

Archeology of the  
Menjoulet Site  
Merced County,  
California

By William E. Pritchard

# ARCHEOLOGICAL

REPORT  
13

Archeological  
Resources Section

STATE OF CALIFORNIA – RESOURCES AGENCY  
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Sacramento, California

DIVISION OF RESOURCE  
MANAGEMENT AND  
PROTECTION

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FRONTISPIECE

## PREFACE

With this report Mr. William Pritchard has clearly demonstrated the value of a cooperative effort in the recovery of archeological values within public construction project areas. The work embodied in this report was made possible by the working together and support of the U.S. National Park Service, the U.S. Bureau of Reclamation, the State Department of Water Resources, the State Department of Parks and Recreation and the Sacramento State College. Such an approach is both constructive and highly commendable. Without it our state's prehistoric heritage would have suffered the loss of an important body of knowledge held within the cultural deposits of 4-Mer-3 at the mouth of Menjoulet Canyon in western Merced County.

Not only are the participating agencies and institutions to be complimented on the completion of a good job, but Mr. Pritchard, as field director for the two seasons of excavation, is to be highly credited for his work in the field, in the laboratory, and at his desk in the preparation of this report. The excellence of his work, both in the field and out, is attested to by this present report.

Of particular interest and of great importance is the attention Mr. Pritchard and his field crew paid to the several architectural features which the site afforded. In the past, California archeology has tended to neglect these features because of their size and complexity, but this neglect has been recognized and data such as presented here by Mr. Pritchard are being gathered at all service archeology projects.

The service archeology program of the State of California as administered by the Archeological Resources Section of the Department of Parks and Recreation has grown to the point where positive results in the recording of the fast disappearing prehistoric resources of California are being felt. This present report exemplifies the best aspects of service archeology.

Francis A. Riddell, Editor  
State Park Archeologist

STATE OF CALIFORNIA  
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## ABSTRACT

Archeological investigations were carried out at the Menjoulet site (4-Mer-3) in 1964 and 1965. The site is located in the lower section of the Menjoulet Canyon at the eastern edge of the Diablo foothills on the west side of the San Joaquin Valley, 7 mi. southwest of the city of Los Banos.

The midden deposit covers approximately five acres and reaches a depth of 42 in. in the main village area. Significant surface features at the site include ten depressions that are the remains of large semisubterranean ceremonial and domicile structures. In addition to these, there are bedrock mortars to the south of the site and a cupule-style petroglyph situated on the western edge of the site.

The recovery of 22 primary burials and 32 cremations in stratigraphic context indicates at least two cultural and temporal components within the site. Nine extended burials and the variety of artifact types associated with them, suggest a period coeval with the Late period, Phase I as expressed at 4-Mer-14 in the San Luis Dam and Reservoir area. The cremations and large structures clearly represent a protohistoric occupation with a relationship to the coastal and southern California sequences.

## THE ARCHEOLOGY OF THE MENJOLET SITE MERCED COUNTY, CALIFORNIA

by William E. Pritchard

### INTRODUCTION

In 1964 and 1965 a program of service archeology was undertaken by the author at the Los Banos Detention Dam Project, 7 mi. southwest of the city of Los Banos, California. As an adjunct of the San Luis Dam Project, a part of the California Water Plan, the Los Banos Detention Dam was built to protect the canal system south of the main dam complex. The Detention Dam has created a reservoir some 3 mi. long and 1/4 mi. wide, and is located at the edge of the Diablo foothills on the west side of the San Joaquin Valley.

The State of California Department of Parks and Recreation was requested to assess and investigate the archeological resources within the construction zone at Los Banos Creek. This request was implemented by an interagency agreement between the California Departments of Water Resources and Parks and Recreation.

During the first summer season the reservoir area was completely surveyed for archeological resources within the take line, and test excavations were carried out at two sites. In light of the fact that the other sites were badly damaged, and the fact that 4-Mer-3 was obviously the largest and most significant site in the whole region, primary emphasis of further investigations was placed on the archeological deposit of the Menjoulet Site (4-Mer-3). This site covered approximately five acres in the lower Menjoulet Canyon on the Los Banos Creek and had surface indications of at least ten semisubterranean structures.

Excavations were continued in April and during the summer of 1965 and were partially subsidized by the National Park Service (Contract No. 14-10-0434-1900) with funds provided by the U.S. Bureau of Reclamation and the State Department of Water Resources. A total of 6,100 man-hours were spent on these two seasons and approximately 550 cu. yds. of material were removed and processed.

The data in this paper, plus the original site survey of the project and the descriptive information from the test excavations at two other sites in the Menjoulet Canyon, originally appeared in a report written by this author in 1966 for the National Park Service. In 1967, the National Park Service report, which had limited distribution, was used as the foundation for a thesis by the author in a Master's Program at Sacramento State College. The present paper is the result of an almost total rewrite and reanalysis of the data presented earlier, and is published with the permission of the National Park Service. I would hope that future investigators interested in 4-Mer-3 would use this final manuscript in lieu of the earlier reports as this is much more complete and the analyses are far more reliable.

Previous to the investigations at 4-Mer-3 studies in the Los Banos area were limited to: 1) intensive (but as yet unpublished) excavations by the U.C.L.A. Field School and the archeological staff of the State Department of Parks and Recreation at 4-Mer-14 at the San Luis Dam site (Riddell and Olsen 1965); 2) a general survey of the west side of the San Joaquin Valley by Gordon Hewes (1939); and 3) a limited amount of published ethnographic data gathered by F. F. Latta (1949).

In way of a summary statement of the above, the archeologists were aware that there was no real temporal sequence of the area available. The work at 4-Mer-14 yielded important data on a cultural expression very similar to materials coeval with the Late period, Phase I in the Delta region of central California. Yet there was no comparable material close at hand, so that this information stood alone. The Hewes survey (1939) touched all around the Los Banos and San Luis Creeks area but gave no specific information.

Ethnographic information also is limited. A. L. Kroeber (1925) briefly mentioned the west side of the San Joaquin Valley in his compendium on California Indians. He passed the whole region off with the comment that it may not have been Yokuts territory and has, "Sometimes been attributed to the Costanoan peoples or the Miwok. *This very doubt indicated an unimportant occupation; . . .*" (italics mine). He goes on to make the conservative observation that, ". . . the number of residents must also have been very few . . .", (1925: 476).

In Latta's work (1949), we come out somewhat better. His informants revealed that the immediate area around Pacheco Pass and Los Banos Creek, originally inhabited by the Kawatchwa or Grass-nut people, had been abandoned probably by the first decade of the 1800's (1949: 3). This termination date for the protohistoric occupation is corroborated by Spanish records of the excursions of Fr. Jose Viader in 1810 and Sergeant Jose Dolores Pico in 1815 into the San Joaquin Valley (Latta 1949: 18) in which the first inhabited villages were found well into the center of the valley. In other words, the region of the Pass and adjacent foothills was abandoned before those trips. Unfortunately, this means that all we have is a termination date for the occupation of the area, and are left with no definitive data on the culture and prehistory of the region.

With this in mind then, two basic precepts were generated as regards the theoretical approach to the investigations at 4-Mer-3. In the first place, it was recognized that a need existed to provide data to establish a temporal sequence for the area based upon assemblages of artifacts related to the technology of the Menjoulet villagers and the ecology of the region. This could be accomplished by obtaining stratigraphic and artifactual data for comparisons with contiguous regions.

Secondly, intensive investigations of the architectural features at the site would provide data on the social, political, and religious behavior of the people and further, would provide valuable information on demographic and settlement patterns. With the lack of ethnographic information, these kinds of data are absolutely necessary to explain and understand the cultural behavior of the Kawatchwa Yokuts as expressed in the Menjoulet Canyon area.

A comprehensive archeological program has recently been completed in the San Luis Dam Reservoir, with several major excavations completed (Olsen and Payen 1969). Investigations and excavations were also completed (Olsen and Payen 1968) at Little Panoche Creek, 15 mi. south of the Los Banos area. As this present report was written before the work was done at San Luis and Little Panoche Reservoirs there are few references herein regarding these sites. However, the cultural and temporal relationships between the three areas are significant (Olsen and Payen 1969: 39-42), and formed the basis of a symposium of that subject given at the Southwestern Anthropological Association meetings at San Diego, California, in April 1968.

The cultural material, field notes, maps, charts, profiles, photos, and other data have been preserved and stored by the Archeological Laboratory of the California Department of Parks and Recreation in Sacramento. This material is available for use by qualified agencies, institutions, or individuals for review and research.

## THE MICRO-ENVIRONMENT

The Los Banos area climate is characterized by cloudless, hot summers and cool, mild winters. The average annual rainfall at the city of Los Banos, 7 mi. northeast of the canyon, is 8.47 in., most of which is recorded between the months of January and April. During the winter months, evening fogs are frequent, but they are usually dispersed by midmorning (Climatological and geological data obtained from *U.S.D.A. Soil Survey: Los Banos Area*, 1952).

There are frequent high winds that blow down the canyons as a result of atmospheric pressure imbalances between the hot valley and the cooler coastal regions. Pacheco Pass, 7 mi. to the northwest, acts as a funnel for these winds and the Los Banos Creek Canyon is a natural pathway for the air

currents. At times these winds will reach a destructive velocity (30-50 mph) and are frequent enough to be a factor to be considered in any human occupation of this region.

The flow of water in Los Banos Creek is classed as annual, although during the late summer and fall months the amount is negligible. The average annual runoff is 15,500 acre ft., 80 percent of which flows from January to May. The creek drains about 187 square miles of the east slope of the Diablo Mountain Range. There are records in some years of no rainfall and no runoff during an entire 12-month period.

Los Banos Creek is well entrenched into the southeastern slopes of the Diablo Range, but does not flow directly into the San Joaquin River. After leaving the lower canyon, the streambed is slightly entrenched in old alluvial fans and then empties into the flat valley floor in a series of swamps and meandering sloughs.

Los Banos Creek bisects two major geologic formations before it empties into the San Joaquin Valley. On the west, the steep slopes of the Diablo Range consist primarily of hard sandstone and shales, some heavily metamorphosed. There are outcrops of igneous rocks, mainly andesites, rhyolites, and basalts. This formation, called the Franciscan Formation, is probably of Jurassic age.

The vegetation of the region consists primarily of short grasses and frequent sagebrush and other small shrubs. Heavy growths of live oak and black oak also occur in this upland region.

The basic stratum just to the east of the Franciscan Formation is the younger Cretaceous sediments. This stratum is generally soft, poorly consolidated sandstone and shale, and the soils in this region are characterized by being highly calcareous and gypsiferous. The outcrops of softer rock were no real barrier to the flow of Los Banos Creek and the stream is well entrenched in this region. The vegetation is primarily grassland and the Pleistocene and recent soils upon the Cretaceous strata were developed under similar conditions; that is, by low rainfall and grass cover (*U.S.D.A.* 1952: 4).

Generally speaking, the two geologic formations have a very characteristic physical relief. The Franciscan Formation is characterized by steep

wooded slopes and high peaks of basalt. The Cretaceous formations produce low, grassy, rolling hills and steep-sided stream canyons. A very distinctive break between the two formations can be seen about 6 mi. above the upper end of the reservoir.

A closer examination of the section of canyon filled by the Los Banos Reservoir shows the remains of at least three levels of river terraces. The highest terraces are the tops of the material deposited from the higher Franciscan Formation during the late Pleistocene period (Charles Hall, Project Geologist, U.S. Bureau of Reclamation, personal communication 1965). This material is only slightly eroded except by the larger streams. The poorly-developed soils on these terraces are a reddish-brown clay with many fist-size pebbles of quartz and andesite. The soils are high in calcareous precipitants and will support only a meager amount of wild grasses and are a part of the "Kettleman" soil series (*U.S.D.A.* 1952: 40).

The medial terraces in the canyon are of recent origin. They were deposited after the major entrenching of the canyon had been accomplished. They occur only in areas where the present stream-cutting action has been inhibited by tight bends in the stream course or by outcrops of the Cretaceous sandstones and shales. The soil development on this terrace is called the "Panhill" series (*U.S.D.A.* 1952: 59). This terrace is the level area where most of the aboriginal occupation sites were located. The soil profile is poorly developed and leaching has produced a caliche layer from 12 to 24 in. below the present surface. The soil itself is a clay loam with a high percentage of quartz and andesitic pebbles. The amount of alkaline precipitants in the soil is so high that a pH test registered completely off any available scale.

The lowest terraces are the result of meandering action of the present streams. Gravel bars and sand deposits are found along the entire length of the streambed within the reservoir limits. Just east of the two constricting outcrops of sandstone that form the shoulders of the Los Banos Detention Dam, the low terraces are larger and well developed. They form most of the present alluvial fan and the streambed is only slightly entrenched in this material.

The ecology of the area is influenced by the San Joaquin Valley to the east and the higher mountainous region to the west. The immediate area

surrounding the reservoir is poor grassland. The only trees found in the area are the softwood varieties that grow close to the creekbed and include the sycamore (*Platanus racemosa*), cottonwood (*Populus fremontii*), and willow (*Salix* sp.). Some tule and water grasses grow in small ponds along the streams. Wildlife in the immediate area is limited, though cottontail rabbits, jackrabbits, and rodents such as field mice, moles and ground squirrels were seen. Few blacktail deer or other large mammals were noted. Fish seen in the ponds along the creek are introduced species: catfish (*Ameiurus nebulosus*) and black bass (*Micropterus salmoides*). The seed grasses nearby may have been important in the past, but overgrazing by sheep for the last 90 years has permitted extensive soil erosion and has reduced the grass cover drastically.

Although the immediate site area may have had few food resources in the past, excellent foraging regions were close at hand. A few miles to the east the San Joaquin Valley floor, in prehistoric times, was a vast swamp with all of the associated materials and food resources. The large tule swamps and environs were teeming with wildfowl, tule elk, fish and a variety of small and large rodents and fur bearing animals.

Six miles to the west, the above-mentioned region of the Franciscan Formation produced large oak groves. Live oak (*Quercus agrifolia*), blue oak (*Quercus douglassii*) and white (valley) oak (*Quercus lobata*) grow in abundance along with buckeye (*Aesculus californica*) and juniper (*Juniperus californica*) trees. Several species of bushes and shrubs are also found on the steep slopes. Deer and medium-sized mammals still inhabit this region in substantial numbers.

Even though the site locality does not seem to have been able to support a large population, the two adjacent areas, as noted above, were exceedingly rich in resources for a hunting and gathering economy. The distances involved were no barrier to people living along Los Banos Creek. In fact, there is reason to believe that sites in the canyon were areas of retreat when weather conditions in the valley or mountains were adverse. The canyon also was a central location for the utilization of both resource areas which were within easy access at all times.

## EXCAVATION TECHNIQUES AND PROCEDURES

The initial step taken in the excavations was to establish a north-south-oriented grid system across the site. A permanent datum point was set at a spot that would not be disturbed and 5 ft. by 5 ft. units were laid out and numbered in reference to the datum.

The choice of units to be excavated was originally governed by the distribution and make-up of the surface features, and not by any random number system. The house depressions were within the grid system, but they and all other features or burials were treated as separate entities. The control point for elevation and orientation to the datum point for the house depressions was a unit corner outside the limits of the feature. The control for the excavation of burials or rock features was the southeast corner of the unit in which they occurred.

The test units and the units excavated in the midden areas were dug in 6 in. levels with control from the southeast corner. All of these units were excavated at least 6 in. into the sub-strata.

The excavated material from 4-Mer-3 was processed by a combination of screening the material through a 1/8 inch slide screen and then washing the residue with water under pressure. Wheelbarrows were used to transport the material from the units to the slide screen, thus alleviating the back dirt problems on the site as the residue was deposited in the creekbed below the site.

The washing procedure was not used initially, but after it was started it was seen that artifact recovery from the 1/8 in. screen was greatly increased. The recovery of small bone and stone artifacts and very small shell beads was numerically greater than in the eight units that were not washed.

The excavation of the structural depressions at 4-Mer-3 was accomplished in two phases. During the summer of 1964, and Easter vacation in 1965, test excavations were conducted on Housepit Nos. 2, 3, 4, 10 and 11. Units or trenches in the depressions were excavated by the usual method by digging 6 in. levels with trowel, brushes and shovels. By using these techniques, the floor surfaces were found and housefill strata were investigated.

In the summer of 1965, a backhoe was used to complete the excavations of Housepit Nos. 3, 4, 10 and 11. The decision to use the large machine was based on: 1) the prior knowledge of structure patterns obtained by previous test excavations, and 2) the need to move a great amount of earth in the form of housefill in the short time allowed by the construction schedule.

The backhoe is an easy machine to operate and the archeological crew members could control the machine to tolerances of less than a few inches. With a crewman directing the bucket at the point of contact with the earth, about 90 percent of the fill was removed from the house depressions. Shovels, trowels and brooms were then used to complete the excavation.

Another machine used to good advantage in the excavation of housepits was a housepainter's air compressor. The portable compressor produced about 30 lbs. of air pressure which was used on the final cleaning of the exposed floor. This technique replaced the use of a broom which can scratch dried mud surfaces.

## THE ARCHEOLOGY

4-Mer-3 is located on the second terrace above the creekbed on the northwest side of Los Banos Creek, one mile upstream from the mouth of the creek where it flows out into the flat valley floor. The site area covers about 5 acres and is situated at a sharp bend in the creek caused by the outcropping of a ledge of Panoche Sandstone. The second terrace is broad and flat above the outcrop and the deposit covers most of this area. A wide flat just behind the dam used during construction as a barrow area, was almost completely covered by a thin layer of midden and scattered stone artifacts. There was no break in the surface evidence from this region eastward about 1,000 ft. to the area of the deepest midden concentration adjacent to the sharp bend of the creek. The average depth of the midden in the main site area was 24 in. It thinned out to less than 6 in. toward the flat below the dam.

The area with the deepest midden concentration received the most intensive investigation. The area shown in Fig. 2 delimits this region. Within the limits of this area, surface evidence of at least eight structures were noted and recorded.

A ninth structure was recorded on the south side of an outcrop of sandstone on the west edge of the site. Six of the eight surface features were large, circular to oval depressions with mounded rims completely around the features. Of special interest was the huge oval depression (Housepit 2) near the bluff on the east side of the site. This depression measured 93 ft. in diameter from the outside toe to outside toe, and is one of the largest structural remains ever recorded in California.

Two small units were excavated into the south bank of the steep-sided gully cutting across the site just north of Housepit 4 (Fig. 2). These test pits showed the depth and general consistency of the midden in that area. They also permitted the investigators to locate and identify the yellow caliche layer that underlies the entire site.

The main area of midden, undisturbed by house depressions, was in the southwest corner of the site. The surface of this area exhibited evidence of much uncontrolled digging by relic hunters. The surface was strewn with large rocks, fragments of stone artifacts, shell beads, and fragments of human bone; the usual residue of the vandalism of a large prehistoric cemetery. A trench was dug in this area to retrieve any remaining information. It was found that the oldest cultural patterns identified in the site were represented by the extended burials found here.

Excavations at 4-Mer-3 were carried out in two phases. Initial investigations were conducted in the midden area while excavation of the housepits was postponed until later. In the following sections a similar order is followed; the description of artifactual material and human remains precedes the discussion of structures. The emphasis of this report is on descriptive analysis.

## CHIPPED STONE ARTIFACTS

There were 789 chipped stone artifacts found at the Menjoulet site. Seventy-eight of these were projectile points and fragments of points. The remaining 711 specimens consist of seven major types of artifacts and 17 subtypes. Tables 3 and 4 contain specific data on these specimens as well as their distribution within the deposit. In general terms the overall chipped stone assemblage (except for the projectile points) reflects a percussion flaking technology. The flake tools are produced from various size percussion flakes and a high percentage of

the total tool inventory are reused cores. As might be expected the material selected to manufacture the heavier tools (see Table 3) was a dense, hard stone such as chert or andesite (61 percent). The softer stone such as chalcedony and jasper were selected for the flake cutting tools (34 percent).

