

UC Merced

Journal of California and Great Basin Anthropology

Title

Chumash Architecture: Sweatlodges and Houses

Permalink

<https://escholarship.org/uc/item/3nk5s05m>

Journal

Journal of California and Great Basin Anthropology, 17(1)

ISSN

0191-3557

Author

Gamble, Lynn

Publication Date

1995-07-01

Peer reviewed

Chumash Architecture: Sweatlodges and Houses

LYNN GAMBLE, American Indian Studies Center, Univ. of California, Los Angeles, CA 90095.

Based upon an examination of ethnographic, ethnohistoric, and archaeological information, it is possible to identify attributes that distinguish Chumash houses from sweatlodges. Such a distinction is essential for the accurate reconstruction of Chumash social organization. Several variables are important in the differentiation of sweatlodges from domestic structures, including postholes, interior storage, size, location of hearths, and whether the structure was burned or not. Many Chumash sweatlodges differ from houses in the archaeological record in that they usually were larger, had substantial interior posts, were found in a burned condition, lacked evidence of interior storage, had interior rims, and had hearths in the southern portions. Clearly, some of the differences between sweatlodges and houses were functional; however, it is also possible that this variability was ritually significant. There is some evidence that as one looks back in time at archaeological examples of Chumash architecture, these distinctions are less discernible. Hopefully, future archaeological investigations of the Chumash, one of the most complex hunter-gatherer societies in the world, will address the developmental history of Chumash architecture.

THE most substantial structures built by the Chumash Indians in southern California at the time of Spanish colonization were houses and sweatlodges. Other structures used by the Chumash include sacred enclosures, menstrual houses, windbreaks, storage and drying facilities, and dance areas. The Chumash Indians did not build large dance houses such as the earth-covered houses found in the Patwin area and elsewhere in central California. Instead, the Chumash used outside dance areas that were cleared of rocks and other items and were partially surrounded by a windbreak made of poles or mats (Hudson and Blackburn 1986:50). In addition to these ceremonial structures and areas, the Chumash used sweatlodges or *temescals*. Most Chumash settlements contained at least one sweatlodge that was heated by direct fire and situated near fresh water so that the participants could immerse themselves after sweating.

The problem of distinguishing sweatlodges from houses was addressed by Glassow (1980a: 310-311) 15 years ago in a book review on archaeological investigations at the Ring Brothers site complex by Clewlow et al. (1980).

Glassow (1980a) pointed out that diagnostic features that might differentiate sweatlodges from houses has not been adequately identified in Chumash archaeology. He suggested that traditional Chumash houses did not need any interior supports whereas earth-covered sweatlodges did; therefore, interior posts might be an indicator of sweatlodges.

The primary objective of this paper is to examine archaeological, ethnographic, and ethnohistoric information on Chumash houses and sweatlodges. Detailed archaeological accounts describing the attributes of Chumash houses and sweatlodges are rare in the published literature. Even when archaeological information on structural remains is presented, sweatlodges and houses are not always clearly identified as such (Harrison 1965). An extensive survey of published and unpublished archaeological examples of houses and sweatlodges, with attributes of each type of structure listed, was presented in an earlier work (Gamble 1991:48-176) that contains more detailed information. This paper is a synthesis of that more comprehensive examination of the subject, and only selected archaeological examples of structures are included in this dis-

cussion. It is hoped that as a result of this analysis, archaeologists will become more aware of structural remains and attempt to identify them in the archaeological record. In the past 20 to 30 years, very few structural remains have been identified in the Chumash area, particularly in contract archaeology. This situation is the result of a number of factors, including the emphasis on excavating small units (1 x 1 m.) for purposes of testing as part of the Environmental Impact Report process. In addition, there has been a positive emphasis on the recovery of small remains, such as bone and beads, which has required a shift to smaller mesh screening. Because processing time for these smaller remains increases dramatically, there has been a tendency to reduce the number and size of units in contract archaeology. This tendency for increased analysis of small remains should not be discouraged, but archaeologists, especially those involved in data recovery or mitigation, should attempt to look for architectural remains. If structural remains are observed at sites, analyses on subjects such as spatial patterning, activity areas, and features will be more meaningful. Other impediments to identifying architectural remains in the Chumash area include bioturbation, plowing, and other activities that make it very difficult to observe sites from surface indications. House pits are observable on the Santa Barbara Channel Islands; however, most site areas on the islands are not under threat, nor are they under the auspices of contract archaeology. Through increased awareness of the types of features associated with Chumash structures, hopefully a new trend will develop where greater emphasis is placed on the recognition of architectural features.

ETHNOHISTORIC AND ETHNOGRAPHIC ACCOUNTS OF HOUSES

The ethnohistoric accounts of houses located along the Santa Barbara Channel coast indicate that most domestic structures were large, up to

55 ft. (16.8 m.) in diameter, hemispherical in shape, and made with poles covered with grass or reeds. Houses were usually observed clustered together in villages, sometimes in rows. It was frequently stated that more than one family shared these houses, with one account by Crespi suggesting that 70 people could sleep in one (Brown MS:unpaginated). Raised platform beds are described in several accounts (von Hemert-Engert and Teggart 1910:137; Priestley 1972: 48), and these were often set apart from the rest of the structure by mats. Mats were also used for doors. The following account was written by Fages in 1769 when he observed Chumash from the San Luis Obispo area on the first land expedition into this region:

Their houses, shaped like half-globes, are neatly built; each one is capable of sheltering four or five families which, being kin, are accustomed to live together. The houses have one door on the east, and one on the west, with a skylight in the roof, halfway between. Their beds are built up high on bedsteads, which are called tapextles, of heavy sticks; a reed mat serves as a mattress, and four others as curtains, forming a bedroom. Beneath the bedsteads are the beds of the little Indians, commodiously arranged [Priestley 1972: 48].

An account by Costanso, who was on the same expedition in 1769, corroborated that of Fages in the description of beds (von Hemert-Engert and Teggart 1910:137). The early date of these two accounts indicates that these platform beds probably were not a result of Spanish influence. Font, who visited the Santa Barbara Channel region seven years later, also provided an excellent description of Chumash houses.

Once I went near a hut which I saw open, to examine its structure, for among all the huts which I saw in all the journey these are the best. They are round in form, like a half orange, very spacious, large and high. In the middle of the top, they have an aperture to afford light and to serve as a chimney, through which emerges the smoke of the fire which they make in the middle of the hut. Some of them also have two or three holes like little windows. The frames of all of

them consist of arched and very strong poles, and the walls are of very thick grass interwoven. At the doors there is a mat which swings toward the inside like a screen, and another one toward the outside which they ordinarily bar with a whalebone or a stick [Bolton 1931:251-252].

There are no references to large center posts or earth-covered dwellings in any of the historic accounts that were reviewed (Gamble 1991:71-77). Fireplaces were usually observed in the center of the houses beneath an opening that allowed smoke to escape.

The majority of the ethnographic information on Chumash structures is summarized in Volumes II and IV of Hudson and Blackburn's *The Material Culture of the Chumash Interaction Sphere* (1983, 1986) and is presented in an abstracted format here. Most of the ethnographic material in Hudson and Blackburn was based on the copious notes of John P. Harrington, who collected information from Chumash consultants beginning in 1912. These ethnographic accounts indicate that houses were usually dome-shaped and occasionally conical in shape, with a diameter of 12 to 20 ft. (3.7 to 6.1 m.) or larger, although how much larger is not described in detail. House posts were usually set 1.5 ft. (30 cm.) apart and made from willow, or less often from sycamore or cottonwood. Horizontal poles were lashed to the posts, to which thatching of tule, fern, or carrizo was attached in tiers. In some houses, holes were left in the wall for windows and the interior of the walls were lined with mats. In most houses, a smokehole was made near the center of the roof with a fireplace directly beneath which was used for cooking and heating. There are references that fireplaces were also used outside of houses for cooking. In rainy weather, the smokehole was covered with a deerskin. The doorway, which was covered with a woven mat, was set low in the side of the house away from the wind. Occasionally, dirt was used in the construction of houses around the perimeter so water would not enter when it rained. Most of

Harrington's consultants described the arrangement of houses as close to one another, with some of the consultants claiming that they were always arranged in rows (Hudson and Blackburn 1983: 325-331). There are also indications in the ethnographic accounts that raised platform beds were used in houses (Gould 1887; Hudson and Blackburn 1983:372-373). One of Yates' consultants, Justo of Santa Barbara, described these platforms as forked sticks that were driven into the ground, across which more sticks were placed (Hudson and Blackburn 1983:373).

If ethnographic and ethnohistoric information on Chumash houses are synthesized, a brief summary of domestic structures can be constructed. Houses were dome-shaped and constructed with house posts along the perimeter which were covered with thatch. Houses ranged in diameter from about 4 m. to 16 m. in diameter, with those on the mainland coast of Santa Barbara often the largest. Fireplaces were usually situated in the center of the house, with a smokehole above. Beds were generally raised, arranged around the edges of houses, and enclosed with mat partitions. Houses were clustered together and organized in rows in many Chumash settlements.

ETHNOHISTORIC AND ETHNOGRAPHIC ACCOUNTS OF SWEATLODGES

Descriptions of sweatlodges are less frequent than those for houses in the ethnohistoric accounts. Nevertheless, the available accounts indicate that sweatlodges were different than houses in several aspects. Sweatlodges were usually semisubterranean, dome-shaped, and covered with earth, with entrances on the roofs that also served as smokeholes. Ladders were used to enter and exit the structure through the smokeholes. One of the best descriptions of a sweatlodge is this 1769 account by Crespi at a Chumash village near present-day Fillmore.

The village was close to where we had found them encamped, with a great many very large

round houses well roofed with grass. We saw some underground ones also vaulted with dirt roofs on them, so that only the vault is to be seen, rising out of the ground like an oven; these houses have chimney-holes on top, a sort of doorway through which they go in and out by means of ladders. Inside these are quite large, making a sort of porticoes¹ where, it seems, they build their fires and must go inside them during very cold seasons [Brown MS:unpaginated].

The reference to porticoes by Crespf implies that the interior of sweatlodges had large center posts. This is the only reference to interior posts in the ethnohistoric accounts. Another account, written in 1769, indicated that men slept in sweatlodges because they were safer there than sleeping at home with the women and children (Priestley 1972:48).

Ethnographic accounts on Chumash sweatlodges provide more detailed information on these structures than accounts found in ethnohistoric documents. Two types of sweatlodges were described by Harrington's consultants, a large and small one (Hudson and Blackburn 1986:33-41). The smaller one was semicircular, semisubterranean, earth-covered, and high enough so that a man could stand in the center of it (Hudson and Blackburn 1986:34). These smaller sweatlodges were partially subterranean with wattle and daub construction (Hudson and Blackburn 1986:33). One of Harrington's consultants described this smaller sweatlodge as having two forked poles in the center. A smokehole was not used in these smaller sweatlodges; instead, the fire was built near the door. Harrington (1942:9-10) noted that these smaller sweatlodges were often built into a bank.

Large sweatlodges tended to be used for ceremonial purposes and, according to one of Harrington's consultants (Felix Carillo), the 'antap used the larger sweatlodges, which commoners were prohibited to use (Hudson and Blackburn 1986:41). Most of the accounts state that women usually did not habituate these sweatlodges (Hudson and Blackburn 1986:39).

Sweatlodges functioned to purify and cleanse the spirit and body. The direct fire method was used by the Chumash in the past, instead of the indirect method of heating rocks (which was used by the Plains Indians and is currently used by many Indians, including the Chumash).

Larger sweatlodges were similar to smaller ones in that they were subterranean and covered with earth; however, in contrast to smaller sweatlodges, they were circular in plan view (Hudson and Blackburn 1986:36). They were made with four forked posts, which were approximately 10 in. (25 cm.) in diameter, and placed in the interior of the structure, with four crossbeams on them. Long, straight poles made from willow were put closely together on the crossbeams (Hudson and Blackburn 1986:38). The structure was then covered with thatching and finally with earth, to make it airtight (Hudson and Blackburn 1986:38). A small opening in the roof, directly above the central fireplace (Hudson and Blackburn 1986:36), was used as a smokehole and as a doorway, with a ladder in the interior. A willow pole about 10 in. (25 cm.) in diameter, with notches on the side, served as the ladder (Hudson and Blackburn 1986:43). One of Harrington's consultants said that some sweatlodges had the doors on the side (Hudson and Blackburn 1986:41). Fernando Librado told Harrington that sweatlodges were always located near water and that fireplaces were large, often six ft. (1.8 m.) long and two (0.6 m.) or three ft. (0.9 m.) wide (Hudson and Blackburn 1986:37-38). According to Juan de Jesus Tumamait, one of Gould's consultants, a large sweatlodge could hold up to 30 people (Gould 1887). Based on his extensive knowledge of North American Indians, Harrington (1922:126) noted that "the sweathouse is certainly the same as the kiva."

Ethnographic and ethnohistoric accounts are in agreement on the following attributes assigned to sweatlodges: (1) they were semisubterranean; (2) they were dome-shaped; (3) they were cov-

ered with earth; (4) they contained large, interior center posts; (5) the door was through the roof; and (6) a pole ladder was used to enter and exit the structure.

DIFFERENCES BETWEEN SWEATLODGES AND HOUSES

Ethnographic and ethnohistoric accounts indicate that sweatlodges, especially large sweatlodges, differed from houses in several aspects. Sweatlodges were usually covered with earth, were semisubterranean, and had four large center posts. The larger ones often were entered through a smokehole in the ceiling which was situated in the central portion of the structure above the fireplace. A notched pole, next to the fireplace, served as a ladder for entering or exiting the sweatlodge. Men were frequently the only people to use the large sweatlodge, and there is some indication that only elite men had access to this structure. Sweatlodges and houses were similar in shape, as most are described as dome-shaped.

Given the above descriptions, the remains of houses and sweatlodges should be distinctive in the archaeological record. Based on the ethnographic and ethnohistoric accounts, if the structure had been used as a house, one could expect to find at least some of the following attributes in the archaeological record: (1) evidence of small posts around the perimeter of the structure; (2) lack of evidence of large interior posts; (3) evidence of small interior posts used for beds or bedroom partitions; (4) lack of evidence of an earth roof; (5) evidence of a small, central fireplace; (6) evidence of a path used as a doorway; (7) diameter of approximately 4 to 16 m.; (8) evidence of other houses nearby; and (9) evidence of domestic debris.

