

UC Merced

Journal of California and Great Basin Anthropology

Title

The Organization of Artifacts, Features, and Activities at Pitas Point: A Coastal Chumash Village

Permalink

<https://escholarship.org/uc/item/32w98124>

Journal

Journal of California and Great Basin Anthropology, 5(2)

ISSN

0191-3557

Author

Gamble, Lynn

Publication Date

1983-07-01

Peer reviewed

The Organization of Artifacts, Features, and Activities at Pitas Point: A Coastal Chumash Village

LYNN GAMBLE

REMAINS of house structures, refuse heaps, and activity areas within a coastal Chumash village are examined in this paper in order to describe the internal organization at a Late Period archaeological site in southern California. Methods of analysis include visual inspection of the distribution of artifact types and features, contingency tests, and examination of graphs resulting from standardization and other processes. All feature types are described in detail. Then, with the aid of ethnographic analogy and the use of historic records, activity areas are delineated. Activities that occurred within houses are distinguished from those that took place outside houses. In addition, specific activity loci are defined, such as basket-making areas.

Knowledge about the relationships among artifacts and features within a site is important in understanding the uses of artifacts. The distribution of different artifact types often indicates the locations and types of activities that occurred at a site. Although houses in the Chumash area have been excavated, little is known about the organization of activities within houses. Archaeological evidence from the Pitas Point site, located in the Santa Barbara Channel region, offers an excellent source of data for addressing these problems.

Using the available data, I will attempt to demonstrate that there was a non-random distribution of artifact types at the Pitas Point site. Certain areas excavated are believed to be inside house structures on the basis of stratigraphic evidence. It is proposed that there are expectable differences between the types of artifacts occurring within as opposed to outside these structures. By using simple quantitative statistical techniques, including chi-square tests, this hypothesis will be tested. Once the range of activities performed inside house structures has been determined, features within these structures such as hearths or clusters of tarring pebbles will be identified. Ethnographic and historic data in conjunction with the archaeological record will be used to suggest the types of activities that took place at the site. Other activities described in the ethnographic record undoubtedly occurred at the Pitas Point site, but will not be discussed until more data have been examined.

The Pitas Point site is located approximately eight miles northwest of Ventura along the Santa Barbara Channel coast on U. S. Highway 101. The site was excavated in 1969 and 1970 under the direction of Chester King as a salvage project for the realignment of Highway 101. A report discussing the results from the excavations and catalogued remains was never completed because of financial and time constraints.

Lynn Gamble, Dept. of Anthropology, Univ. of California Santa Barbara, CA 91306.

DATING OF THE SITE

The Pitas Point site, VEN-27, was occupied from Middle Period Phase 5c through Phase 1 of the Late Period, approximately A.D. 1000-1550. This dating is indicated by beads and ornaments found at the site. Common beads and ornaments include *Olivella* split-punched beads, *Olivella* cupped beads, small *Olivella* saucer beads, *Megathura* ornaments, and *Dentalium* beads. *Olivella* cupped beads were used only during the Late Period (after A.D. 1100) in the Santa Barbara Channel area (King 1981: 253-254). *Olivella* split-punched beads were used immediately prior to the use of *Olivella* cupped beads, during the Middle Period Phase 5c (King 1981: 247-248). In addition to their use, split-punched beads were manufactured at the Pitas Point site. Evidence includes split-punched bead blanks and pieces of shell removed during manufacture (King 1981: 358, Fig. 4).

SITE STRUCTURE, SITE FORMATION PROCESSES, AND EXCAVATION PROCEDURES

The following information concerning the Pitas Point site is based on an analysis of field notes, maps, discussions with King, and background research. At the time of occupation, the houses at the Pitas Point site were situated on the edge of a low marine terrace overlooking a beach to the south. The upper layers of this low marine terrace consisted of fine-grained colluvial soils formed by downslope particle flow. The terrace was truncated on the seaward side by a wave-cut bluff. Below the bluff were beach sands of which the upper 140 cm. contained cultural remains. Since the occupation of the site, the beach has risen approximately eight meters above the present sea level and is 300 m. north of the modern shoreline. Geological studies have shown that the Ventura Basin has been subsiding while

the northern margin of the basin (in the Pitas Point area) is uplifting (Yeats 1977: 295). Estimates that the northern rim is rising at an average rate of 10.2 mm. per year (Yeats 1977: 295) or four to ten m. per thousand years (Lajoie et al. 1979: 10) imply that in the last 800 years the coastline has risen an average of eight meters.

The main units of controlled excavation were five area exposures (Fig. 1). These area exposures were placed on the basis of observations of data from test excavations and backhoe trenches. An attempt was made to sample areas where there might be houses as well as areas outside structures. The volume of excavated material varied considerably between the five different areas. Both Areas 1 and 3 consisted of ten-meter-square units excavated in five-meter-square quadrants. Both were excavated until sterile soils were encountered, which occurred at 80 cm. depth in Area 3 and at 140 cm. depth in Area 1. Areas 2 and 4 were each excavated as two five-meter-square units. Area 5 was even smaller and was only excavated to 20 cm. depth, at which point excavations were discontinued because of a lack of funds. All five of the areas were excavated in 10-cm. levels and screened through ¼-in. mesh screen. One-meter-square control samples were taken from Areas 1, 2, and 3. These samples were water screened through 1/8-in. mesh screen and sorted in the laboratory. All large artifacts or clusters of artifacts, as well as rocks and features, were mapped *in situ* for each 10-cm. level for Areas 1 through 5 (Figs. 2-8).

SITE DESCRIPTION

My description begins with the beach zone and continues with the higher portions of the site. Areas 1 and 4 were located on beach sand, and Areas 2, 3, and 5 were situated on top of the low terrace overlooking the beach (Fig. 1). Present in both Areas 3 and 5 are what have been interpreted as

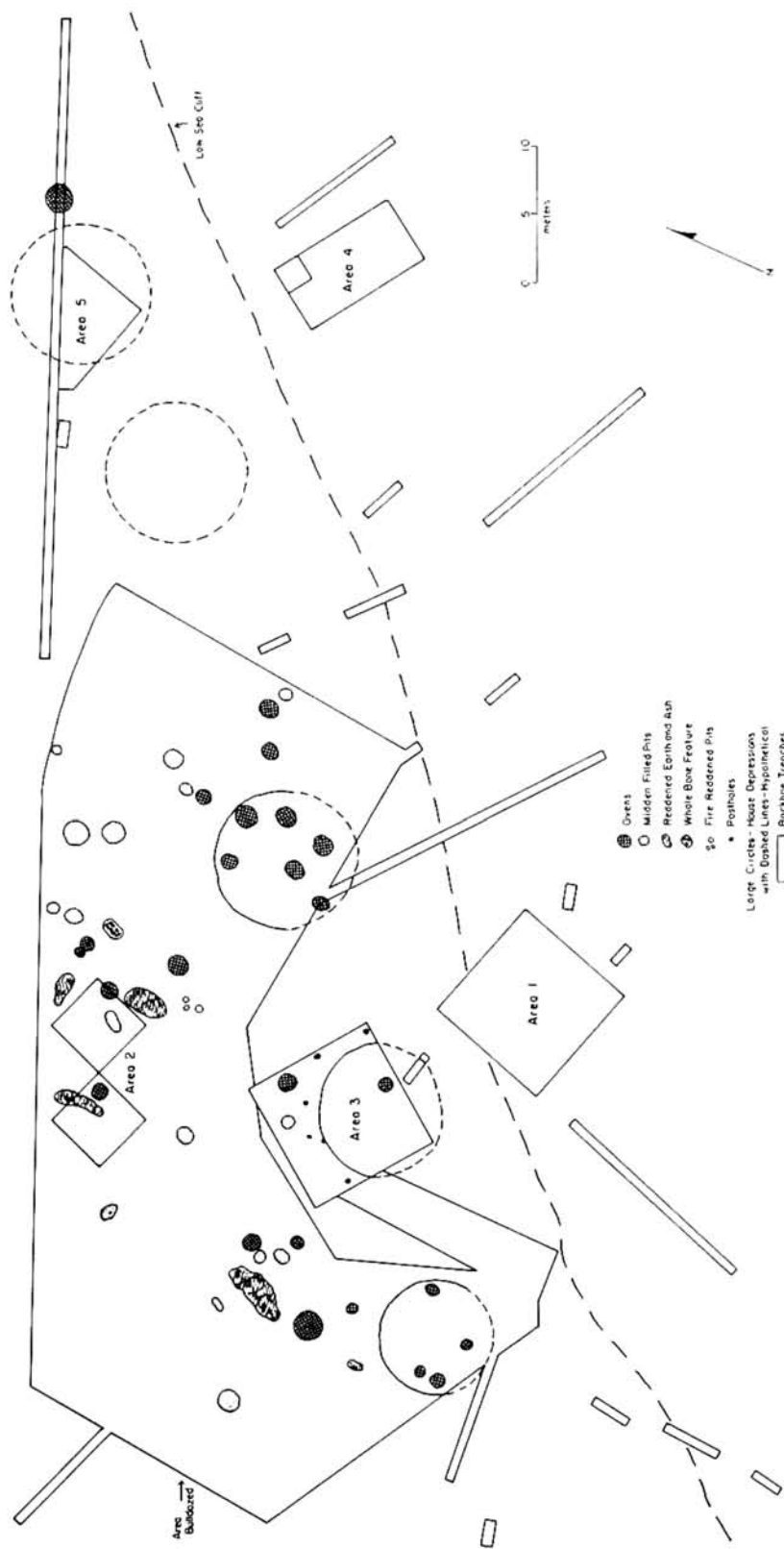


Fig. 1. Excavations and features at the Pitav Point site.