**Projectile Points:** The thirteen projectile points sufficiently complete for classification can be subdivided into five discrete types. These types are based primarily upon the configuration of the basal sections, sides, and the overall size of the point. Seven specimens (Type 1a) are small, concave base, triangular points with U-shaped side-notches situated high up on the sides (Fig. 30a-d). They are dissimilar to any of the subtypes of the Desert Side-notched points described by Baumhoff and Byrne (1959: 32-33). They are, however, almost identical to the point series found at 4-Fre-128, and 4-Fre-129 in the Little Panoche Reservoir area (Olsen and Payen 1968, Fig. 26e, f, h). The major difference between the two series is that all but one specimen at 4-Mer-3 are made of obsidian while the Panoche points are exclusively of colored silicates. This may reflect the local manufacture of this type at the Los Banos Creek site, and as regards total numbers would seem much less an important economic tool.

The small side-notched points found at 4-Mer-3 tend to occur in the upper levels of the midden area, and a single specimen from Housepit 11 (see Table 2). In their discussion of the type Olsen and Payen (1968: 16-17) suggest that these "Panoche Side-notched" points have close affinities to southern California types in a late protohistoric context. The context of the specimens at 4-Mer-3 suggest that the above statement is also true at this site.

Type 1b projectile points are represented by a single fragmentary point. This specimen was originally a large side-notched chert point with a straight-to-round base. This point has no relationship to the smaller obsidian side-notched points and probably is much older. Similar points were found at 4-Mer-S94 in the San Luis Dam area (Olsen and Payen 1969: 18, Fig. 17a-f) in a context predating the protohistoric period of the area.

The Type 2, contracting stemmed, and Type 3, expanding stemmed points (Fig. 30g-h) also are large. They weigh 6 grams, or more, and are made from cherts and basalt. The distribution of these two types, and Type 4 corner-notched points, is inconclusive

though most are found in the upper levels. One Type 2 point of green chert (Fig. 30i) was associated with Burial 1, an extended interment of the earlier cultural period.

The one Type 2 contracting stemmed point (Fig. 30k) is made of a laminated material commonly called Monterey Chert. The grayish-blue material is thin-bedded with interspacing of a white precipitate. This material is common to the central coast and the desert regions of southern California, thus suggesting the specimen was a trade item.

There were 65 projectile point fragments found at 4-Mer-3; 11 of which are tip fragments. Forty-eight fragments are midsections and six are basal fragments. Three of the tip fragments and one midsection are parts of serrated obsidian points. The six basal fragments, all of obsidian, are remnants of large, concave-based, or barbed points. None of the complete points have this basal configuration. A study of two local collections revealed no specimens of this kind. A tip section of a small obsidian point was found in Housepit 4, and one each in Burials 17 and 43, both of which are cremations found in Housepit 2.

Forty-eight of the 65 broken specimens are made of obsidian while the remaining fragments are manufactured from a brown chert, near-white chalcedony, red jasper, and basalt. It may be noted here that all of these obsidian fragments are part of large broken points or blades. As obsidian is not native to the area and must have been traded in, the suggestion is that these incoming artifacts were not looked upon as usable in their original condition but were instead considered raw material for the manufacture of other small tools.

**Drills and Gravers:** There are three types in this artifact category; perforators, reamers and gravers. These tools are made from both cores and flakes and it is the distinctive shape of the working edge that separates the types.

Type 1: Perforators (20, Fig. 32a, 33b-c). On each of these 20 implements the working edge is a long narrow point with use-wear all around the projection or shaft. Most of these are flake tools with fortuitous projections that were slightly shaped before use as a drill or perforator. There were two core tools, however, that were additionally modified beyond their original configuration to make an

elongate beak. In addition, there are five obsidian specimens which are shattered fragments of a larger artifact (three are point tip fragments) that have use-wear of an identical nature to the drills. Finally, there is one specimen (Fig. 32a) that is a well-made drill manufactured from basalt.

The use-wear on all these specimens (with the exception of the basalt drill which shows heavy use-wear) is of such a nature as to suggest that the material being perforated was soft (e.g., steatite or wood). The edges of the shafts are rounded and slightly polished, and are not crushed as would be the case if used on the harder shell or stone.

**Type 2: Reamers (19, Fig. 33a, d, f, h, k).** These specimens are quite similar in size to the perforators but only five of the 19 are flake tools. The beaks are less elongate and are more conical. The use-wear is evident only on the more prominent edges down the beak and there is less polish or striations on the shaft. The points of the reamers are more rounded or triangular than the drills. The reamers' beaks average 4 to 5 mm. long and are quite blunt. They are established on a striking platform but are not fortuitous and seem to be the result of definite chipping design. Several of the better defined reamers have secondary chipping around the beak in an obvious attempt to produce the tool from a straight cutting edge.

**Type 3: Gravers (16, Fig. 32b, 33e-i, j).** This category is a loose collection of various sizes and configurations of core tools (no flake tools) varying from large fist-size broken cobbles to very small core pebbles. However, each have one-or-more conical-to-bulbar projections (with a plano-convex profile) along the specimen's edge. These projections have secondary use-wear or retouch flakes. The use-wear and polish is on both the upper, or convex, and lower faces of the projections. The projections are too blunt to have been efficient reamers, and too thick to have been drills, thus may have been used as graving or gouging tools. The use-wear is moderate and none of the edges are crushed, which suggests these were used on wood or bone and not on stone.

There is a definite size separation seen in this series. Five of the 16 implements are fist-size cobbles which were broken and then additionally modified to

produce the projections. The remaining tools are small (55 mm., or less, in any direction) but the working edges on both subtypes are the same.

**Knives: (13, Fig. 34a-b).** Thirteen large percussion flakes have been additionally modified by secondary retouch into elongate or ovoid cutting implements. All but one specimen are made from hard, dense basalt or andesite and the use-wear is heavy. The blunted unifacial cutting edges suggest the use of these knives on hard wood, or bone material.

**Core Scraper Planes: (73, Fig. 30l, 34c).** There are two varieties of scraper planes based upon size. The larger subtype is generally 65 mm. or larger in both length and width. Although there is some overlap, the smaller variety is usually 60 mm. or smaller. The basic shape of these core tools ranges from a domed, plano-convex stone with an ovoid outline to an elongate, tabular core. All specimens regardless of size or shape exhibit the same configuration on the worked edge. That is, the edge is step-flaked (with some use-wear and secondary retouch) on the convex surface with a flat plane extending away beneath the cutting edge, usually with a 45° to 60° angle between the two surfaces. This produces a strong, blunt cutting edge.

The use-wear apparent on the cutting edges is suggestive of use on softer materials and does not have the crushed appearance from work on stone. One unique specimen is a domed scraper plane of clear quartz crystal.

**Flake Tools:** A total of 211 flake tools were found at the Menjoulet site. They are separated into eight subtypes based upon the configuration of the implement and the position and condition of the scraping edge. In general, the flake tools are scraping implements manufactured from various sized percussion flakes with a variety of retouch and shaping processes occurring. In most instances the retouching has not disguised the positive flake scar and the bulb of percussion still remains. The specific data and distribution are seen in Tables 3 and 4.

**Large Flake Scrapers (12).** These implements are very large percussion flakes, the majority of which are made of a hard dense andesite. Most specimens still contain sections of polished cortex and are obviously fragments of stream cobbles. The scraper edges are primarily fortuitous with a minimum



amount of secondary retouch and use-wear along steep-sided, unifacial cutting surfaces. They tend to be ovoid-to-rectangular flakes with a distinct bulb of percussion.

**Small Thinned Flake Scrapers (14, Fig. 31f).** Amorphous shaped small percussion flakes removed from prepared cores of chert or chalcedony. The flakes are extremely thin and flake scars of previous flakes show on the negative face. The scraper edge is not retouched but exhibits use-wear and is usually placed only on the sides or near the bulb of percussion. The thin, trailing edge shows no secondary chipping.

**Tabular Flake Scrapers (45, Fig. 32c-g).** Large and small flakes, square-to-rectangular in shape and struck from prepared cores. The large specimens are 35 mm. or larger in length or width with a 5 to 8 mm. separation between the large and small. The tools have two or more edges that were secondarily chipped and bifacially retouched. The upper surface of these implements shows flake scars from previous flakes removed from the core with some resulting in almost a fluting effect.

**Turtleback Flake Scrapers (26, Fig. 32h).** Most of these specimens are primary flakes which have had additional flakes removed from the upper surface with the lower surface usually showing the original flake's positive scar. This configuration results in a planoconvex profile. The scraper edges show additional modification by use-wear with a few showing secondary retouch. Three of the six andesite tools are large primary flakes with some cortex still showing and the bulb of percussion still evident.

**End Scrapers (26, Fig. 31a-e).** These implements consist of fortuitous flakes which have been selected because of a rounding-to-square end which has had secondary retouch and intentional shaping to form a steep-cutting edge around the end of the specimen. The flakes, themselves, are not prepared, although several may have been removed from prepared cores. The flat flake scar normally is used to form the base of the steep cutting edge, and the profile of that section of the artifact is plano-convex.

**Side Scrapers (60, Fig. 31g-m).** The tools in this category generally are alike in that they are rectangular-to-tabular flakes struck from prepared cores and then further modified along one side only.

There is a suggestion that the use of the elongate edge for scraping was preferred. Several tools are quite thick (12-14 mm.) and have steep-edged, retouched cutting surfaces. Most, however, are unmodified flakes with retouch or use-wear on the elongate edge. Most specimens are small, short flakes.

A unique specimen of this type was made of a fragment of clear quartz crystal. The flake was struck from the terminating end down the length of the crystal. Small secondary retouch flakes were removed along one elongate edge and use-wear is seen on the cutting surface.

**Irregular Flake Scrapers (25).** Simple flake tools that have one or more edge or areas with retouching, either by use-wear or resharpening. No patterning of shape or style is seen. They are probably just fortuitous flakes picked up and used a short time and then discarded. The four obsidian tools are all fragments of broken points, or blades, which show retouch and use-wear on the cutting surfaces.

**Spokeshaves (3, Fig. 31n-p).** These three specimens are irregularly shaped percussion flakes with some retouch or use-wear in several areas around the tool. Each specimen, in addition, has a concave area on an otherwise straight scraping edge. The curved edge is steep-flaked with a plano-convex profile. The cutting edges are blunted from use on a hard material and all three specimens show secondary retouch flaking.

**Core Tools:** Two hundred and thirty core tool artifacts were recovered. These specimens are to be differentiated from the other two core categories in that these were additionally modified by use or design. There are four types of core tools distinguished primarily upon the kind of use patterning noted on the artifact. Again, the specific data and distribution of the core tools can be found on Table 3 and 4.

**Biface Scrapers (40, Fig. 34d-e).** These specimens are generally small ovoid-to-pyramidal-shaped cores with a large number of flake scars. The cutting edges are short, irregular areas at the conjunction of several flake scars. A majority of the tools have some secondary retouch flakes removed and considerable use-wear. There is little difference except size between these tools and

the biface chopper tools discussed below. The biface scrapers tend to be 60 mm. long or smaller, although there is some overlap with the larger choppers.

**Biface Core Choppers (90, Fig. 35a-b).** These specimens are fist-sized, or larger, cobbles with large percussion flakes removed. The bifacially-flaked edges show moderate use-wear and a few have evidence of some secondary retouch. A high percentage of these tools were made of the harder materials such as basalt and andesite. The use-wear on the choppers is not the blunted, crushed effect as is seen on the core hammerstones, thus suggesting use on softer material such as wood, etc.

**Core Hammerstones (76).** These artifacts are basically large cores with many flake scars. The points and edges are blunted and crushed by smashing against another hard material (stone). Thirty of these are broken stream cobbles with some flakes removed and the edges battered, with most of the cortex still remaining.

These artifacts should not be compared with the core choppers whose edges show use on a softer material, and are not blunted and crushed. Many of the spalls, with battered edges, noted in the miscellaneous category, probably are fragments of these hammerstones.

**Small Amorphous Core Scrapers (24).** These implements are very small cores that, in addition to having some flakes removed, also show one or more used edges. Most edges exhibit light use-wear with no clear retouch flaking, and further are slightly blunted and step-flaked from use. The majority of the tools still have a striking platform remaining but were used as scrapers instead of merely being remnant cores. They are ovoid to spheroid, though a few are small tabular tools.

**Prepared Cores: (109, Fig. 32j).** This category consists of cores which are triangular to subrectangular in outline, and are roughly pyramidal in profile. Each has a distinct, prepared striking platform for removing flakes. The desired shape of the flakes (as seen from the flake scars) was short, wide, and thin. Several of the cores were used to the ultimate and it is difficult to see how they were held when striking off the last flakes. It is obvious that

here the flake was the portion which was to be used, and these cores were simply the manufacturer's raw material.

The Large Cores listed in Table 3 and 4 are natural stream cobbles which were split or broken and with a few flakes removed. The 20 specimens are fist-size or larger, and probably were discarded raw material that failed to meet the qualifications for needed tools.

**Miscellaneous:** Four small flakes and three core tools are not modified other than showing one edge that has been ground smooth. These edges are the result of extensive use on a very soft material (e.g., hide scraping). All seven of these implements are variable in size and shape and are insignificant except for this trait.

Four other implements are unique in that they each have a battered working edge about one inch long, located on the square end of an elongate flake or cobble. The edge is both ground and chipped from use on a hard material.

Another unknown object is a small fragment of steatite which is ground and polished on one edge. This is not to be mistaken for a pipe fragment, but is instead an edge resulting from a rubbing or polishing action; its function is unknown.

There are 37 fragments of larger cores or flakes which have battered areas which originally were parts of hammerstones. These specimens were the spalls that come off the hammerstones when they were being used. Only four are chert, the rest are andesite and range in size from very small flakes up to fist-size split cobble fragments.

#### GROUND AND PECKED STONE ARTIFACTS

**Mortars:** Stone mortars were common at 4-Mer-3 with complete and fragmentary specimens being found throughout the site deposit. A total of 85 specimens were catalogued with 67 sufficiently complete to classify. The 18 remaining pieces are fragments with no trace of the rim or base of the original vessel.

The criteria utilized in establishing the classification consist of the specific configuration of both the inside and outside portions of the rim section of the vessel and size, material, and degree of

intentional shaping. The function of the specimens were not specifically considered. The configuration of the rim section was one of the important aspects of the classification.

**Bowl Mortars.** This general class is broadly defined as oval cobbles which have had a depression ground or pecked into one surface. There are 50 specimens which generally fit this definition, including 11 small rim fragments representing identifiable vessels. The other 39 specimens can be further subdivided.

Twelve mortars measure over 20 cm. in length while the remainder measure well below this mark; therefore, groups of large and small bowl mortars are recognized. The complete, small bowl mortars range in size from 7.5 cm. to 18.9 cm. One small bowl mortar has a shallow depression which is stained by red ochre (Fig. 36*b*). It should be noted that the smaller the diameter of the bowl, the less evidence of outside surface modification. This suggests that the smaller vessels were made from selected cobbles with the desired shapes, where the larger cobbles had to be modified into the preferred form.

The group of large mortars (over 20 cm. in diameter) is further separated into two subgroups. The criterion for this separation is primarily the configuration of the rim section. Six specimens have beveled rims (Fig. 36*a*). That is, the rim is completely shaped in such a way that the acute angle between the rim and the slope of the inside wall is less than 90 degrees. The rim, then, slopes, or is beveled, down and away from the interior edge of the depression. In most cases the sides and bottoms of these specimens are also shaped. The distribution of these items is suggestive of a special funerary use. The two vessels of this configuration not associated with burials were located on the surface and are likely the result of vandals having disturbed a burial. Although both types of large vessels occur with extended burials, the only occurrences of bowls being found over skulls were of the beveled-rim type. The unshaped-rim types found in the lower levels of the site come only from the rock cairns over the burials.

The inside walls of the 12 large vessels are smooth and polished. There was no foreign material such as carbon, seeds or artifacts found in the matrix inside the excavated depressions.

**Slab Mortars.** Four specimens are oblong slabs, each with a shallow, conical depression toward the center. The depressions first were pecked but became smooth through use. The area around the depression is flat and slightly polished. This suggests the possibility that a basket was placed there over the hole. However, none of the four mortars have traces of asphaltum or other mastic around the depression to attest to the affixing of a basket to the stone.

Three of these mortars were found in the rock cairns above three burials. These burials were extended and each had large and small bowl mortars also in association with the rock cairns. One mortar was not associated with a burial but was found in the burial area and is most likely part of a disturbed cairn. Therefore, this artifact type is seemingly diagnostic of the assemblage associated with the extended burials.

**Pitted Irregular Cobbles.** There are seven rough, irregularly-shaped cobbles that exhibit a small pitted area on one side (Fig. 37*c*). The pitted areas are shallow depressions and should not be mistaken for mortar holes as none of the depressions are smoothed from use-wear. The specimens were not shaped nor was any other kind of modification observed except for the pecked pits. The bottoms of the cobbles are so irregular that the stones could not be levelled except in soft ground, as by digging a pit. It is possible that these specimens are anvil stones.

**Steatite Bowl Fragments.** Six pieces of light-gray micaceous schist, or steatite represent fragments of five separate vessels (Fig. 28*a-c*). Two specimens are fragments of the same vessel. However, as is seen by their location, considerable distance (25 ft.) separated them when they were found. This is an excellent example of the amount and severity of the disturbance encountered in the midden area. The two fragments together produced a rim section of a large, probably shallow, oval bowl.

One fragment was used after the fragment was broken from the original vessel. The broken edges of the fragment are rounded and smooth and the entire inner surface is coated with a layer of carbonized material from 2 to 3 mm. thick. This substance was baked onto the steatite, suggesting that the fragment was used as a platter or griddle.

**Mortar/Pestle Combination.** One artifact can be described as both a mortar and a pestle (Fig. 38*d*).

The specimen is 20.0 cm. long, 13.6 cm. wide and 7.2 cm. thick. The oval cobble is unshaped except for a shallow depression on one side 12.3 cm. in diameter by 24 mm. deep. The depression was pecked and ground smooth by use. One end of the cobble was used as a pestle. The striations, which are deep and well defined, produce a shoulder around the battered end. The artifact was found in Unit 45N-50W at the 6 to 12 in. level.

Discussion. As a summary statement, there were five types of stone mortars found at 4-Mer-3; large and small bowl mortars, slab mortars, pitted irregular cobbles and the steatite bowl fragments. The distribution of these types is of interest in establishing whether any diagnostic forms exist. It can be seen from the distribution of these implements that at least two mortar types have temporal significance. The slab mortars are definitely associated with the extended burials as are the subgroup of large bowl mortars with beveled rims. In both instances the high percentage of occurrences with the extended burials, and the lack of associations with other items or levels suggest a strict temporal correlation.

The beveled-rim mortars also occur in the San Francisco Bay region (E. N. Johnson 1942). The specimens at 4-Mer-3 are very similar to Johnson's Type "A" (1942, Fig. 39), which he states occur in several levels of the Emeryville shellmound, Ellis Landing site, and the Hotchkiss mound. Johnson feels that this type of mortar is typical of the Costanoan groups of the Central coast and San Francisco Bay regions of California.

**Pestles:** Forty-seven pestles, or pestle fragments were found at 4-Mer-3. Twenty of the specimens are complete, and the remaining 27 fragments have observable single-worked ends except for two medial fragments. There are two basic types abstracted from the collection — shaped pestles and cobble pestles.

The shaped pestles are modified by pecking over their entire surface. The cross section of all of these specimens is circular, although the configuration of the ends varies. Of the ten specimens included in this subtype, only two are complete. One specimen is a short pestle with one broad, blunt end smoothed and polished by use (Fig. 37d). The other end is pointed and slightly battered. This specimen,

which was associated with Burial 31, was found next to a shaped bowl mortar (with a beveled rim) that had been placed over the skull of the burial. As the burial was that of a woman, the mortar and pestle are considered to be parts of her tool inventory.

The other cylindrical, shaped pestle (Fig. 37e) is extremely long compared to its diameter. Both ends are blunt and smooth with a definite shouldering occurring on each end. The pestle, from the fill of Housepit 10, was part of a rock feature above the floor surface, and can be seen in Fig. 16b. One of the rocks in that feature was the basal fragment of a shaped sandstone bowl mortar. The relationship between the pestle and the mortar fragment cannot be inferred beyond the association within the feature.

Eight specimens are fragments of pestles. The modified ends of the pestle fragments are all broad, shouldered and smooth. This kind of modification suggests considerable use as grinding tools and not strictly pounding or battering tools.

The remaining 37 pestles are cobbles or fragments of cobbles. There was no attempt to modify the shape of the original cobbles beyond the battering of the ends as a result of use.

Fourteen of the 37 specimens are complete, the others are fragments either split lengthwise or broken in half. The ends of these cobble pestles differ through use from blunt, shouldered ends to slightly pecked or battered ends.