If the structure had been used as a sweatlodge, one could expect to find the following attributes: (1) evidence of large, interior posts; (2) evidence of an earthen roof; (3) evidence of a large, central fireplace; (4) lack of evidence of

a doorway; (5) evidence of a large pole (that was used to enter the sweatlodge) near the hearth; (6) lack of evidence of domestic debris deposited at the time of structure use; (7) evidence of a semisubterranean structure; and (8) few artifacts associated with female activities.

A wide range of dispersed and often fragmentary information is available on the archaeological remains of Chumash structures, much of it from unpublished accounts. In some such cases, a structure is only briefly alluded as little information has been reported. In other such cases, a structure is described in detail. Although there are some excellent archaeological examples of structures excavated outside the Chumash area, they are not incorporated into this discussion.

ARCHAEOLOGICAL EXAMPLES OF CHUMASH SWEATLODGES

Most of the archaeological examples of structures discussed in this section have been interpreted as sweatlodges by the archaeologists who investigated them. Also included herein are a few structures that are reinterpreted as sweatlodges. Structures are classified as sweatlodges in this analysis if the features identified in the ethnographic and ethnohistoric records as listed above were present. In addition, two other attributes that are not mentioned in the ethnographic or ethnohistoric accounts have been observed in the archaeological record in association with interior postholes; plastered floors and raised interior rims. More information on these archaeological correlates will be addressed with the examples from the archaeological record.

Harrison's Excavations at the Historic Village of Mikiw (CA-SBA-78)

Mikiw and Cuyamu were two historic villages associated with Dos Pueblos, a Chumash village site located at the present-day Dos Pueblos Ranch, several miles west of the Goleta Slough. Most of the information on Harrison's excavations at Dos Pueblos is from a published account

(Harrison 1965:91-178), although the original field notes were also consulted for this research.

At Mikiw, the floor of a large structure (Fig. 1) was uncovered in 1958 during excavations at the site (Harrison 1965:102-103). Because the property owner wanted to preserve the floor, it was left intact for display purposes, and a large aluminum building² was constructed over the area (Harrison 1965:102). This floor was excavated in a more controlled manner and was documented in greater detail than most excavations of structures at or since that time. This semisubterranean structure was somewhat oval in shape and measured 19 by 21 ft. (5.79 by 6.40 m.) (Fig. 2). The mud-plastered floor was basin-shaped, with the top of the rim 18 in. (45 cm.) below the ground surface. Near the center of the structure, the concave shape of the floor was interrupted by a slightly elevated rectangular platform, surrounded by an even higher raised ridge. This center platform was about 7 by 8.5 ft. (2.13 by 2.59 m.) and was also somewhat basin-shaped. There were four large postholes at each corner of the center ridge, with two slightly smaller ones on the northern and southern side of the center ridge (Figs. 1 and 2). The floor was somewhat irregular and consistently broken to the northeast of the posts, indicating to Harrison (1965:153-154) that the final collapse of the posts may have occurred in this direction. The entire surface of the floor was covered with several layers of sand and mud plaster, which was considerably thicker in the central platform area.

Although the actual floor was never removed or excavated, cross sections of it could be observed in areas disturbed by gophers. In several instances, four separate layers of plaster between 1/4-in. and 1/8-in. in thickness were observed. The plastered floor was peppered with fine grains of sand and small splinters of charcoal, shell, and stone. With the exception of the southern end, the rim was apparent around the entire periphery of the floor.

One of the features associated with the floor of this structure was an oval fire pit located approximately two ft. (60 cm.) north of the southern edge of the floor (Fig. 2). The fire pit was basin-shaped and separated from a circular flue by a deflector composed of a large, flat, sandstone rock set upright in mud plaster and smaller rocks. The floor of the fire pit was not lined with plaster, but the soil in the fire pit was fire-reddened. A large deposit of ash, charcoal, and burned rock was found at the base of the fire pit. Several large ground stone artifacts and whale bone fragments were found above the base of the fire pit. As they were not burned, they most likely were deposited after abandonment of the fire pit (Harrison 1965:153).

A reliable reconstruction of the roof of the structure was based on several lines of evidence. A large number of burned beams, ranging up to eight inches in diameter, were found laying on the floor. There were more beams than could be accounted for by the six postholes. Many smaller carbonized pieces of wood, ranging from the size of twigs to poles an inch in diameter, were found on the surface of the floor. A large section of carbonized, interwoven, fibrous material was found on the eastern ridge of the central platform, and was interpreted as the remains of thatching. Dark brown soil was observed a few inches above the floor, and was more compact than the black soil above it. Very few artifacts and little refuse were located within the dark brown soil, although carbonized twigs, logs, poles, and plant material were profuse. This stratum of dark brown soil covered many portions of the floor, but was thickest in the deeper areas, occasionally reaching a depth of six inches. No postholes were found around the exterior perimeter of the structure (Harrison 1965:153).

Harrison (1965:153-154) noted that the roof consisted of six large support posts set upright around the raised ridge of the central platform. Smaller logs were probably laid across these to



Fig. 1. Sweatlodge floor at Mikiw.

form a network of roof beams. Others may have sloped to the ground from this network, but were not embedded in the ground. The entry penetrated the southern wall.³ The walls were made from smaller poles, twigs, and thatching material. Sterile earth was packed over the entire structure, which may have been conical in shape with possibly a small, flat, rectangular area directly over the central platform (Harrison 1965:153).

The only artifacts found directly on the floor were five glass beads that were embedded in the top layer of plaster. The only faunal material found in contact with the floor were two large sections of whale bone, one a broken rib bone (Harrison 1965:153-154). The few large arti-

facts that touched the floor were those in and around the fire pit (Harrison 1965:154), with the majority of them occurring on the southern half of the floor. Carbonized wood and plant remains were found on the floor, primarily in the northern half of the structure (Harrison 1965: 154). The soil above the sterile floor contained a vast quantity of artifacts and food refuse. Numerous lenses of ash and accumulations of trash were recorded in the profile drawings of the balks associated with the floor. Harrison (1965:153-154) believed that this stratigraphic profile indicated that after the structure was burned and the roof collapsed, the house depression was used for general garbage disposal.

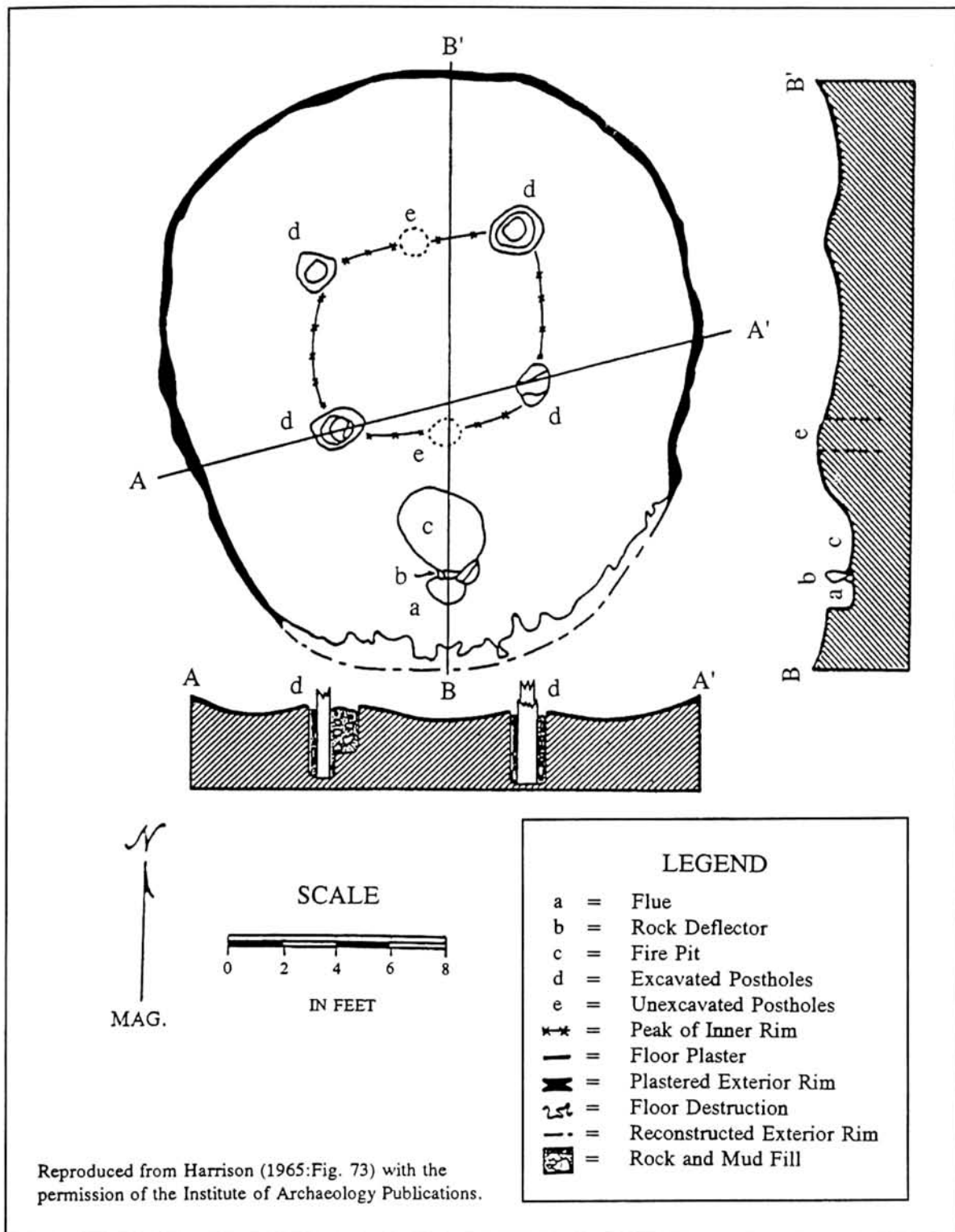


Fig. 2. Plan view of remains of large structure excavated at Mikiw.

Information from four radiocarbon dates, obtained from carbonized logs and shell resting on the floor level and just above it, indicate the structure probably was built in the early 1700s (A.D. 1710 \pm 55) and abandoned by the last quarter of the eighteenth century (A.D. 1780 \pm 55) (Harrison 1965:154-155).⁴

Harrison (1965:155-157) suspected the structure was deliberately destroyed by fire because the floor had been cleared of artifacts. Judging from the direction that the support posts collapsed and the location of most of the carbonized remains, Harrison suggested that the fire was started on the northern side of the structure, and hypothesized that the structure was deliberately burned by the Spanish or by the Chumash (Harrison 1965:155-157).

This example of what has been interpreted as a sweatlodge is the clearest archaeological illustration of this type of structure, in part because the floor was excavated in its entirety and the excavations are well documented. The floor was plastered with mud and had a raised interior rim with large central postholes at each corner, in addition to two smaller ones along the rim. The hearth was very large and situated at the southern edge of the structure, outside the interior rim. Harrison (1965:153-157) interpreted the stratigraphic section of the floor area as an indication that the structure was originally earth-covered, semisubterranean, and had clearly burned down. Very few artifacts were found in association with the floor, and the ground stone artifacts and whale bone observed in the hearth were unburned and apparently were deposited after abandonment of the structure. Based on Harrison's descriptions, this example clearly displays the attributes which are identified as those associated with sweatlodges. The structure was found in a state of good preservation, probably because it dates to the Historic Period and was substantial when it was originally built, especially compared with other structures used by the Chumash. The next archaeological exam-

ples of sweatlodges in this discussion are also from historic contexts.

Excavations of Structures at H'elxman (CA-SBA-485)

H'elxman is a village site that is situated in the central Santa Ynez Valley, overlooking present-day Lake Cachuma. The remains of three floors at H'elxman were excavated by a variety of archaeologists, including Albert Mohr, William Harrison, Don Miller, and Jay Ruby. In 1959 and 1960, Harrison and Miller reexcavated Structure 1 to determine the similarities between this structure and the one at Mikiw. The only account of these excavations, other than the field notes, is a thesis by Macko (1983), who reviewed the notes and artifacts recovered from the site. Based on historic descriptions of sweatlodges and dwellings, Macko (1983:85) interpreted two of the structures at H'elxman as sweatlodges or "temescals" (Fig. 3). One of these, Structure 1, was about 22 by 27 ft. (6.7 by 8.2 m.) in diameter, and the other, Structure 2, was about 17 by 19 ft. (5.2 by 5.8 m.) in diameter (Macko 1983:Map 3). Structure 1 was superimposed over Structure 2 (Fig. 3; Macko 1983:95). Structures 1 and 2 have interior rims, large central postholes, and definite hearth areas near their exterior rim (Fig. 3; Macko 1983:88). The hearths were large and situated in the southern portions of the sweatlodges (Macko 1983:68). The interior raised rim was roughly square in plan view, and within it were large postholes. Both structures 1 and 2 apparently burned, as the remains of charred posts were observed in the postholes.⁵ Structure 1 contained four large postholes on the interior rim. Macko (1983:92) noted that the types of features in Structures 1 and 2 were similar to those that one would expect to find in a sweatlodge. Miller (Horne and Miller 1978), also made these same observations. In addition, Miller noted that the floors associated with Structures 1 and 2 were more carefully constructed than the floor in the



Fig. 3. Two sweatlodge floors at H'elxman.

structure at Mikiw and that the structure burned to the north, which was the same direction that the structure at Mikiw apparently burned (Horne and Miller 1978). The plastered floors at H'elxman probably date to the historic occupation of the site (Macko 1983:92-95).

The two floors from H'elxman clearly exhibited attributes similar to the floor at Mikiw, indicating that they too were probably used as sweatlodges. In addition, the similarities between the floors indicate that there was some type of standardization in the construction of sweatlodges during the Historic Period, despite the fact that the inhabitants of these two villages spoke different dialects of Chumash (Barbareño and Ynezeño) and were located in different environmental zones (coastal and interior).