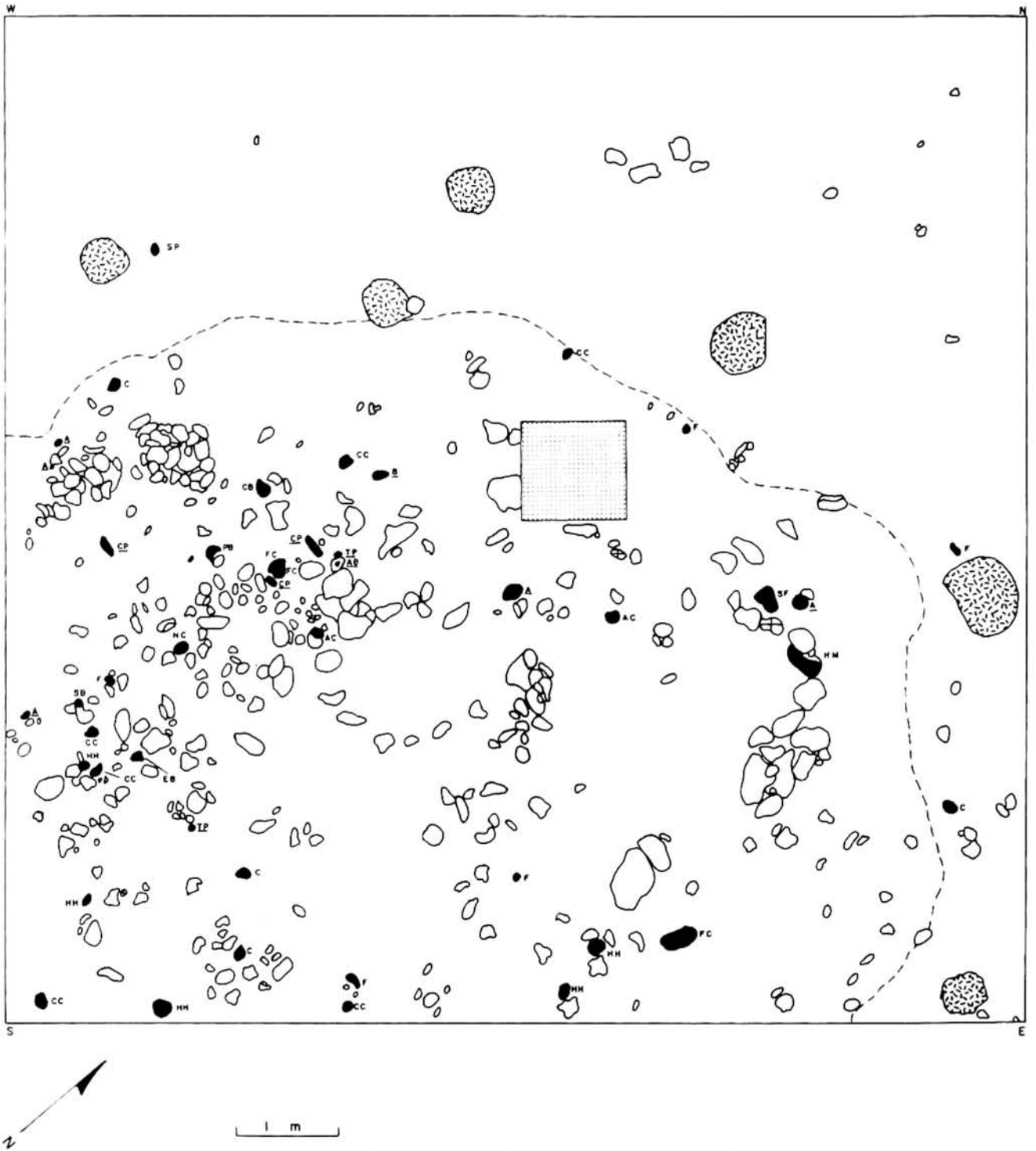


Fig. 2. Artifact types and features in Area 3, 0 - 10 cm.

portions of houses, judging from stratigraphic evidence.

Area 1 was located on the southern edge of the site near its western boundary. At the time Pitav Point was occupied, Area 1 was

situated on the beach directly below the terrace on which Area 3 was located. The soil in Area 1 was particularly dark and greasy, with a high density of organic material. It was observed during excavation that most of the

KEY FOR FIGS. 2 - 8

AC	- Angular Chopper
A	- Asphaltum
AA	- Asphaltum Applicator
AB	- Asphaltum Basketry Impression
	- Bone
	- Bone Awl
B	- Bowl of Steatite
CH	- Chopper
CC	- Cobble Chopper
CP	- Cobble Pestle
	- Control Column
C	- Core
CT	- Core Tool
CB	- Corner Battered Hammerstone
----	- Dashed Line Marks Boundary Between Sterile and Midden
DS	- Domed Scraper
EB	- Edge Battered Broken Pestles and Cobbles
EH	- Edge Beveled Hammerstone
F	- Flake
FK	- Flake Knife
FH	- Flaking Hammerstone
FC	- Fire Cracked Rock
HH	- Heavy Hammerstone
HM	- Hopper Mortar
LA	- Large Anvil
H	- Large Cobble Hammerstone
LF	- Large Flake
NC	- Notched Cobble
P	- Shaped Pestle
PB	- Pestle Blank
	- Postholes
	- Rock with Asphaltum
	- Shell
SA	- Small Anvil
SB	- Shaped Bowl Mortar
SF	- Siltstone File
TP	- Tarring Pebble
UC	- Unclassified Chipped Stone
UF	- Utilized Flake
W	- Whale Bone
—	- Underline indicates presence of asphaltum

refuse (i.e., shellfish remains, bone, burnt rock, and broken artifacts) appeared to be concentrated in the northern portion of Area 1, just south of the bluff (Fig. 1).

The only observable features in Area 1 besides burials were rows of cobbles and burnt rocks. These configurations of stones ran parallel to the shoreline. They were presumably a result of two forces: rubbish disposal and wave action. Area 1 contained two intact human burials; both lacked clearly associated artifacts. In addition to these two human burials, a dog burial was found in Area 1.

Area 4 was located about 45 m. to the east of Area 1 in the same beach zone. It was situated directly below Area 5 (Fig. 1). At 60 cm. depth, excavations were discontinued in most of Area 4 because of time constraints. A single two-meter-square unit located in the northeast corner of Area 4, however, was excavated to sterile soil, which was encountered at 110 cm. below the surface. Observations during excavations were that the northern portion of Area 4 was similar to portions of Area 1; both portions contained large quantities of artifacts and refuse and had a similar black greasy midden soil. On the northern edge of the two-meter-square unit, a human burial was found which had no clearly associated artifacts. No other definite features were observed.

Area 3 was one of the three areas (2, 3, and 5) situated on the terrace above the relict beach. Area 3 was located about five meters north of Area 1 (Fig. 1). In this area, a depression thought to be a house floor about nine meters in diameter was observed during excavations. The depression was filled with a dark soil mixed with habitation debris. Except for features, the area surrounding the large house depression in Area 3 was manually excavated to only 10 cm. depth. The archaeological evidence indicates that a house structure was located in Area 3. For purposes of

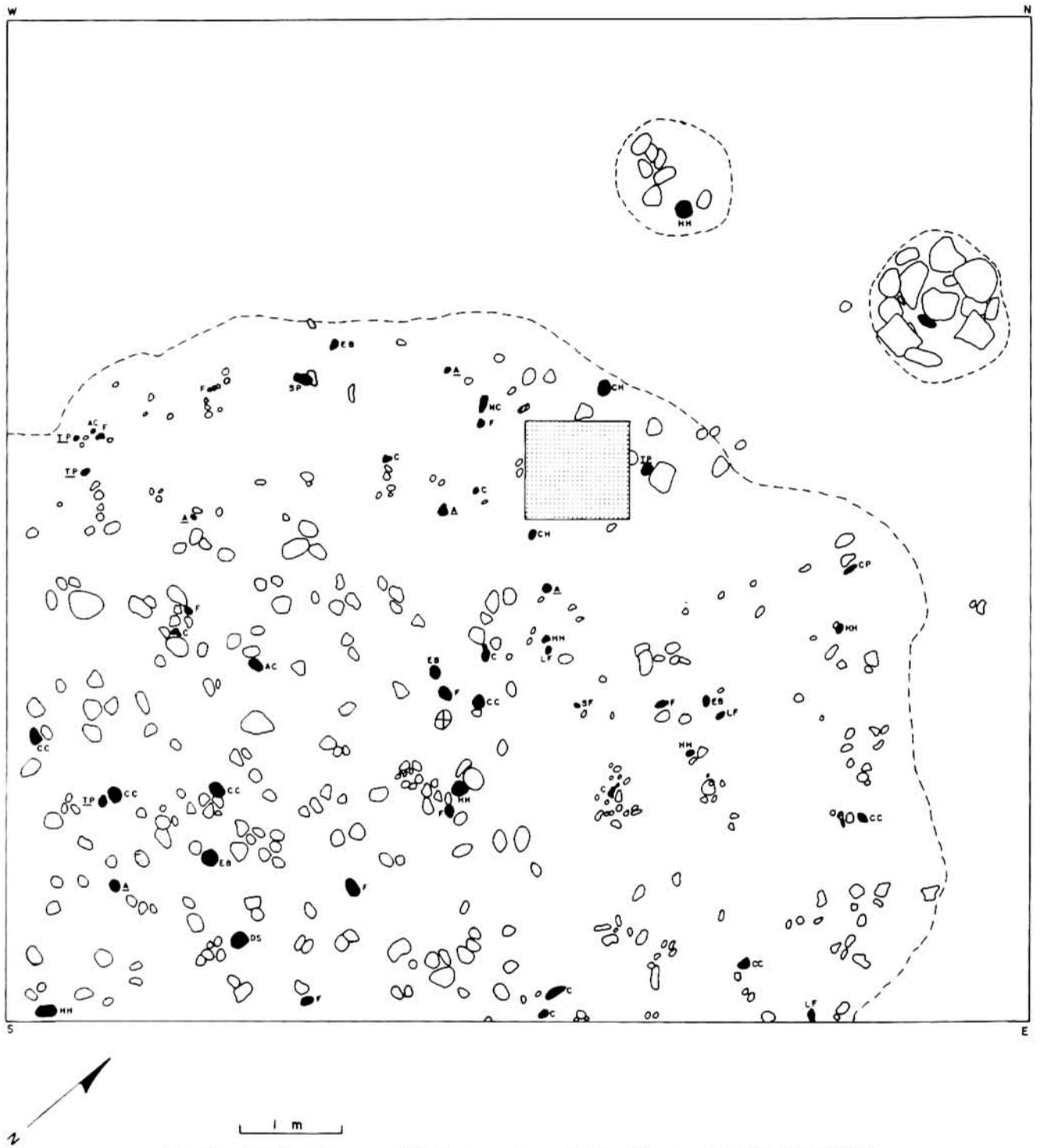


Fig. 3. Artifact types and features in Area 3, 10 - 20 cm. (see Fig. 2 for key).

this paper, this feature and a similar feature in Area 5 will be referred to as "houses." No burials were observed in Area 3.

Area 5 was located about 40 m. north of Area 4 on the low terrace overlooking the

beach (Fig. 1). A portion of Area 5 appeared to be a house. The entire area contained a heavy concentration of rocks, both large and small. No definite features were observed during field excavations.