Finally, there was found a ground stone object that is most probably the cut-off end of a shaped pestle (Fig. 29e). This object was made of a gray andesite and measures 85 mm. long, 57 mm. wide, and 38 mm. thick. The object is pecked and smoothed around the oval end and the opposite end is grooved to where it was snapped off the original artifact.

The distribution of the pestles and pestle fragments is shown in Table 7 and certain trends are suggested. The majority of pestles were, of course, found in the midden area. The low number of pestles found with burials does not suggest a close association to burial complements as is noted by the mortars and metates. Therefore, pestles cannot be considered as diagnostic artifacts for any group of

burials or structures. The two significant associations of shaped pestles have been discussed and seem to be unique in the collection. The four pestles associated with Burials 4, 5, and 31 were found in their respective rock cairns.

**Metates:** Forty-six ground and pecked, stone objects have been identified as metates or metate fragments. All of these specimens are considered to be the stationary segment of the mano-metate complex. There are four types of metates abstracted from the collection for analytical purposes. These types are based on the configuration of the cross section of the specimen. The cross sections vary in configuration and suggest slightly different motor techniques in the grinding process which result in differential wear patterns on the metate. Other factors such as the resistance of the stone, length of use, and amount of resharpening on the metate are also involved in the classification.

Fourteen of the 46 metates are basin shaped in cross section. In each, the depression slopes gently inward with no discernable edge or rim. The depression is not deep and its broad outline cannot be confused with a slab mortar. The general outline of the specimens varies from an elongate oval to a rough, broken slab of sandstone. All of the specimens exhibit pecking in the depression as a result of resharpening the grinding surface.

There are 11 metates made of flat angular slabs of stone (Fig. 40a). All but one specimen is made of the local Panoche Sandstone. The sand particles of the rock are loose and although they make for a good grinding surface, thin slabs would tend to wear out quickly. The one specimen not made of sandstone is a broken, angular slab of fine-grained, gray andesite. The grinding facets on this artifact are poorly developed but observable.

One slab metate is unique in that it has both a grinding facet on the flat surface and a groove through the center of that surface (Fig. 40b). The groove is 28 cm. long, 31 cm. wide, and 13 cm. deep. The inside surface of the groove is highly polished and it is here suggested that digging sticks or other wooden implements were ground or sharpened in it. This artifact was found in the rock cairn overlying Burial 1.

The third type of metate consists of 14 specimens which are characterized by a convex

grinding surface (Fig. 38a-c, 40c). That is, the center of the facet is higher than the edges. The convexity of these surfaces is slight, varying from 3 mm. up to 16 to 17 mm. There is a similarity of these surfaces to some of the mano facets, but the size differential between the two is significant. It is also significant to note that these metates were manufactured from red or gray andesite. The hardness of this stone may have some bearing on the configuration of the grinding surfaces.

Two specimens are round, convex metates manufactured from red andesite (Fig. 38c). They were found lying directly on the exposed floor surface of Housepit 1, working surface down. The similarity of size, shape and material, plus the close association to each other and the floor surface, suggest a contemporary relationship.

The last of the four metate types is made up of seven irregularly-shaped cobbles which exhibit one or more grinding facets. The surfaces are small areas on the stone and do not represent extensive use or distinctive patterning. The reason they are placed in the metate class is that they were used as grinding tools and the facets are located in such places that another tool; i.e., a mano, had to be used upon them.

**Discussion:** The general distribution of metates throughout the site suggests the following: basin and slab metates are more closely associated with the primary extended burials and general midden area than they are of the later housepits or cremations. Conversely, convex and cobble metates tend to group in the housepits (with the exception of Housepit 1, which is older) and not the midden area.

The metates found with the extended burials were part of the rock cairns placed over the burials. This then, makes their association with the cultural period represented by these burials very distinct.

The large number of metates of all four types found in the midden and on the surface again probably represents the disturbance of the midden (burial) area. Rodent activity and vandalism have destroyed many burials associated with rock cairns and some of these artifacts were probably part of these features.

A metate very similar to one illustrated (Fig. 40a) was found in Housepit 2 but is not directly associated with the structure. The large slab metate

was located 5 in. below the floor in the southwest quarter of the structure. It was found inverted and resting directly on the caliche subsoil. Therefore, this metate may not be associated with Housepit 2, but was already there when the structure was built above it.

**Manos:** The size, weight and configuration of the mano is related to the attributes needed to execute the grinding process. It must be heavy enough to crush the shells, husks, and kernels of nuts and seeds. It must also be small and light enough for the individual to manipulate the mano for some length of time. Another consideration must be whether the mano is used in one or two hands. The shape and consistency of material of the metate will also affect the shape of the mano.

The several criteria mentioned above are factors in the following analysis of the 16 complete and 44 fragmentary manos found at 4-Mer-3. The results of the analysis are in two parts. The configuration of the wear patterns was considered to be most important in the classification system used.

**Bifacial Manos:** Twenty-four of the 60 manos are modified on at least two sides. Of the 24, only five are complete and intact. The bifacial manos can be separated into two classes based on their exterior modification.

Thirteen of the bifacial manos or fragments are shaped. This shaping took the form of pecking along the edges, either intentionally or as the result of pounding. The grinding surfaces connect with the modified edges to produce a distinct shouldering around the artifact on both sides. These manos are oblong with squared sides and convex milling surfaces (Fig. 39a-b).

One particularly well-made bifacial mano was manufactured from a hard quartzite (Fig. 39b). The convex grinding surfaces are distinctly marked along the junction with the pecked sides. The striation patterns and the oblique alignment of the surfaces with an overlapping of these grinding surfaces on the bottom left-hand side suggest that the individual responsible for its use was left-handed (Haury 1950: 308-316; Riddell 1960: 33-37). No other mano or mano fragment exhibits these traits in an identifiable manner.

**Unifacial Cobble Manos:** Thirty-six specimens identified as manos are river cobbles modified on one surface only. (Fig. 39c-d). There was no attempt to further modify them by shaping the exterior margins. Further, there was no evidence of their use as hammerstones as noted in three bifacial manos.

Examination of this group of artifacts has shown that at least two different kinds of wear patterns were developed. One class of these artifacts exhibits wear patterns that were produced by moving the stone across the base material, in this case probably a basin metate, in a straight line. The pressure applied is by both hands side-by-side or one on top of the other and this motion produces only a slight amount of torque but a considerable amount of pressure. As a result of the pressure the wear pattern on the mano is a surface with a convex profile with most of the wear under the heel of the hand.

This kind of wear pattern is seen on 20 of the unifacial manos. In each case, varying according to the irregular shape of the river cobble, the worn and polished surface is convex in profile and covers most of the utilized side of the cobble.

In some specimens the grinding facet is only slightly developed which would suggest either they were just beginning to be used, or that the grinding process was a light one that required little pressure but good control across the metate.

The remaining 16 unifacial manos are characterized by the flatness of the grinding surface (Fig. 39e). All 16 artifacts are unshaped river cobbles. The unique attribute on each specimen is that the grinding facet is almost perfectly flat. This flat surface covers all or most of the side of the artifact, producing a distinct sharp shoulder on the specimen.

The motor habit which would produce the flat surface is distinctly different from that which would produce a convex surface. The applied pressure must have been from directly above the mano, downward. Any other angle would permit the torque of the hand and arm motion to exert pressure on the edges of the surface, thus producing a convex profile. The motion of the mano cannot be determined except that the strokes were probably short, and the amount of pressure was limited possibly to purposefully restrict

the grinding abilities of the mano. This would be exactly the case if fragile grass seeds were being brushed or the shells of nuts were being removed. (For a discussion on these various processes see Haury 1950; Riddell 1960; and Riddell and Pritchard 1970).

The opposing implement to the above mano type could not be a basin-shaped tool as with the more common convex mano types. By necessity, the metate would either have to be completely flat or slightly convex itself to accompany the flatness of the mano. Another possibility is its use upon a basket sieve. The basin-type metate would apply pressure to the edges of the mano and not to the center and would therefore round the edges or produce a convex surface completely.

**Discussion:** As a summary statement, there are two types of manos represented at 4-Mer-3: the unifacial type and the bifacial type. Each type has at least two subgroups within it. The configuration of the grinding surface is the criterion for the separation. The arbitrary separation of uniface manos from biface manos does not necessarily distinguish the function or motor habits involved. That is, we cannot assume that a unifacial mano was used for a different purpose or in a different process than a bifacial mano. However, analysis of the wear patterns that have produced the ground surfaces, whether on one side or both, indicates the kind of motion used and the type of base tool or metate used.

The surfaces on the manos that have a convex profile were all produced in a similar manner. The 24 bifacial manos and the 20 unifacial manos all have a surface or surfaces with a convex profile. Disregarding, for the moment, the idea of the use of one or two sides of a stone, the configuration of the convex surfaces suggests a similar grinding technique. In each case the torque produced by the rotation of the hand and arm in a forward and backward motion across a metate applies pressure unevenly over the contact surface. The amount of pressure applied by the hand is greatest near the heel of the hand and will therefore produce more wear at that point. The resulting differential wear in at least one specimen has shown that the individual using the mano was left-handed (Fig. 39b).

The grinding technique that produces the convex surface on a mano would produce a concave-shaped base tool or metate. As described in

another section, there were basin-shaped metates found at 4-Mer-3. There is no way to state definitely that such metates were connected with convex-shaped manos, but there is a correlation in the techniques that produced both.

Therefore, there were at least two distinct grinding techniques existing at 4-Mer-3; the method producing a torque and consequently a mano with a convex profile discussed above, and the method that produced the flat profiled manos described earlier. The distribution of the two types is shown in Table 7, and both types are represented in all areas and at all depths. The flat surfaced manos represent only about 26 percent of the total, but their distribution is very similar to the convex surfaced manos. The conclusion that can be drawn is that the two techniques are essentially contemporary.

When considering the gross configuration of all the 60 manos, whether unifacial or bifacial, the distributional percentages are only slightly different. The convex faceted manos tend to group at the 6 to 18 in. levels. This is in contrast to the slightly lower level of concentration seen in the flat faceted manos. The important difference here is that the manos found in the housepit are predominately the unifacial type while both kinds of mano surface profiles are found in the midden area. Inasmuch as the house remains are later than most of the midden area, it would follow that the unifacial manos are later than the bifacial types.

The material used to manufacture the manos reflects the use of locally available stone. Analysis of the material used shows that a hard stone was preferred. Andesite, in the form of cobbles in the creekbed satisfies this criterion. The sandstone in the surrounding outcrops and the quartz pebbles on the high terrace were not extensively used. Exotic material, such as granite, forms a very small percentage of the total. Therefore, it is seen that 88 percent of the manos are made of a gray andesite and only about four percent were manufactured from a reddish andesite. The remainder are made from quartzite, granite, or sandstone.

**Abrading Stones:** Seven small, oval, somewhat flat river pebbles are identified as abraders. The specimens are all bifacially ground or polished. The material used to make these seven artifacts is a fine-grained sandstone, either red or gray in color. It

is not the local Panoche Sandstone but a harder, more consolidated material. The creekbed has much of this material in it, and its origin is the Cretaceous sediments above the Franciscan Formation to the west of the site.

These artifacts are separated from the mano classification because of their size and use-wear patterns. The average size of the seven abraders is 8.5 cm. long by 7.0 cm. wide by 3.2 cm. thick. The wear patterns are on both faces and consist of a slight polish with a few deep striations. No pecking marks were noted either on the flat surfaces or on the edges.

One specimen has additional modification in the form of three flakes removed from one end of the artifact. The edge produced by this flake removal is further modified by use-wear as a scraper.

**Anvil Stones:** One sandstone and three andesite river cobbles are here called anvils. In all four instances, one surface of the thick oval rock was heavily pecked and battered. In none of the four artifacts is the pecked area depressed into the surrounding surface. Conversely, the curve of the surface is convex. The artifacts are small, averaging about 10.0 cm. long by 8.0 cm. wide by 4.7 cm. thick.

**Charmstones:** Identified as charmstones are a single cylindrical specimen broken on both ends (Fig. 29a) and a complete ovoid stone with a short tapering projection on one end (Fig. 29d). The center section of the first fragment gradually expands making a humped appearance. The specimen was manufactured from a yellow andesite by a grinding and pecking technique. The center diameter is 3.4 cm. and tapers to 2.1 cm. on one end and 1.9 cm. on the other. The artifact is 7.7 cm. long and was found 4 in. deep in Unit 5S-50W. The second specimen is made of a gray andesite and has an unfinished appearance. The pecking is uneven and there is little grinding or polishing. It was found on the surface and is 91 mm. long, 38 mm. wide, and 31 mm. thick.

**Discoidals:** Fragments of two ground and pecked discoidals were found (Fig. 29b-c). Both artifacts were found in the fill of Housepit 2 at the 6 to 12 in. level. The donut-shaped objects are both broken across the center. The central holes are small and measure 1.1 cm. and 1.4 cm., respectively, as

compared to the overall diameter of 6.9 cm. and 6.7 cm., respectively. The centers are pecked and drilled in a wide biconical shape. The largest specimen was made of a white conglomerate and the other a red andesite.

**Stone Pipe:** A dark gray, steatite pipe (Fig. 27k) was found associated with Burial 10. The tube was biconically drilled with the interior constriction occurring 15 mm. from the small end. The outside diameter is 27 mm. and the tube is 82 mm. long. The pipe was not burned with the cremation but was placed in the grave pit afterwards (Fig. 20f). All of the surfaces of the artifact are polished smooth and there is no internal evidence of tobacco or other burned material.

**Stone Ring:** A thick, perforated disc made of gray serpentine was found associated with Burial 17. This interment is a cremation and the specimen is slightly burned. The disc is 3.2 cm. in diameter and 1.0 cm. thick. The central hole was biconically drilled and polished. The perforation measures 1.1 cm. at the outside and only .8 cm. at the inside constriction (Fig. 20e, 27j).

**Ground Stone Rods and Pins:** Sixteen ground and polished stone objects were classed together because each has a round or oval cross section and has been ground or polished into a rod or pin shape. The function of these specimens is unknown and the name "rod" or "pin" does not necessarily imply function.

Two specimens were manufactured from a fine-grained sandstone and are pointed on one end. Both are fragments of longer artifacts. One of the items has four cut grooves next to the break. The other rod fragment has no modification other than being ground into its present shape (Fig. 28f). It, and two fragments of a third rod (Fig. 28j), was found in association with Burial 46 in Housepit 2. A third artifact was manufactured from a white calcite and as Burial 46 is a cremation the calcite artifact is also burned. An additional rod-like artifact was manufactured from slate.

The remaining 12 ground stone pins or rods were all manufactured from a green actinolite (Fig. 28d-g). Actinolite is a hard, fibrous lithic material



that is easily polished. One of these artifacts is complete, while the others are remnants of split, shattered pins or awl-shaped objects.

The distribution of stone rods and pins is presented in Table 7. Eleven of the 16 artifacts were found in Housepit 2. These items were found above the house floor. One actinolite pin was excavated from the dark midden matrix underlying the floor surface on the south side of the structure. However, the floor surface had been disturbed in that area, thus not forming a complete seal.

The remaining five artifacts are widely scattered. One specimen was within the fill of Housepit 3, while the other four pins were found at various levels in the midden.

**Earplugs:** There are ten items identified as earplugs. As is the case in most of these unique kinds of artifacts, their specific use or function is not clear.

There are three basic forms represented in the ten specimens. Three of the items are a tapering cylinder (Fig. 27f-h); three have a large flared end with the body contracting to a smaller stem (Fig. 27c-e), and three are flat spools (Fig. 27a-b). The remaining specimen is a fragment of the large end of either the stemmed or spool type.

The distribution of the earplugs is significant in that four specimens were found outside Housepit 2. These were found in the midden area at a depth that places them near several of the primary burials but there were no recognizable associations. It seems highly probable, however, that these specimens were originally grave goods which were later displaced by rodents or vandalism. Therefore, the earplugs, especially the spool type, may well be associated with the earlier portions of the site.

**Steatite Beads:** Twenty-seven beads were manufactured from a gray or black steatite. The measurements and other data of 26 of the small beads are given in Table 6, while the distribution of these specimens are contained in Tables 11 and 12. This was done to keep continuity of the several bead types. The remaining bead is a large disc of a green

steatite. The outside diameter is 12 mm. and the biconically drilled perforation is 5 mm. in diameter. The disc is 8 mm. thick and was found in the midden (Unit 60N-50W) at the 12 to 18 in. level.

The 26 smaller steatite beads can be separated into two subtypes on the basis of manufacturing technique. Twenty-five of the beads are disc shaped and were made in a manner similar to the clamshell disc beads. That is, lots, or groups of bead blanks were drilled and then ground smooth on a rod or string, producing a uniform size and shape. Different lots will be different sizes but the characteristic square edges of the discs are seen on all the beads.

The remaining pebble steatite bead was manufactured individually. The perforation is slightly off center and the edge of the bead is rounded and irregular. The cross section of this bead is irregular to triangular in opposition to the rectangular section of the disc beads.

#### BAKED CLAY ARTIFACTS

Baked clay was found to be common at 4-Mer-3. Most of this material was found in the fill of the several housepits in the form of irregular pieces with rod or twig impressions. These objects are obviously the remnants of wall or roof coverings that have been burned and have fallen into the destroyed house. The pole or stick impressions found in the clay range in size from 1.0 to 12.0 cm. in diameter. Thirteen clay objects other than the impressed burned material were found.

**Baked Clay Object:** A single, pebble-sized baked clay object was found which had been completely wrapped in strips of tule while wet (Fig. 28q). The impressions are each about 4 mm. thick and form bands which run completely around the spherical object. A final band was placed over the other bands near the center and cinched tightly, compressing the soft clay. This specimen is similar to the objects illustrated by Wedel (1941: Plate 19) from Buena Vista Lake. Its function is not known.

**Baked Clay Cylinders:** Four cylinders or short rods were found (Fig. 28k-l). There are no impression marks of any kind on them and three of the objects have both ends squarely cut, probably before firing. The fourth specimen was broken but the remaining end is also cut.

**Baked Clay Tubes:** Two fragments of small tubes were found in the midden. The specimens are midsections of two tubes 29 and 15 mm. long, respectively. The central holes were punched, not drilled, before firing and both are about 1.5 mm. in diameter.

**Pottery Fragments:** There are two objects of baked clay which are fragments of two different clay vessels. One small specimen is a rim fragment of a clay bowl, probably not more than 11.0 cm. in diameter at the rim. The walls of the vessel were 6 mm. thick, and were incised on the inside and outside by long irregular lines pressed into the wet clay (Fig. 28h). The fragment has seven of these lines on it and represents about 20 percent of the circumference of the vessel. There does not appear to be any temper added beyond the natural sand particles in the clay.

The other fragment is a curved wall section of a small vessel. This specimen has a dark brown color and has a mica and sand temper. The fragment is very similar to Owens Valley Brown Ware pottery (Riddell 1951: 20-23). It was found in the fill of Housepit 2.

**Baked Clay Spindle Whorls:** Three objects of baked clay are tentatively identified as spindle whorls (Fig. 28n-p). The specimens are small fusiform objects with small holes punched through the center about 1.5 mm. in diameter.

**Zooform Clay Object:** The remaining baked clay object is a small, cylindrical object broken on one end (Fig. 28m). The general configuration of this specimen suggests the neck and head of a bird. This consists of a near flat, head-bill region connected to the curving neck area.

Although this zooform object is unique along the western San Joaquin Valley, these objects are found to the north in the Central Valley and Delta Regions (Beardsley 1954: 77).

#### MISCELLANEOUS MINERAL OBJECTS

**Asphaltum:** Asphaltum was rare at 4-Mer-3. Remnants of asphaltum stops in four whistles were noted (Fig. 26s-v). Three split and ground *Olivella sp.* beads and four *Haliotis sp.* circular ornaments have traces of asphaltum adhering to the callus. In these cases the asphaltum was used as a glue to apply or

further adorn the objects. This is especially seen on one of two steatite earplugs with asphaltum on the facing. A small circular shell ornament with asphaltum on the callus face was found to fit the face of the stone artifact (Fig. 27a).

A large irregular mass of black asphaltum was found completely encompassing the right hand of Burial 5. The hand was placed over the chest of the individual but the asphaltum stuck only to the phalanges and wrist bones. The bones have not been extracted from the mass and it will take X-ray photos to tell if there is any pathological evidence or bone damage. The asphaltum mass measures 12.5 cm. long, 8.9 cm. wide and 4.2 cm. thick, and includes the second through fifth metacarpels, the hamate, triquetrum and pisiform and fragments of several other wrist bones.