Excavations of a Sweatlodge at Muwu (CA-VEN-11)

In 1929, the Van Bergen-Los Angeles Museum Expedition excavated at the village site of Muwu (CA-VEN-11), situated on the edge of a lagoon near Pt. Mugu in Ventura County (Woodward 1938:141). The remains of what was interpreted as a sweatlodge were uncovered as a result of these excavations (Woodward 1938:141-142). This example of a sweatlodge is from the coast near the southern boundary of the Chumash where Ventureño dialect is spoken. The following description is taken from Woodward's (1938:141-142) published account of the excavations of this sweatlodge, since the original field notes for these excavations are either

missing or nonexistent. The floor was circular in plan, semisubterranean (18 to 24 in. [46 to 61 cm.] below the surface), and approximately 21 ft. (6.4 m.) in diameter. The floor consisted of hard-packed clay that was about four in. (10 cm.) thick. No artifacts were found on the surface of the floor,⁶ but in the center of the floor there was a fire pit three ft. (91 cm.) in diameter and filled with "clear white ash," with no fish or mammal bones in it. A stone slab (Fig. 4) about two feet high was recorded on the western side of the fireplace and immediately adjacent to it, a decayed center post⁷ was observed. An even layer of eelgrass (*Zostera marina*), which was interpreted as a layer of thatching for the roof, covered the floor. This thatching apparently was covered with earth (Woodward 1938: 141-142). A buried rock was also observed next to the post. The floor lacked evidence of domestic debris and artifacts associated with female activities. It is not clear whether it had a raised interior rim. Some house remains from this site date to the Historic Period, but whether the remains of the sweatlodge are historic is uncertain.

Unfortunately, the limited notes that are available on the excavation of this structure make it difficult to compare with the previous examples. Nevertheless, certain attributes, such as plastered floors and large interior postholes, indicate that it probably was used as a sweatlodge. In addition, Woodward (1938:141-142) identified the structure as a sweatlodge and observed enough traits to distinguish it from the house floors that he excavated.

Clemmer's Excavations of a Chumash Floor at Morro Bay

In May of 1961, Clemmer (1962:19) excavated a Chumash structure at Morro Bay that was approximately 30 ft. (9.14 m.) in diameter and roughly circular (Fig. 5). It was covered with a layer of ashes and midden, and once cleaned, had a dull polish to it. The floor varied in thickness between about one to two inches

and was composed of transported earth which may have been formed by puddling. It was described by Clemmer (1962:21) as well-defined and saucer-shaped in profile, with a raised inner circle. The cross section view of the structure (Clemmer 1962:Fig. 13a) indicates that it was semisubterranean. Sixteen postholes, roughly conforming to the outline of the floor, were recovered within the floor boundaries, but outside the raised inner platform (Fig. 5). These postholes ranged in size from about 5 or 6 to 10 in. (15 to 25 cm.) in diameter (Clemmer 1962: Figs. 13 and 14). Charcoal fragments occurred within all of the postholes, although six of them contained well-preserved ends of charred posts that were *in situ* (Clemmer 1962:21, Fig. 14). There was one larger center posthole that was slightly offset with a charred post in it about 27 in. (69 cm.) in diameter (Fig. 5; Clemmer 1962: Figs. 14 and 14a). Within the circle of posts is a pronounced ridge that apparently marked the perimeter of several central fire pits (Fig. 5; Clemmer 1962:23). Heavy concentrations of ash and charcoal were in the northern and western portions of the floor, whereas the southeastern part of the floor did not have this extremely black color. There were elongated pieces of charcoal scattered across the southwest side of the floor, including fragments of small poles ranging in size from one to two in. (2.5 to 5.0 cm.) in diameter (Clemmer 1962:23). Charred tule fragments also were observed in the debris overlying the floor (Clemmer 1962: 28). The roof of the structure appeared to have burned, as indicated by the entire floor being covered with ashes and soot.

In the central area of the floor, there was a concentration of five ash pits, interpreted as hearths by Clemmer (1962:23-26). No fire-altered rock or any other rock of significant size was found on the floor itself, although there were fragmentary pieces of fire-altered rock found in the midden above the floor (Clemmer 1962:26).



Fig. 4. Profile of center post and deflector rock in a sweatlodge at Muwu.

A series of eight burials was exposed in a pattern than conformed roughly to the inner ridge of the floor. No attempt was made to replace the floor where the burial pits had been excavated (Clemmer 1962:26-28). Most of the burials intruded into the floor, and were directly below floor level or on top of the floor. With one exception, Clemmer (1962:58-59) believed these burials were interred after the structure was abandoned.⁸ The bead types indicate that the floor probably was used sometime between A.D. 300 and 1050 during the Middle Period (King 1990).

It is possible that the offset center posthole that was larger than the others was used as a ladder to enter and exit the structure, as described in the ethnographic descriptions of sweatlodges (see above). This suggestion con-

flicts with Clemmer's (1962:21) discussion of the possibility of a doorway at the west side of the floor, where the edge tended to be straight instead of circular. He noted that there were two thin channels that ran toward the center of the floor in this area and that the floor was smoother and more consolidated between these channels. Otherwise, no additional evidence indicating a doorway, such as worn paths or post-holes, were noted (Clemmer 1962:21). Given this evidence, it is not clear whether this structure had a doorway at the time of its use or whether the large center post served as a ladder for entrance and egress. Regardless, this structure is similar to the above examples of structures interpreted as sweatlodges in that it has a plastered floor, a raised inner platform, and large interior posts. In addition, it appears to

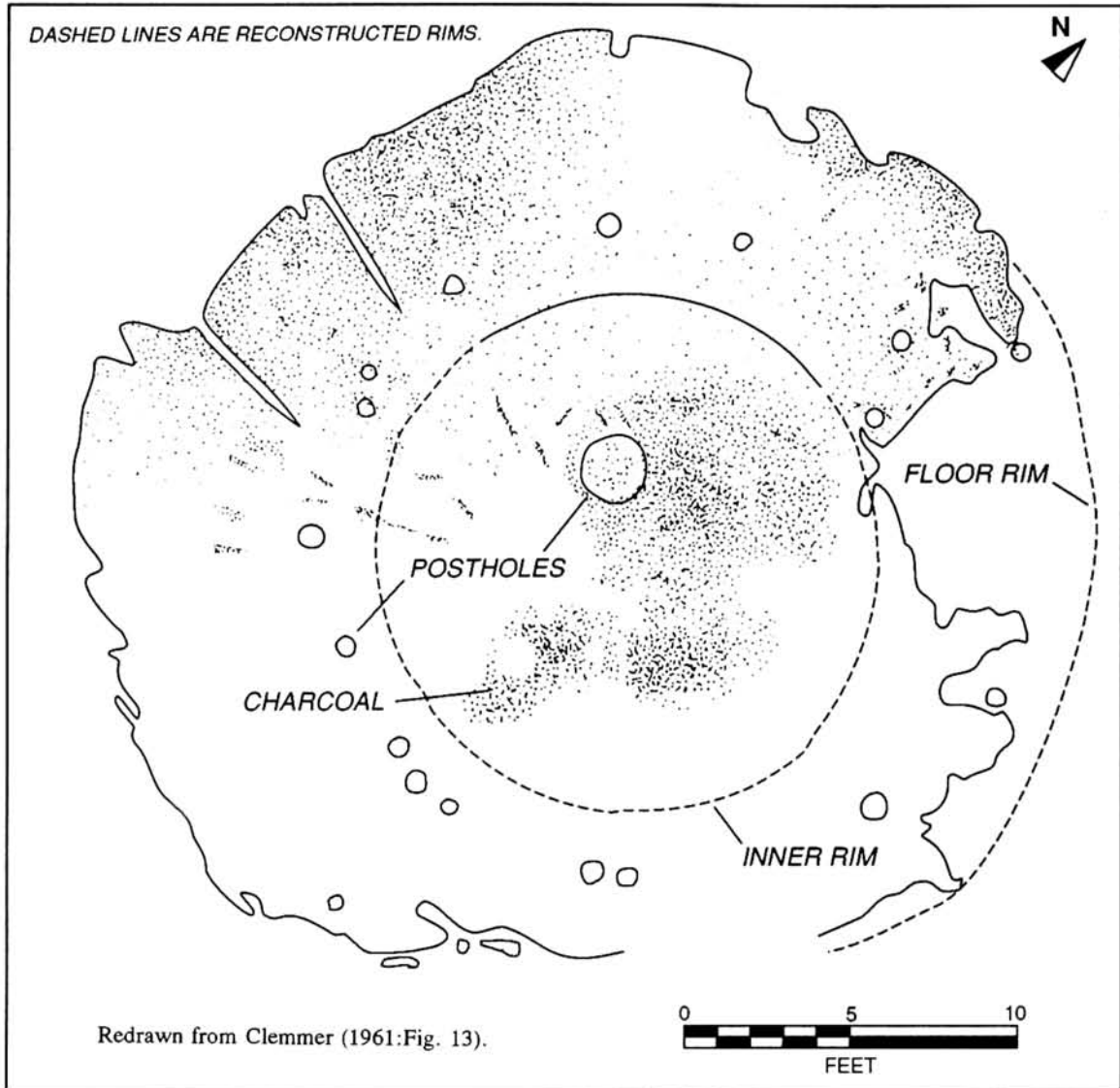


Fig. 5. Plan view of floor, postholes, and charcoal at Morro Bay site.

have burned, a trait that has been observed with several archaeological examples of what are interpreted here as sweatlodges.

Wenexe'l or the Ellis Rice Site (CA-SLO-94/95)

In the summer of 1968, excavations in the Cuyama River Valley near Santa Maria were conducted by Roger Desautels under the Highway Salvage Program, and administered by Fritz Riddell of the California Department of Parks

and Recreation (Wildesen 1968). No report was ever written on the excavations; however, there was a short summary of findings in a Society for California Archaeology Newsletter (Wildesen 1968). Most of the information in this section is taken from this article and the meager field notes. One of three floors that was observed at this site was completely exposed (Fig. 6). Glass beads that were found on the floor of the structure indicate that it was probably used sometime after Spanish contact (1769). Burned timbers



Fig. 6. Sweatlodge floor at Wenexe'l.

were observed in place on the floor and could be plotted and the construction details studied.⁹ The plan view (Fig. 7) indicates that the floor of the structure was between 22 ft. (6.7 m.) and 24 ft. (7.3 m.) in diameter. A large hearth was located near the perimeter of the structure at the southern end.

In the floor near the hearth, a cluster of quartz crystals and a stick or bone with asphaltum was noted. Eleven large postholes were mapped in the interior of the house; nine of these were over 8 in. (20 cm.) in diameter. Near the perimeter of the floor were 16 smaller postholes. In the photographs, it appears that the interior postholes were located along an interior rim (Fig. 6).

Although the information recorded about this structure is limited, there are similarities be-

tween the archaeological remains of this structure and the ones previously discussed. The most significant similarities are that the structure had large interior posts, probably had a plastered floor, appeared to have a raised interior rim like those observed in the floors from Mikiw and H'elxman, and had burned.

Strong's Excavations in the Cuyama River Valley

Strong (1935:69) excavated the remains of several structures in the Cuyama River Valley that were probably Chumash sweatlodges. Strong's field notes and brief published accounts (Strong MS, 1935) on these structural remains provide important but limited information. One of these structures, located in a protohistoric

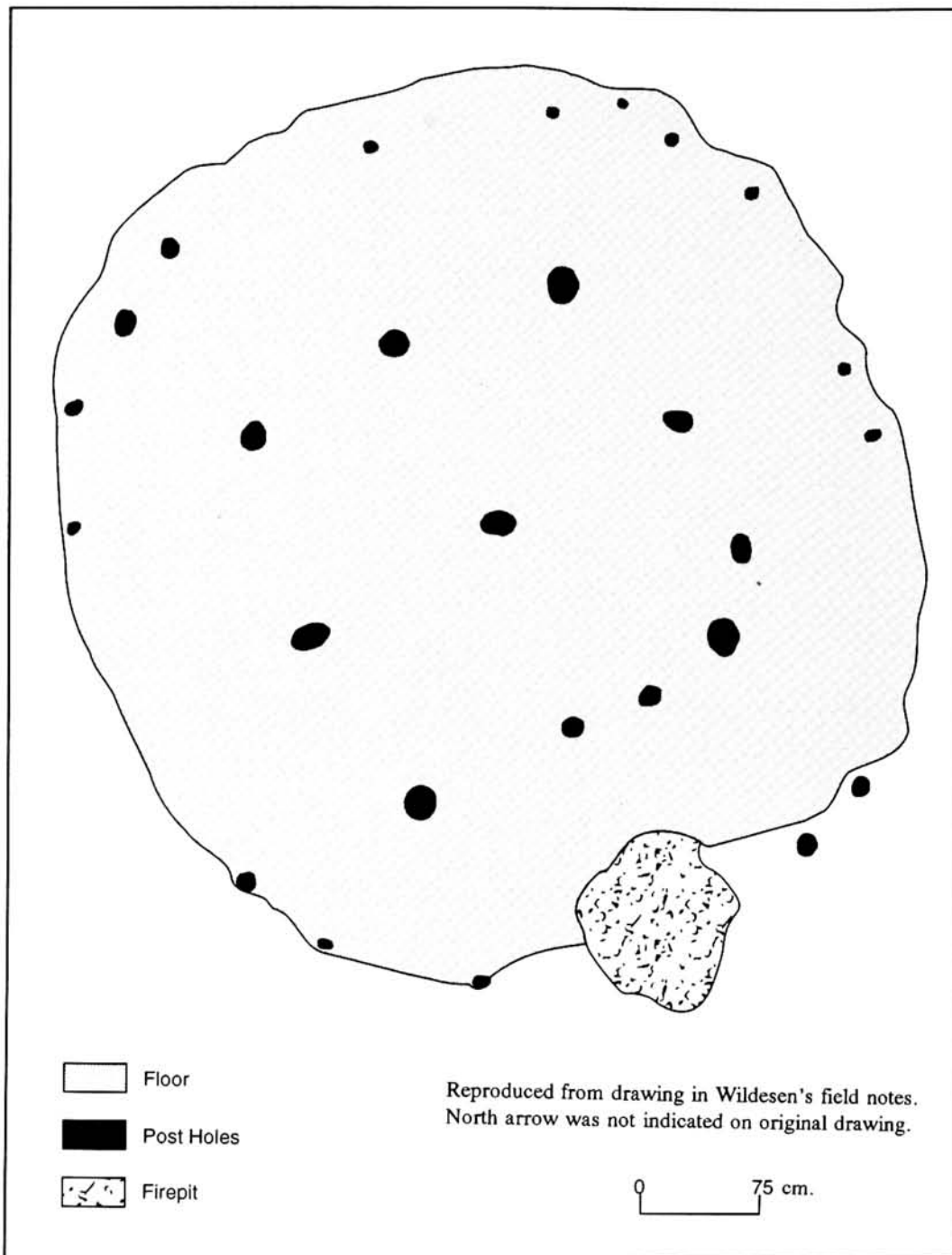


Fig. 7. Plan view of remains of a large structure exposed at Wenexe'l.