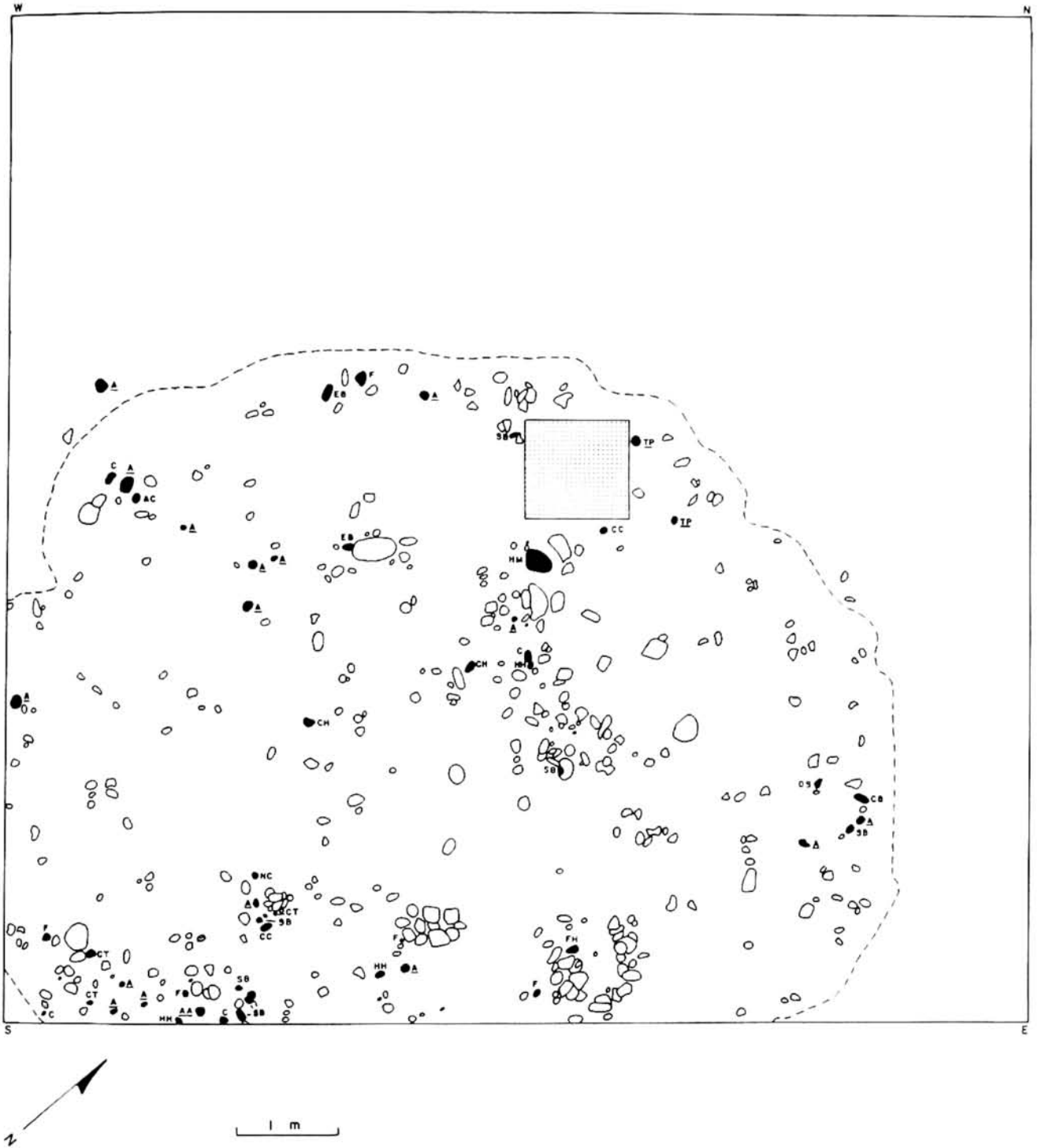


Fig. 4. Artifact types and features in Area 3, 20 - 30 cm. (see Fig. 2 for key).

Area 2 was located about 25 m. north of Area 3 on the terrace above the beach (Fig. 1). Resting on the surface of the midden soil in this area and directly under the colluvial deposit were large rock slabs. Similar

rocks were found on the surface of the midden soil in the house depression in Area 3. Two ovens, like the example described below for Area 3, were recovered from Area 2. Both were lined with carefully placed slabs of rocks

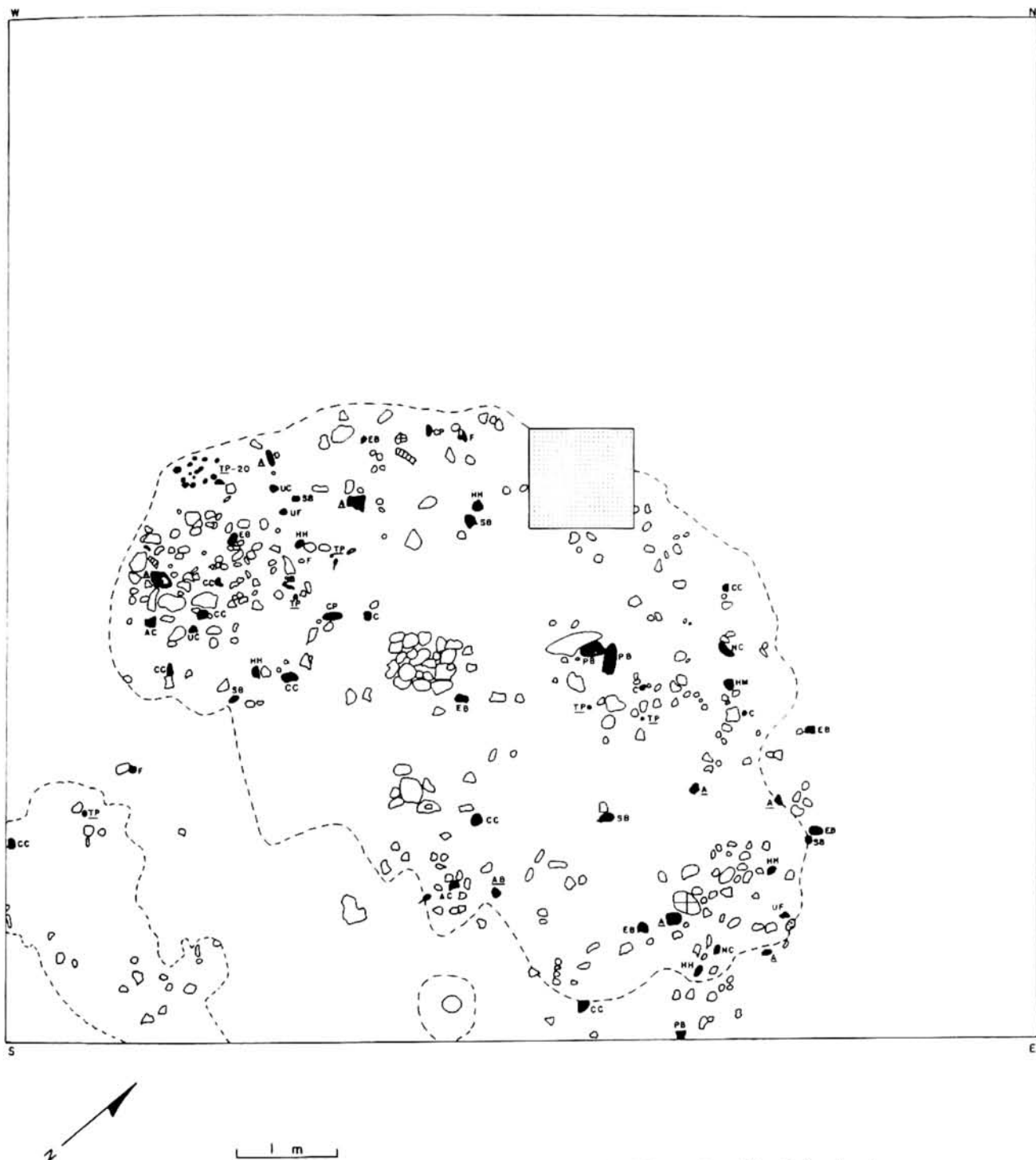


Fig. 6. Artifact types and features in Area 3, 40 - 50 cm. (see Fig. 2 for key).

tabulated many of the artifacts recovered from the excavation of the Pitas Point site. He separated the artifacts into distinct groups of types according to Spaulding's definition of a type, which is a group of artifacts with a

consistent set of attributes whose combined properties have a consistent pattern (Spaulding 1953: 305). In addition, I sorted some of the projectile points into types. Tables were constructed from data sheets that included

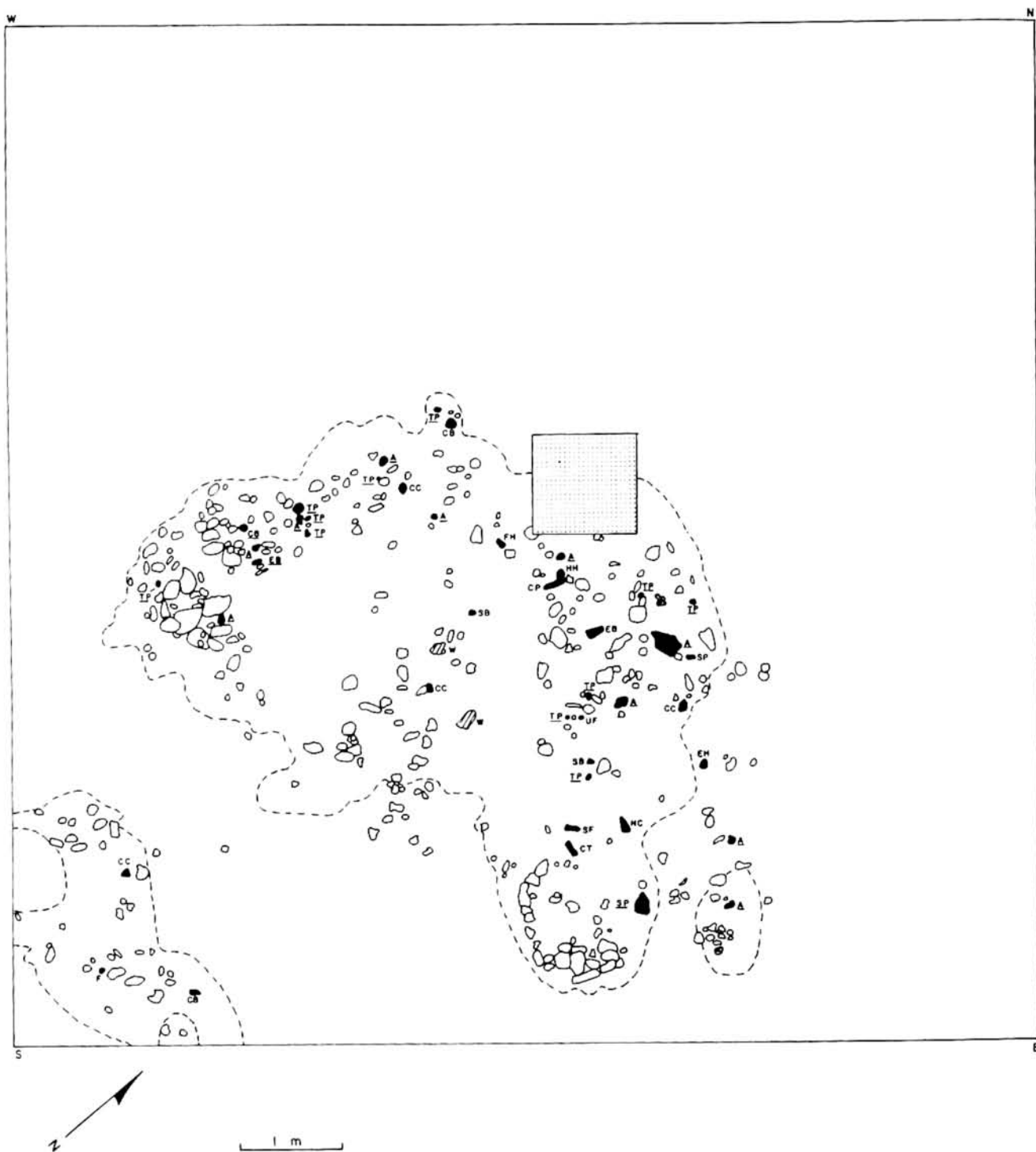


Fig. 7. Artifact types and features in Area 3, 50 - 60 cm. (see Fig. 2 for key).

the distribution of artifact types according to provenience and, in most cases, the completeness of the artifacts (i.e., whole or fragmentary).

