.

Fortunately, Johnson's (1982) research into historic-era Chumash social organization gives scholars working in the region confidence that no major village has gone unnamed or unrecognized in the mission records, and thus our analyses can proceed accordingly. Increasingly intensive archaeological investigations on the island enable us to constantly refine our interpretations of historic reports

and we now can link long-known historic village names to specific localities on the island with much greater assurance.

#### NOTE

1. Formerly, these were SCRI-B-135 and SCRI-B-138, respectively. Sites with a "B" notation originally were assigned numbers by the University of California, Berkeley, Archaeological Research Facility, or its predecessor, the Archaeological Survey. Sites without this notation have numbers assigned more recently by the regional Archaeological Information Center at the University of California, Santa Barbara.

#### ACKNOWLEDGEMENTS

The fieldwork described in this paper has been supported in part by National Science Foundation Grant BNS 88-12184. The support of NSF and the contributions of many volunteers and students at the University of California, Los Angeles are gratefully acknowledged. I also thank Don Morris of Channel Islands National Park for the extraordinary opportunity to jointly carry out, with his support, the first major reconnaissance effort on eastern Santa Cruz Island in many decades. I am grateful to John

Johnson, who helpfully commented on a draft of this paper and graciously provided useful unpublished information, and to two anonymous reviewers, who made several constructive suggestions that were incorporated into this paper. Thanks as well to Tim Seymour for working in a timely fashion on the creation of Figures 1 and 2.

#### REFERENCES

- Arnold, Jeanne E.  
 1983 Chumash Economic Specialization: An Analysis of the Quarries and Bladelet Production Villages of the Channel Islands, California. Ph.D. dissertation, University of California, Santa Barbara.  
 1987 Craft Specialization in the Prehistoric Channel Islands, California. University of California Publications in Anthropology, 18.  
 1988a An Analysis of Emergent Complexity in the Prehistoric Channel Islands, California. Proposal to the National Science Foundation, Anthropology Program. Grant # BNS 88-12184.  
 1988b Field notes and maps from the 1988 field seasons on Santa Cruz Island. MS on file at the Department of Anthropology, University of California, Los Angeles.
- 1989 Field notes and maps from the 1989 field seasons on Santa Cruz Island. MS on file at the Department of Anthropology, University of California, Los Angeles.
- 1990a The Emergence of a Complex Political Economy and Linkage to Environmental Stress in Prehistoric Coastal California. Paper presented at the annual meeting of the Society for American Archaeology, Las Vegas.  
 1990b Field notes and maps from the 1990 field season on Santa Cruz Island. MS on file at the Department of Anthropology, University of California, Los Angeles.
- Brown, Alan K.  
 1967 The Aboriginal Population of the Santa Barbara Channel. Berkeley: University of California Archaeological Survey Reports No. 69.
- Cook, Sherburne F., and Robert F. Heizer  
 1965 The Quantitative Approach to the Relation Between Population and Settlement. Berkeley: University of California Archaeological Survey Reports No. 64.  
 1968 Relationships Among Houses, Settlement Areas, and Population in Aboriginal California. In: Settlement Archaeology, K. C. Chang, ed., pp. 79-116. Palo Alto: National Press Books.
- Glassow, Michael A.  
 1977 An Archaeological Overview of the Northern Channel Islands, California, Including Santa Barbara Island. Report on file at the National Park Service, Tucson.
- Harrington, John P.  
 1984 Unpublished papers on Chumash history, language, and culture. National Anthropological Archives (Harrington Collection microfilm). The Smithsonian Institution, Washington, D.C.
- Heizer, Robert F.  
 1955 California Indian Linguistic Records. The Mission Indian Vocabularies of H. W. Henshaw. University of California Anthropological Records 15(2).
- Hoover, Robert L.  
 1971 Some Aspects of Santa Barbara Channel Prehistory. Ph.D. dissertation, University of California, Berkeley.

- Hudson, Travis, and Thomas C. Blackburn, eds.  
 1983 *The Material Culture of the Chumash Interaction Sphere, Volume II: Food Preparation and Shelter*. Menlo Park: Ballena Press Anthropological Papers No. 27. Washington: Bureau of American Ethnology Bulletin No. 78.
- Hudson, Travis, Thomas Blackburn, Rosario Curletti, and Janice Timbrook, eds.  
 1977 *The Eye of the Flute: Chumash Traditional History and Ritual as Told by Fernando Librado Kitsepawit to John P. Harrington*. Santa Barbara: Santa Barbara Museum of Natural History.
- Johnson, John R.  
 1982 *An Ethnohistoric Study of the Island Chumash*. Master's thesis, University of California, Santa Barbara.  
 1988 *Chumash Social Organization: An Ethnohistoric Perspective*. Ph.D. dissertation, University of California, Santa Barbara.
- King, Chester D.  
 1975 *The Names and Locations of Historic Chumash Villages*. *The Journal of California Anthropology* 2:171-179.  
 1981 *The Evolution of Chumash Society: A Comparative Study of Artifacts Used in Social System Maintenance in the Santa Barbara Channel Region Before A.D. 1804*. Ph.D. dissertation, University of California, Davis.
- Kroeber, Alfred L.  
 1925 *Handbook of the Indians of California*. Washington: Bureau of American Ethnology Bulletin No. 78.
- LeBlanc, Steven  
 1971 *An Addition to Naroll's Suggested Floor Area and Settlement Population Relationship*. *American Antiquity* 36:210-211.
- Naroll, Raoul  
 1962 *Floor Area and Settlement Population*. *American Antiquity* 27:587-589.
- Olson, Ronald L.  
 1927-28 Unpublished field notes from 1927 and 1928 excavations on Santa Cruz Island. MS on file at the Lowie Museum of Anthropology, University of California, Berkeley.
- Rogers, David B.  
 1929 *Prehistoric Man on the Santa Barbara Coast*. Santa Barbara: Santa Barbara Museum of Natural History.
- Spaulding, Albert C.  
 1974 Unpublished field and collections notes, SCRI-240, Prisoners Harbor Site. MS on file at the Department of Anthropology, University of California, Santa Barbara.
- Tapis, Estevan, O. F. M.  
 1805 *Biennial Report for the Years 1803 and 1804*. MS on file at the Santa Barbara Mission Archives.
- Wiessner, Polly  
 1974 *A Functional Estimator of Population from Floor Area*. *American Antiquity* 39:343-349.