village site near the head of Quatal Canyon at the Mathews site, was described as a semisubterranean earth lodge that was about 4.9 m. in dia-

meter, had two charred center posts, a clay fireplace, and a hard, black floor¹⁰ (Strong 1935: 69). Burned rafters rested on the floor and

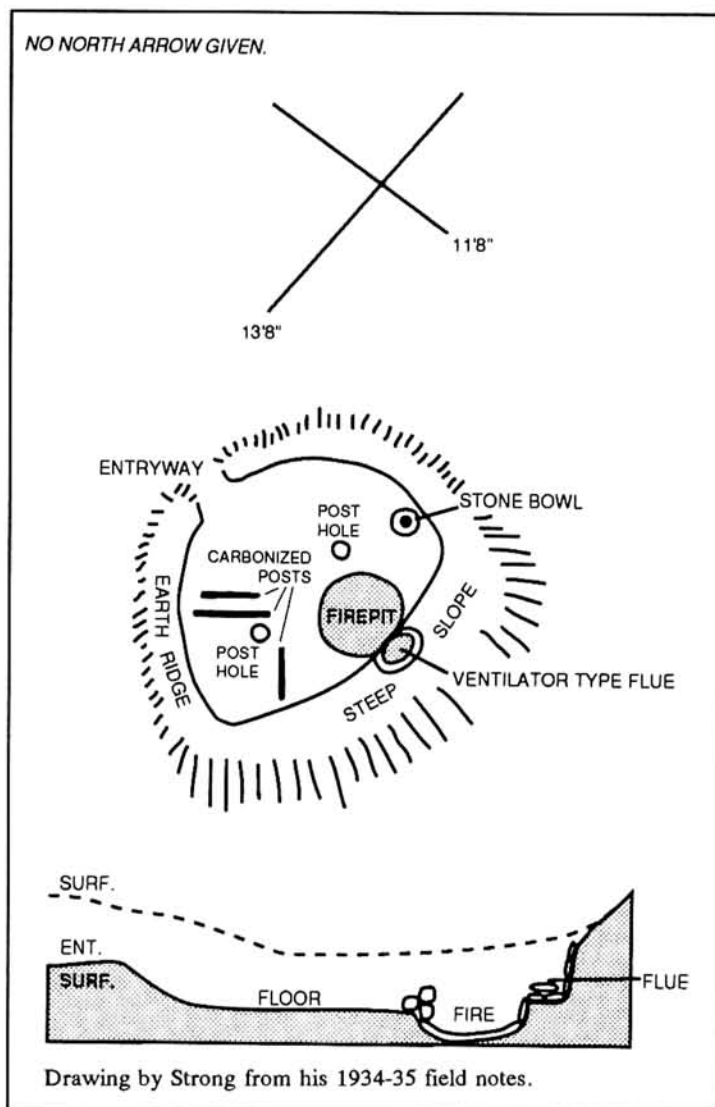


Fig. 8. Floor at Mathews site, Quatal Canyon.

radiated in from the walls with burned twigs, grass, and earth superimposed above them (Strong 1935:69). Strong's field notes include a plan view and vertical cross section of the remains of this structure, which have been reproduced in Figure 8. A flue for the fireplace appears to be on the southeastern wall of the structure, with a doorway at the opposite end (Fig. 8). This drawing also indicates that there was a stone bowl on the floor, that the structure was semicircular in plan view with the straight

side of the semicircle up against a steep bank, and that the hearth, which was large, was on the southeastern edge of the structure.

If this structure was indeed a sweatlodge, it was the smaller type that is described above in the section on ethnographic accounts. The remains of two large interior posts instead of four, the small diameter of the floor, the semicircular plan view of the floor, and the location of the floor next to an earthen bank indicate that the remains of this structure are more similar to the

smaller types of sweatlodges described in ethnographic accounts than to the larger, ceremonial types (Hudson and Blackburn 1986:33-41, and see above).

Another structure excavated by Strong in the Cuyama River Valley that probably was also a sweatlodge was at the Caliente Ranch site. In Strong's 1934-1935 fieldnotes (Strong MS), he described House 1 as having a packed clay floor approximately 5.8 m. in diameter. This structure was excavated in its entirety. A plan view and vertical cross section drawing of this structure has been reproduced from Strong's field notes in Figure 9. These illustrations indicate that the structure had four large central postholes, a cache pit, and a well-made hearth lined with boulders in the southern portion of the structure. The floor was about 60 cm. below the ground surface (Strong 1935:60). Carbonized beams that were observed on the floor of the structure indicate that it burned. This site may date to the Historic Period. The structure appears similar to many of the others identified as sweatlodges in this section because it had a plastered floor, had four large center postholes, was semisubterranean, and had burned down.

A third structure excavated by Strong (1935:69), that also appears to have the characteristics of a sweatlodge, was on the Cuyama Ranch. The remains of this structure indicate that it was about 7.3 m. in diameter with four large center posts and a small storage pit (Strong 1935:69). A sketch of this structure from Strong's 1934-1935 field notes (Strong MS) that has been reproduced in Figure 10 indicates that there was a fire pit near the southwestern portion of the structure, a baking pit in the center of the structure, and a possible doorway at the southern end of the structure. Strong made no mention of these features in his notes or published account. This structure is interpreted in this analysis as a sweatlodge because of the four large center posts; however, Strong's notes are so incomplete that such a conclusion is difficult to make with

any certainty. It is more likely that the other two structures recorded by Strong represent the remains of sweatlodges; the one at the Mathews site is most similar to the small types described in ethnographic accounts, and the one at the Caliente Ranch site is most similar to the large, ceremonial types.

Discussion of Archaeological Examples of Sweatlodges

Despite the variation in the information that was recorded for the archaeological examples of Chumash sweatlodges, the remains of these structures have certain attributes in common. All of the sweatlodges in this sample had large center posts and hearths, and most appear to have burned, although there are two examples where this information was not recorded (Table 1). Nevertheless, with both of these examples, there is some indication that these structures had burned as well (see above). Most of the sweatlodges had plastered floors; however, at Wenexe'l and Cuyama Ranch, the floors were not recorded in detail, so it is unclear whether they were plastered (Table 1). Most of the floors in the sample examined had a raised rim in the interior of the sweatlodge, although there were a few examples where this information was not recorded (Table 1). It may be significant that most (77%) of the examples of sweatlodges had hearths that were situated in either the southern or southeastern portions of the structures. One exception was at Muwu, where the location of the hearth was not accurately recorded, although it appeared to be centrally located (Table 1). Another exception was at Cuyama Ranch, where the hearth was recorded near the southwestern edge of the floor and a "baking pit" was recorded in the center of the floor. The third exception, the structure from Morro Bay, is from a much earlier period (Middle Period). The two sweatlodges from H'elxman and the one from Mikiw are extremely similar in their pattern of postholes, the interior rim, the plas-

Table 1
ARCHAEOLOGICAL EXAMPLES OF CHUMASH SWEATLODGES*

Site	Widest Diameter (m.)	Burned	Clay or Plastered Floor	Interior Rim	Time Period	Large Center Posts	Hearth	Location of Hearth
H'elxman 1	8.2	yes	yes	yes	Historic	yes	yes	S edge
Cuyama Ranch	7.3	?	?	no?	Historic	yes	yes	SW edge and center?
Wenexe'l	7.3	yes	probably	yes	Historic	yes	yes	S edge
Muwu	6.4	?	yes	?	Historic?	yes	yes	center?
Mikiw	6.4	yes	yes	yes	Historic	yes	yes	S edge
H'elxman 2	5.8	yes	yes	yes	Historic	yes	yes	S edge
Caliente Ranch	5.8	yes	yes	?	Historic?	yes	yes	S edge
Mathews Site	4.9	yes	yes?	?	Protohistoric	yes	yes	SE edge
Morro Bay	9.1	yes	yes	yes	Middle	yes	yes	center

* Sites are ordered by time period first and then diameter within this category.

tered floor, and the placement of the fireplace at the southern edge. Two of the structures identified as sweatlodges (Wenexe'l and Morro Bay) had 16 postholes near the perimeter. This feature is not found in the other examples of sweatlodges.

Most of the archaeological examples of sweatlodges date to the Historic Period, which may be in large part because the preservation of structural remains is probably better in these later sites than in earlier sites. It is conceivable that in the Historic Period Chumash construction of sweatlodges was standardized to a greater degree than had occurred before that period. Certainly the similarities between the structures at H'elxman and the one at Mikiw indicate that there was some type of standardization in the construction of sweatlodges, despite the fact that these settlements were in different environmental zones (one is in a coastal area and the other in an interior area) (King 1976). Some of this standardization was probably functional. For example, the occurrence of large center posts was probably necessary in order to support the extra weight of the earthen roofs of the sweatlodges. On the other hand, some of the stan-

dardization seen in sweatlodges, such as the placement of the hearths at the southern end of the structure, may have ceremonial significance. The significance of cardinal directions to the Chumash has been well documented (Hudson et al. 1977; Hudson and Underhay 1978:41-42). Hudson and Underhay (1978:41) commented on the importance of cardinal directions:

Unquestionably, cardinal directions were extremely significant in Chumash ritual behavior. . . . Prayers and offerings were made to Sun, as well as to the four cardinal directions. Cardinal directions are also mentioned repeatedly in descriptions of various ceremonies held for *Hutash* (Earth) and *Kakunupmawa* (Sun). Even the physical arrangement of the ceremonial structures and paths taken by the dancers in these rituals mirrored the sacred compass.

The significance of the south as a cardinal direction was mentioned by Fernando Librado when he discussed the ritual universe: "The south was the chief point of the ancient Indians, for it was infinite and clear, and it extended to the north" (Hudson et al. 1977:35). It is fully conceivable that the layout of features inside sweatlodges was ritually significant and predetermined based on Chumash cosmology. The loca-

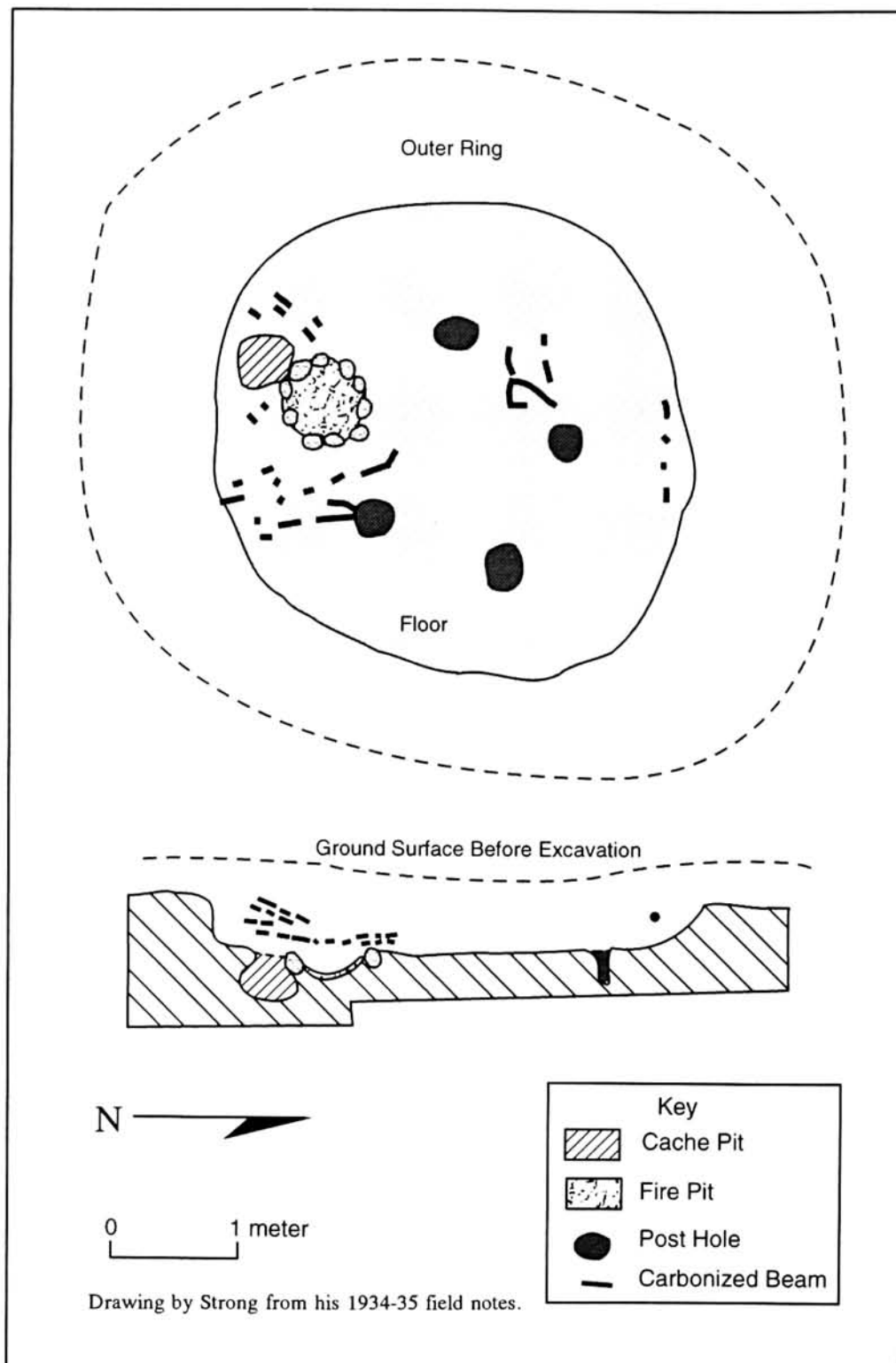


Fig. 9. Plan view and cross section of structure at Caliente Ranch.