With these data, a number of tables and

graphs were produced. A table listing all artifact types used for this report, together with their frequencies and percentages, was constructed for Areas 1 through 5 (Table 1).

In order to test if artifacts were non-

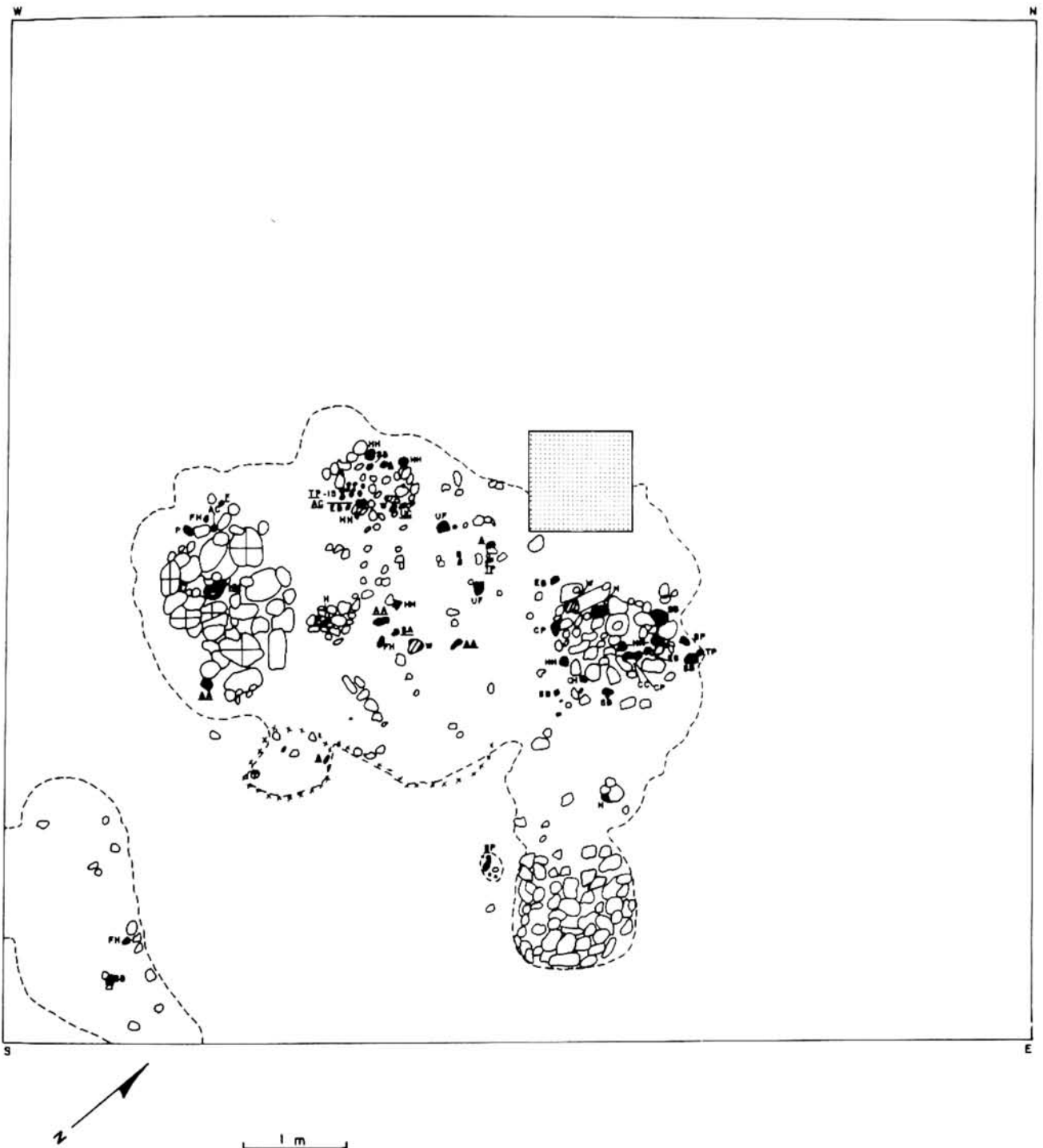


Fig. 8. Artifact types and features in Area 3, 60 - 80 cm. (see Fig. 2 for key).

randomly distributed, a chi-square value of all the artifact types in the five areas in Table 1 was computed. The resulting chi-square value is 509.985 with 80 degrees of freedom. At the .001 probability level, the table value is

124.839. The chi-square value of 509.985 is a higher value than the probability table value. This indicates that the observed distribution of artifact types is non-random when compared to the expected distribution of artifact

Table 1
 FREQUENCY AND PERCENTAGE OF TOOL TYPES BY EXCAVATION AREA

	Area 1		Area 2		Area 3		Area 4		Area 5		Total Frequency
	Fre- quency	Per- centage	Fre- quency	Per- centage	Fre- quency	Per- centage	Fre- quency	Per- centage	Fre- quency	Per- centage	
Fish Hooks	83	5.98	5	2.96	17	3.28	2	3.03	1	.40	108
Notched Cobbles	20	1.44	-	0.00	8	1.54	2	3.03	4	1.61	34
Fish Hook Blanks	68	4.91	2	1.18	13	2.51	2	3.03	-	0.00	85
Fish Hook Drills	45	3.25	5	2.96	17	3.28	3	4.55	-	0.00	70
Flake Knives	52	3.75	-	0.00	2	.39	2	3.03	3	1.21	59
Flaking Hammerstones	54	3.90	2	1.18	6	1.16	2	3.03	4	1.61	68
Edge-Battered Cobbles	80	5.77	13	7.69	13	2.51	4	6.06	7	2.82	117
Cores	61	4.40	9	5.33	25	4.82	1	1.52	16	6.45	112
Irregular Flake Scrapers	54	3.90	4	2.37	2	.39	6	9.09	7	2.82	73
Domed Scrapers	38	2.74	1	.59	4	.77	1	1.52	6	2.42	50
Pestle Blanks	20	1.44	1	.59	7	1.35	1	1.52	8	3.23	37
Heavy Hammerstones	62	4.47	18	10.65	45	8.67	1	1.52	19	7.66	145
Shaped Pestles	31	2.24	4	2.37	10	1.93	2	3.03	3	1.21	50
Cobble Pestles	14	1.01	4	2.37	10	1.93	1	1.52	7	2.82	36
Shaped Bowl Mortars	39	2.82	4	2.37	34	6.55	4	6.06	11	4.44	92
Small Tarring Pebbles	233	16.81	52	30.76	219	42.15	5	7.58	41	16.54	550
Large Tarring Pebbles	55	3.97	12	7.10	13	2.51	2	3.03	19	7.66	101
Asphaltum Applicators	12	.87	7	4.14	8	1.54	1	1.52	11	4.44	39
Arrow Points	182	13.13	9	5.33	29	5.59	20	30.27	7	2.82	247
Harpoon Points	30	2.17	2	1.18	5	.96	-	0.00	-	0.00	37
Cobble Choppers	153	11.04	15	8.88	32	6.17	4	6.06	74	29.84	278
Totals	1,386	100.01	169	100.00	519	100.00	66	100.00	248	100.00	2,388

types. A series of pairwise contingency tables was also constructed to compare the observed distribution of tool types over the various areas with the distribution expected on the hypothesis of random deposition. A number of these tables gave significant chi-square values at the .001 and .01 levels. This indicates a non-random distribution of artifact types, especially when the house areas were contrasted with the beach zones.

Table 2 presents the values obtained by a standardizing process (Mosteller 1968) for the data on the distribution of 21 tool types over the five areas. The purpose of this standardization is to eliminate the effects of unequal marginal totals on the proportions in each cell while still preserving the inequalities in cell values that measure strength of association between the tool-type variable and the area-provenience variable. Ignoring rounding error,

each tool-type margin in Table 2 sums to $1/21 = .0476$, and each area-margin sums to $1/5 = .2000$. The grand total for the table is 1.000. The mean cell value is $1/21 \times 5 = .0095$, and departures from the mean indicate positive or negative associations. The size of the departure is a measure of strength of association, but it is not a test of significance. The standardized values are calculated by iteration: (1) each cell value is divided by its column marginal total multiplied by five (there are five columns), producing a new table with column marginal totals of 2.000; (2) the new row marginal totals are calculated, and each cell value is divided by its row marginal total multiplied by 21 (there are 21 rows), producing a new table with row marginal totals of $1/21 = .0476$. These two steps complete one cycle of iteration. Cycles are repeated until both column and row marginal

Table 2
STANDARDIZED FREQUENCIES OF TOOL TYPES BY EXCAVATION AREA

	Area 1	Area 2	Area 3	Area 4	Area 5	Total
Fish Hooks	.0152	.0106	.0117	.0081	.0021	.0477
Notched Cobbles	.0079	.0000	.0114	.0168	.0114	.0475
Fish Hook Blanks	.0182	.0056	.0122	.0117	.0000	.0477
Fish Hook Drills	.0094	.0116	.0136	.0131	.0000	.0477
Flake Knives	.0197	.0000	.0035	.0176	.0069	.0477
Flaking Hammerstones	.0149	.0062	.0062	.0130	.0073	.0476
Edge-Battered Cobbles	.0089	.0164	.0062	.0099	.0062	.0476
Cores	.0066	.0127	.0108	.0028	.0148	.0477
Irregular Flake Scrapers	.0084	.0076	.0011	.0219	.0088	.0478
Domed Scrapers	.0139	.0042	.0072	.0069	.0155	.0477
Pestle Blanks	.0067	.0041	.0090	.0068	.0211	.0477
Heavy Hammerstones	.0053	.0154	.0136	.0026	.0109	.0478
Shaped Pestles	.0087	.0131	.0101	.0116	.0041	.0476
Cobble Pestles	.0037	.0134	.0106	.0055	.0145	.0477
Shaped Bowl Mortars	.0047	.0058	.0154	.0111	.0107	.0477
Small Tarring Pebbles	.0055	.0141	.0189	.0027	.0066	.0478
Large Tarring Pebbles	.0063	.0150	.0057	.0055	.0151	.0476
Asphaltum Applicators	.0027	.0160	.0066	.0055	.0170	.0478
Arrow Points	.0088	.0062	.0062	.0226	.0031	.0469
Harpoon Points	.0188	.0144	.0144	.0000	.0000	.0476
Cobble Choppers	.0064	.0076	.0057	.0047	.0232	.0476
Totals	.2007	.2000	.2001	.2004	.1993	1.0005

totals approximate the desired sums (in this case, .2000 for columns, .0476 for rows) to a satisfactory level of accuracy. (Discrepancies in Table 2 are due to rounding error.) This standardization is justified by the large chi-square value of Table 1. Fig. 9 was produced by changing the decimal fractions resulting from standardization to whole numbers by moving the decimal point three places to the right.¹

Once it was established that the house areas differed from the areas outside the houses, the features and artifact types within a house were examined. Area 3 was chosen for this more detailed analysis because it was the only house at the site that was excavated by hand to sterile soils. All of the artifacts mapped during field work were identified on the maps as to artifact type. In Figs. 2-8, artifacts have been blackened in, while rocks are not. The dashed line on each map represents the division between sterile and midden

soil. Surrounding this dashed line in Fig. 2 are stippled areas that represent midden-filled pits or postholes. The one-meter-square unit near the center of the map was the control column that was processed separately.