**Concretions:** A sandstone concretion was found in association with Burial 33 (Fig. 27i). The burial was a cremation but the item was not burnt and was probably placed in the grave pit after interment of the ashes. The concretion is best described as a series of globular nodules. At least three nodules have been broken off giving a configuration suggestive of a female anthropomorphic figure. Female sexual attributes are heightened by the removal of a nodule in what would be the abdomen area. The measurements of these objects are 42 mm. long, 42 mm. wide, and 21 mm. thick. The more reasonable feminine measurements would be 79 by 77 by 72 mm. and the little lady weighs 33.3 grams. This interpretation is speculative but the specimen's context does suggest some special value, and for this reason it is bestowed the name of "Venus de Menjoulet".

Another concretion was associated with Burial 18. This object is a circular, disc-shaped specimen with a concave surface on one side. The other side is flat; in cross section the object is wedge shaped. The concretion was interred with the cremation but was not burned. The specimen is a dark gray sandstone and measures 39 mm. in diameter and is 13 mm. thick. A third concretion is a thin tubular object shaped much like a modern fishhook without the barb. The object was found in the fill of Housepit 2 but there is no evidence of modification or use, thus it may be completely fortuitous.

**Fossil:** A reddish silicate object identified as a

large herbivore incisor was found in the ashes of Burial 14. The tooth is unburnt and definitely part of the grave accompaniment. It measures 37 mm. long, 14 mm. wide and 11 mm. thick. The dentine and enamel are completely replaced by a silicate. The species of the animal has not been identified.

**Polished Pebbles:** Fourteen small oval pebbles were found that exhibit a high degree of polish. Four pebbles are sandstone, six of red quartzite, three of basalt and one each of tuff and schist. These pebbles are too small to have been used as grinding tools and the wear patterns are very smooth and polished.

**Quartz Crystals:** There were 47 crystals or fragments of crystals found at 4-Mer-3. There is no positive evidence of modification on any of the items. Three of the single terminal specimens do show battering on the edges, but of the kind that could be received in a tumbling action at the bottom of a stream. Therefore, the inclusion of these items in an artifact description is on doubtful grounds. They are, however, exotic to the area, both to the site and the canyon, and are, therefore, considered significant.

There were four crystals which have retained the double termination of the crystalline facets. Seventeen crystals had only a single terminal facet with the other end being broken. The remaining 26 specimens were fragments of broken crystals.

The distribution of the crystals and fragments is presented in Table 8. The crystals associated with burials were found in the grave fill and close to the body.

**White Paint:** A fist-sized nodule of gray diatomaceous earth was found associated with Burial 18; a cremation found in Housepit 2. The nodule itself had no obvious modification, but is exotic to the immediate region and is a significant addition to the cultural inventory of the cremations. Gayton (1948: 265) states that the Yokuts used diatomaceous earth mixed with grease to make a white paint and Latta (1949: 58) said it was mixed with plant juices or oil from certain seeds. Sherwin (1963: 87) noted that the Tulare Lake and Valley Yokuts made white paint from burned shell but that other Yokuts groups used diatomaceous earth traded in from "... Yokuts who lived in the Coast Ranges" (Riddell 1951: 22). Two major sources for the whitish material are near Lompoc in Santa Barbara County and at Crow Creek in Stanislaus County.

**Andalusite Crystals:** Two unmodified mineral crystals of a unique type were found. These crystals

( $Al_2SiO_5$ ) are a gray-black, square shape with a distinctive cross-shaped (+) interior design formed by a yellow to clear material. They measure 20 mm. by 5 mm. and 17 mm. by 4 mm., respectively. It is significant to note that this crystalline form occurs only in granitic formations on the east side of the San Joaquin Valley in Mariposa, Mono, Kern, and Fresno Counties (Pough 1955). It is probable that these objects, although not modified, represent trade relations with the aboriginal groups on the east side of the valley.

## BONE AND ANTLER ARTIFACTS

There was a total of 133 complete or fragmentary bone artifacts catalogued, only 13 of which were complete. Nine bone awls, one whistle, and four bone beads were found intact or unburned. In all cases, however, the bone preservation was poor. Many of the specimens were rodent-gnawed or broken after interment. The high pH content of the soil at the site has been the major cause of bone deterioration including the human skeletal remains.

The majority of bone artifacts, or 66.4 percent, were manufactured from mammal bone. Bird bone is represented by 31.2 percent of the total, while the three antler artifacts comprise 2.4 percent of the inventory.

**Bone Awls:** Thirty-seven complete or fragmentary bone awls were found at 4-Mer-3. Nine of these are complete except for one which has a small portion of the tip missing. The remaining 28 fragmentary tools consist of 21 tip fragments and seven midsections of broken awls.

Five of the complete awls were manufactured from splinters of split mammal, long bones. On three of the specimens there was no attempt to shape the body or base by grinding. The remaining two were split long bone fragments with the edges rounded from tip to base either by use, or modified in the attempt to shape the objects.

The four remaining complete specimens were included in this awl classification because the criteria are the same. However, they are much larger and better made. All four were associated with the cremated burials in Housepit 2. Burial 11 had one unburned specimen placed upon the ashes after

interment (Fig. 24c). The artifact similar to Gifford's bone awl type Ale1 (1940: 168), was made from a split mammal long bone. The base is completely modified with no remnant of the articulating end of the bone evident. The entire body is ground smooth and the tip is short and blunt. The artifact is poorly preserved and the tip end is rodent-gnawed.

Burial 13 was accompanied by three large, bone artifacts (Fig. 20c and Fig. 24a, b, d). Two specimens are similar to the above-described artifact. They were manufactured from split mammal bone, and the base is completely modified, leaving no trace of the original end of the bone. The third specimen was manufactured from a split mammal cannon bone (Fig. 24a), with one-half of the distal end of the bone remaining on the base of the artifact. Typologically it is similar to Gifford's Type Alcl (1940: 168).

The function of the four artifacts described above is questionable. Although the specimens were placed in the awl classification, their size, quality of manufacture, and context might suggest that they were daggers or hairpins instead of awls.

The 21 awl-tip fragments were analyzed primarily on the basis of the configuration of the tip section. Through this kind of classification, it may be possible to ascertain the specific function of the artifact. The four awl tip subtypes abstracted from the data are defined as follows:

**Type 1.** The tip is blunt, rounded and thick, and there is little or no tapering from the shaft to tip of the artifact. The cross section is circular and the end has crossing striations from multi-directional use.

**Type 2.** The tip is foreshortened and tapers quickly to a rounded point. The cross section of the tip portion is circular-to-oblong, depending on whether the body of the awl has remnants of the edges of the split long bone.

**Type 3.** The tip is small and narrow, and the point is blunt. There is no evidence on any of the specimens of a shoulder, but the heavy striations on the point show strong wear patterns and shouldering could occur. The sides are nearly parallel along the shaft and the cross section of the tip is circular.

**Type 4.** The tip is small, narrow and tapers to a sharp point. The cross section of the tip

portion is oblong. In some cases the shaft of the tip is near parallel-sided, with a distinctive shoulder 8 to 10 mm. from the end, making a thin needle-like point.

It would seem that the tip section of an awl would most likely yield clues to the specific function of the tool. This is, however, not as obvious as it may seem. Awl Types 1, 2, and 3 are thick and heavy with blunt points and would be more suitable for flint knapping than for basketry work. Gifford (1940: 170) suggested that some bone awls were used in the shaping or knapping of obsidian and other stone objects.

Conversely, Type 4 awls have a long, narrow point, and could have been used as a puncturing tool on basketry, fibers, or other soft materials. Ethnographic awl specimens, with shouldered, needle points are generally associated with coiled, rod foundation basketry (Gifford 1940: 169; Barrett and Gifford 1933: 214). Inasmuch as the above-mentioned shouldering is usually thought to be produced by a perforating action between the stiff coils with a rod foundation, the presence of the grass bundle foundation coil basket fragment found with Burial 12 becomes significant. Barrett and Gifford (1933: 229) suggest that the rod-foundation type of coil basketry does not occur in the Yokuts ethnographic area. This means that the shouldered awl type would not necessarily be expected to appear at 4-Mer-3. The long, narrow pointed, non-shouldered awl type is in the majority at 4-Mer-3 and is probably associated with the grass bundle foundation basketry. The fact that shouldered awls do occur suggests that stiff rod construction coil baskets may also occur, although there is no evidence at present to support this.

**Bone Beads:** There are six specimens included in this category (Fig. 26a-d). The two largest of these were made from small mammal long bone. Two specimens were made from large bird tibia and the last two specimens were made from small bird long bones. In all six items, the bone was cut perpendicular to the long axis of the bone, then smoothed and polished on the outside. The inside was cleared of marrow or structural prominences. The cut edges are worn and smooth, with the wear pattern originating from the inside. This kind of pattern could be produced by a string or thong passing through the bead.

There are several fragments, probably of beads, which have been placed in the unidentified modified bone category, but in lieu of any absolute criteria they are not considered here.

**Whistles:** Seven specimens of bone tubes were identified as whistles (Fig. 25a-b, Fig. 26p, s-v). Two specimens were manufactured from bird ulnae, and four specimens were made of the tibiae of a large bird. All four of the above are fragmentary with the two ulna fragments and one tibia fragment broken at the orifice. The remaining tibia fragments are shattered on one end. One specimen (Fig. 26s) was found intact and was made from the femur of a bobcat (*Lynx rufus*).

These seven artifacts were distinguished from the general class of bone tubes for two reasons. Each has an oval orifice cut into the midsection of the tube. Beneath the orifice, an asphaltum plug was placed to constrict the passage of air. Remnants of this plug are seen in four specimens. In the more complete specimens the orifice sizes range in length from 4 to 13 mm. and are 3 to 12 mm. wide. The placement of the orifice, which is meaningful in other areas of California, is variable in this collection. In the measurable specimens the orifice tends to be placed off-center toward one end. The measurements range from 39 to 56 mm. on the long end and 12 to 15 mm. on the short side.

One of the bird tibia whistle fragments has an extensive incised design on the outside (Fig. 25a). The design consists of short, straight lines cut into the bone and conforms to Pattern 5 described below. The cuts are shallow and are filled with a dark material making the design contrast with the lighter bone color. The design pattern is composed of 13 long lines entirely circling the tube in a spiral down to the left. Between these long lines, short unevenly-placed lines were cut, also down to the left. One band near the end of the tube was filled with the short lines but also has crossing lines, down to the right, producing cross-hatching. The specimen is very similar to Gifford's Type EE2b (on the small side of the size range; 1940: 228).

An additional bone tube fragment is here included as a bone whistle (Fig. 26p). The artifact is a short tube, 31 mm. long, and is split length-wise, perpendicular to the side upon which the orifice is

located. The oval orifice was cut, and measures 5 by 3 mm. The way in which the specimen was split removed the area where any asphaltum plug might have been. Therefore, there is no evidence of the important criterion of an air restricting mechanism opposite the hole. This specimen has six connecting V-shaped incised lines on one side and both ends are ground or worn smooth from the outside. The design style is similar to Pattern 5 described below.

**Tubes:** There were 25 plain, non-incised bone tubes or tube fragments catalogued from 4-Mer-3 (Fig. 25c). One or both ends had been cut off on all but a single specimen. The one exception is a large bird ulna, 81 mm. long and 7 mm. in diameter, which has both ends broken. Three other bird ulna tubes are complete; both ends are modified on each. These three items and a bird tibia with one cut and one broken end are the only complete tubes. The remaining 20 specimens include the seven tube fragments associated with Burials 11, 33, 37, and 43 and unassociated fragments found in the housepits and midden fill.

Because of the presence of at least one cut end on each specimen, whether it be a complete tube or a fragment, these specimens are considered here to be raw material or manufacturing residue from some kind of artifact production. The small number of bone whistles compared to the above category does not clearly permit the conclusion that the residue is from the manufacture of bone whistles.

Seven bone tubes were found associated with four cremated burials. The tubes in three of the burials were burned, either with the cremation, or afterward in the grave pit. In each case the tubes were smashed and warped into several hundred pieces and were impossible to reconstruct.

The distribution of the bone tube fragments is shown in Table 10. It should be remembered that the distribution was greatly affected by rodent and vandal disturbance, especially in the midden area.

**Incised Bone Tubes:** The remaining 25 bone tubes or tube fragments are all additionally modified by one of several patterns of incised designs. As with the two previously-described incised bone whistle fragments, the cuts on the outside surface of the polished bone are shallow and filled with a dark material making the design distinct. There are five patterns of design abstracted from the analysis of the 25 specimens.

**Pattern 1.** (6 specimens) This pattern consists of from one to three singular lines cut completely around the specimen, perpendicular to the long axis of the tube. The lines are within 4 mm. to 11 mm. from the cut end of the artifact. It is possible that these lines may be only butchering marks. However, the quality and workmanship suggest a design function, not the residue of manufacturing techniques. (Fig. 26e-g).

**Pattern 2.** (2 specimens) Pattern 2 is a simple diamond design occurring around the entire tube with the lateral tips of the diamonds connecting with each other. The area inside the diamond is filled with short crosshatch lines. The crosshatched lines are not uniform and produce unbalanced sections in relation to each other (Fig. 26o, q).

**Pattern 3.** (7 specimens) This pattern of incised design consists of a series of oblique bands around the entire tube. Inside the bands are short lines from the top edge of the band to the bottom edge, usually perpendicular to the edge line. In all but two specimens the bands slant down to the right. One specimen has the lines slanting down to the left. The specimen has a series of hatched chevrons spiraling down to the right and down to the left around the tube (Fig. 25b, 26h-k).

**Pattern 4.** (4 specimens) Pattern 4 consists of a series of wide bands filled with short line crosshatching. The bands are completely around the tube and the plane of execution is perpendicular to the long axis of the tube. Between the bands, single lines space the several sections. The crosshatching is well measured and produces well-balanced design patterns (Fig. 26l-n).

**Pattern 5.** (6 specimens) This group of design patterns is made up of many single lines cut entirely around the tube. The lines are unevenly cut and placed. They may consist of long or short lines some in V-shapes, and placed over any part of the tube. Any grouping consists generally of short straight lines in no apparent pattern other than the grouping itself (Fig. 25a, Fig. 26p-r).

The general distribution of incised bone tubes can be seen in Table 10. It is significant that 84 percent of the specimens were found in Housepit 2.

This includes the 18 noted, plus the three occurrences associated with Burials 19 and 43. Both are cremations from Housepit 2. The two specimens found in the midden at the 12 to 18 in. depth account for 8 percent and the two specimens found in Housepit 10 make up the remaining 8 percent.

One specimen of Pattern 5 was found in Housepit 10 and has remnants of both ends which exhibit edge-incising (Fig. 26r). The fragmentary artifact was manufactured from a heavy mammal bone. It measures 45 mm. long and has a diameter of 25 mm. Because of the presence of cut ends and the configuration of the fragment, it is here suggested to have functioned as a gaming bone (Gifford 1940: 228, Type EE2c). This kind of artifact was used by both the Yokuts (Latta 1949: 132) and the Miwok (Barrett and Gifford 1933: 265, Plate 71).

**Spatulas:** There are eight fragmentary specimens identified as bone spatulas. All are in poor condition; three specimens are burned and the other five are cracked and crumbly. However, the criteria of a spatula are met in every case; each is a fragment of a flat object produced from split mammal bone. The outside surfaces of the artifacts are polished but still retain most of the characteristics of bone epidermis. The inside area is slightly concave with the edges ground smooth and rounded. Only one specimen has any evidence of an original end which is a rounded blunt edge.

A unique spatula fragment was found in the fill of Housepit 2. It was manufactured from a large mammal's long bone, possibly an elk tibia or femur. The surface of the bone was highly polished with no striations or wear patterns evident; the bone was burned and broken. Two fragments of this artifact were found about 3 ft. apart, but they fit together and all the breaks are old. There is no suggestion of the artifact being associated with any burial.

One small portion of a thin spatula was recovered in the grave pit of Burial 4 at the 30 to 36 in. depth.

**Fishtail Objects:** Two fragments of unique fishtail-shaped artifacts of bone were found (Fig. 25d, e). Both have a configuration on the end similar to the objects described by Gifford (1940: 166 and 232) as Type MM2, "fish gigs or toggle heads". The basic shape of these artifacts are blades with a single-shouldered base. The bone surface is polished.

and ground to the present shape. One of the artifacts was found in the midden area at the 0 to 6 in. depth and the other was associated with Burial 49 at the 12 to 18 in. depth in Housepit 2. The object associated with the cremation, Burial 49, was burned, probably at the time of the cremation of the body.

**Bipointed Pin:** A single bipointed bone pin was found in the fill material of Housepit 2. This unique artifact measures 25 mm. long and is 2 mm. in diameter.

**Unidentifiable Modified Bone:** There are 24 artifacts of modified bone in such fragmentary condition that identification was impossible. One fragment of burned bone is significant in that the modified portion is suggestive of a fishspear or harpoon. On one end of the fragment several artificial lines appear which are probably due to differential burning caused by the wrapping or binding on the artifact. Unfortunately, the specimen is too fragmentary to be specifically identifiable. None of the remaining artifacts yielded information which would allow placement into a classification of any kind.

**Antler Wedges:** Three artifacts were manufactured of antler material. Two of these specimens were apparently used as wedges. Both of these artifacts were associated with Burial 36 (a cremation) found in Housepit 2 (Fig. 25*i*). The burned, fragmentary artifacts were mixed with bone ashes of the burial. Partial reconstruction was possible and the overall configuration was determined. Both specimens have a blunt, cut-off base with a tapering beveled point. One specimen is estimated to have originally been about 140 mm. long and 45 mm. in diameter at the base. This artifact was made from a small, split antler. No remnants of branching were found which indicated it was probably made from one of the slender outer tines. The second wedge fragment is almost complete but burning has warped it considerably. The specimen was manufactured from a deer antler and the section used was just below, and includes part of the juncture of two branches of the antler. It is 171 mm. long and 30 mm. in diameter just below the flat junction area. Immediately below the junction the point gradually bevels down to a chisel point.

The third antler tool is a tip fragment of a deer antler tine with a worn and scratched region on the tip end. This artifact was found in the fill of Housepit 2 at the 6 to 12 in. depth.

**Discussion:** Table 10 shows the distribution of all the bone artifacts found at 4-Mer-3. The distribution of the several artifact types show trends which could have temporal or spatial significance. For instance, the bone awls are almost evenly distributed between the midden area, Housepit 2, and the cremated burials. However, the primary burials have no bone artifacts associated with them. The five awls found with the cremations are large daggers or hairpins and are very different from the awl fragments found elsewhere.

The bone spatula fragments and bone beads are almost entirely limited to the midden and Housepit 2. Only one spatula fragment was found with a burial (Burial 4). Comparing these two artifact types shows that the bone beads were almost all found in Housepit 2 while the spatulate fragments were found in a greater percentage in the midden area.

Bone tubes, either incised or plain, were found in all areas except Housepits 3 and 11. The trend seen here is that the majority, 25 of the 50 were recovered from the fill and on the floor of Housepit 2. When considering the distributional difference between the plain tubes and the incised tubes, there is a shift. The plain bone tubes are equally split between the midden area and Housepit 2 and only one specimen is from Housepit 10, while 84 percent of the incised bone tubes or 18 specimens were found in Housepit 2. The remaining five artifacts are evenly distributed between the midden area and Housepit 10.

The whistles and wedges are also predominantly associated with Housepit 2. The burials with which the whistles and the two wedges were associated were cremations found inside the large structure.

In summary, the trends seen in Table 10 suggest that the small bone awl fragments, the spatula fragments, and some of the plain bone tube fragments are more closely associated with the midden area. Conversely, the large awls, or daggers, the bone beads, the incised bone tubes, the antler wedges, and the bone whistles are associated, at least in a distributional sense, with Housepit 2.

These associations are general and loosely recognized. In all cases except the wedges and whistles, there is overlapping. The artifact types do

not fall clearly into neat groups but the majority of certain types tend to orient toward either Housepit 2 or the midden area.