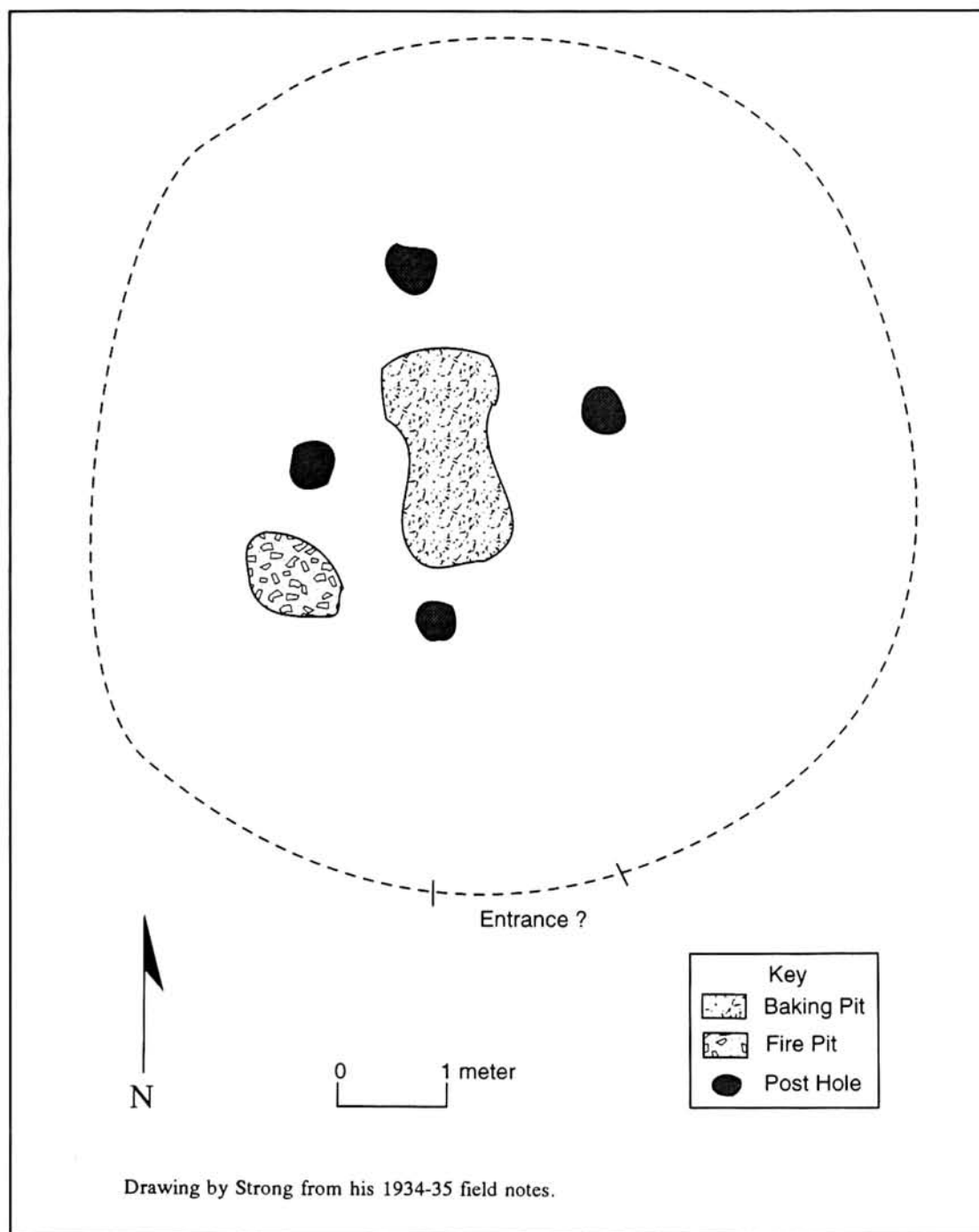


Fig. 10. Plan view of structure at Cuyama Ranch.

tion of hearths in the southern area of the sweatlodges examined in this paper may have been ritually determined.

The diameters of the archaeological examples of structures interpreted as sweatlodges vary considerably (Table 1). The example with the

smallest diameter is the floor from the Mathews site in Quatal Canyon. The suggestion that this structure may have been a small, nonceremonial type of sweatlodge was discussed above. If this example is deleted from the sample, the size range of all other sweatlodge floors is more consistent (Table 1). The structure from Morro Bay has the largest diameter in the sample and is the only one from the Middle Period (Table 1). It is possible that sweatlodges were larger during the Middle Period than in the Historic Period; however the sample is much too small to indicate this with any certainty. Despite the small sample, the difference in size from the northern, central, and southern Chumash areas can be compared. Wenexe'l and Morro Bay are the two northern examples and Muwu is the southern example (Table 1). The rest of the sites are in the central area, except for the example of the Mathews site. Sweatlodges are larger in the northern portion of the Chumash region, becoming smaller as one moves south. Again, the sample is so small that it is difficult to say anything definitive. Nevertheless, it is possible that the Chumash in the northern area made larger sweatlodges due to influence from their central California neighbors, who built large, earth-covered dance houses and practiced a different type of ritual associated with these structures. More examples will be needed in order to test this hypothesis, however.

ARCHAEOLOGICAL EXAMPLES OF CHUMASH HOUSES

Most of the structures in this section are substantially different from the structures described in the section on sweatlodges. The remains of these structures all lack large interior postholes and interior rims. Some of the structures identified as houses in this section have plastered floors; therefore, in this respect, they are similar to some of the structural remains identified as sweatlodges.

Excavations of Structural Remains at Muwu (CA-VEN-11)

In addition to the sweatlodge at Muwu (described above), nine other structures were found at the site (Fig. 11) (Woodward 1933:490). These structures were investigated in 1932 by members of the Van Bergen-Los Angeles Museum Expedition, who returned to the site to gather additional data on Chumash houses and to check information obtained by the museum in the 1929 excavations (Woodward 1933:490). During these investigations, the remains of three structures were excavated in their entirety, and a fourth structure was partially excavated. All of the structures were described as partially subterranean, approximately 17 to 23 ft. (5.2 to 7 m.) in diameter, and circular in shape (Woodward 1933:490). The latest occupation of the site was estimated to be from about 1791 to 1810 (Woodward 1933:490). The most information on any of the three structures is from House C (Fig. 12). This house was approximately 23 ft. (7 m.) in diameter and consisted of two semi-subterranean floors, identified as upper and lower. The upper floor was composed of an artificial fill consisting of subsoil mixed with fine, hardened ash and beach sand. Small pieces of bone, shell, and charcoal were embedded in the hardened surface.

One hundred seventy-four postholes were encountered in the house (Fig. 12). In the field notes, two definite rings of postholes were observed near the perimeter. These postholes can be seen near the perimeter of the floor in Figure 13. In addition, random groups of postholes were encountered throughout the floor. Stumps of poles were occasionally observed, but the wood was so decayed that they were not recovered. Compact masses of eelgrass were encountered in various places across the floor. According to Woodward (MS), the angle in which the eelgrass lay indicated that it was part of the fallen roof. Eelgrass was probably abundant in

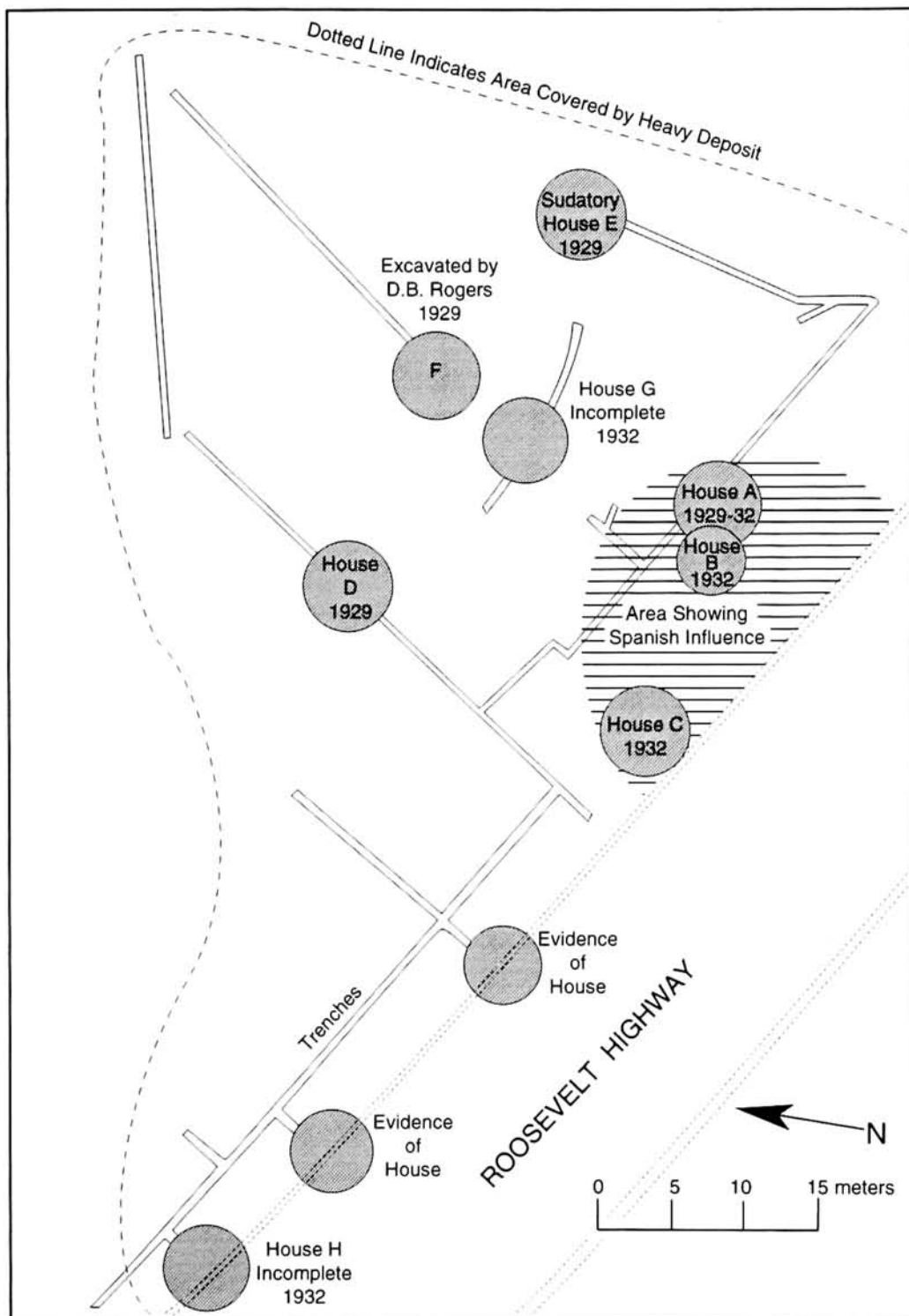


Fig. 11. Map of houses excavated at the village of Muwu.



Fig. 12. Postholes and other features associated with House C at Muwu.

the bottom of Mugu Lagoon (Woodward MS).

Several subterranean pits were encountered in the floor of House C (Fig. 13). Two fire pits with fire-altered rock were excavated in the upper floor. An asphaltum basketry impression, found in one of the pits and level with the floor, contained wheat and peas. Pit 3, which was approximately nine in. (23 cm.) in diameter and filled with mussel shells (Fig. 14), was encountered in association with the lower floor. Between 70 and 80 opened mussel shells filled the pit. Pit 4 consisted of two linked postholes. In the shallower posthole, five mussel shells, three pecten shells, two small cockle shells, and two unworked beach stones were found. The deeper posthole was filled with sand and near the center of this matrix a small whistle was recovered (Fig. 14). The whistle, which had two asphaltum plugs, was in such perfect condition that a note could be played without damaging it (Woodward MS). Pit 5 was six in. (15

cm.) in diameter, eight in. (20 cm.) deep, and was filled with clean beach sand. A plug of plaster covered this pit, making it level with the floor (Woodward MS). In addition to Pits 1 through 5, the burial pit (Pit 6) of a child approximately one year old was encountered near the fire pits. Asphaltum impressions from a basket rested on the floor of the Pit 6. Also on the floor of this pit were remains of what appeared to be food (Woodward MS).

Several features also were found in direct association with the floors identified as House C. In the northern section of the lower floor, a group of flagstones was recorded. A section of whale bone held the keystone in place. Near the eastern periphery of the upper floor, a large, flat stone was encountered. Another feature found on the floor, consisted of a slightly curved portion of a whale rib that was two ft. (60 cm.) long and had cut ends. In association with this rib was a small group of flagstones. Some of

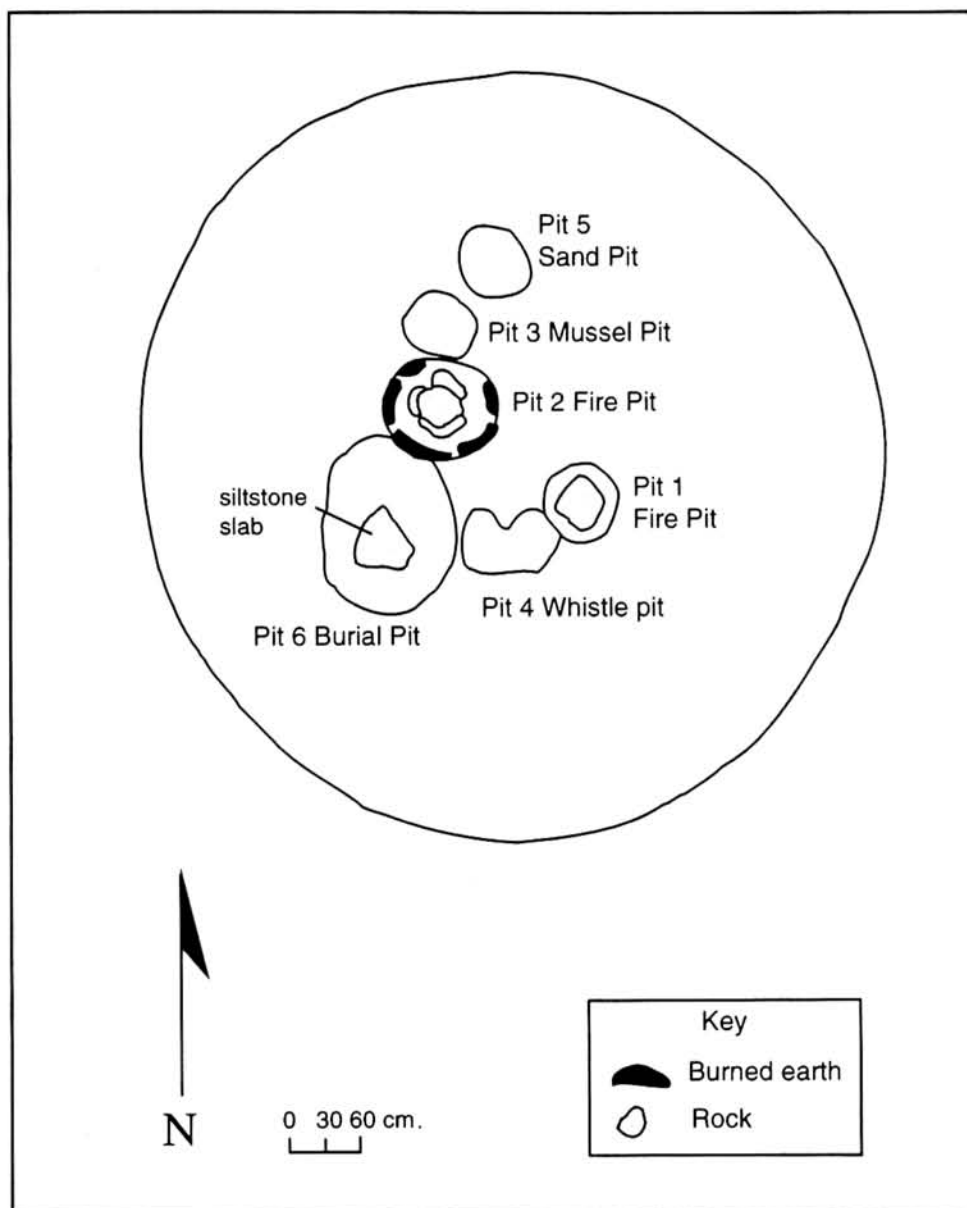


Fig. 13. Plan view of pit features in House C at Muwu.

the cultural remains observed in association with the floors in House C include asphaltum basketry fragments, tarring pebbles, fishhooks, and stone points. Potsherds, metal, and glass beads were all found in association with the upper floor (Woodward MS).