DESCRIPTIONS OF FEATURES IN EXCAVATION AREA 3

A number of features were recovered during excavations in Area 3, including hearths, ovens, postholes, and artifact clusters. Each feature and its location are described below.

Hearths

These features are called "hearths" because they possess a number of similar attributes (described below), and it is believed they functioned as fireplaces. Hearths consisted primarily of clusters of relatively small rocks, many of which were fire-altered. These clusters ranged between 50 and 100 cm. in

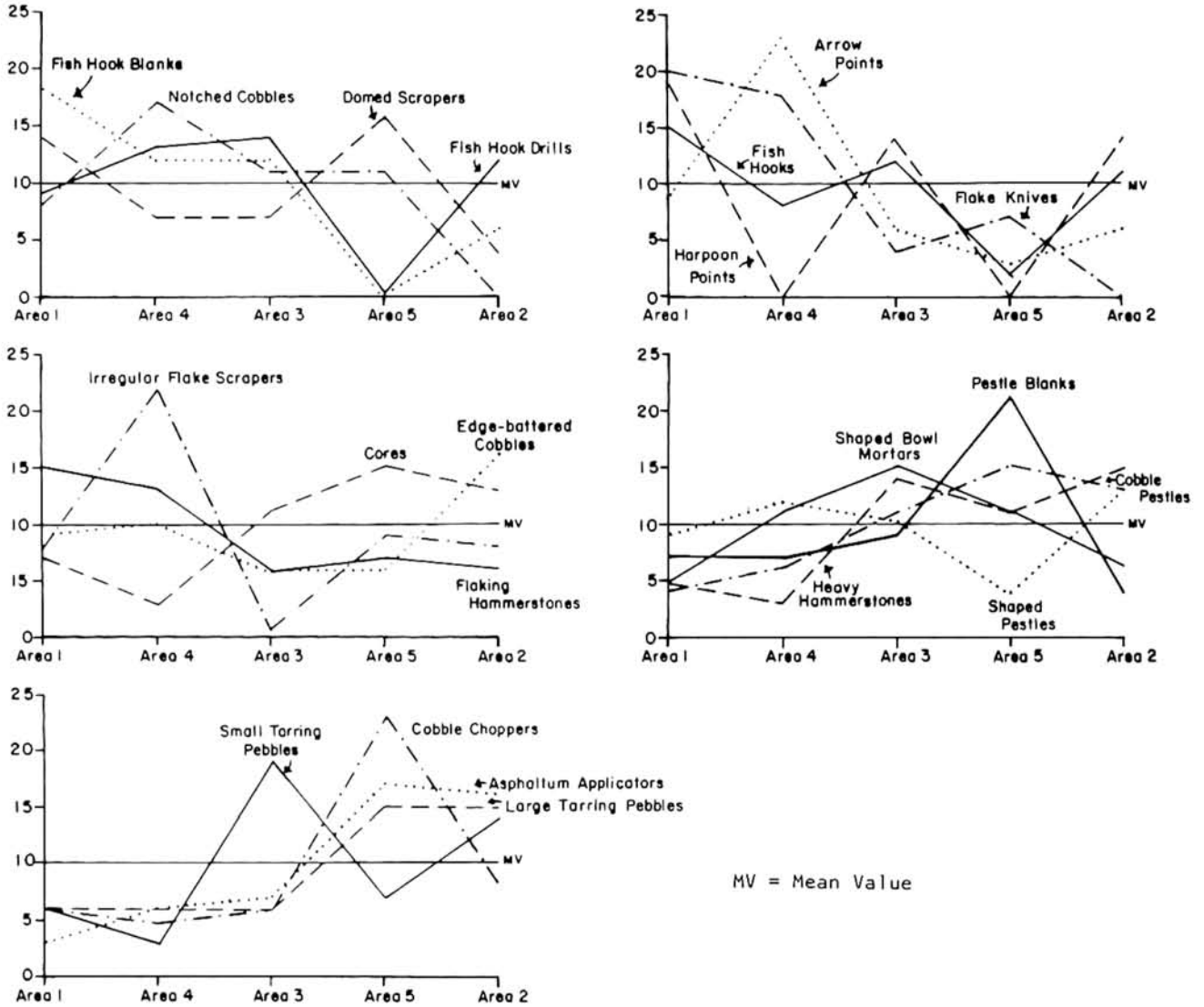


Fig. 9. Standardized data of tool types based on Table 2 (decimal point has been moved three places to the right).

diameter. Usually, few or no artifacts were found in the hearths. Of the six hearths observed in Area 3, one was considered as only a possible hearth because it was not as large or as distinct a cluster of rocks as the other hearths. All features are numbered as they were originally numbered in the field. If features were not given field numbers, they were numbered beginning with 16 because 15 was the last assigned field number.

Feature 5: 0-10 cm. This cluster of rocks was located in the western quadrant (Fig. 2). Its maximum diameter was approximately

one meter. Unlike the other hearths, it was quite close to the outside perimeter of the house. A narrow band of cleared space surrounded the hearth. Another cluster of rocks containing a few artifacts was located to the west of Feature 5. Because of its proximity to Feature 5, this cluster appears to have been associated with the hearth.

Feature 16: 10-30 cm. This was a cluster of rocks in the eastern portion of the southern quadrant (Figs. 3-4). No artifacts were mixed with these rocks. In the 10-20 cm. level, a ring of rocks partially surrounded the

periphery of the cluster of rocks in the underlying 20-30 cm. level. A cleared area surrounded this feature for a width of about 50 cm. This hearth was almost one meter in maximum diameter. There were two clusters of artifacts to the west of this hearth, including numerous shaped bowl mortar fragments (Fig. 4).

Feature 13: 30-50 cm. There was a distinct cluster of rocks near the center of the house in the 40-50 cm. level. Carbon, but no artifacts, was recovered from this hearth (Fig. 6). When the 30-40 cm. and the 40-50 cm. levels are combined, even more rock is clustered in this hearth area (Figs. 5-6). This feature was approximately 75 cm. in diameter and had a band of cleared space surrounding it that was approximately 50 cm. in width. This feature was the clearest example of a hearth in Area 3, especially since charcoal was recorded here. Therefore, it was used as a model to aid in the identification of other hearths in the house. A number of other features were associated with this hearth. Large, flat rocks ranging from 25 to 80 cm. in length were arranged around the hearth a short distance away, (Figs. 5, 10). Another large, flat rock was encountered just northwest of the hearth in the 20-30 cm. level. In addition, a small group of rocks (Fig. 5) was clustered near the hearth, similar to the rock cluster associated with Feature 5.

Feature 17: 40-60 cm. This feature has been identified as a possible hearth. It was located near the center of the southern quadrant. It was slightly different from the other hearths in that it was not as large (about 50 cm. in maximum diameter) or as distinct, and the rocks were more variable in size (Fig. 6-7).

Feature 18: 60-80 cm. This was a cluster of rocks with a heavy hammerstone located in the middle of it. It was centrally located in the northern part of the southern quadrant and was about 50 cm. in diameter. There was

a narrow band around this hearth containing few artifacts. Directly to the west of this feature was a large depression lined with large rock slabs, many of which had asphaltum on them (Figs. 8, 11; Feature 22).

Ovens

Feature 19: 49-96 cm. The only oven identified in the house was found at the base of the midden deposit. This feature and others called "ovens" have similar attributes to those known archaeologically and historically (Gibson 1979: 22). Since they probably functioned as roasting pits, they are called "ovens." In the example at Pitas Point, a pit had been excavated to a depth of about 40 cm. and was filled with burnt sandstone rocks. The oven was about 150 cm. in diameter, much larger in diameter than any of the hearths. It also contained a greater volume of rocks than any of the hearths. The oven was surrounded by sterile soil on three sides and was located at the southern end of the structure (Fig. 8).

Feature 4: 5-35 cm. This oven was situated north of the house and was similar to the one inside the house. It was not as large, however, its diameter being approximately 125 cm. Large, flat rocks were placed at the base of the oven. Two artifacts were found within this feature: a heavy hammerstone and a shaped pestle fragment (Fig. 3).

Distinct Artifact Clusters

This type of feature consists of discrete concentrations of artifacts or rocks. Features of this type differ from the "artifact clusters" described below in that their boundaries were much more well-defined. Four "distinct" artifact clusters were identified in Area 3.

Feature 20: 30-50 cm. This was a cluster of tarring pebbles concentrated in an area with a maximum diameter of 50 cm. (Figs. 5-6). It was found in the northwest part of the house in the western quadrant. Near this

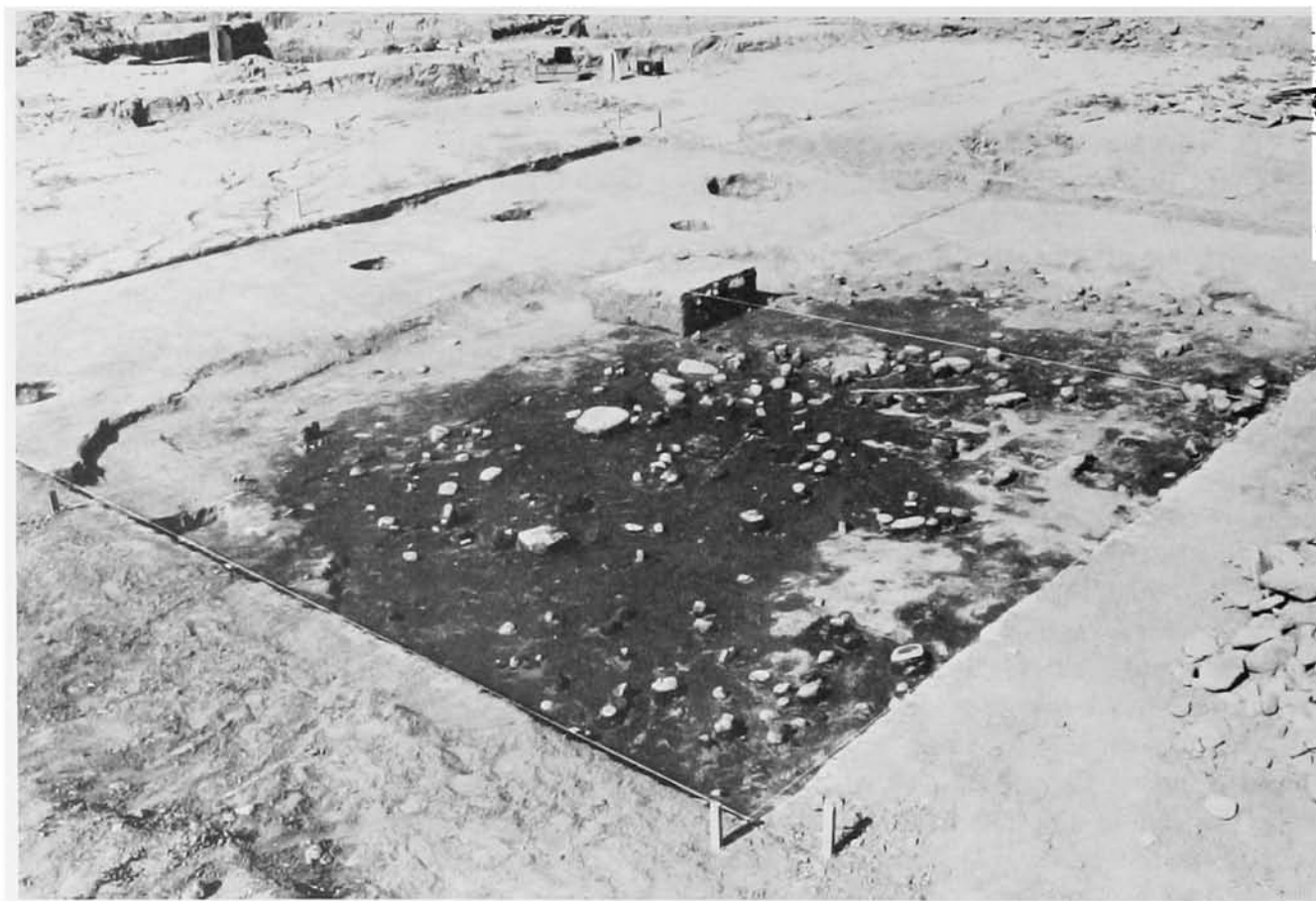


Fig. 10. View of Area 3 facing north, 30 - 40 cm.

cluster, in the 30-60 cm. levels, was a high frequency of asphaltum pieces and other tarring pebbles. Feature 20 may represent a cache of tarring pebbles stored near a work area in the house.