### SHELL ARTIFACTS

There are three subgroups within the shell artifact category: a) Shell Beads; b) Shell Ornaments and c) Shell Tools. For purposes of description in this report it shall be understood that a bead is smaller than an ornament with no measurement over 20 mm. There is always a perforation, generally towards the center of the artifact. Even the applique beads have perforations, although the holes seem to be functionless. Conversely, an ornament is larger with no limits to the size and number or placement of the perforations. The ornament is designed to be a significant part of a string, applique or isolated display.

A shell tool is an artifact not designed for ornamental purposes. There are two kinds of shell tools to be described here: shell "spoons" and shell "saws".

The existing classifications were used wherever possible in the description of these artifacts. This was done for two reasons: 1) the established classifications are well known and enable quick recognition; and 2) an entirely new classification would only complicate an already complex situation.

**Shell Beads:** A total of 2,642 shell beads was found at 4-Mer-3. Of these, 1,766 were associated with burials. The main trench in the general midden area produced 333 beads. The five excavated housepits had a total of 543 beads with 443 of them associated with Housepit 2. The material predominantly used for shell bead manufacture was *Olivella biplicata* with several specimens made from *Haliotis rufescens*, *Tivela stultorum*, *Saxidomus* sp., or *Mytilus* sp. In addition, six bone and 26 steatite beads were found but their discussion is included in their respective categories for continuity.

The classification system used to analyze the collection is basically the same as outlined by Lillard, Heizer and Fenenga (1939) later modified and clarified by Bennyhoff and Heizer (1958) and Olsen

(1963). The temporal criterion of the classification is not necessarily a factor in this description although the analysis here suggests certain chronological significance of types. The following is a list of the bead types and their distribution:

Small and Large Whole *Olivella* (Type 1a, 1b, 461 specimens, Fig. 22a).

The spire is ground or broken off perpendicularly to the axis of the univalve. The angle of the opening varies, but generally is less than diagonal. The two types are separated upon the basis of the diameter of the shell measured opposite the orifice. The small, Whole *Olivella* (Type 1a, 95 specimens) measured 6 mm. in diameter, or less with the majority being 5 mm. The large, Whole *Olivella* (Type 1b, 366 specimens) measures 7 mm. in diameter, or more, with the majority in the 8 to 9 mm. range. The size separation is distinct and suggests a selectivity for the particular size-forms. Both types are found scattered throughout the midden but also are associated with several burials. Each type is associated with the cremated burials, but also show up in the grave lots of the semiflexed burials. There is one occurrence each with two extended inhumations but are numerically insignificant.

Thin Rectangular *Olivella* Bead with Central Perforation (Type 2a1, 321 specimens, Fig. 22c-g).

The bead is cut from a transverse section of the whole shell and the small, single perforation is biconically drilled from the concave side. The form varies from a flat, symmetrical outline with the concave face slightly ground to a deeply-cupped, rectanguloid shape. They range in size from 4 by 5 mm. up to 8 by 10 mm. The several grave lots are generally mixed with a variable range of sizes and forms. This situation is similar to the grave lots of rectangular beads found at 4-Mer-14 (Riddell and Olsen 1965). The distribution of this type is significant at 4-Mer-3 in that they tend to numerically increase towards the lower level of the midden and are predominantly associated with the extended burials, although they have single occurrences in three cremations. This bead type is similar to the diagnostic time marker in the central California culture province which relates to the early stages of the Late period, Phase I (Beardsley 1954: 47).

Thin Rectangular *Olivella* Bead with End Perforation (Type 2a2, 6 specimens, Fig. 22e).

This type is similar in size and form to the



Type 2a1 *Olivella* bead except that the single perforation is located toward one end. The outline of this bead type tends to be trapezoidal rather than rectangular. All six specimens were found in the midden fill of Housepit 2. It is possible that this bead type is but another variation of the basic bead form described above. This suggestion takes on credence when we consider that the Los Banos area is peripheral to the main complex area to the north and the variation may be only a reflection of the ideal form expressed by local manufacture.

Thin Lipped *Olivella* (Type 3a1, 185 specimens, Fig. 22j).

These are small oval-to-round, and deeply-cupped beads which are centrally perforated, and which sometimes have the remnant of the whorl on one edge which produces one thin and one thick edge. They range in size from 6 to 10 mm. in diameter. The distribution of this bead type is limited at 4-Mer-3. It is found in the fill of Housepit 2 and with four cremated burials. It is also the predominant bead type associated with the single cremation found outside of Housepit 2 (Burial 21). There were singular occurrences in two additional cremations and two semiflexed burials. The specimens associated with Burial 21 are burned and form a cohesive grave lot in that they are dissimilar in detail to the other examples. This bead type is similar to the type found in the central California culture province which is diagnostic of the Late period, Phase II.

Split and Punched *Olivella* (Type 3a2, 9 specimens, Fig. 22i).

These half-shell *Olivellas* are split longitudinally and the perforations are crudely punched through the center of the half-shell. These few specimens were found exclusively in the fill of Housepits 2, 10, and 11. The minimal number of these specimens makes them statistically insignificant and may represent raw material for local bead manufacture.

Concave with Transverse Profile, Saddle *Olivella* (Type 3b, 16 specimens).

These are oval-to-rectangular and have a small central perforation biconically drilled from the concave face. The size range is 5 by 7 mm. up to 8 by 9 mm. The edges are ground, the bead is well-made and is similar to the classic Saddle *Olivella* bead

diagnostic of the Middle period in central California. This bead type has a limited distribution in the site and was found in single occurrences with two extended burials, and 14 specimens make up about one-half of the grave lot of Burial 30, a semiflexed interment. These deeply-concave beads should not be confused with the Type 2a1 *Olivella* variants found in Housepit 2 and in mixed lots at 4-Mer-14 (Riddell and Olsen 1965).

Subrectangular, Modified Saddle *Olivella* (Type 3b2, 3 specimens, Fig. 22k).

This particular bead type is slightly concave with a trapezoidal-to-ovoid outline and has small, single, biconically-drilled perforations. The very small number of specimens of this type clearly identified suggests that these specimens may be a variation of another form. Indeed, there are specimens in the Oval *Olivella* beads, to be discussed below, which tend to be quite similar to this type, thus, we may be dealing with a continuum instead of two distinct types. However, the three specimens here were found in Housepit 2 and are culturally and temporally disassociated with the Oval specimens which are grave lots of the several older extended burials.

Flat-to-slightly-cupped, Saucer *Olivella* Beads (Type 3c, 10 specimens).

These beads are circular-to-oval and have a flat-to-cupped profile, and a large, biconically-drilled central perforation 2 to 3 mm. wide. These specimens measure 6 to 8 mm. in diameter. There are two occurrences in the fill of housepits and five beads were found in the upper 24 in. of the midden. This particular bead type is similar to the type which occurs in a Middle period context in central California (Lillard, Heizer, Fenenga 1939: 51), but there are also samples from the southern San Joaquin Valley at a much later time period (Wedel 1941: 52, Plate 27e-d).

Small Disc *Olivella* Beads (Type 3d, 73 specimens, Fig. 22n).

These beads are small, thin, circular specimens measuring 3 to 5 mm. in diameter. They are essentially flat in cross section and are well made. One specimen from the upper levels of the fill in Housepit 2 is unique in that one face around the

central perforation has crosshatched incised lines upon it. Most beads of this type were found in the fill of Housepit 2, although they were also found in the grave lots of four cremations and one semiflexed burial.

Small, Thick Cupped *Olivella* Beads (Type 3e, 924 specimens, Fig. 22m).

This bead type is related to the Type 3a1 bead, but is smaller and is trimmed so that no remnant of the interior whorl remains. The central perforation is biconically drilled from the concave face and the overall size of the bead is less than 6 mm. in diameter. Six specimens from the fill of Housepit 2 exhibit incising around the ground edges. There are two kinds of incised patterns; single diagonal lines and crosshatching. The Type 3e is, by far, the predominant bead type recovered from 4-Mer-3, and is temporally diagnostic as seen by their distribution in the site. They appear in small numbers in the upper levels of the midden, but were a common association with the 12 cremations in Housepit 2. Some 226 Type 3e *Olivella* beads were found in the fill of Housepit 2, but are probably stray specimens from the various cremation grave lots. Additional specimens also were found in the fill of Housepits 3 and 10. More will be said about the temporal significance of this bead type later.

Amorphous *Olivella* Beads (No type designation, 10 specimens, Fig. 22l).

These specimens are similar to, but are definitely *not* the Rough Disc bead common in a late context in central California. They probably are more closely associated with the Split-drilled (Type 3b1) *Olivella* bead type, although they may represent unfinished beads (Bennyhoff 1968: 13). The specimens from 4-Mer-3 are subrectangular-to-ovoid, with the edges broken but not ground. The perforation varies in size and is usually off center and drilled from the concave face. The size of the beads is highly variable with a range from 7 by 8 mm. up to 10 by 12 mm. The grave lot with any significant number of these beads is from a semiflexed burial beneath the floor of Housepit 2, thus probably predating the structure.

Oval *Olivella* Beads (No type designation, 525 specimens, fig. 22h).

The Oval beads are the second-most numerous type found at 4-Mer-3. They are a subrectangular-to-fully-oval bead with a small, central

perforation. The edges are ground but occasionally a remnant of the inside whorl remains. They range in size from 5 by 6 mm. up to 10 by 10 mm. but with the majority in the 6 by 8 mm. size. The large number of these beads and their distribution makes them a reliable diagnostic bead type at 4-Mer-3. They occur in only three grave lots, two of which are extended burials and a third a semiflexed interment. They also occur in all levels of the midden with the greatest frequency in the 24 to 36 in. level. A single occurrence in the fill of Housepit 2 and a total absence from the cremations shows a definite non-association with the later periods at the site.

Applique Half-shell *Olivella* Beads (No type designation, 7 specimens, Fig. 22b).

These specimens are whole or spire-lopped *Olivella* ranging in diameter from 8 to 12 mm. They are ground on one side until one-half of the shell remains. The inside whorl forms an "S"-shape and the interiors are usually filled with asphaltum. No perforations were noted which suggests that these specimens were glued to another object (shell ornament?) instead of being strung. Six of the seven specimens were found in the fill of Housepit 11 and none are associated with burials.

The applique bead is a common type in southern California and the Channel Islands, but is rare in northern California. In southern California the temporal context of this type seems to be early, possibly dating before 1 A.D. (Reinman and Townsend 1960: 17-28, Plate 161).

The beads made from *Haliotis* sp. (20 specimens, Fig. 22o) are small and disc-shaped, with a small, central perforation and were manufactured from the red callus of the shell.

The clamshell beads are of three types. A thick cylinder bead (Fig. 22q) was made of *Tivela Stultorum* with the thickness equal to, or larger than, the diameter (Gifford 1947: 32, Type VIa1). A thin disc bead (Fig. 22p) was made of *Saxidomus nuttalli* with the thickness one-half or less of the diameter. There are four examples, all fragments, of tubular *Tivela* sp. beads. These items are similar to the Type Av2b beads shown by Gifford (1947: 111). A third

type of clamshell bead was a small disc bead manufactured from *Mytilus* sp. that is similar in size and form to an *Olivella*, Type 3e bead.

Most of the *Olivella* sp. Oval beads, which occur exclusively in association with the extended burials, are coated with a layer of red material not to be confused with ochre. In some instances the chemical action of the coating has resulted in the near destruction of the bead. There is no evidence in the grave pits of the general spreading of ochre, but this coloration may possibly be the result of decomposition of the body.

A bead pattern consisting of 313 Oval *Olivella* beads was found in and about the pelvic region of Burial 2 (Fig. 19d). The pattern suggests a broad band about 5 in. wide by 18 in. long. The beads were probably strung in a series of shingled rows across the long axis of the pattern. No trace of the stringing material or the backing if any, survives and is probably a part of an apron designed either for dance or burial ceremonies.

Nine line-incised Type 3e *Olivella* beads were found. All of them are extremely small; six measure 3 mm. in diameter and two measure 4 mm. in diameter, with the central perforation averaging 0.8 mm. in diameter. All of the specimens were found in Housepit 2 with three of them part of the grave lot of Burial 10. The remaining six were found at various depths in the housefill. There are two patterns of decoration demonstrated. One consists of simple diagonal lines running from top right to bottom left (if the bead is placed concave side down). The other pattern was a crosshatching, forming a series of "x's" around the edge. A single thin disc Type 3d *Olivella* bead was found in Housepit 2 fill, that exhibited incising on the outside facing. These lines were simple linear marks with no apparent design or pattern.

It must be noted that the measurement data of the steatite beads are given in Table 6 and the distribution is included in the shell bead tables. This was done so that no distortion of the bead inventory would occur.

**Discussion:** Analysis of the grave lots shows that several bead types are almost exclusively associated with different kinds of burials. For example, Oval *Olivella* beads occurred only with extended burials but not vice versa. Extended burials

were found with a variety of *Olivella* beads. From this evidence it is assumed that the Oval bead type is diagnostic of whatever period the extended burials represent.

Another significant bead type is the *Olivella* Type 2a1 or Thin Rectangular bead. This type is found sporadically and usually individually in other grave lots, but is predominantly associated with Burials 1, 2, and 39. The Oval and the Type 2a1 beads were the only forms in the grave lots of Burials 1 and 2. Burial 39 was a primary inhumation found 13 in. beneath the floor of Housepit 2. Its burial accompaniment consisted of 44 Type 2a1 *Olivella* beads. The significance of finding only the Type 2a1 beads with Burial 39 is that they were associated with the above-mentioned diagnostic Oval type. This association and the stratigraphic position of Burial 39 suggests that Housepit 2 was probably built after the extended burials had been interred.

A third bead type that shows numerical significance in Table 12 is the *Olivella* Type 3e. Its complete absence in the grave lots of the extended burials and sporadic occurrence with the flexed burials is notable. When the grave lots of the cremations are studied, however, it is seen that they occur in almost every one. Burials 8, 14, and 43 are conspicuous because of the large numbers of the Type 3e beads in association. It should also be noted that in all three instances the beads are burned.

The importance of the Type 3e bead is that its numerical and spacial distribution sets it apart from the extended burials. The predominance of this bead type in cremations suggests that it may be considered a diagnostic trait in the period when cremation of the dead was a major cultural attribute. Burial 21 is significant in that it was the only cremation found in the midden area and the Type 3a1 *Olivella* bead is the predominant form in the grave lot. There are only four other occurrences of this type. Burial 5, a semiflexed burial, about 5 ft. from Burial 21, has a single Type 3a1 *Olivella* bead found in the grave pit and most likely belongs to Burial 21. The absences of the Type 3a1 *Olivella* bead in all other cremations but two, will be one factor in considering Burial 21 as separate from the cremations found in Housepit 2.

All of the other bead types listed in Table 12 are predominantly associated with the cremation burials found in Housepit 2. Of special interest are

the bead types VIa1 and AV2b which are made from the clam *Tivela stultorum*. Both types are common to archeological sites in southern California and along the south coast (Gifford 1947: 32 and 45).

The steatite disc beads and the *Saxidomus* clamshell disc beads are both known to have been used ethnographically by the Yokuts Indians (Latta 1949: 78).

**Shell Ornaments:** The second major classification within the shell artifact category is shell ornaments. Of the 58 complete or fragmentary specimens, only one was not made from *Haliotis* sp. A small circular, edge-incised ornament lacking a perforation was made of cut and ground clamshell. This item was discovered near a sandstone concretion in association with Burial 18. Close examination in the laboratory showed that the shell specimen had traces of asphaltum on the back face. A comparison of these traces and the asphaltum adhering to the large face of an earplug found several feet north of the burial revealed that the two specimens are associated and form a complex, ornamental artifact. There is little question then that the earplug was originally part of the grave lot of Burial 18 and has somehow become disassociated with the interment.

Gifford's (1947) shell artifact classification was found to be adequate for the overall description of the *Haliotis* sp. ornaments found at 4-Mer-3. An attempt was made to use Lillard, Heizer and Fenenga's (1939) classification, but the circular ornaments were the only types not forced into their miscellaneous category. Gifford's (1947: 4) main criteria were shape, material, number and placement of perforations and the absence or presence of decoration in the form of incising or punctuation.

Seventeen of the 57 specimens are either too fragmentary to identify or are fragments resulting from the manufacture of complete ornaments. Seven of the 17 fragments have one or more cut or ground edges which reveals that they were additionally modified. But their irregular shape, small size and general unfinished appearance would not allow a classification. Three of these fragments are small sections of the *Haliotis* sp. shell. Comparing these with the finished specimens, it can readily be seen

that in the process of manufacturing the rim ornaments, residual fragments such as these would result.

There are 18 unclassifiable fragments. Seven of these are estimated to be circular ornaments. On all seven there is clear evidence of linear or crosshatched edge incising. The 11 remaining specimens were probably small rectangular ornaments.

Because of the uncertainty of identification, none of the above 18 specimens are included in the analysis below. While this is unfortunate, the classification of ornaments is felt to be more valid.

The 22 remaining ornaments make up the total of the classified types. The type numerals are from Gifford (1947).

**A2aI:** *Haliotis cracherodii* (Fig. 23h). Oval, edge linear incised, no perforation noted on single fragmentary specimen, asphaltum on callus, found in midden, 0-6 in. depth.

**AP1b:** *Haliotis* sp. (Fig. 23b-c). Two complete specimens, elongate rim sections, no incising, no perforation. One is associated with Burial 13. The other specimen is associated with Burial 48.

**AP2aII:** *Haliotis rufescens* (Fig. 23a). Elongate rim section, small perforation at narrow end, no incising. One specimen associated with Burial 13.

**J2bII:** *Haliotis cracherodii* (Fig. 22dd). Three incomplete specimens circular, ring shaped, inside edge has linear incising. All three found in midden from 18-36 in. depth.

**K2bII:** *Haliotis rufescens* (Fig. 22ee, 23d-f, i). Four complete and one fragment, circular to oval shape, single edge perforation, three specimens have linear incising on the edges. One specimen has outside edge crosshatch incising. Similar to Lillard, Heizer and Fenenga (1939) Type C1a. Fragment is associated with Housepit 11, the other three were found with Burial 28.

**P1a:** *Haliotis rufescens* (Fig. 22aa). Single specimen, triangular, one perforation near wide edge, no incising. Associated with Housepit 2 floor surface.

**Q1aIII:** *Haliotis rufescens* (Fig. 23g). Single specimen, large, slightly curved rectangular shape, single perforation in corner, ceremonially broken and placed in ashes of Burial 13.

**Q1aIV:** *Haliotis rufescens* (Fig. 22bb). Single specimen, small rectangular shape, single edge perforation. Associated with Burial 48.

**S2bI:** *Haliotis rufescens* (Not illustrated). Two specimens, small, rectangular, with concave edges incised with a linear design, single perforation near end, found in midden at depths of 6-12 in. and 12-18 in.

**Z1:** *Haliotis* sp. (Not illustrated). One specimen, small, rectangular, no perforation or incising, found in midden at 12-18 in.

**Z2aII:** *Haliotis* sp. (Fig. 22x, z). Two specimens, small, rectangular, rounded corners, single perforation near end, linear incising on concave edge. Found on floor surface of Housepit 11.

**Z2aIII:** *Haliotis* sp. (Fig. 22v-w). Two specimens, small, rectangular, rounded corners, single perforation near end, no incising. Both found on floor surface of Housepit 11.

**Miscellaneous:** *Haliotis* sp. (Not illustrated). Single specimen, very small, rectangular, no incising or perforation. This may be a bead blank, found in fill of Housepit 2 at 12-18 in.

**Discussion:** The limited number of shell ornaments that can be classified makes discussion of the significance of any one type almost meaningless. Single occurrences are the rule. Only three burials had ornaments in association. The four *Haliotis rufescens* Type K2bII (Fig. 22ee, 23d-f, i) found with Burial 28 are the only homogeneous grave lot. The circular, single perforation on the edge, and edge-incised type is a common occurrence with extended burials at 4-Mer-14 (Riddell and Olsen 1965). However, the elongate ornaments from Burials 13 and 48 and Housepit 11 from 4-Mer-3 have no counterpart at 4-Mer-14. Riddell and Olsen suggest that 4-Mer-14 is a single phase site coeval with the Late period, Phase I of central California. If this is accepted then there is evidence of cultural stratification at 4-Mer-3. This follows from the similarity of the extended burial

components at both sites which is overlaid at 4-Mer-3 by the later cremation and housepit component.

**Freshwater Mussel Shell Artifacts:** The freshwater mussel which was widely used as a food source by the California Indians has a shell that is not conducive to the manufacture of tools or ornaments. However, seven specimens of the shell found at 4-Mer-3 show modification.