House C had the largest area of any house pits excavated at Muwu. In addition, it had evi-

dence of small postholes in the interior (indicating the use of bedroom partitions or beds), and had the most interior storage facilities of the three houses excavated at Muwu. House A also had interior pits, although not as many, and was similar in area to House C. The small size of House B, and its stratigraphic relation to House A, indicate that houses became smaller at this

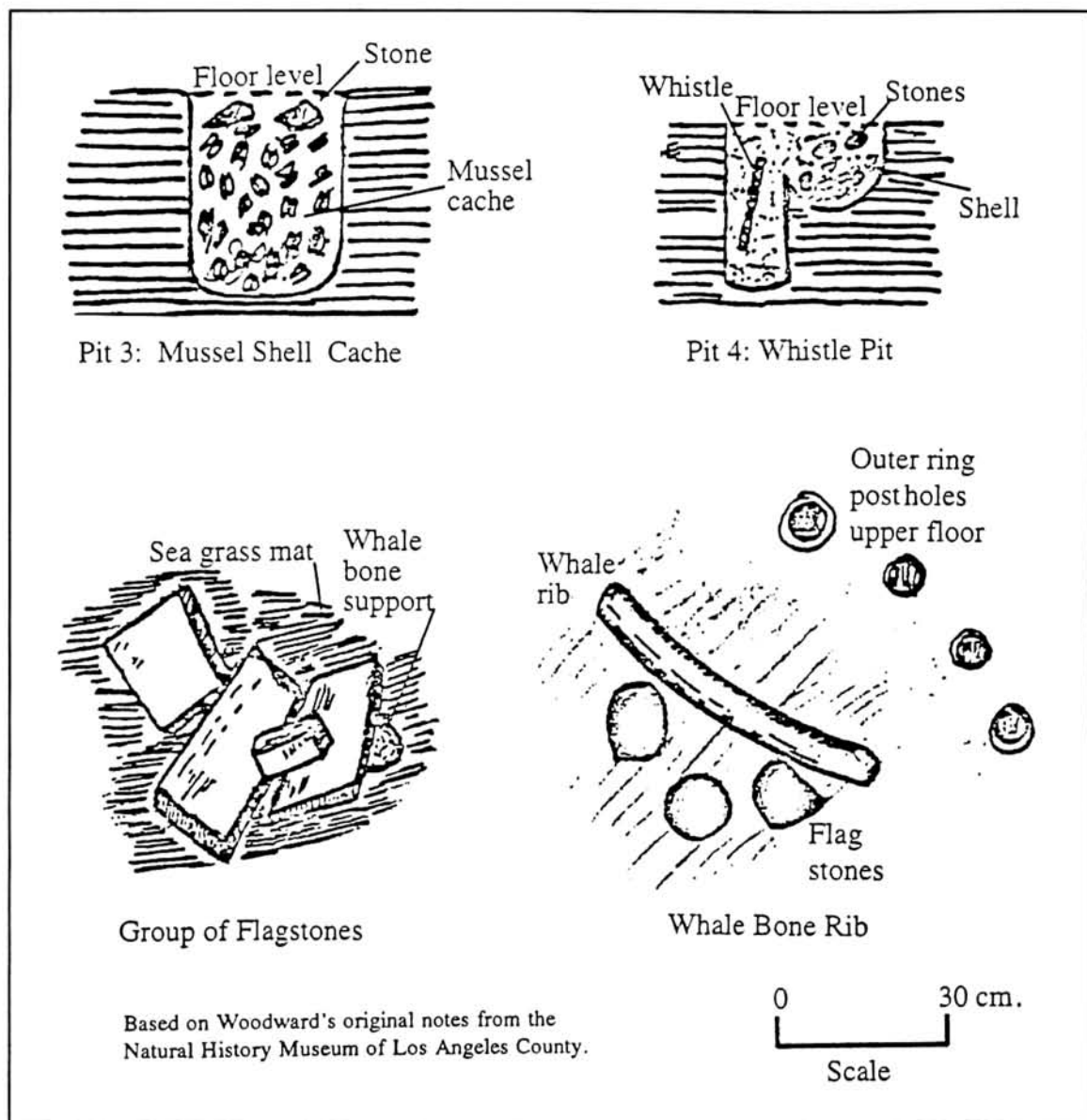


Fig. 14. Features found in association with House C at Muwu.

site in the later Historic Period. The artifacts and cultural material found in association with the three houses indicate that they were probably used as habitations.

Excavations of Structural Remains at Pitas Point (CA-VEN-27)

The Pitas Point site is located approximately eight miles northwest of Ventura along the Santa

Barbara Channel coast and was excavated in 1969 and 1970 under the direction of Chester King. Although a full report on the excavations was never completed due to financial constraints, the author worked extensively with the field notes and artifacts from the site. As a result, an analysis of the spatial organization of the artifacts, features, and activities at the site was published (Gamble 1983), and the information in

this section is based on that work.

The Pitas Point site was occupied from Middle Period Phase 5c (A.D. 1050) through Phase 1 of the Late Period (A.D. 1500). Excavations occurred in portions of the remains of two structures at the site. These structural remains were interpreted as houses and will be referred to as such herein. The house in Area 3 was described and mapped in detail (Gamble 1983). The depression of this house was about nine m. in diameter and was filled with dark soil mixed with habitation debris. This floor was similar to House C at Muwu in that there were numerous rocks and features associated with the floor. Six large postholes were found around the perimeter of the house, ranging in size between 50 and 75 cm. These postholes were filled with midden soil but were located in a matrix of sterile soil.

Six hearths were observed in this structure, one of which was near the outside perimeter. The remaining hearths were more towards the central portion of the house. All of the hearths consisted of clusters of fire-altered rock (Gamble 1983:115-117). These hearths probably were not contemporaneous, but used throughout the time the house was occupied. Beads found in the structure indicated that this house location probably was in use during the entire occupation at the site.

In addition to the hearths, one oven was identified at the base of the midden deposit in the house. It was approximately 150 cm. in diameter and 40 cm. deep, and was filled with fire-altered rock. There were also distinct clusters of artifacts found within the site, including two clusters of tarring pebbles.¹¹ Associated with these clusters of tarring pebbles was an area of the floor¹² approximately 1 by 2 m. in size, where large, flat rocks were placed in a pit in the floor. Many of these rocks had asphaltum spilled on them. This feature was about a meter from one of the tarring pebble clusters, at the same level, and was less than 25 cm. from the

hearth. It appeared to be an area where asphaltum was used, probably where water bottles were covered with asphaltum. There was also a cluster of rocks and artifacts found at the base of the house in a pit approximately 150 cm. in diameter. Three pestles were in this feature, two complete and another nearly complete. These were among the few unbroken pestles found in the house. It was suggested that this pit may have been used to store tools. Other artifact clusters found in the house included a cluster of shaped bowl/mortar fragments, two clusters of asphaltum pieces, a cluster of four heavy hammerstones, and a cluster that included four heavy hammerstones, four cobble choppers, and four tarring pebbles (Gamble 1983:115-118).

Certain features (such as the hearths described above) were situated in such a manner that one overlaid the other. This is significant because it indicates that there were several different periods of occupation in Area 3. The size of the house depression in Area 3 changed through time; during the occupation of the site, structures became larger in diameter.

Another house at Pitas Point was similar in size to the one just described, although the lower levels were not excavated. The types of artifacts recovered in this house depression (Area 5) were similar to the ones in the house depression from Area 3; however, a greater number of artifacts were observed from this area. Depressions of three other houses also were observed at the site, each of which was approximately nine m. in diameter. Houses were aligned with the beach.

The remains of domestic structures at Pitas Point is in contrast to the remains of sweatlodges discussed previously, particularly in the types and quantities of artifacts found associated with the floors. At Pitas Point, there was an abundance of artifacts associated with the houses, including basketmaking materials, tarring pebbles, and other types of artifacts that have been traditionally associated with female activities

(Gamble 1983). In addition, the house remains at Pitas Point lacked large interior posts, plastered floors, and any evidence of an earth roof or that the structure had burned.

Orr's Excavations at Skull Gulch on Santa Rosa Island (CA-SRI-2)

In 1941, Orr commenced archaeological investigations on Santa Rosa Island, which is one of the northern Santa Barbara Channel Islands. He continued investigations on the island for more than twenty years, particularly from 1947 to 1967. The following section is a synthesis of Orr's (1968:212-219) descriptions of house depressions and excavations at Skull Gulch.

Orr (1968:210) reported approximately 100 house depressions at Skull Gulch, although some of these were not well defined. Of these 100, 35 well-defined pits were observed in the eastern section of the site, and 26 in the western section (Orr 1968:210). A typical house depression was dish-shaped and measured about 40 ft. (12.2 m.) from rim to rim, with the top of the rim rounded between it and the next house, like a street. The houses were arranged in rows trending north/south. In general, it appeared that houses were built about 8 to 10 ft. (2.4 to 3 m.) apart. A high, circular midden was built around the house where the inhabitants dumped their trash. The village was occupied from approximately A.D. 1 to 1542. Turtle House (House No. 1) and Whale House (House No. 3) were excavated completely. About half of two other houses was excavated while investigating Cemetery B, which lay under them. In all of the houses, matted eelgrass was found layered in the deeper portions of the midden, in addition to fragments of thatch, netting, bags, and string of the same material (Orr 1968:210). The depression of Turtle House was 41 ft. (12.5 m.) in diameter from rim to rim, although the floor itself was only about 16 ft. (4.9 m.) in diameter and made from compacted clay. The perimeter of Turtle

House was clearly marked by 44 small post-holes. In addition to those on the perimeter, 23 postholes were scattered around the eastern portion of this house, some in a straight line. Orr (1968:212) suggested that some of these may have resulted from the presence of furniture, which was occasionally moved around. A fire pit about 10 in. (25 cm.) deep and filled with ash was encountered in the center of the house. Some small objects were found in the floor, such as points and fishhooks (Orr 1968: 213). A radiocarbon date on a fragment of one of the posts indicated that Turtle House was occupied around A.D. 1550 (400 ± 80 , UCLA-104).

Whale House (House No. 3) was located on the west side of Skull Gulch and was 18 ft. (5.5 m.) in diameter. In cross section, the Whale House floor was less concave than the Turtle House floor (Orr 1968:215). A radiocarbon date from the remains of this house indicated it was in use about A.D. 720 ($1,230 \pm 60$, UCLA-103) (Orr 1968: 215). Whale House was similar to the Turtle House in that the fire pit was in the center of the floor and postholes surrounded the floor (Orr 1968:215). After clearing about two in. (5 cm.) of the hard-packed floor, numerous postholes were discovered throughout the floor, including nearly 200 around its perimeter (Orr 1968:215). Some of these were up to six in. (15 cm.) in diameter and contained rotted wood. Numerous whale bones were lying on the floor or were embedded in it (Orr 1968:215). A few charred human bones, ashes, and burned beads were recovered in the underlying Pleistocene soils near the fire pit (Orr 1968:215). Stone graters were the most abundant type of stone implement found in the house (Orr 1968:215). Orr (1968:218) could not determine the positions of doorways in either structure.

Orr described the general construction of houses based on the excavated houses at Skull Gulch (Orr 1968:216-218). He believed that well-made houses of the type excavated at the site required no center posts, but as the house

aged and the poles rotted, uprights were sometimes added (Orr 1968:217). Eelgrass was used for thatch. There were no indications that these structures were covered with earth, had burned, or had large, interior postholes. It is probable that the small interior postholes were the result of either interior partitions or the presence of furniture. Both of the remains of these structures had central hearths, typical of houses described in the ethnographic literature.

Excavations at Shilimaqshtush (CA-SBA-205)

The Chumash village of Shilimaqshtush is located on a concave stretch of the coast between Point Conception and Point Arguello in Santa Barbara County. Most of the excavations at the site occurred on the south side of Jalama Creek, where the creek converges with the Pacific Ocean. The report on these excavations was published 25 years after the completion of excavations (Lathrap and Hoover 1975), and perhaps because of this there are problems with the information on houses and their associated features (Glassow 1980b¹³).

The period of occupation for the site is not entirely clear, but it appears to have been occupied around A.D. 1000 (Glassow 1980b:317). The feature maps and descriptions indicate that the floors may be 30 ft. (9.1 m.) or greater in diameter, although there is not enough information to make this claim with certainty. Clusters of rocks, stone slabs, and artifacts occurred throughout the floor and immediately above it. Hammerstones, choppers, bifaces, pitted stones, incised tablets, abalone, and asphaltum were associated with these clusters. In general, most of the areas in the vicinity of the floors contained an abundance of rocks and artifacts.