Feature 21: 60-80 cm. This was a tarring pebble cluster located in the western quadrant of the house slightly over a meter away from a hearth (Feature 18; Fig. 8). There were 15 tarring pebbles, all within an area of about 25 cm. in diameter. This feature was associated with a group of artifacts, a number of which had asphaltum on them or were made from asphaltum (Fig. 8).

Feature 22: 60-80 cm. This feature was at the base of the cultural deposit in the western part of the house in the southern quadrant. Large, flat rocks covered the floor of the pit. Many of these rocks had asphaltum on them.

This feature was approximately 200 cm. long and 125 cm. wide. Besides the many rock slabs with asphaltum, there were three artifacts with asphaltum. This feature was about one meter from the tarring pebble cluster in the same level and less than 25 cm. from the hearth in the same level (Figs. 8, 11).

Feature 23: 60-80 cm. This feature was a cluster of artifacts and rocks within an area approximately 150 cm. in diameter. It was located in the eastern part of the house (Fig. 8). All of the artifact types are not illustrated in the figure drawing because of space limitations. There were three pestles in this feature, two complete ones and another nearly complete specimen. These were among the few unbroken pestles found in the house. Feature 23 was, perhaps, a pit used to store tools.



Fig. 11. View of Area 3 facing north, 60 - 80 cm.

Artifact Clusters

These concentrations of artifacts did not always have well-defined boundaries. Often, such artifact clusters were recognized because they were comprised of the same or similar artifact types. Five of these features were identified.

Feature 24: 20-30 cm. This feature consisted of a cluster of shaped bowl/mortar fragments made of igneous rock. It was located at the southern end of the southern quadrant of Area 3. A cluster of four fragments were all found within 50 cm. of each other (Fig. 4). A fifth fragment was also apparently located in this cluster, but it was not included on the original field map. All the fragments were evidently from the same bowl mortar, judging from their size, shape, color, material, and proximity to each other. A sixth

bowl mortar fragment was found about 75 cm. north of the cluster (Fig. 4). It may also have been from the same bowl mortar. Most of these mortar fragments were resting on sterile soil.

Feature 25: 20-30 cm. This was a cluster of three asphaltum pieces all located within a meter of each other at the southern end of the southern quadrant (Fig. 4). A fourth piece of asphaltum was found in the 30-40 cm. level less than a meter to the northwest of Feature 25. This cluster was also less than a meter from the shaped bowl mortar fragments (Feature 24).

Feature 26: 30-40 cm. This was a cluster of four heavy hammerstones near the center of the southern quadrant. A pestle was recovered within a meter of Feature 26 (Fig. 5).

Feature 27: 30-40 cm. This was a cluster of artifacts made from asphaltum or artifacts with asphaltum on them. Feature 27 was located at the eastern edge of the house in the eastern quadrant (Fig. 5).

Feature 28: 30-50 cm. This was a cluster of artifacts in the southern quadrant south of the tarring pebble cluster (Feature 20). The more commonly occurring artifact types in Feature 28 included four heavy hammerstones, four cobble choppers, and four tarring pebbles (Figs. 5-6).

Postholes

These were pits that were filled with midden soil but situated in a matrix of sterile soil. They were found arranged around the circumference of the house (Fig. 2). The postholes indicate a diameter of about 12.25 m. for the house structure. They ranged in maximum diameter from about 50 cm. to 75 cm. The postholes were relatively evenly spaced, about two to three meters apart, with the exception of one on the boundary of the house depression. That one appears to be an anomaly in relation to the other postholes, possibly representing a posthole from a smaller house or a support post. There are no field notes that indicate how deep these postholes were but, judging from the photographs, their bottoms were seldom over 25 cm. below the surface of the sterile soil.

Features Overlying Features

Certain features, most of which were just described, were situated in such a manner that one overlay another. This is significant because it probably indicates different periods of occupation. Five examples are described below.

In the 0-10 cm. level, a hearth (Feature 5) lay directly over the tarring pebble cluster (Feature 20) in the 30-50 cm. level. Both of these features were intact. Apparently, the hearth represents a later occupation in com-

parison to that represented by the tarring pebble feature (Figs. 2, 5, 6).

Two clusters of rocks in the 0-10 cm. level overlay two of the large, flat rocks mentioned in the discussion of Feature 13 in the 30-50 cm. level. One of these clusters was in the northern portion of the southern quadrant. The other occurred at the far western end of the eastern quadrant (Fig. 2). Midden soil filled the space between the rocks in the 0-10 cm. level and in the 30-40 cm. level (Figs. 2, 5).

The large, round, flat rock near the center of the house in the 30-40 cm. level overlay the hearth in the 60-80 cm. level (Feature 18; Figs. 5, 8). Both features appeared to be intact when excavated.

The final example was a cluster of rocks in the 20-40 cm. level at the southern end of the eastern quadrant. It overlay the oven in the 60-80 cm. level (Feature 19; Figs. 4-5, 8).

INTERPRETATIONS

One of the conclusions derived from the foregoing observations, maps, figures, and significant chi-square values is that certain artifact types and features occurred more frequently in certain areas of the site than in other areas. In this section, I will first examine the activities that apparently occurred outside of the houses at the Pitas Point site, and then the activities that appear to have taken place inside the houses. It is assumed that the artifacts and features recovered during the excavations represent objects used in the course of these activities. Furthermore, it is assumed that the majority of features and artifacts were found in or near the areas where they were last used or stored.

Certainly, natural processes such as rodent disturbance and downslope movement occurred at Pitas Point. Wave action in the beach zone may have accounted not only for displacement of the artifacts but also for the removal of some of them to sea. Despite these

natural disturbances, many of the features appeared to be intact.

Activities at the Pitas Point Site

The variety of artifact types and features encountered during excavation indicates that numerous activities occurred at VEN-27. Fages observed a few of the likely activities while traveling in the Santa Barbara Channel region in 1769.

The occupations and ordinary pursuits of these people are limited; some of them follow fishing, others engage in their small carpentry jobs; some make strings of beads, others grind red, white, and blue paint clays, and a certain kind of plumbiferous stones, which serve for the men to paint themselves with when they are celebrating and dancing or when they go to war, and which are used by the women for their usual adornment. They make variously shaped plates from the roots of the oak and the alder trees, and also mortars, crocks, and plates of blackstone, all of which they cut out with flint, certainly with great skill and dexterity. They make an infinite number of arrows. The women go about their seed-sowing, bringing the wood for the use of the house, the water, and other provisions. They skillfully weave trays, baskets, and pitchers for various purposes; these are well made with threads of grass roots of various colors [Priestly 1972: 34-35].

A number of these activities were identified at the Pitas Point site. Production of beads is suggested by the evidence of detritus and various stages of manufacture of split-punched beads (King 1981: 358, Fig. 4). Many activities, such as woodworking, hide-working, and beadmaking, will not be discussed until further knowledge is gained about particular artifact types.

Prior to discussing the different activities at Pitas Point certain observations should be mentioned. Area 1 clearly had a greater frequency of each artifact category than any of the other areas included in the analysis

(Table 1). Approximately twice as much midden soil was removed from Area 1 than was removed from Area 3. Both areas, however, were excavated until a sterile soil matrix was encountered. The fact that there was a great quantity of refuse, including bone fragments, shell fragments, and broken artifacts, indicates that parts of Area 1 were probably used as a trash or refuse area. In addition, no features aside from the burials were discovered in Area 1. Generally, burials have been found in cemeteries in the Chumash region. Both of the burials in Area 1 may have been placed there because the people were outcasts and, as a result, were not allowed internment in the cemetery. The soil in Area 1 was also noted to be especially greasy. All of these data indicate parts of Area 1 were used as a disposal area and may explain the large quantity of artifacts in this part of the site.

Repair and Manufacture of Fishing Equipment. One activity that probably occurred in Area 1 was the production and maintenance of fishing equipment. Artifacts most clearly associated with the production of fishing equipment were fish-hook blanks and fish-hook drills. Fish-hook blanks occurred in much higher frequencies in Area 1 than in the other areas (Fig. 9). Significant chi-square values were obtained when the distribution of fish-hook blanks was compared with the distribution of shaped bowl mortars and heavy hammerstones from Areas 3 and 1. The *tomol*, or plank canoe, was also used in the acquisition of fish, particularly pelagic fish. In addition, boats were used in trade. The construction and maintenance of plank canoes is discussed in depth by Hudson, Timbrook, and Rempe (1978). Boat construction and maintenance probably occurred in the beach zone. A high percentage of domed scrapers was found in Areas 1 and 5. Perhaps these were employed to shape planks used in canoe building. Long, shaped drills, probably associated with boat repair and manufacture,

occurred relatively infrequently at the site. Eleven were found in Area 1, three in Area 4, and one each in Areas 3 and 5. These drills probably functioned in the repair or manufacture of canoes used for fishing.

Acquisition of Fish and Sea Mammals. Artifacts used to acquire fish and, in some cases, sea mammals were fish hooks, harpoon points, nets, and net weights. Fish hooks and harpoon points may have become lodged or broken off in the fish or animal. In such instances, the broken points or hooks were probably dislodged during butchering. These types of artifacts, therefore, will be discussed with butchering activities. Notched cobbles were known historically and ethnographically to be used as net weights in fishing. They were found in especially high frequencies in Area 1 (Table 1). Moreover, Fig. 9 indicates that there was a high percentage of notched cobbles in Area 4, also located in the beach zone. There were no notched cobbles found in Area 2, the area most removed from the beach. This supports the hypothesis that they were used as weights for fishing.

Ethnographic evidence indicates that the acquisition of fish was primarily a male activity. In Chumash mythology, when Coyote goes and visits the widow *Qaq* (raven), she tells him "No, I'm a woman, not a fisherman. I can't go and get fish" (Blackburn 1975: 207).