Of the seven items catalogued, only one is complete enough to safely state what its function was. The specimen was made of *Gonidea angulata*. A small portion of the outside edge is missing, but along the remaining edge and on the hinge region, it is ground smooth. The striations resulting from the grinding are parallel to the edges and are probably caused by use. This specimen has been referred to as a "spoon". There is one other specimen of *Gonidea angulata* that is also tentatively identified as a "spoon". Only a fragment of the edge was recovered which exhibits the same grinding pattern as on the above specimen.

Five specimens, four fragments of *Anodonta* sp. and one fragment of *Gonidea angulata* are here identified as "saws". All five items are small fragments of the valve's outer edge that are cut or ground so as to produce a serrated edge. Whether these items were actually used as "saws" cannot be proven. There are no wear patterns on the serrations. It is possible that the serrations are actually of a decorative nature.

## HUMAN REMAINS

There were 54<sup>1</sup> human burials located at 4-Mer-3. Seventeen were recovered from the midden area, 33 were located within the limits of Housepit 2 and one burial each was found in Housepits 3, 4b, 10 and 11.

All of the bone material was in extremely poor condition with the primary inhumations being broken and poorly preserved. The high pH condition in the midden would account for most of the deterioration of the unburned bone, but rodent activity was also a major factor. Rodent burrows were noted in grave pits and beneath the rock cairns, and many of the long bone fragments show evidence of rodent teeth marks on them.

<sup>1</sup> The burial numbers 34 and 50 were assigned to material later identified as non-human mammal bone and will not be considered here.

Caution was used in determining if some of the scattered human bone fragments were actually discrete interments. The disturbance of the midden by rodents and pothunters, however, made it difficult to distinguish between an undisturbed burial in poor condition and the randomly-located bone fragments. This was especially true in the upper levels of the midden. Fortunately, most of the burials in the midden area had cairns above them, and the absence of these, plus the lack of a grave pit, usually was sufficient evidence to allow a decision on whether the fragments were intentional burials or not.

**Burial Practices:** There were at least two ways in which the dead were interred at 4-Mer-3; primary inhumation or secondary cremation and interment (see Table 15 for position of burials). In primary inhumation the body was placed in the grave pit in one of three positions. The extended burials were placed on their back with arms folded across the lower abdomen and the hands placed over the innominate. The tightly flexed burials were placed in a fetal position with the knees drawn up next to the chest. The four semiflexed burials were positioned by laying the body on the left side with the shoulders turned to the right. The arms were folded across the chest and the legs were slightly bent forward at the hips. The lower legs were bent backward at the knees to about a 90° angle to the femur.

The cremated inhumations were secondary cremations. That is, the body was burned elsewhere and the ashes were gathered and deposited in small grave pits. There is no evidence of where the initial cremation took place, but was probably off the site somewhere. Post interment burning was noted in four burials, and amounted to a handful of twigs burned in the small grave pit.

The distribution of the several types of interments is significant in that there is a definite correlation between the cremations and Housepit 2 on the one hand, and the primary burials within the midden area and smaller structures on the other.

The nine extended burials, all from the midden area (Fig. 3), had been placed in separate elongated grave pits excavated into the caliche subsoil. Of the three semiflexed burials in the midden, only one (Burial 5) had a grave pit (oval in outline) extending into the subsoil. It was dug through the grave pit of Burial 4. The single tightly flexed burial (Burial 20)

found in Housepit 10 is difficult to categorize because of several unique characteristics. Its position, condition of bone, and context do not permit the interment to be aligned with the semiflexed burials. There is no similarity between Burial 20 and the semiflexed burial found in Housepit 3. The lack of any artifactual associations with Burial 20 is also a factor in the difficulty of placement.

The nine extended burials are representative of the oldest occupation at the site. Evidence supporting their relative chronological placement is indicated by their stratigraphic position in the site. As previously mentioned, an extended burial had been disturbed by the subsequent interment of a semiflexed burial. Burial 2 (extended) had a well-defined grave pit that was beneath the floor surface called Housepit 1. The outlines of the grave pit, seen in profile, were noted from the caliche up to, but not through the floor. The similarity of convex metates found in association with both the extended burials and Housepit 1 suggests some contemporaneity. The extended burials were not associated with any of the surface structures.

The *Olivella* bead types associated with the extended burials form similar grave lots. They are comparable to the beads associated with the Central Valley Late period Phase I sequence; i.e., the Oval, 2a1, small Spire-topped or 1a, and 3b2 types. The *Haliotis* ornaments found with Burial 28 (extended) are also similar to the types associated with the Phase I period (Riddell and Olsen 1965). The beveled-rim shaped bowl mortars are also singularly associated with the extended burials. One of these bowls each was placed directly over the skulls of Burial 25 and Burial 26. Other bowls and fragments of bowls of this type were located in the cairns of the other extended burials. They are considered to be diagnostic of the earliest period at 4-Mer-3.

Burial 39 is of special interest because of its location and exceptional grave lot of *Olivella* Type 2a1 beads. The burial was located in Unit 70N-95E, which is in the south-central area of Housepit 2. The bone was found 7 in. below the floor surface and in a shallow depression in the yellow caliche subsoil. The burial was extremely fragmentary but enough of the bone material survived to identify that it was not a cremation. Burial position was not identifiable but the 44 *Olivella* Type 2a1 beads suggest that the grave lot was contemporary to the extended burials in the

midden area. No other burials in Housepit 2 had Type 2a1 beads in association. This evidence suggests that Housepit 2 was constructed after the period represented by the extended burials.

The semiflexed and tightly flexed burials are difficult to place chronologically. The three semiflexed burials found in the midden have accompanying grave lots of beads and artifacts which suggest an earlier period than the cremations, but are not similar to the extended burials' grave lots. Burial 55 was a semiflexed burial which was interred through the floor of Housepit 3. There is no evidence that the house floor around the grave pit was subsequently used. This evidence, then, demonstrates an association between the semiflexed burials and Housepit 3. Because of the distribution, location, and kind of grave lots associated with the semiflexed burials, they are here considered to represent a transitional period between the extended burials and the cremations in Housepit 2. Because the cremations in Housepit 2 are fully non-historic and are related to the Central Valley Late period Phase II, the semiflexed burials should be placed, chronologically, near the early part of Phase II.

The 30 cremations found within Housepit 2 represent one of the latest occupations of 4-Mer-3. No historic material of any kind was found anywhere at 4-Mer-3. This is contrary to the information given by R. L. Millikan (Personal communication 1964) that a small group of Indians reoccupied the site after their release from the coastal missions in 1836. The site was abandoned by that time (Latta 1949: 16) and this investigation found no evidences of any historic occupation.

The cremations in Housepit 2 are fully contemporaneous with the occupation of the structure. The grave pits of 21 of the cremations are intrusive through the floor surface. However, there are eight cremations which were found directly on the floor and probably result from digging the grave pit after some house fill had accumulated within the depression. In at least three cases the bundle of cremated bone had been placed in abandoned post holes. The burned bone and artifacts of Burial 14 occupies only the upper 5 to 7 in. of the midden fill of the hole. Below this the material was similar to the fill of the other post holes. The post hole itself (Feature 4) was excavated into the underlying caliche 14 in. and was found to have a diameter of 10 in.

At least three cremated burials were located in and under the south wall of Housepit 2. Burial 48 was found 4 in. below the floor directly under a disturbed area of the polished floor surface. Burials 12 and 18 were located just above the floor surface 2 and 3 ft. east of Burial 48. Above all three interments were fragments of the mud plaster wall that had fallen from the wall face. This configuration suggests that the burials were placed in their final position while the house still stood and sometime after the house had been abandoned the wall had partially collapsed over them.

Burial 41 was located adjacent to a large post hole in Unit 55N-95E. This interment is unique in that the body was an infant and it was not cremated. This is the only interment directly associated with Housepit 2 that was not cremated. The bones of the infant were placed near the southwest side of the post hole and about 4 in. below the surface in a small, shallow excavation. (The post was probably standing when the interment occurred because the shape of the grave pit conforms to the general shape of the post hole.) Burial 51 was found in a similar situation in Housepit 11. This burial was also an infant (primary interment) and was buried next to the southeast post hole (Post Hole 3) in Housepit 11. Here, also, the grave pit was adjacent to the edge of the post hole and slightly below the polished mud floor surface.

The only cremation located outside the limits of Housepit 2 was Burial 21. This cremation was found in Unit 65N-50W at a depth of 24 in. The area covered by the ash and burned bone of the interment was much larger than the usual grave-size within the housepit. The size of the grave pit was 27 by 30 in. The largest grave pit found in Housepit 2 was only 18 in. in diameter. The burial components of Burial 21 are different from the other cremations, also. Although the *Olivella* Type 3a1 bead was associated with other cremations, there was no grave lot of Type 3a1 beads comparable to the 178 burnt beads associated with Burial 21.

The cultural period represented by the grave lots of the 30 cremations in Housepit 2 is the latest at 4-Mer-3 and is directly comparable, by artifact types, to the Central Valley Late period Phase II. The more diagnostic bead types associated with the burials and the chronological period represented by Phase II are *Olivella* Types 3a1, 3e, the *Saxidomus* clamshell disc

beads, the *Tivella* clamshell disc and tube beads, and the steatite disc beads. Other diagnostic artifacts include the steatite pipe, bone awls and whistles and the four separate basket specimens similar to ethnographic Yokuts basketry (Lawrence Dawson personal communication 1966).

**Canine Burial:** A single burial identified as a large canine was found on the north rim of Housepit 11. The burial consisted of a skull, mandible and forelimbs of a dog or large coyote. The exact genus and species has not been determined. The burial was covered with a large andesite cobble and formed a cairn. There were no other associated artifacts or features. The burial was intentional but the exact relationship to Housepit 11 is not known.

### STRUCTURES

There was a minimum of 12 structures at 4-Mer-3, ten of which could be identified from surface indications. The surface evidence for nine of them consisted of shallow circular depressions with rims rising a few inches to several feet above the surrounding surface. The tenth consisted of seven large sandstone boulders placed in a semicircle on the south side of the outcrop containing the petroglyph on the west side of the site (Fig. 2). The two remaining structural indications were floor surfaces found in the midden during excavation.

During the three seasons spent at 4-Mer-3, seven of the 12 structural features were completely or partially excavated and two were tested. Housepits 5 and 9 and the stone circle were not investigated due to time limitations. Housepits 10 and 11 were completely exposed and Housepit 2 was more than three-quarters excavated. Housepit 3 was more than two-thirds exposed and Housepits 4a and 4b were less than one-half exposed. Housepits 7 and 8 were tested with 5 by 5 ft. units which defined the depth and consistency of their respective floor surfaces. The fragmentary surface called Housepit 1 was exposed but it is not known just how much of the original structure is represented.

The procedures used to excavate the structures were varied. As each structure was thought of as a separate unit or feature, the configuration and limits of the structures dictated their excavation. Therefore, it was not necessary to conform to the arbitrary grid system established over the site or to excavate the fill

with arbitrary 6 in. vertical controls. The structures were, however, tied into the grid system after excavation to relate them to other features in the site. Features and burials within the structures were plotted in relation to the total site.

The large size of Housepit 2 required a major effort even to complete a portion of the structure. Because of the distances involved in plotting features, artifacts and burials (it was more than 90 ft. from one outside edge to the other), the 5 by 5 ft. grid system was continued over the area and each unit was excavated separately. Vertical control was made to conform to the surface contours within the rim of the structure. Instead of establishing an arbitrary elevation plane above the units, the natural surface strata were followed. The 6 in. levels were made to follow the slope of the surface down as the unit was excavated. The elevation of each corner of the units was recorded so that data on volume and the fill constituents could be compiled.

The east half of Housepit 2 was excavated with the above controls. The excavated material was processed by use of the slide screen and washing technique (Fig. 13d). This procedure provided optimum conditions for investigation of the fill material, its constituents, how it built up over the floor and the strata within the fill. The southwest quarter of Housepit 2 was removed without screening or washing to expose that section of the floor surface. It was felt that sufficient information had been gathered on the fill material to warrant relaxation of the controls in the effort to expose as much of the floor as possible in the time available.

Two strata trenches were excavated across Housepit 2 in north-south and east-west directions. These 5 ft.-wide trenches were excavated well into the underlying caliche and past the outside limits of the structure (Fig. 5). Detailed profiles on the west wall of Trench A and the north wall of Trench B were drawn to a scale of one-quarter actual size. These have yielded a considerable amount of information on the construction of the structure.

The manner of excavation used to expose Housepits 3, 4a, 4b, 10 and 11 was a departure from the usual method used in California, although not so in other areas. The majority of the house fill of the structures was removed by backhoe with a half-yard bucket. Before the machine was brought onto the



site, each of the above five structures was tested using the normal tightly controlled excavation techniques. Housepits 10 and 11 were about half exposed, and Housepits 3 and 4b were tested with a single 5 by 5 ft. unit. Housepit 4a was tested by two 5 ft.-wide trenches excavated across the structure in north-south and east-west orientation.

It was felt that information gained by the exposure of the structures and their floor surfaces would outweigh data obtained from the fill by the normal controlled excavations. Therefore, it became a question of how to remove the fill in some controlled yet expeditious manner. The backhoe fulfilled this requirement very well. The author and one other crew member operated the machine (Fig. 13a). The hydraulic controls of the machine proved to be so sensitive that the digging could be controlled to about a 3-in. tolerance. Preliminary hand testing delimited the floor surfaces and the backhoe removed the fill to within 6 in. of this level. The remaining fill was removed by shovel and trowel to expose the floor surfaces without damage. When features were encountered, the backhoe was stopped or moved to another area so that the feature could be exposed carefully by the usual hand methods.

In the following section, details of the construction and attributes of each structure are described in as much detail as the data will allow. A more or less standardized list is provided in each description to accommodate comparisons. However, each structure was unique in its size and construction. All structural remains, whether investigated or not, are included.

**Housepit 1:** The floor surface identified as Housepit 1 was located in the midden area in the southwest quadrant of the site. There was no ground surface indication of any kind, and the floor surface was encountered at about 30 in. below the surface. The floor was identified in three units: 35N-45W, 35N-50W and 35N-55W.

The floor surface was constructed directly upon the yellow caliche subsoil. Extensive disturbance by later rodent and human excavation (both prehistoric and modern) has destroyed most of the structural details of the surface. The remnants of this feature measure approximately 12 by 7 ft. The surface was almost flat, though a slight curvature put

the center of the floor about 2 in. below the rim. There were no post holes identified and the outer limits of the surface were not completely defined. The profiles taken in the area show no meaningful strata above the structure and there is no way to separate what would have been accumulation upon the house floor from the general midden.

**Housepit 2:** The surface depression designated as Housepit 2 is the largest and most important artifact encountered in the Los Banos Creek project. The depression was located in the east-central part of 4-Mer-3 (Fig. 2). Its size and depth denoted a tremendous feature beneath the surface. The dimensions of the depression before excavation revealed that it was one of the largest structures known or reported for California.

The depression created by the collapse and filling in of the structure left a distinct high mound or rim around the feature. From the highest point on this rim, which was on the west edge, to the lowest point in the inside center surface, there was a 6 ft. difference in elevation. The eastern edge of the rim was about 8 in. lower than the western edge. The distance across the depression in a north-south direction from the highest point on either edge was 69 ft. The distance measured from similar points in an east-west direction was 67 ft. (Fig. 14a).

The rim was completely above the surrounding ground surface. The ground in the area of Housepit 2 sloped down toward the east to the bluff above the creek bottom. The slope of the ground surface explains the higher rim elevation on the west side than on the east side. Although the east rim was 8 in. lower than the west rim, the east rim was higher above the original ground level. That is, more material was needed to produce an eastern rim equally as high as the western rim. Therefore, the height of the west rim above the outside ground surface was 3 ft. where the east rim was 5-1/2 ft. above the outside ground surface. The distance from the outside toe of the north rim across to the outside toe of the south rim was 93 ft. The distance between similar points in an east-west direction was 84 ft.

The two small rectangular depressions located on the west and south sides of Housepit 2 are considered to be borrow areas for the midden material needed to construct the high rim around the

structure. Test units in these areas showed that the midden was only 12 to 18 in. deep, and the other areas in this vicinity were 24 to 30 in. deep (Fig. 2).

The very size and importance of Housepit 2 directed the major effort needed to excavate the remains of the structure. Approximately one-half of the total time spent in the field was devoted to the excavation of Housepit 2. There were one hundred and seventy-five 5 by 5 ft. units excavated to an average depth of 18 in. within the limits of the structure, plus the cross trenches. More than three-quarters of the structure was exposed to the floor surface. Only part of the northwest quadrant and sections of the outside rim areas were not exposed (Fig. 2 and 14a). Trench C, in the rim area on the southwest edge of Housepit 2, was excavated to a depth of 9 ft. by the backhoe. This was done to enable the stratigraphy of the rim to be exposed and recorded.

The material which had partially filled the depression after abandonment of the structure was more or less homogeneous. That is, the material was similar in color, consistency and general texture throughout. This material was, in fact, similar to the rest of the midden in all but a few ways. The most obvious difference noted was that when excavating within the structure, the fill material was much harder and more compact than the surrounding areas. In conjunction with this hardness, at least four cleavage planes were discovered in stratigraphic sequence in the fill. These cleavage planes, varying in thickness from 2 to 3 in., were caused by water collecting in the depression and compacting and cracking the fill material upon drying.

No other kinds of strata were noted in the fill material. It is, therefore, assumed that when the defined floor surface was finally abandoned, no more living activities occurred in the depression. The depth of the overburden on the floor averaged 10 to 12 in. in the center of the structure. How this much material came to be deposited there is not exactly known. Certainly the possibility of an earth-covered roof would account for some of the material. Other actions might deposit material in a natural catch basin such as the house depression. Wind, water and erosion down from the mounded rim areas would also account for some material. This last point may be the cause of the deeper fill closest to the wall areas where the material was as much as 24 in. thick.

As has been stated, more than three-quarters of the floor surface of Housepit 2 was exposed. The northeast, southeast and southwest quadrants were excavated. The oval shape of the structure and the placement of the cross trenches forced the northwest quadrant to be much smaller than the other three. The area covered by this quadrant, and therefore not excavated, amounted to about 325 sq. ft. The floor area exposed covered approximately 1,650 sq. ft. The distance between the northernmost point of the floor, inside the wall, and the southernmost point was 63 ft. The average height of the edges of the floor above the center of the floor was 14 in. This made the overall shape of the floor a very shallow, saucer-shaped depression.

The condition of the exposed floor varied. An area about 12 to 15 ft. wide around the structure, next to the wall, was in excellent condition. The floor was well defined and the upper surface of the mud floor had a hard polished texture. The area near the center was less well defined. Most of this area rested directly on the yellow caliche subsoil. In the center and towards the western side of the structure, some aboriginal excavation into the caliche must have occurred. The combination of the proximity of the caliche and the hard-packed floor served as an impervious layer, and moisture would tend to accumulate. Therefore, the water collected in the depression, seeped to the center and settled there. During excavation in this area in late August, moisture was still encountered while the rest of the fill was very dry. The water that thus stood in the center of the structure destroyed the polished surface of the floor and cracked the surface into an almost indistinguishable mass. Fortunately, a thin layer of ash and charcoal about 1/8 to 1/4 in. thick lay just above the floor and this interface was followed throughout the central area.

The floor surface itself was exceedingly thin in places. In some areas the polished surface was less than 1/2 to 1/4 in. thick. In the outside edge areas, where the floor was well preserved, thin layers of plastered mud were noted. These sections were usually small and probably represent patching of the floor by applying new material over a hole, crack, or pit.

A unique feature within Housepit 2 was the wall constructed completely around the oval structure. It was made of plastered mud with a

vertical face on the inside that began immediately at the edge of the floor. The outside face of the wall tapered downward and outward at about a 15° angle. This outer section of the wall was made by successive layers of mud being applied, one over the other, in staggered intervals. Thus, each layer, 6 to 8 in. thick, formed a solid mass of material which was needed to help support the weight of the roof. The height of the vertical face of the wall on the inside varied. On the south side it was 26 in., the east side was 17 in., the north side was 20 in. and the west side only 14 in. These measurements are from the highest point on the floor edge to the high point and the first layer of mud. In most areas the floor surface just next to the wall sloped up sharply in nearly a 45° angle. Therefore, on the average, the distance between the floor, a few feet out from the wall, and the top of the wall was almost 2 ft. This distance may have been more if the roof had any angle to its slope.