Some of the most distinctive features associated with the floors were a series of subterranean globular pits under the floor in Feature 11 (Lathrap and Hoover 1975:21-23). Seven of these pits apparently had fired clay walls. The floors of these seven pits were covered with

asphaltum, which usually extended up the sides of the walls for a short distance (Lathrap and Hoover 1975:21-23). The pits ranged from a few inches to about 15 in. (38 cm.) in depth. Lathrap and Hoover (1975:21-23, 112) suggested that these pits were used for storage.

The structural remains from Shilimaqshtush are different from the other house remains just examined in that there were numerous pits in the interior of the house that appear to be carefully and intentionally constructed so that they could be sealed. The fact that they were underneath floors in the interior of the structure indicates that they were concealed in a safe location. On the basis of these interpretations, it can be inferred that valuable materials were probably stored in these pits. Because of the effort to create a sealed environment, it is also possible that perishable items were stored in these pits. Other than the information on the pits in the structural remains, there is little information on house diameter, postholes, and other information that might indicate the function of these remains. Nevertheless, it is most likely that the structural remains from Shilimaqshtush were used for domestic purposes.

The Remains of a House at H'elxman (CA-SBA-485)

In addition to the two structures identified as sweatlodges at H'elxman, the remains of what was interpreted as a house (Structure 3) was investigated by Ruby in 1965. Whether this structure is contemporaneous with either of the sweatlodges at the site is not clear (Macko 1983:95). Structure 3 was between 16 and 17 ft. (4.9 and 5.2 m.) in diameter (Macko 1983: Map 3). The floor had no central postholes like those in the sweatlodges at H'elxman, nor was it plastered (Macko 1983:93). However, a series of small, clearly defined postholes were recorded around the perimeter of the structure (Macko 1983:93). There was a fire pit near the southern perimeter of the floor which contained

fire-altered rocks and burned logs (Macko 1983:92). Macko (1983:93) believed that these remains indicate it was used as a domestic structure. The lack of large, interior postholes, a plastered floor, or indications that the structure had burned all confirm Macko's interpretation.

Floors from Helo', Mescalitan Island (CA-SBA-46)

The historic village of Helo', located on Mescalitan Island in the Goleta Slough area of the Santa Barbara Channel, was one of the largest Chumash villages mentioned in the 1769 accounts of Portolá's first Spanish land expedition in Alta California (Brown 1967:29-33). In 1986 and 1987, the author conducted excavations at the site as part of a mitigation program for the Goleta Sanitary District Improvement Project. During excavations, two floors were encountered, one of which (Floor 1) was quite distinctive (Fig. 15) and was made from clay. Approximately one-half to one-third of Floor 1 was excavated (Fig. 16), because this portion of the site was slated for destruction. Floor 1 had a diameter of about 5.5 m. and was concave in shape. The rim of the floor was clearly observed. The floor was approximately two cm. thick and pieces remained intact when held in one's hand. It was readily distinguishable from the surrounding midden matrix due to its high content of silt and clay. Several layers of Floor 1 were observed in certain locations of the floor. Various features were associated with this floor, including ash lenses or hearths and subterranean pits. Although some artifacts were recovered directly on the floor, it was relatively devoid of large rocks and artifacts.

An ash and midden-filled pit and one other pit are two major features that were associated with Floor 1. The beads from the feature indicates that both pits were probably made by the occupants of Floor 1, which was used between 1782 and 1803. The ash and midden-filled pit actually consisted of several subterranean, ash-

filled pits with a quantity of charcoal, baked clay, and burned beads. Some of these ash lenses may represent hearths, particularly those with an abundance of baked clay. Contiguous to the ash lenses was a midden-filled pit with relatively less charcoal, ash, and baked clay. The midden-filled pit may be the remains of a subterranean storage pit under the floor. The other pit feature was observed when the western vertical wall of the house floor exposure was drawn and an abrupt break in Floor 1 was observed (Fig. 17). This interruption in Floor 1 continues for approximately 60 cm. The pit contained a concentration of wood and charcoal. The wood appears to be redwood. Both pits may have been used as storage areas by the inhabitants of the structure, similar to those excavated at Shilimaqstush.

Underlying Floor 1 was Floor 2, which consisted of a compacted surface formed by either intentional or unintentional means, and was much less substantial than Floor 1. The soil from Floor 2 contained a small amount of clay mixed with silt and sand. The diameter of Floor 2 was a minimum of eight meters. Bead types indicate that Floor 2 was used prior to 1782 and probably before 1770 (Gamble 1991:232). Multiple layers of Floor 2 were observed in some areas. A number of features and artifacts was associated with Floor 2, most notably a large asphaltum basketry impression that may have been the type known ethnographically to have been used for storage. Some rocks and artifacts were associated with the floor, but it was relatively devoid of large artifacts and rocks. The larger diameter of the earlier floor, Floor 2, indicates that houses became smaller during the later occupation of the site.

On the basis of a stratigraphic cross section from the west wall of the floor area (Fig. 17), several observations can be made. Both strata A1e and A1f overlaid the floors and contained clay lumps within them. Some of the clay above the floor may be the result of bioturbation, with



Fig. 15. Floor 1 at Helo', looking north.



Fig. 16. Overhead view of Floor 1 at Helo.

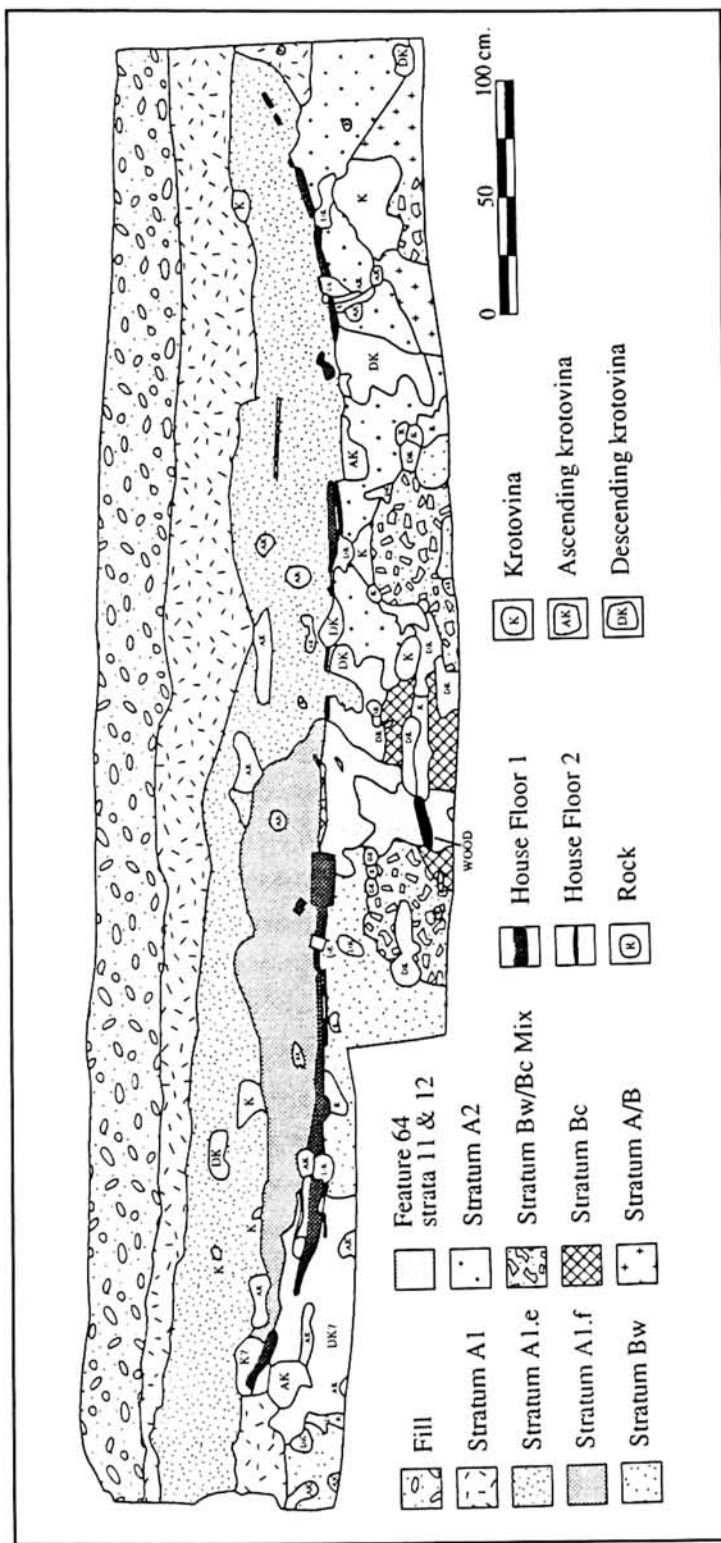


Fig. 17. Vertical cross section of west wall at Helo, floor area.

fragments of the clay floor moved upward by burrowing animals. However, other clay lumps, such as the yellow-colored clay ones observed above the floor, must have been introduced to these strata from a different source, since none of the floor was yellow in color. It is possible that the structure associated with the floor was daubed with clay and that strata A1e and A1f represent the collapsed roof of this structure. It is possible that Stratum A1f, which was only observed above the floors, represents the collapsed roof of the structure associated with Floor 1. The roof may have collapsed in a southerly direction, leaving less clay at the northern end of the structure.

In the ethnographic and ethnohistoric literature on the Chumash, dwellings usually did not have center posts or dirt-covered roofs and dirt was occasionally thrown around the perimeter of houses to keep the rain out (Hudson and Blackburn 1983:323-337). It is possible that the chief's house may have been constructed with a clay floor and a daubed roof because he or she was an important person in the village who entertained guests and hosted public events. It is also possible that the roof was primarily made from thatch and was patched with clay when it leaked. Although no interior postholes¹⁴ were observed associated with either Floor 1 or Floor 2, it is feasible that the structure associated with Floor 1 was used as a sweatlodge. The example from Helo' illustrates the complexity of identification of function of archaeological structures. The classification of Floor 2 is less problematic. This floor was not plastered like Floor 1 or those at Mikiw and H'elxman. No large, central postholes were observed in this floor, nor did the structure appear to have burned. An asphaltum basketry impression, probably the remains of a storage basket, rested on the floor of this structure. The attributes of this floor and the artifacts associated with it indicate that it probably was used as a house and not a sweatlodge.

Discussion of Archaeological Examples of Houses

The archaeological examples of houses have a number of attributes in common. None of these structures appears to have burned, and although a few of them had plastered floors, none of the remains had interior rims such as those observed in most of the sweatlodges. More than half of the structural remains identified as houses had postholes near or around the perimeter of the structure (Table 2). Hearths were associated with most of the structures identified as Chumash houses in the sample, some of which were located in the center, and others near the perimeters of the structures (Table 2). Archaeological examples of houses range in size from 5.2 to 9.1 m. in diameter. Some of the variability in the size of houses may be affected by how they were measured, although by including only examples of excavated structures, this type of variability hopefully was reduced.

In an earlier work on this subject (Gamble 1991:48-176), both excavated and unexcavated archaeological examples of houses were examined. Several observations based on these structures are of interest in this analysis. At Muwu, the remains of some houses were significantly larger than others at the village (Gamble 1991: Tables 3.1 and 3.2).¹⁵ Larger houses may have belonged to chiefs or wealthy members of the village. Information on the floor area of structures was summarized by Gamble (1991:171, Table 3.2). This summary indicated that there is a tendency for houses in the Middle and Late Period to be larger than those dating to other time periods. There are also some indications that houses along the Santa Barbara Channel mainland were larger, especially if only excavated houses are compared (Gamble 1991:Table 3.1). More information on the size of excavated floors is needed, though, before firm conclusions regarding changes in house size through time can be made.

Table 2
 ARCHAEOLOGICAL EXAMPLES OF CHUMASH HOUSES^a

Site	Widest Diameter (m.)	Burned	Clay or Plastered Floor	Interior Storage Pits	Time Period	Small Postholes near or on Perimeter	Hearth	Location of Hearth
Muwu	7.01	no	no?	yes	Historic	yes	yes	center and western side
Helo' 1	5.5	no	yes	yes	Historic	no	yes	central area
H'elxman 3	5.2	no	no	?	Historic?	yes	yes	southern perimeter
Helo' 2	8.0	no	no	no	Historic and Protohistoric	no	?	?
Skull Gulch Turtle House	5.5	no	yes?	no	Protohistoric	yes	yes	center
Pitas Point	9.0	no	no	yes	Terminal, Middle, and Late	large	yes	most in center, some in perimeter
Shilimaqshtush	9.1?	no?	no?	yes	Terminal Middle	?	?	?
Skull Gulch Whale House	5.5	no	yes?	no	Middle	yes	yes	center

^a Sites are ordered by time period first and then diameter within this category.

SUMMARY

Most examples of sweatlodges can be clearly distinguished from houses in the archaeological record for the Chumash.¹⁶ All of the structures classified as sweatlodges had evidence of large interior postholes (Table 1). The sweatlodge at the Mathews site had only two postholes, was semicircular in plan view, and was smaller than the other examples of sweatlodges, which had four or more large center posts and were circular in plan view. On the basis of ethnographic accounts, it is suggested herein that these larger structures were ceremonial types of sweatlodges, and the semicircular one was a smaller, more secular type of sweatlodge. In contrast to sweatlodges, houses lacked large center posts, but often had small postholes around the periphery of the floor, and in some cases, in the interior of the floor. The posthole patterns for

both houses and sweatlodges conform to the different construction methods described for these types of structures in the ethnographic and ethnohistoric accounts. The posthole patterns found inside Chumash houses may be a result of the presence of partitions and possibly furniture, both of which have been noted in the ethnohistoric accounts. Sweatlodges usually had plastered floors and interior rims occurring in alignment with the postholes. Although some of the houses in the sample had clay or plastered floors, none of them had interior rims. Interior rims, observed in the archaeological examples of sweatlodges, were not explicitly described in the ethnographic or ethnohistoric accounts of sweatlodges.

The location of hearths for the sweatlodges in the archaeological sample tends to be in the southern portion of these structures (Table 1), which is different than the central location de-

scribed in the ethnographic accounts for sweatlodges. The tendency for the hearths to be located in the southern portion of the sweatlodges is probably of ritual significance, although the meaning of this is unknown. The location of hearths for houses in the archaeological sample tends to be in the center of these types of structures. This corresponds to the ethnographic literature, although there is some variability in the archaeological record (Table 2).