Butchering. Another common activity in Area 1 was butchering. The percentage of flake knives in Area 1 was high compared to other areas except Area 4, which was also in the beach zone (Fig. 9). The flake knives examined from the Pitas Point collection all had edge angles under 60 degrees and utilization scars on both faces of the utilized edge, indicating a cutting or sawing motion (Tringham et al. 1974). Only 21 out of the 73 flake knives identified had signs of retouch or secondary flaking. In butchering experiments with sea mammals, it was found that flake

knives with no retouch were more effective in butchering tasks than bifacially flaked tools (Walker 1978). Therefore, it is probable that many of the flake knives from the Pitas Point collection were used for butchering. Other artifacts that possibly were associated with butchering are fish hooks and points that may have lodged in the fish or mammals when they were caught. Fig. 9 indicates that fish hooks, harpoon points, arrow points, and flake knives were all common in Area 1. A high percentage of arrow points was present in Area 4. In his account of the Chumash Indians in the Santa Barbara Channel area, Ascension noted: "I saw with my own eyes some Indian women cleaning some fish on the beach for food for themselves and their husbands and children" (Wagner 1929: 237). This passage suggests that butchering occurred on the beaches and that women participated in this activity. Ethnographic evidence indicates that men participated as well. The distribution of bone in the site, however, is critical to an understanding of butchering activities, and it has yet to be studied.

Flake Tool Manufacture. The production of flake tools was another common activity at Pitas Point. The percentage of flaking hammerstones is high in Area 1 (Fig. 9). These hammerstones are small, end-battered stones, each over 7 cm. but under 15 cm. in length when complete. Many of them are made of siltstone, with a few made from sandstone. The lithic materials employed are relatively less dense than those used to manufacture heavy hammerstones. The use-wear on the smaller hammerstones is also less extensive than those on the heavy hammerstones. It is postulated that these smaller hammerstones were used for flaking stone, and that this activity was common in Area 1. On the other hand, cores have a different distribution than flaking hammerstones (Fig. 9). All of the chipped stone needs to be examined further for use-wear; possibly, many of the cores were

utilized and therefore indicate an activity other than flintknapping.

Other Activities. Activities besides those mentioned above occurred in the beach areas at the Pitas Point site. Until further analysis is completed, however, these other activities will not be discussed. Instead, the activities that occurred inside the houses and the internal organization of the houses will be discussed. In addition, activities that apparently took place adjacent to the houses or behind the houses to the north of the beach zone (such as Area 2) will be discussed. Harrington described the *'aqilik'oyis* as "a semicircular structure, made of poles covered with a brush, tule, or mat thatching, that is used primarily in warm weather" (Hudson and Blackburn 1983: 344). According to Harrington's consultant Fernando:

Some lived in these *'aqilik'oyis* the greater part of the year, and when winter came, those who had big jacals would take them in. Some others had a regular jacal and next to it, on one side of the doorway, they would have one of these *'aqilik'oyis*. [Hudson and Blackburn 1983: 344].

Perhaps the oven and hearth adjacent to the house in Area 2 (see "Cooking of Food" [below]) were associated with an *'aqilik'oyis*. Another structure outside the houses described in the ethnographic literature was a windbreak or *'aqilik'oy*. María Solares, one of Harrington's consultants, said "The *'aqilik'oy* was a windbreak made from two or three poles erected with mats or sacks thrown over so as to make a break against the wind when one wanted to sit down and work out in the yard" (Hudson and Blackburn 1983: 351). These may have been used in parts of the Pitas Point site north of the houses, such as Area 2, or a shade may have been erected in this area. Before activities occurring in these areas are examined, however, the house as a structure will be discussed.

Description of Chumash Houses. A number of historic accounts included observations of the houses of the Chumash, particularly houses located in the Santa Barbara Channel area. Costansó wrote:

They live in towns, the houses of which are spherical in form, like the half of an orange, are covered with reeds, and are as much as 20 yards in diameter. Each house contains three or four families. The fireplace is in the middle, and in the upper part of the house they leave an air passage or chimney for the escape of smoke [Hemert-Engert and Teggart 1910: 133-135].

This account describes large houses, similar in size to the houses at Pitas Point. Other historic descriptions confirm the description in this account, but they are not listed here because they are discussed at length elsewhere (Hudson and Blackburn 1983).

The postholes surrounding the house in Area 3 display large diameters. The large size of these posthole remains may be accounted for by the practice of repairing houses by tying new posts to rotted posts. An ethnographic account gathered by Harrington from a Chumash consultant supports this reasoning. "When a housepost is badly rotted, they tie another to it. But after a long while they rot away. When the old one is rotted, they set the new post in the ground, and they lash the old housepost to it" (Hudson and Blackburn 1983: 331).

Many people from the early historic expeditions commented on the sleeping platforms of the Chumash. One example is from Costansó:

In their houses the married people have their beds set apart on platforms raised above the ground. Their mattresses are some plain petates, or mats of rushes, and their pillows are the same kinds of mats rolled up at the head of the bed. All the beds are hung with similar mats, which serve as decency, and as a protection from the cold [Hemert-Engert and Teggart 1910: 137].

Food Preparation. Much of the evidence recovered from inside the house indicates that food preparation, including cooking of food but not butchering, was an important activity here. These activities were noted by the early explorers. According to Crespi's journal:

Inside these Houses were Women scattered in various lodgings, some grinding for pinole, others toasting the seeds, and others making bowls and trays made so finely of rushes, with such patterns and pictures, as to strike one with wonder [Brown 1967:4].

Costansó described the preparation of seeds for food:

In order to eat the seeds which they use instead of bread, they first of all roast them in large bowls, putting among the seeds red hot pebbles or small stones; then they stir and shake the bowl so as not to burn it, and after the seeds are sufficiently roasted, they grind them in mills or stone mortars. Some of these mortars are of extraordinary size, and as well-formed as if the best tools had been used in making them [Hemert-Engert and Teggart 1910: 135-137].

Grinding implements such as shaped bowl mortars and cobble pestles occurred in relatively high percentages in Areas 3 and 5, where the houses were located. The distribution of shaped pestles is slightly different, perhaps because of sampling error (Fig. 9). Historic accounts and the archaeological record suggest that foods were ground inside of the houses by women. Cobble pestles and shaped pestles were relatively frequent in Area 2, indicating that the grinding of foods also occurred there (Fig. 9).

Other methods of food preparation have been mentioned in ethnographic accounts. Consultants in a number of these accounts observed that stones and rocks of various sizes were used for preparing foods. Harrington's ethnographic data indicate: "Hammerstones were of various sizes. Among them can be reckoned the small stones used for pounding

the tip of acorns in acorn shelling" (Hudson and Blackburn 1983: 92). Some of the hammerstones at the Pitas Point site may have been used for such purposes, although many of them are relatively large (Table 1). The use of larger rocks in food preparation was also known ethnographically. A cutting board or *winatî's* was defined as "a slab of stone or wood on which food is placed for cutting or pounding" (Hudson and Blackburn 1983: 168). María Solares told Harrington: "Every kind of work had its *winatî's*. There would be one for cutting meat on, like a chopping block" (Hudson and Blackburn 1983: 168). Fernando's account was similar. Many of the rocks in the house were probably used as anvils, yet little evidence of their use remains. A few anvils, however, were identified in Area 3 (Figs. 5, 8). Large, flat rocks inside the houses may have been used in this manner: "The lupine is kneaded with the hands to separate the white heuros. These heuros are the kernals [sic]. They would put the kernals to one side and spread the pulp on a flat rock such as those in the mountains" (Craig 1967: 100). Notably, Area 2 had a relatively high percentage of heavy hammerstones and edge-battered cobbles, in addition to numerous rocks and slabs of stone. Perhaps many of these activities that occurred inside the house were also conducted in Area 2.

Cooking of Food. "In the center of the room they make a fire for cooking seeds, fish, and other foods, for they eat everything cooked or roasted" (Martinez in Simpson 1939: 4). This account by Longinos Martinez is similar to the historic descriptions already mentioned. The hearth was also described by Fernando: "The firepit was called *sapi'wil*. It was in the middle of the house below the smokehole. They cooked in this fire in the house. In the evening after they got through pounding their seeds and talking, they would spread their mats out and go to sleep, having first smothered the fire with ashes for the

night" (Hudson and Blackburn 1983: 330-331). The hearths in the house in Area 3 tended to be situated near the middle of the structure, with the exception of one hearth in the 0-10 cm. level. This organization was similar to that in the ethnographic and ethno-historic accounts. Other foods besides seeds were cooked over these hearths. Some examples of cooking methods were recorded by Yates (1957: 83):

The wild cherry (*islaya*) was boiled, and bruised in a mortar; the seeds or pits were taken out. Fish were generally roasted or baked in holes in the ground, but they were considered best when boiled.

María Solares, when interviewed by Harrington, described how foods were boiled:

When boiling mush in a cooking basket, they would use a stick to lift the boiling stones out of the fire and put them in the basket, usually two, three, or four, whatever was necessary [Hudson and Blackburn 1983: 184].

Boiling stones probably account for a number of the piles of rocks in the houses. Many of these rocks appear to have been fire-altered. The fact that fish were sometimes baked in holes in the ground may explain one of the uses of ovens. Ovens were distributed both inside the houses and behind them at the Pitas Point site (Fig. 1), suggesting that the baking of foods occurred in both places. All of the rock-lined hearths, however, were found inside the houses, indicating that most of the cooking on hearths was done inside the houses. One exception was a hearth just east of Area 3. Roasting (of seeds), boiling, and other cooking techniques were probably used in association with the hearths at Pitas Point. Wood was necessary to keep the hearths burning. Cobble choppers, commonly found in the house areas, particularly in Area 5 (Fig. 9), may have been used to chop wood. Furthermore, according to the Fages' account quoted earlier, women gathered the wood for

the houses. Perhaps women were collecting and chopping the wood.

Food Storage. Storage of food inside Chumash houses was common in the winter (Craig 1967: 103-104). One of Harrington's consultants discussed storage baskets:

They filled the *X'im* with *islay* (Sp. – *Prunus ilicifolia*), *bellota* (Sp. acorn – *Quercus* sp.), and chia (Sp. *Salvia columbariae*). They kept the baskets inside. They don't put them on the bare ground though; they put them on *petates* (Sp. mats). If this is not done, the basket rots [Craig 1967: 103-104].

Possibly storage baskets were placed on rocks to keep them off the ground. According to another Chumash consultant interviewed by Harrington, one "Always kept the *X'im* inside the house; had definite place for this and sleeping" (Hudson and Blackburn 1983: 60). According to Fernando: "As soon as the time comes to make a *tapanco* (sp. platform) outdoors early in the summer, they take the *X'im* outdoors" (Craig 1967: 104). Baskets used to store water, twined water bottles, were also stored in the houses. According to Fernando: "The water basket would be put in the jacal (Sp. hut) where it would not be in the way. They usually put it on a flat stone" (Craig 1967: 98).

Ground Stone Tool Manufacture. Evidence obtained primarily from archaeological data indicates that ground stone tool production occurred in the houses at Pitas Point. Pestle blanks, representing an unfinished stage in the production of pestles, were common in the houses relative to other artifact types. Pestle blanks were especially evident in Area 5 (Fig. 9). In the 1840s, Hugo Reid described the production of mortars and pestles by the Gabrieliño:

Mortars and pestles were made of granite, about sixteen inches wide at the top, ten at the bottom, ten inches high and two thick. Sharp stones and perseverance were the only

things used in their manufacture [Blackburn 1963:10].