The vertical face of the wall was not smooth, nor otherwise prepared. The top and back slope of the wall was investigated thoroughly for post holes or impressions. Nothing of this sort was noted.

A total of 43 post impressions, in the form of circular holes, were located and identified within the excavated portion inside the walls of Housepit 2. The diameter and depth of these holes varied from 7 by 20 in. wide to 12 by 32 in. deep. An estimation of the number of post holes that might be found beneath the unexcavated portion of the floor, based on the number found in the exposed areas, would be from 8 to 10. This estimate would bring the total up to approximately 50 to 55 posts. However, this is only an estimate and will not be considered in the description of the structure.

The 43 post holes are arranged in no distinct pattern as observed in the smaller dwellings. A suggestion of a pattern might be warranted if several blank areas to that pattern are accepted. There was a tendency for a ring of small post holes (all less than 16 in. in diameter) around the outer edges of the floor. This ring would be about 4 ft. in from the wall with the posts being about 7 ft. apart. There are two blank spaces in this suggested pattern. In the southeast corner about half-way between the southern and eastern extensions of Trenches A and B there should be a post if the pattern is correct. Another area where a post hole is missing is just north

of the eastern extension of Trench B. There was a shallow pit encountered at both locations but these pits could not have contained posts similar to the ones suggested by the other post holes in the rest of the pattern.

The seemingly randomly-placed large post holes scattered about the center of the structure near the fire area also suggest a pattern. All five of these post holes are very large compared to the rest. They average 18 in. in diameter and are about 30 in. deep. The pattern here is not necessarily a multi-post situation, but probably a single center post which had been moved or replaced several times in the life-span of the structure. The area of these large posts was at the apex of the oval structure and much of the weight of the roof would rest upon the center pole.

The area between the center post and the ring of posts near the wall does not contain enough evidence to make even a suggestion of a pattern. There are post holes in this area but they are so randomly-scattered that no alignment, either circular or radiating, can be seen. Certainly, the roof must have been supported in this stretch of 22 or 25 ft., but the present evidence does not suggest how. One purely subjective guess would be that posts were placed in a ring or square pattern in this region, but some of the posts might have been placed in holes while others were simply wedged between the floor and the rafters.

There were at least three areas that showed evidence of the structure being repaired or renovated while still in use. The multiple center post holes were one such instance. Three of these post holes were completely sealed-off by the application of mud plaster in an attempt to repair the floor. These post holes were found when the floor and material 6 in. beneath it were removed to look for just such evidence. Several of the peripheral and scattered medial post holes were found in this manner also. The third instance suggesting repair is seen in Fig. 16f. This peripheral post hole is 3 ft. 10 in. from the wall and measures 13 in. in diameter and was 16 in. deep. The lip area of the hole is damaged, but the two smaller depressions (placed an equal distance toward the wall from the post hole) are slanted down and away from the vertical axis of the main post hole. These two impressions are probably the result of two short posts or timbers being braced into the floor and

thus supporting the main post as it leaned, or otherwise threatened to drop its support of the roof.

The centrally located fire hearth area was not well defined. There was no pit or encircling stones to delimit the feature. The floor surface in this vicinity was burned to a reddish color. The proximity of the fire hearth to the center post holes may have a correlation to the number of post holes. It is possible that one or more of the posts were burned by the fire and for that reason had to be replaced.

There were two rock features located in Housepit 2 (Fig. 17a, c). Feature 24 was a large inverted sandstone metate found 7 in. below the floor surface in Unit 60N-100E which is located in the central portion of the southwest quadrant. Its actual relationship to Housepit 2 is doubtful because of its depth below the surface. The metate was lying directly on the caliche subsoil. Feature 26 was a rock cairn containing 14 thermal-fractured stones lying just above the floor surface in Unit 85N-100E. This was the cairn placed over Burial 33 which was resting directly on but not through the floor. This is good evidence of the interment of burials in the structure after some amount of fill had accumulated after abandonment. This point is further discussed in the Human Remains section (*infra*).

Feature 25 consisted of impressions of long reeds or sticks pressed into the floor in Unit 65N-110E (Fig. 17c). The floor surface in this area was in good condition and the surface had a hard polish to it. The 30 distinct impressions were sunk into the floor 1/8 to 1/4 in. and varied in length from 2 in. to as much as 14 in. The interpretation of this feature is difficult but a suggestion of it being the impression of a bed or sitting place seems reasonable.

On the west side of Housepit 2, beginning just west of the wall and extending outward toward the toe of the rim mound, a well-defined mud plastered surface was located (Fig. 5). This surface was 11 ft. long and 3 ft. 5 in. across at its widest part, and was 5 ft. below the highest point on the rim. The cross section of the surface would show it to have a concave profile with the edges 4 to 5 in. above the depressed center. The entire surface sloped down toward the toe of the rim at about an angle of 6°. The vertical wall of the house was in place and in good repair. This surface was followed up to and under the wall. It connected with the upper edge of

the floor surface at the point where the vertical wall face also connected with the floor edge. The floor sloped up from the center of the structure at a 7° angle and did not curve up sharply near the wall as in other areas near the wall. Therefore, the floor surface made a 7 percent slope up to the edge of the structure then down a 6 percent slope on the other side of the wall toward the outside of the structure.

It is suggested that the concave, sloping surface was an entryway and that it probably was a covered tunnel or crawlway. The presence of the wall across this surface is enigmatic but it may have been constructed at a later period to close off the tunnel entry.

There was no feature on the floor surface similar to what was found in Housepits 3, 10 and 11. That is, the hardened, packed area suggesting a roof opening or roof entryway. However, the poor condition of the floor in the center of Housepit 2 may have resulted in this apparent lack.

**Housepit 3:** Housepit 3 was a large shallow depression in the south-central part of 4-Mer-3 (Fig. 14b). The depression was defined by a slightly raised rim around the oval surface feature. The surface depression measured 42 ft. in an east-west direction and 40 ft. in a north-south direction. The depression was 19 in. deep from the highest point on the rim.

The depression was tested initially by the excavation of Unit 55S-20E. The floor surface was encountered at the 14 in. level whereupon the backhoe was used to excavate and expose about two-thirds of the structure. The fill material of the test unit and the midden around the features was screened through 1/8 in. mesh screen. The remainder of the fill was not screened.

The house fill above the floor ranged in depth from 14 in. toward the center, to 8 to 10 in. near the rim. There were no discernable strata within the fill material other than a cleavage line produced at the lower level of the grass roots. The fill was similar to the general midden surrounding the structure. No fire or ash concentrations were noted within the fill, nor were there any rock concentrations encountered.

The floor surface exposed in this structure was an oval, hard-packed, shallow saucer-shaped surface. The surface measured 38.5 ft. in a

southwest-northeast direction and more than 28.7 ft. in a northwest-southeast direction. The center area of the floor surface was only 7 in. below the rim.

There were eight post impressions located within the limits of the floor surface, seven of which made a discernable pattern. There was one large center pole and six peripheral posts located about half-way between the center pole and the outside limits of the structure. There were probably seven peripheral posts to fill-out the pattern suggested by the known post holes. The area where a seventh post would have been located was thoroughly searched as far as the surface was exposed, but no indication of a post was noted. A single auxiliary post impression (Post Hole 8, Fig. 6) was found only 18 in. from the west edge of the surface.

The average distance between center points of the peripheral post holes is 8.3 ft. with a range of 6.5 to 10.0 ft. The average distance between center points on the center post hole and the six peripheral post holes is 11.6 ft. with a range of 8.5 to 13.5 ft. It is significant to note that the three post holes on the southwest side are all 8.5 ft. from the center post while the opposing post holes are 10.5, 11.5 and 13.5 ft., respectively. This patterning would make the configuration of the roof line slightly off-balance. The west side of the roof would have a shallower slope than the east side. The center post was placed off-center of the exposed surface. The distance from the center post hole to the western edge of the surface is 28.3 ft. where the distance to the eastern edge is only 15.5 ft. The positioning of the posts in the above manner would tend to have made the superstructure oval or egg-shaped. This configuration becomes important when the floor surfaces between Post Holes 6 and 7 are examined. There is a section of the floor surface (about 50 sq. ft. in area) that was markedly different from the rest of the surface. In this region the floor surface was extremely hard and compacted. This surface was more than 4 in. thick as compared to the 1/2 to 1 in. thickness of the rest of the floor. The consistency was harder, had a larger grain size, and was light gray to white in color. Housepits 10 and 11 have this trait, also.

About 2.5 ft. to the west of this area, and still between the sixth and seventh post holes, a rectangular depression in the floor was noted. This feature (Fig. 13b) was smooth and surfaced as was

the floor surface, but was depressed 3 in. below the upward sloping floor. The hardened and compacted area may have been caused by an opening in the roof of the structure permitting rain or moisture to further compact the area. It is postulated that above this area there was a roof entryway.

The theory above is supported by the following evidence. The superstructure of the dwelling had an unbalanced roof line as seen by the placement of the post holes. The roof line on the west side was not as steep as on the east side. The position of the compacted floor surface between the sixth and seventh post holes in a line between the center post and the rectangular depressed area corresponds to the more sloping sides of the roof line. The compactness and larger grain size of the floor area suggests that it was subject to more moisture than the surrounding floor surface. An entryway above this area would permit rain to enter the house at this spot. The placement of the auxiliary Post Hole 8 may be connected to this configuration of features but it is not certain how.

There was no suggestion of a ground level entryway found on the edges of the exposed floor surface or in the configuration of the ground surface rim. The edges of the floor surface were plainly marked and there was no evidence of a mud wall as was found in Housepit 2.

There were two distinct fire areas represented by burned floor surfaces. There was no pit dug or rocks piled up to contain the ashes. The position of these two areas, as seen in Fig. 6, is opposite the entryway region and close to the center post.

A single burial was associated with Housepit 3. Burial 55 was a semiflexed, primary interment placed in a grave pit dug through the floor surface (Fig. 14b and 21e). The grave pit was located in the northeast edge of the floor surface, and was dug through the floor proper into the underlying caliche to a depth of 15 in. The edges of the grave pit exhibit the floor surface curving down into the pit 1 to 2 in. The floor surface was intact when the grave was dug, but no floor plaster was placed over it to seal the burial. The conformity of the midden fill, in and above the grave pit, suggests that the burial was interred at, or shortly after, the time of the final abandonment of the dwelling and before the collapse and filling of the

depression

**Housepit 4a:** Housepit 4 was originally thought to be a single structure located in the center of the site. However, after some excavation on the east side of the depression, a floor surface was found underlying the living surface associated with the surface depression. This lower surface has been given the designation of Housepit 4b and will be described later. The surface indications of the structure consisted of a large depression 53 ft. in diameter, and about 35 in. deep from the highest point on the rim.

The partial excavation of the depression was made in the form of two crossing trenches. Each trench was excavated as part of the site grid system. That is, the trenches were made up of 5 by 5 ft. units laid out in north-south and east-west directions. Fourteen units, or a linear distance of 70 ft., were excavated in the east-west trench along the 125N baseline. The units were excavated to the living surface and the trench overlapped the rim of the depression about 7 ft. on each side. The north-south trench consisted of seven 5 by 5 ft. units extending from the edge of the access road on the north to about 3 ft. beyond the south rim. The unit forming the junction of the two trenches was 125N-0W.

The living surface encountered in Housepit 4a was poorly defined. The dampness of the soil at the time of exposure created many problems in the identification. The only positive information gained on the configuration of the floor was that it was a saucer-shaped surface. There was no evidence of a wall around the structure and no rock features or strata were encountered. The floor surface sloped up to within 8 in. of the ground surface just inside the mounded rim. There were no indications of post hole impressions, fire hearths or other features. There were no burials associated with the structure. There is insufficient information on the structural details to make any statements of how the structure was built. Suffice to say, the structure was semisubterranean, circular, covered (at least around the lower sides of the building) and probably similar to Housepit 3 and 10.

**Housepit 4b:** Housepit 4b was located below the eastern rim of Housepit 4a. The lower surface was at least 14 in. beneath the floor surface of Housepit 4a. There was no indication of the lower floor from the surface and it was encountered in Unit 125N-5E

when that unit was selected to be excavated down through the floor surface of 4a in an attempt to reveal the floor and rim construction of that structure. The lower floor was exposed in the unit at a depth of 30 in. beneath the ground surface.

The rest of the floor surface of 4b was exposed with the use of the backhoe. The importance of the juxtaposition of 4b and the amount of fill material to be removed made a rapid exposure necessary.

About three-quarters of the existing floor surface of 4b was exposed. The outside limits of the north and southeast edges were well defined. The original limits of the western edges of 4b were destroyed by the construction of the floor surface 4a. The remnant exposed was basically a saucer-shaped, oval-to-circular surface about 22 ft. in diameter. The depth of the surface was 12 in. from the highest point on the edge to the center. Only one positively identified post hole was found and it was placed near the existing center of the surface. This would make the hole 3 to 4 ft. from the original center of the structure.

The only other feature found in or on the floor surface was a fire hearth area 8 in. from the damaged west edge. A fragmentary burial was exposed on the north edge of the surface. The burial (Burial 56) was the primary interment of an adolescent. There was no rock cairn or observable grave pit associated with the burial.

**Housepit 5:** Housepit 5 was a large circular surface depression on the northern limits of the site. The depression was not excavated or tested. However, the similarity between this depression and the other excavated depression leaves little doubt as to what it was. The depression measured 39 ft. from the high points of the rim in a north-south direction and 36 ft. in an east-west direction. The maximum depth of the depression from the high point on the rim was 17 in. This was very shallow compared to the other depressions. However, a 5 by 5 ft. test unit was excavated just 25 ft. west of the depression and an 8 in. layer of gravel similar to an alluvial fan was found to overlie the unit and immediate surrounding area. This material had worked down from the steep slope to the west. The center of the depression had within it much of this eroded material. Therefore, the depression was probably much deeper in past times.

The rim of this depression was well defined and there was no break in it to suggest a ground level entryway.

**Housepit 6:** A feature was located in Unit 240N-50W that was at first thought to be a living surface covered with rock. The feature was given the designation of Housepit 6 but was later found not to be significant. As the numbering of the structures was already completed, this designation was left out of the list and does not correspond to any feature.

**Housepit 7:** A small, poorly-defined depression in the southeast corner of the site was tested by placing two 5 ft. square units on each side of the rim. At the 11 in. level in one unit and 13 in. level in the northernmost unit, a poorly-defined surface was located. The diameter of the depression was 32 ft. in a north-south direction and 31 ft. in an east-west direction. The rim was low and not well defined. The depression was only about 12 in. deep.

The living surface was disturbed by rodent activity but enough was present to reveal that it was made with midden plaster as in the other structures. No post holes were found and no other structural details were noted.

**Housepit 8:** A shallow depression 22 ft. in diameter was noted in the southeast corner of the site. The depression was not excavated. It was very poorly defined; the depth was only about 12 in. and the rim showed no evidence of an entryway or other feature.

**Housepit 9:** This depression was a small, well-defined, circular feature in the extreme northeast corner of the site. It was not excavated or tested because the limits of a gravel barrow area for the dam construction included it and the depression was destroyed before any excavation could be done.

The diameter of the depression was 21 ft. in a north-south direction and 19 ft. in an east-west direction. It was the smallest such feature noted on the site, although several housepits on sites near 4-Mer-3 were smaller.

The ground surface of this depression was located on a steep slope. The part of the rim toward the east and the creek was built up about 3 ft. and

the west edge of the depression was obviously below the surface. This similar condition was noted in Housepit 10 and excavation showed that the floor was dug into the caliche on the high side and built up on midden on the low side.

**Housepit 10:** Housepit 10 was a large, oval depression located in the extreme northeast corner of the site. The depression measured 36 ft. in an east-west direction and 33 ft. in a north-south direction. It was 34 in. deep from the highest point on the rim (Fig. 8).

This structure was almost completely exposed, with only a small section of the southern rim, about 2 ft. wide, not exposed (Fig. 15a).

Excavation disclosed an interface between two strata in the housefill. This interface, at first taken to be a living surface, formed a deep, saucer shaped depression within the ground surface depression. Beneath this interface lay the hard-packed floor surface associated with Housepit 10. The upper surface was located and easily followed near the rim of the depression. At this position the upper surface was 8 in. below the surface and 10 in. above the lower floor. The upper surface became indistinct toward the center and could not be identified in the area surrounded by the defined post holes (Fig. 8). The upper surface, or a better term, interface, was at best an ill-defined curving, cleavage plane. As the lower surface was exposed it became clear that the upper surface may have been a natural phenomenon caused by water action and was not a living surface.

The lower surface was a true floor. The exposed surface measured 31 ft. 6 in. in an east-west direction and 30 ft. in a northeast-southwest direction. The floor surface was nearly flat with the rims measuring only 6 in. above the center. The structure was built on a slight grade (about 6 percent). To make the floor surface as level as it was, the builders had to excavate into the subsoil caliche 14 in. on the west side and construct the surface 8 in. above the caliche on the east side. This, in effect, produced a low wall around the west half of the structure. There was no evidence of a correspondingly constructed wall on the east half.

The floor surface itself was constructed by carrying in and wetting down material from the

surrounding midden. The surface was rough and had a polish only around the edges. The floor was 2 to 3 in. thick with its surface slightly bumpy and rolling. Just off-center in the middle of the structure was a hearth area. There was no pit or concentration of rock to delimit the size of the fire. The floor surface was burned to hues of red, yellow and white in this area. There was little evidence of rodent activity in the floor but the fill above did show some disturbance.

There were six well-defined post holes located in the floor surface. These formed a peripheral pattern with no holes in the center of the structure. Their position was central to the surrounding edges, unlike Housepit 3. The distance between the holes ranged from 7 ft. 2 in. to 9 ft. 8 in., with an average of 8 ft. 1 in. The average size of the holes was 11 in. in diameter and 15 in. deep. The actual diameter of the posts was probably smaller than the 11 in. but probably more than 8 in.

There were two rock features associated with the floor surface in Housepit 10. Feature 29 was a concentration of nine thermal-fractured cobbles lying directly on the floor just south of Post Hole 2. None of the rocks were modified artifacts or tools and there is no evidence to suggest for what purpose they were so-placed. Feature 4 was a concentration of five rocks and artifacts in the southeast corner of the structure (Fig. 16b). Three of the stones were unmodified thermal-fractured cobbles. A fourth was a bottom fragment of a shaped sandstone bowl mortar. The fifth was a complete and extremely well-shaped pestle.

A single burial (Burial 20) was associated with Housepit 10. It was a primary interment placed in a tight-flexed position next to the west wall (Fig. 16c, 21b). The grave pit was not specifically noted but the burial rested directly on the floor surface and adjacent to the caliche wall. The burial was an adult female and lacked accompanying grave goods.

Housepit 10 shared a common feature with Housepit 3. In both structures the floor surface contained an area where the surface was much harder and more granular than the surrounding surface. In Housepit 10 this area was found northwest of the center of the structure, between Post Holes 1 and 6 and the fire hearth area (Fig. 8). As was suggested for Housepit 3, this region is thought to be caused by

moisture falling through the roof opening (smoke hole entry).

Even though the two structures have this similar trait, the rest of the structural configurations are different. Housepit 10 does not have a center pole and the opening in the roof was probably near the center of the structure, thus differing from Housepit 3.

**Housepit 11:** Housepit 11 was a small, deeply concave, circular depression measuring 31 ft. in a north-south direction and 29 ft. in an east-west direction. The depression was 38 in. deep as measured from the bottom center to the highest point on the rim.

The feature was excavated in a manner similar to the excavation of Housepit 10. That is, the southern half of the depression was excavated to the floor surface using trowel, shovel and broom. The northern half was exposed by the use of a backhoe. None of the house fill material was screened, except for a single 5 by 5 ft. unit near the center of the depression. The fill material was a homogeneous, non-stratified midden that was 18 in. deep in the center of the depression, and 6 in. deep around the floor edges. The structure was completely exposed except for a small section of the southeast corner.

The exposed floor surface was a well-defined, circular surface of hard packed midden plaster. The floor was deeply concave with the edges 12 to 14 in. above the center section. The outer edges of the floor sloped up from the center with as much as a 20 percent grade. The floor measured 26 ft. in a north-south direction and 27.5 ft. in an east-west direction. The average diameter, therefore, was about 26.75 ft. and the concavity of the floor produced steeply sloping walls around the center of the structure. The floor surface around the outer 2 ft. of the structure was just as hard and well-packed as the surface toward the center. This would suggest that the outer areas of the structure were as well-used as the central area.