One of the most intriguing observations made in this study is the incidence of burned sweatlodges. Most archaeological examples of the remains of Chumash sweatlodges indicate that these types of structures were burned, although there are two examples in the current study where this information was not recorded (Table 1). In the ethnohistoric accounts, however, there are numerous references indicating that villages were burned as a result of warfare. One of the most relevant and well-known accounts is the 1801 massacre at H'elxman, where individuals from three Cuyama River Valley villages came "to set fire at night to H'elxman, where they killed five persons and wounded two" (Engelhardt 1923:7). This reference is of special interest because three of the structures described in this analysis are from the historic village of H'elxman. Of these three structures, two have evidence that they burned, and both of these are the remains of sweatlodges. The third structure has been interpreted as a house, and shows no evidence of burning. In fact, none of the archaeological structures identified as houses at any sites show any evidence of burning.

This distinctive pattern in the archaeological record of burned sweatlodges and unburned houses led the author to look for additional references that might illuminate this pattern. In the ethnographic literature, there is some indication that houses were occasionally burned when a person died (Hudson and Underhay 1978:47). In one account by Henshaw, it was stated that this was done sometimes for a man of impor-

tance (Heizer 1955:157). No ethnographic references to the burning of sweatlodges were found. As noted above, however, there are some references to the burning of villages in the ethnohistoric accounts. In 1775, Rivera noted that a village at La Quemada (translated as "burned" in Spanish) was found burned. Rivera reported that:

I have counted the huts [at the latter], and including the two that serve as sweatlodges, there were more than 90. One night [the Indians from Dos Pueblos] went out and put fire to them, and no one knows the number that they killed [Johnson 1988:123].

The description is somewhat confusing in that it is unclear if the entire village or only the sweatlodges were burned. Nevertheless, at a minimum, the sweatlodges were burned in this incidence of warfare.

Another reference to burned villages is in the ethnohistoric accounts of Portolá's 1769 expedition, where two villages were described as abandoned and burned (Brown 1967:36-37). One of these is at Montecito (CA-SBA-19) and the other at Paredon (Coloc, probably CA-SBA-13). There is also a reference from Mission Santa Ynez of a man dying when a sweatlodge burned down (J. Johnson, personal communication 1994). These accounts are of special interest when considered in the light of Fages, who mentioned that men often slept in the sweatlodges at night for safety.

The archaeological record clearly indicates that sweatlodges were usually burned. Judging from the ethnohistoric accounts, this may have been a result of warfare. It is also possible that when these structures were abandoned, they were intentionally burned by the site inhabitants, conceivably because of their religious function or other reasons, such as sanitation. Another possibility is that sweatlodges burned more regularly because of the frequency and size of the fires in them. This seems unlikely, however, because the Chumash were probably quite accustomed to sweating in structures and knew how to

prevent accidental fires. Whatever the reasons for the burning of sweatlodges, the archaeological record unquestionably shows a pattern of this treatment that is worth further investigation.

One other pattern that was observed in the archaeological record, but not in the ethnographic or ethnohistoric record, is the presence of storage pits in houses (Table 2) and their almost complete absence in sweatlodges.¹⁷ Although this is not surprising, it is worth mentioning because such a pattern can be used as an archaeological indicator of houses when storage pits are present in the interior of structures.

Comparisons between archaeological, ethnohistoric, and ethnographic data emphasize the need for more detailed analyses of structural remains by archaeologists. Ethnohistoric and ethnographic information provides a baseline for interpreting the functions of structures observed in the archaeological record. Unfortunately, the archaeological record is limited to a few accounts, implying that the full range of variation is not yet documented. Archaeological examples of sweatlodges are particularly limited in terms of time depth. It is possible that the distinction between sweatlodges and houses is less discernible, at least in some instances, prior to the Historic Period.¹⁸ There may have been a long developmental history in the distinction between sweatlodges and houses that may have originated from the combination of domestic and ceremonial activities in early residential structures.¹⁹ Nevertheless, information gleaned in the archaeological record has shed light on patterns that have not been available through other lines of evidence.

NOTES

1. A portico or colonnade is defined as a series of columns set at regular intervals. The reference to porticoes indicates that there were probably posts in the interior of the sweatlodges.

2. There is no indication of this aluminum building at the site today.

3. Harrison's (1965) interpretation of this entry-way conflicts with the criteria developed for sweat-

lodges based on ethnographic and ethnohistoric accounts in the previous section of this article. This case may be an exception, or Harrison may have misinterpreted the archaeological evidence.

4. These dates are not corrected or calibrated and are referenced as Harrison (1965:154-155) published them.

5. Evidence of burned posts was in a letter to Jay Ruby from Donald Miller in the UC Santa Barbara accession files on the site.

6. In a 1966 letter written to Donald Miller from Leif Landberg about this structure, Landberg commented that a "deer rib sweat scraper" was found in this structure. I have found no further documentation of the presence of this artifact in the temescal. Sweat scrapers were used inside sweatlodges to scrape perspiration from the skin (Hudson and Blackburn 1986: 107-109). Landberg also commented that according to Woodward, the structural remains identified as a "temescal" were totally different than the rest of the house types at Muwu.

7. In one of the photographs, this center post appears to be burned.

8. This is the only archaeological example of a structure that has burials associated with it. It is not known why this is the case, but this is also the only example of a structure interpreted as a sweatlodge from this time period, indicating that it may have been a practice that occurred during the Middle Period.

9. There are no plan views, cross sections, or other documents with these burned timbers plotted.

10. In Strong's 1934-1935 field notes (Strong MS), he commented that the floor was cup-shaped.

11. Tarring pebbles were used by the Chumash to line twined water bottles with asphaltum to make them watertight.

12. The structures at Pitas Point did not have clear floors, such as the mud-plastered floors found in some of the sweatlodges described above.

13. Glassow (1980b) reviewed the book on this site and discussed many of the problems. Nevertheless, I have chosen to discuss this example because of the subterranean pits associated with the house floors.

14. Although Floor 1 was not excavated in its entirety, enough of it was excavated to indicate that there probably were no interior posts.

15. Area was computed by square meters versus diameter. The smallest house was 21.1 square m. and the largest 38.5 square m.

16. This is especially true for the Historic Period, because the sample of sweatlodges from this time period are much more frequent than from earlier time periods (Table 1). The sample of houses is more evenly distributed from the different time periods (Table 1), although there are no examples of struc-

tures from the Early Period in the sample examined (see Gamble 1991 for information on Chumash Early Period sites).

17. At the Cuyama Ranch site, Strong (MS) indicated a small storage pit in his drawing of a floor.

18. The structure from Morro Bay, dating to the Middle Period, and the one from the Mathews site (Table 1), dating to the Protohistoric Period, are the only examples in this paper that predate the historic era.

19. These ideas on earlier structures are based on comments from an anonymous reviewer who I gratefully acknowledge.

ACKNOWLEDGEMENTS

Many people have contributed to this paper. The photographs and line drawings (Figs. 4, 11, 12, 13, and 14) from the site of Muwu are from the Anthropology Section Archives at the Natural History Museum of Los Angeles County. I am particularly indebted to Margaret Hardin, Charles Rozaire, and Chris Coleman for their assistance. Three of the line drawings (Figs. 8, 9, and 10) are from the original notes of Duncan Strong, which were made available through Los Padres National Forest with the aid of Stephen Horne and John Johnson at the Santa Barbara Museum of Natural History. The UCSB Repository for Archaeological and Ethnographic Collections provided the original documentation and photographs for Figures 1, 3, 6, and 7. Both Cynthia Bettison and Karen Rasmussen helped me access these important documents.

The line drawing in Figure 2 was originally published in the *Annual Reports of the University of California Archaeological Survey* (Harrison 1965) and the Institute of Archaeology generously gave me permission to reprint this illustration. Chester King was especially helpful in providing a number of references for this paper, as well as aiding with the graphics. Terisa Green also helped with some of the final graphics for this paper. I particularly owe my gratitude to Don Miller, who originally documented some of the structural remains described in this paper. Appreciation is also extended to a number of people who made editorial comments on this and other versions of this paper, including Michael Glassow, Phillip Walker, John Johnson, Michael Jochim, Chester King, and two anonymous reviewers. Finally, I want to acknowledge the American Indian Studies Center at UCLA, who have encouraged and supported my continuing research efforts. Of course, any errors in the paper are the sole responsibility of the author.

REFERENCES

- Bolton, Herbert E.
1931 *Font's Complete Diary: A Chronicle of the Founding of San Francisco*. Berkeley: University of California Press.
- Brown, Alan K.
MS Unpublished Translations of Portions of Crespi's Journals. MS in possession of the author.
1967 *The Aboriginal Population of the Santa Barbara Channel*. Berkeley: University of California Archaeological Survey Reports No. 69.
- Clemmer, John S.
1962 *Archaeological Notes on a Chumash House Floor at Morro Bay*. Report for Pacific, Gas, and Electric Company. Sacramento: Central California Archaeological Foundation.
- Clewlow, C. William, Jr., David S. Whitley, and Ellen L. McCann (eds.)
1980 *Archaeological Investigations at the Ring Brothers Site Complex, Thousand Oaks, California*. Los Angeles: Institute of Archaeology Monograph XIII.
- Engelhardt, Zephyrin
1923 *Santa Barbara Mission*. San Francisco: James H. Barry.
- Gamble, Lynn
1983 *The Organization of Artifacts, Features, and Activities at Pitas Point: A Coastal Chumash Village*. *Journal of California and Great Basin Anthropology* 5(1):103-129.
1991 *Organization of Activities at the Historic Settlement of Helo': A Chumash Political, Economic, and Religious Center*. Ph.D. dissertation, University of California, Santa Barbara.
- Glassow, Michael A.
1980a *Reviews of The Running Springs Ranch Site: Archaeological Investigations at Ven-65 and Ven-261, by Jack Pritchett and Allen McIntyre, and Archaeological Investigations at the Ring Brothers Site Complex, Thousand Oaks, California, by C. William Clewlow, Jr., David S. Whitley, and Ellen L. McCann*. *Journal of California and Great Basin Anthropology* 2(2):308-312.

- 1980b Reviews of Excavations at Shilimaqshtush: SBA-205, by Donald W. Lathrap and Robert L. Hoover, and Los Osos Junior High School Site 4-SLO-214, by Robert L. Hoover and Col. W. B. Sawyer. *Journal of California and Great Basin Anthropology* 2(2):315-321.
- Gould, G. H.
1887 Second Interview with Justo Gonzales, Jan. 18, 1887. MS No. 6034, on file at Bureau of American Ethnology, National Anthropological Archives, Smithsonian Institution, Washington, D.C.
- Harrington, John P.
1922 Field-work on the Kiowa, Pueblo, and California Indians. Washington: Smithsonian Miscellaneous Collections 72(15): 125-127.
1942 Culture Element Distributions: XIX, Central California Coast. *University of California Anthropological Records* 7(1).
- Harrison, William M.
1965 Mikiw: A Coastal Chumash Village. Los Angeles: Annual Reports of the University of California Archaeological Survey 7:91-178.
- Heizer, Robert F. (ed.)
1955 California Indian Linguistic Records: The Mission Indian Vocabularies of H. W. Henshaw. *University of California Anthropological Records* 15(2).
- Horne, Stephen, and Donald Miller
1978 Taped Conversation Pertaining to Donald Miller's Work at CA-SBA-485, transcribed by Michael E. Macko. Tape and MS on file at Los Padres National Forest, Goleta.
- Hudson, Travis, and Thomas C. Blackburn
1983 The Material Culture of the Chumash Interaction Sphere, Vol. II: Food Preparation and Shelter. Ballena Press Anthropological Papers No. 27.
1986 The Material Culture of the Chumash Interaction Sphere, Vol. IV: Ceremonial Paraphernalia, Games, and Amusements. Ballena Press Anthropological Papers No. 30.
- Hudson, Travis, and Ernest Underhay
1978 Crystals in the Sky: An Intellectual Odyssey Involving Chumash Astronomy, Cosmology and Rock Art. Socorro: Ballena Press.
- Hudson, Travis, Thomas C. Blackburn, Rosario Curletti, and Janice Timbrook
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.
1988 Chumash Social Organization: An Ethnohistoric Perspective. Ph.D. dissertation, University of California, Santa Barbara.
- King, Chester D.
1976 Chumash Intervillage Economic Exchange. In: *Native Californians: A Theoretical Retrospective*, Lowell J. Bean and Thomas C. Blackburn, eds., pp. 289-318. Ramona: Ballena Press.
1990 Evolution of Chumash Society: A Comparative Study of Artifacts Used for Social System Maintenance in the Santa Barbara Channel Region Before A.D. 1804. New York: Garland.
- Lathrap, Donald W., and Robert L. Hoover
1975 Excavations at Shilimaqshtush: SBA-205. San Luis Obispo County Archaeological Society Occasional Papers No. 10.
- Macko, Michael E.
1983 Beads, Bones, Baptisms, and Sweatlodges: Analysis of Collections from "Elijman" (CA-SBA-485), A Late Period Inezeno Chumash Village in the Central Santa Inez Valley, California. Master's thesis, University of California, Santa Barbara.
- Orr, Phil C.
1968 Prehistory of Santa Rosa Island, Santa Barbara, California. Santa Barbara: Santa Barbara Museum of Natural History.
- Priestley, Herbert Ingram (trans.)
1972 A Historical, Political, and Natural Description of California by Pedro Fages, Written for the Viceroy in 1775. Ramona: Ballena Press.
- Strong, William Duncan
MS Personal Diary of Tulamniu CWA Project and Santa Barbara National Forest Expedition. MS on file at the Los Padres National Forest, Santa Barbara.
1935 Archaeological Exploration in the Country of the Eastern Chumash. Smithsonian Institution Reports of Exploration and Fieldwork 1934, pp. 69-72. Washington: Smithsonian Institution.

von Hemert-Engert, Adolph, and Frederick Teggart (eds.)

- 1910 The Narrative of the Portolá Expedition of 1769-1770 by Miguel Costansó. Publications of the Academy of Pacific Coast History 1(4):9-159. Berkeley: University of California Press.

Wildesen, Leslie E.

- 1968 Current Research in Southern California. Society for California Archaeology Newsletter 2(4):5-6.

Woodward, Arthur

MS Unpublished Notes of Woodward-Van Bergen Excavations. MS No. 6042 on file at the Smithsonian Institution, Washington D.C.

1933 Los Angeles Museum Work at Muwu and Simomo, Ventura County, in 1932. American Anthropologist 35(3):490-491.

1938 The First Ethnologists in California. The Masterkey 12(4):141-151.