The heavy hammerstones found at Pitas Point were made of dense, hard materials such as quartzite and porphyritic igneous rocks. Most exhibit heavy use-wear and battering; many had flakes removed as a result of use. Heavy hammerstones were frequently recovered in Area 3 and to a lesser extent in Areas 2 and 5 (Fig. 9). Many of these tools were probably used in the manufacture of pestles and, perhaps, other ground stone tools. Cobble choppers were distributed similarly to pestle blanks. There was a noticeably high percentage of cobble choppers in Area 5. Evidence from an ethnographic study recently completed in the Maya Highlands suggests that chopping implements may have been used to produce manos and metates (Hayden and Nelson 1981). These data indicate that choppers as well as hammerstones may have been used in the production of groundstone implements such as pestles.

Manufacture of Baskets. The Chumash Indians lacked pottery during prehistoric times. Baskets functioned in a manner similar to pottery and were used for storage containers and cooking vessels. According to Crespi's account quoted earlier, women worked inside the houses at a number of occupations, including basketry. Costansó confirms the observation that women made the baskets in his discussion of Chumash women:

It is they who weave the baskets and vessels of reeds, to which they give a thousand different forms and graceful patterns, according to the use for which they intend them—for eating, drinking, holding seeds, or other purposes, as these people do not understand the use of clay as it is used by the Indians of San Diego [Hemert-Engert and Teggart 1910: 136].

Font's account supports Crespi's observation that baskets were made inside houses:

What is certain is that on the Channel I did not see them make a single basket, which perhaps I would have seen if they made any; unless it be that they made them inside of their huts, which I was not able to enter because they did not permit it [Bolton 1931: 272].

Certain types of baskets were lined with asphaltum. Because asphaltum preserves well in the archaeological record, the remains of basket making can be clearly observed. Ethnographic information indicates that tarring pebbles were heated in order to melt asphaltum in the process of coating the inside of water bottles. Water bottles were usually twined and about 18 in. wide and 11 in. tall (Craig 1967: 97-98). The function of tarring pebbles was described by Fernando:

They put some pulverized tar in the jug, when they get the weaving finished. Then they heat up about six rocks which are two inches in diameter or just as big as would go into the mouth of the 'u'em [Craig 1967: 98].

The distribution of tarring pebbles varied at the Pitas Point site, depending on their size; a large proportion of all tarring pebbles, however, were recovered from Areas 3 and 5. Small tarring pebbles were defined as those under five cm. in diameter and large ones were greater than this size. Small types were relatively more common in Area 3 and the larger ones occurred most frequently in Area 5 (Fig. 9). Perhaps they were making larger baskets in the house in Area 5 than in the house in Area 3. The distribution of asphaltum applicators was similar to that of large tarring pebbles (Fig. 9). Asphaltum applicators are small, elongated cobbles with asphaltum at one end, sometimes at both ends. These applicators may have been used in basketry. The percentage of tarring pebbles and asphaltum applicators was also relatively high in Area 2. Judging from these data, basket manufacture occurred primarily in the houses but also

in outdoor activity areas adjacent to the houses.

Basket types other than water bottles were coated with asphaltum. Parching trays, used to roast seeds, were usually covered on the inside with tar. Harrington noted that Fernando:

never saw one being made, but he thinks they mixed the tar with sand for this basket. The whole inside of the basket was tarred—way up to the edge. They poured in the hot tar and tipped the basket so that the tar would run all around [Craig 1967: 110].

Apparently, it was not necessary to use tarring pebbles or applicators for coating the parching trays with asphaltum. During this type of process, however, the spilling of tar in the work area may have been common. *X'i'm*, the storage basket, was another type that was covered with asphaltum. Another asphaltum-covered basket type was the boiling basket, the *patsmu*. "The *patsmu* is a twined basin-shaped basket which is covered with tar," according to Fernando (Craig 1967: 106). The only other type of basket which regularly had asphaltum applied to it was the basket hopper. Asphaltum was used to attach this basket to a stone mortar.

Asphaltum was also used in the production of items besides baskets. According to Fernando: "They made stoppers to keep the water from coming out of the mouth. They were of tar" (Craig 1967: 98). The Chumash also made abalone dishes. María Solares described the process to Harrington:

They made an abalone shell dish by plugging the holes with tar. Sometimes they decorated these with *muc'uc'u* [type of shell bead]. They drank out of these, but also used them as dishes to eat acorn mush, and other things, out of. They had wide usage [Hudson and Blackburn 1983: 278].

Asphaltum was also used in the production of the *tomol* (boat), in hafting harpoon points, and in the hafting of tools such as scrapers.

For obvious reason, boat assembly occurred in the open, but the production of the other artifact types and the hafting of tools probably occurred inside the houses at Pitas Point.

Feature 22 in the 60-80 cm. level of the house in Area 3 was a pit lined with large, flat rocks, many of which had asphaltum on them. Near this pit, a cache of 15 tarring pebbles was recovered. Both of these features were located near the hearth in the same quadrant (Feature 18). This area of the house was probably used by women to make baskets and perhaps other artifact types. The other tarring pebble cluster, in the 30-50 cm. level (Feature 20), was also recovered in the same quadrant of the house. Perhaps this area of the house remained a basket-making area over a period of time.

CONCLUSION

The distribution of artifact types at the Pitas Point site indicates that there was a contrast between activities occurring inside and outside of the houses. The archaeological, ethnographic, and ethnohistoric data indicate that the following activities occurred in the beach zone: the production and maintenance of fishing equipment, butchering, and the production of flake tools. Many of these activities were probably performed by males. The beach zone was also used as a base for fishing expeditions and as a trash heap. Activities that took place inside the houses were sleeping, food preparation, cooking, eating, food storage, water storage, basket-making, and ground-stone-tool production. Chopping of wood for the hearth apparently also occurred inside of the houses. Some of these activities also took place outside of the houses, for example, the production of baskets and ground-stone tools.

More concerning the organization of the Pitas Point site will be learned when the artifacts, bone, shell, carbon, and other organic remains are studied in detail. Thorough

research toward an understanding of the internal organization of sites will enable archaeologists studying prehistoric and historic Chumash villages to identify houses more certainly and to distinguish with greater accuracy the features they encounter.

ACKNOWLEDGEMENTS

I want to thank all the people who have commented on earlier drafts of this report: Steve Craig, Michael A. Glassow, Travis Hudson, Chester King, Albert C. Spaulding, and Phillip L. Walker. I especially want to thank Rose Mucci who typed the original draft of this paper and repeatedly helped me with subsequent computer corrections. I am particularly grateful to Chester King who provided valuable information on the Pitas Point project throughout all stages of this analysis. I also want to thank Travis Hudson and Thomas C. Blackburn for allowing me access to their unpublished volumes of *The Material Culture of the Chumash Interaction Sphere*. I want to express appreciation to both John R. Johnson and Andrew L. Christenson for providing access to the archaeological collections at the University of California, Santa Barbara and Los Angeles. Finally I am grateful to Paul Heuston for his assistance in the graphics lab.

NOTE

1. I want to acknowledge Dr. Spaulding for the description of standardization. He not only wrote this passage, but also introduced me to this technique.

REFERENCES

- Blackburn, Thomas C.
 1963 A Manuscript Account of the Ventureño Chumash. Los Angeles: University of California Archaeological Survey Annual Report 5: 135-158.
 1975 December's Child: A Book of Chumash Oral Narratives. Berkeley: University of California Press.
- Bolton, Herbert E.
 1931 Font's Complete Diary, Anza's California Expedition, 1774-1776. Berkeley: University of California Press.
- Brown, Alan K.
 1967 The Aboriginal Population of the Santa Barbara Channel. Berkeley: University of California Archaeological Survey Reports No. 69.
- Craig, Steve
 1967 The Basketry of the Ventureño Chumash. Los Angeles: University of California Archaeological Survey Annual Report 9: 78-149.
- Gibson, Robert O.
 1979 Archaeological Investigations at SLO-187B, a Mitigation Project for Cambria Water Transmission Facilities at San Simeon Creek /Van Gordon Road, San Luis Obispo County, California. Manuscript on file at the Cambria Community Services District.
- Hayden, Brian, and Margaret Nelson
 1981 The Use of Chipped Lithic Material in the Contemporary Mayan Highlands. *American Antiquity* 46(4): 885-898.
- Hemert-Engert, A. von, and F. J. Teggart
 1910 The Narrative of the Portola Expedition of 1769-1770. Berkeley: University of California Academy of Pacific Coast History Publication 1(4): 9-159.
- Hudson, Travis, and Thomas Blackburn
 1983 The Material Culture of the Chumash Interaction Sphere: Vol. 2: Food Preparation, and Shelter. Los Altos and Santa Barbara: Ballena Press and Santa Barbara Museum of Natural History.
- Hudson, Travis, Janice Timbrook, and Melissa Rempe
 1978 Tomol: Chumash Watercraft as Described in the Ethnographic Notes of John P. Harrington. Socorro: Ballena Press Anthropological Papers No. 9.
- King, Chester
 1981 The Evolution of Chumash Society: A Comparative Study of Artifacts Used in Social System Maintenance in the Santa Barbara Channel Region Before A.D. 1804. Ph.D. dissertation, University of California, Davis.
- Lajoie, K. R., J. P. Kern, J. F. Wehmiller, G. L. Kennedy, S. A. Mathieson, A. M. Sarna-Wajcicki, R. F. Yerkes, and P. F. McCrery
 1979 Quaternary Marine Shorelines and Crustal Deformation, San Diego to Santa Barbara,

California. In: *Geological Excursions in the Southern California Area*, by P. L. Abbott, pp. 3-15. San Diego: San Diego State University Department of Geologic Sciences.

Mosteller, Frederick

1968 Association and Estimation in Contingency Tables. *Journal of the American Statistical Association* 63(321): 1-28.

Priestley, Herbert Ingram

1972 *A Historical, Political and Natural Description of California* by Pedro Fages. Ramona: Ballena Press.

Simpson, Lesley B.

1939 *California in 1792: The Expedition of Longinos Martinez*. San Marino: Huntington Library.

Spaulding, Albert C.

1953 Statistical Techniques for the Discovery of Artifact Types. *American Antiquity* 18: 305-313.

Tringham, Ruth, Glen Cooper, George Odell, Barbara Voytek, and Anne Whitman

1974 Experimentation in the Formation of Edge Damage: A New Approach to Lithic Analysis. *Journal of Field Archaeology* 1: 171-196.

Wagner, Henry O.

1929 *Spanish Voyages to the Northwest Coast of America in the Sixteenth Century*. San Francisco: California Historical Society Special Publication No. 4.

Walker, Phillip L.

1978 Butchering and Stone Tool Function. *American Antiquity* 13: 710-715.

Yates, Lorenzo G.

1957 *Fragments of the History of a Lost Tribe*. Berkeley: University of California Archaeological Survey Reports No. 38: 36-39.

Yeats, Robert S.

1977 High Rates of Vertical Crustal Movement near Ventura, California. *Science* 196: 295-298.