There were five post impressions found in the exposed floor surface of Housepit 11. Four post holes formed a roughly square figure in the central section with the fifth post hole placed directly in the center of the other four (Fig. 15b). An ill-defined fire hearth



was located just south of the center post hole. There was no indication of a ground-level entryway. However, there was an area on the floor surface, north of the center post hole and between the two northern peripheral post holes that is very similar to the hard-packed areas found in Housepits 3 and 10. Here again, is evidence suggestive of a roof opening. The placement of the fire hearth on the opposite side away from the hard-packed area is similar to the situation found in Housepit 3. The size of the hard-packed, washed area in Housepit 11 is not well delimited but is definitely identifiable. Therefore, it is suggested that Housepit 11, like 3 and 10, had a roof entryway. This opening was on the north slope of the roof in Housepit 11 and placed somewhere between Post Holes 1 and 4 (Fig. 9).

The distance between the four peripheral post holes averaged 8.1 ft. with a range of 6 to 10 ft. The average distance of the peripheral post holes to the nearest floor edge was about 7 ft. The post holes themselves were all about 12 in. in diameter and averaged 15.7 in. deep. This indicated very substantial posts, even considering 1 to 2 in. of fill surrounding the post proper. The close-set patterning of the post holes suggests a low domed or conical roof line, and the relationship of the floor edges to the post patterns suggests a symmetrical shape unlike the offset roof line suggested for Housepit 3.

There were no rock features found within the confines of Housepit 11 but two burials were located. Burial 51 was an infant interment which had been placed in an undercut section of Post Hole 3. The small, immature bone fragments were located in a small bundle on the south side of the post hole. The only grave accompaniment was one Applique *Olivella* bead. The other interment was the skull, long bones and fragments of the spinal column of a large canine. This interment was called Burial 50. The bones were found on the northwest rim and a rock cairn of two large boulders was placed over the grave.

**Stone Circle:** A stone alignment was noted on the south side of the sandstone outcrop containing the petroglyph on the west side of the site (Fig. 2). Nine angular sandstone boulders were arranged in a semicircle with the straight south wall of the outcrop forming a base or backdrop for the feature (Fig. 12a, b). Unfortunately the feature was not excavated but

the placement of the stones was not accidental and the configuration suggests some sort of structure. The diameter of the circle is 8 ft. and the alignment extends 6.5 ft. south from the outcrop. A few chips and flakes were found on the surface near the feature.

It is not understood what relationship, if any, exists between the stone circle and the petroglyphs. Three of the cupules on the outcrop are within the limits of the circle intersecting the stone. Two of the cupules are 80 mm. in diameter and are the largest of the entire set.

**Discussion:** The burials and features associated with each of the five excavated or partially excavated structures were discussed under each house description. The burials are further discussed in the section on Human Remains of this report. Their distribution and associations are more clearly defined in that section.

The chronological placement of the several structures is closely associated with the burial types found in each housepit. The large structure, Housepit 2, is felt to be contemporary with the Central Valley Late period Phase II. This is substantiated by the cremations and their grave lots. The distribution of the cremations, in, under and above the floor surface of Housepit 2 establishes the contemporaneity of the cremations and floor surface. There is also evidence that Housepit 2 was an important ceremonial center by the presence of the cremations interred during and after its use. The very size of the structure compared to the other dwellings also supports this hypothesis.

The contemporaneity of Housepit 2 and the other structures is less well demonstrated. The burials and artifacts associated with Housepits 3, 4a, 10 and 11 are different from those found in Housepit 2. Housepit 4b can be demonstrated to be older than Housepit 4a by its superposition. However, the semiflexed burial (Burial 55) found in Housepit 3 was dissimilar to the cremations found in Housepit 2 and the tight flexed burial (Burial 20) found in Housepit 10. The similarity in surface evidence and artifact associations might suggest that Housepits 4a, 10 and 11 were contemporary with Housepit 2. Housepit 3 was less distinct from surface evidence and the semiflexed burial and the grave lot of Spire-topped *Olivella* beads could suggest that it was earlier than

Housepit 2, possibly representing the transitional period between the extended burials and the cremations. If this is accepted, then Housepits 1 and 4b were probably associated with the transitional period or the extended burial period.

The construction details of the excavated structures are difficult to establish. Each structure excavated was semisubterranean. The presence of post holes and their patterns suggest that they were covered. Just how, and with what, the structures were covered is not fully known. The amount of fill material in Housepits 2, 4a, 10 and 11 suggests that the roofs were covered with at least some thickness of earth over a supporting frame. Housepit 3 may not have been earth covered. The 6 to 8 in. of fill over the shallow, flat floor surface does not suggest any large amount of material, either earth or wood above the floor.

The tule-covered houses Latta (1949: 89-95) speaks of, do not seem to be represented at 4-Mer-3. In all cases, including Housepit 3, a heavy wooden frame supported by thick sturdy posts are indicated. All suggestions of entryways, except for Housepit 2, are secondarily indicated by hardened floor areas pointing to possible roof entryways.

### BASKETRY

Carbonized fragments of baskets or textiles were associated with four of the secondary cremation burials found in Housepit 2.

One fragment of the carbonized material was found with Burial 12. There were three fragments found with Burial 14 and eight fragments with Burial 19. Burial 52 had three fragments of the charred material in the grave fill. The one or more fragments in each burial represented only a single, complete specimen originally placed in each interment. In other words, all of the fragments represent only four complete specimens and each of the four burials were accompanied by one of the original specimens.

The 15 fragments were submitted to Lawrence E. Dawson, Lowie Museum of Anthropology, Berkeley, for identification. The following descriptions are quoted from Mr. Dawson's analysis in their entirety (L. E. Dawson, personal communication 1966).

*"Burial 12, Coiled Basket.* Small fragment including the start of a coiled basket. Work direction is from left to right. Apparently grass bundle foundation; some individual stems look much like grass when bent in a small turn. Sewing material a split root, half-round in cross section, probably sedge root. Stitch type mainly non-interlocking, but a few split on work face and some split on back face. It is common to find mixed types of stitches around the start of a basket where precise control is difficult. The start is apparently a small bound knot with a tight spiral stitched into it. No splices visible. There are about seven coils per in. and around 14 stitches per in., therefore 98 stitches per square in.

"There are traces of red hematite pigment on what was the inside of the basket.

"The type of coiled work, insofar as it is observable, is most closely comparable to that of better known Yokuts groups of the southern San Joaquin Valley. Unfortunately, there are no surviving ethnographic baskets from the Northern Valley Yokuts who presumably occupied the site in early historic times. It should be added that the features observable in this fragment definitely distinguish it from the work of several other nearby groups, namely the Plains Miwok, Santa Clara Costanoans, and the Patwin. In other words, it is affiliated with Yokuts basketry and not Miwok, Costanoan or Patwin.

*"Burial 14, Twined-woven Band.* Charred fragments of a twined-woven band made of cordage and decorated with *Olivella* disc beads (Type 3d) and three clamshell disc beads of different size.

"As a group the fragments appear to be done in plain twining technique with slant of twists ( \\\ \\\ \\\ \\\ ) down to the right. The construction is that of a flat band with parallel cordage warps and cordage weft. The cordage of both warp and weft appears much like apocynum fiber cordage of widespread use in California, and both are 2-ply. All of the weft strands are S-doubled and thinner than the warps which are both S- and Z-doubled. The weft strands

appear to be very loosely doubled, probably because twining with slant down to the right tends to unwind the twist of S-cordage. One of the fragments has a good portion of side selvage showing that weft courses were continuous from edge to edge, turning at the margins of the band, not knotted along the sides. This means that weft splices are in the body of the fabric and were probably handled on the non-showy and unbeaded side of the band. One fragment shows two *Olivella* disc beads (Type 3d) each held in place by a weft strand in a turn of the twining. Another fragment shows two similar beads strung on a thread apparently sewn through the fabric parallel to the warp. The groups of beads are in isolated rows, not solidly massed together, and do not appear to have been interspersed with feathers as in similar bands known for the Pomo. The fabric was apparently stained on both sides with red ochre.

*"Burial 19, Twined-woven Band.* Charred fragments of a twined-woven band made of cordage, decorated with *Olivella* disc beads (Type 3d).

"Like the specimen from Burial 14 in every way except not stained with red ochre. Has a fragment showing the same side selvage.

"Both of the specimens from Burials 14 and 19 are reminiscent of, but different from, the flat twined pieces shingled with rectangular *Olivella* beads known from burials of the Late Horizon time in the lower Sacramento Valley.

*"Burial 52, carbonized fragments of a 'String Basket'.* Class of technique: These fragments are comparable to a peculiar type of work known from the Tachi Yokuts\* who made meal sifting trays in what might be called a wound lattice binding weave on a spiral foundation (Balfet terminology; Balfet 1957). In this process a spiral foundation of tule stems is gradually built up, much as in coiling, and the foundation is bound of neighboring peoples. The circumstances suggest that this peculiar technique was an innovation of some western group of Yokuts at an indeterminate

time in the past and did not spread to their alien neighbors. The use of string in these baskets is paralleled only by certain coiled baskets in which string serves as the sewing strand, also principally confined to the Yokuts, but perhaps also adopted to some extent by the southern Miwok. It is difficult to say what analogous process might have been the antecedent which gave rise to such a singular innovation.

"It should be added here that neither the technique itself, nor the ethnographic Tachi Yokuts specimens have ever been reported in publication. Hence, the material is entirely new to science so far as I know."

## FEATURES

The several features described below are from the midden and burial areas. The features associated with the housepits have been described and related to each structure they were found in and are listed in that section of this report.

*Rock Features:* There were three kinds of rock features found. Eleven of the features were rock cairns placed in and above the grave pits. Two features were rock ovens or cooking areas, and six features were large concentrations of rock of an unknown function.

The rock cairns were associated with underlying burials and many contained complete or fragmentary artifacts. These artifacts are listed in the burial associations, but are also listed here to clarify their relationship to the burials.

Feature 1, Cairn for Burial 1; Unit 25N-45W, 32-42 in. deep. Nineteen stones in cairn. Measured 96 by 25 by 10 in. with most stones found within the excavated walls of the grave pit. Artifacts identified with the cairn were one sandstone metate (Fig. 40b) with a ground groove (possibly to sharpen wood points) and one pestle fragment.

Feature 2, Cairn for Burial 2 (Fig. 19e); Unit 30N-45W, 36-48 in. deep. Seventeen stones that include three large mortar fragments, four metates, one pestle and two mano fragments. The cairn

\* Tachi Yokuts meal trays in R.H. Lowie Museum of Anthropology, Nos. 1-10719, - 10720, collected in 1907 by S.A. Barrett who notes that they are called *ukuyus*, and are made of triangular tule *Scirpus campestris* and twine (commercial). He further states that "This is strictly an aboriginal form of tray. In place of twine now employed shredded tule was used in making these baskets in aboriginal times".

measured 80 by 22 by 12 in. All stones and artifacts were found inside the well-defined grave pit.

Feature 3, Cairn for Burial 4; Unit 70N-45W, 30-37 in. deep. Small cairn with twenty fist-sized cobbles and two mortar fragments, two metates, two pestles and two mano fragments. The cairn measured 48 by 36 by 8 in. and was placed above the grave pit.

Feature 4, Cairn for Burial 6; Unit 35N-40W, 11-22 in. deep. Small cairn with sixteen cobbles and one large sandstone metate. The cairn measured 39 by 26 by 13 in. and was only 9 in. above the sterile subsoil. There was no discernable grave pit and the stones covered the underlying burial completely.

Feature 5, Cairn for Burial 7; Unit 35N-40W, 20-31 in. deep. Fourteen stones were found in the cairn, eight of which are large slabs of unmodified sandstone. There were two complete mortars included in the cairn, one over the chest and one over the feet. The cairn measured 74 by 17 by 11 in. All of the stones were within the confines of the grave pit.

Feature 6, Cairn for Burial 21; Unit 65N-50W, 18-25 in. deep. Seven small cobbles and two mortar fragments were placed inside the poorly defined grave pit. The cairn measured 19 by 13 by 7 in.

Feature 7, Cairn for Burial 22; Unit 50N-50W, 18-24 in. deep. Cairn measured 48 by 29 by 6 in. and was composed of 39 small unmodified cobbles. There were no artifacts included in the cairn and the rocks were spread over the entire burial beneath.

Feature 8, Cairn for Burial 25 (Fig. 19a); Unit 60N-50W, 30-38 in. deep. Large cairn measuring 63 by 24 by 8 in. There were 25 stones in the cairn, three of which were large, unmodified sandstone slabs. Of the remainder, one is a sandstone metate, two are mortars, and one is a mortar fragment. One of the complete mortars was inverted over the skull.

Feature 9, Cairn for Burial 26; Unit 80N-50W, 24-30 in. deep. The small cairn had 32 stones, all of which were small unmodified cobbles except for four mortar fragments and one large andesite metate (Fig. 40c). The cairn measured 48 by 18 by 6 in. All of the stones were placed inside the grave pit.

Feature 10, Cairn for Burial 28; Unit 45N-55W, 30-34 in. deep. The cairn measured 86 by 24 by 5 in. and contained 21 large cobble sized stones. The only artifact included in the cairn was a pestle fragment made of red andesite.

Feature 11, Cairn for Burial 31; Unit 65N-45W, 18-24 in. deep. Small cairn that did not cover all of the burial beneath. The cairn measured 29 by 16 by 6 in. and contained 19 stones. A large mortar and one complete pestle were placed near the skull (Fig. 19e) and a metate fragment was found near the feet of the burial.

The two rock features identified as ovens or cooking areas were Feature 12 and 13. In both features there were concentrations of fire-fractured rock overlying thick ash lenses. In the dark, ashy matrix of each feature there was a high percentage of burned and broken mammal or bird bone, burned shell, and charcoal.

Feature 12 was excavated in the southern one-half of Unit 70N-50W and extended from 8 in. to 28 in. below the surface. The feature measured 26 in. in diameter and consisted of 57 small unmodified cobble size, angular rock. The ash lens was 2 in. thick and 13 in. in diameter and was immediately below the rock feature.

Feature 13 was excavated in the southeast corner of Unit 45N-50W and consisted of 37 small, unmodified angular, cobble sized rock and one mortar fragment. The feature measured 23 by 18 by 17 in. The ash lens was about 16 in. in diameter and 3 in. thick. The ash and charcoal were mainly below the rocks but much of this material was also scattered throughout the feature.

Six rock concentrations (Features 14 to 19) were made up of small fist-sized cobbles and were a mixture of stream cobbles and fire-fractured rock (Fig. 18a-c). There was no discernable pattern to the random placement and makeup of the features.

*Petroglyph:* The large outcrop of sandstone on the west side of 4-Mer-3 has been identified as a petroglyph (Fig. 2). The outcrop is about 45 ft. long and 10 ft. wide. The rock is poorly consolidated Panoche Sandstone. The outcrop is fractured into

boulder sized blocks with some of the boulders having fallen from their original position (Fig. 12b-c).

The petroglyph consists of 19 pecked cup-shaped depressions or cupules on three separate faces at different locations on the east and south side of the outcrop. The depressions range in size from two large conical holes, 15.5 cm. in diameter and 50 mm. deep, to several small depressions, 45 mm. in diameter and 20 mm. deep. The two largest depressions are on the vertical wall on the south side of the outcrop 5 ft. above the ground surface and towards the center of the stone circle. Twelve of the smaller cupules are on the upper surface of a dislodged boulder on the extreme east end of the outcrop (Fig. 12c).

There is no discernable pattern to the location of the cupules except the possible association with the stone circle. The function of these depressions is open to question. They have been called "rain rocks" or "baby rocks" by various investigators (Barrett 1952; Loeb 1926; Heizer 1953; Payen 1968). There is, at this time, no empirical data associated with this site to suggest a particular function, and assignment of the petroglyphs to a fertility or a weather control function is strictly speculative. The distribution of these features is almost statewide (Heizer and Baumhoff 1962) and are found in almost every cultural or linguistic group in California. Although reported in limited numbers they are found on both sides of the Central Valley. Besides the example at 4-Mer-3, there are also pitted boulders located at 4-Mer-S119, 4-Mer-15, and 4-Mer-S130, all in San Luis Creek canyon area seven miles north of Los Banos Creek.

*Clay-Lined Pits (Feature 20-23):* There were three complete pits and one partially destroyed pit found in the midden area (Fig. 17d-f). They are oval shaped, dug into the yellow subsoil, and are about the same size. The pits are shallow depressions averaging about 40.0 cm. long by 35.0 cm. wide by 10.0 cm. deep. The inside walls of each of the four pits are lined with a thin coating of light gray or yellowish clay about 2 mm. thick. There is no evidence of heat or fire in or about the features after they were constructed.

The contents of each pit excavated were carefully examined for seeds, grain, rocks, sand,

charcoal or any other cultural material. Feature 23 was not excavated but was seen in profile on the north side wall of Unit 35N-40W (Fig. 17e). Feature 21 was found to have about two inches of clean sand and fine gravel in the bottom of the pit (Fig. 17f). The other three pits were filled entirely of the overlying dark gray midden.

The cleanness of the clay lining and sand fill, plus the lack of any evidence of heat or burning does suggest the possibility of these features being storage pits. In this light it is noteworthy of the position of these features both horizontally and vertically. All four pits were found between 25 in. and 30 in. and at least partially excavated into the sterile subsoil. This suggests a stratigraphic relationship with the extended burials, or the period they represent.

The placement of the four pits near the floor surface called Housepit 1 may be significant. All four pits are within 20 ft. of that surface; are on the same stratigraphic level; and are probably roughly contemporary with the structure. The pits may represent storage pits just outside the structure. What was stored in the pits, or what, if any, was the superstructure of the pits like, no evidence is forthcoming.

*Ash Lens:* There were four ash lens excavated in the midden area. These were simply concentrated, circular areas of pure ash and charcoal. Whether they mark the actual placement of fires or simply ash deposited in refuse areas cannot be discerned from the features themselves. However, the midden around and beneath the ash lenses does not show evidence of heat or burning which would suggest dumping of the material.

*Bedrock Mortars:* It is significant that even with the large number of portable grinding tools such as mortars and metates at the site there are also a large number of bedrock mortar holes associated with the site. The location of the stationary implements are limited to two areas. A single hole was found on the sandstone outcrop on the southwest corner of the site.

The other location of 33 bedrock mortar pits is 200 ft. upstream from the site on the north side of the creek (Fig. 12d). The outcrop the holes are in is a series of elongate-shaped sections of poorly

consolidated shale. The outcrop is just at the edge of the creek and was under water in times of flood or high water in the stream channel.

Figure 10 is a diagrammatic sketch of the outcrop and the position of the mortar pits. The tendencies shown for the holes to be set in lines parallel to the long axis of the outcrop shows the placement of many of the mortar pits between the bedded planes of the rock. In other words, the pits were made where resistance was minimal.

## SUMMARY AND CONCLUSIONS

The excavations at the Menjoulet site have provided a variety of data pertaining to the prehistory of the Los Banos Creek area. Analyses of these data reveal that there were two distinct cultural components in stratigraphic sequence in the deposit at 4-Mer-3. The earliest of the components is best represented by extended, primary burials and their associated grave goods. The predominant burial practice during this period was a supine extended interment, but with a semiflexure as a variant. The more diagnostic artifacts of this period are the beveled-rim mortars, slab mortars, the *Olivella* Thin Rectangular, Oval, Saddle, and modified Saddle bead types, and *Haliotis* ornament Type K2b11.

The economic expression of the early component is seen as primarily one of seed gathering with little clear data regarding hunting. Influence in the technological and social spheres seems to be oriented to the north, primarily to 4-Mer-14, and secondarily, to the Sacramento-San Joaquin Delta area. There is no dating available for the early component at 4-Mer-3 but typologically it seems to be coeval with the Late period, Phase I of the central California sequence.

The second, or later, component noted at the Menjoulet site is best represented by the large structures, and the cremations. A Carbon 14 determination of less than 185 years B. P. (I-3164) was obtained on one of the cremations in Housepit 2 (Burial 14). This determination, combined with the estimated date of abandonment of the area because of Spanish intrusion in the first decade of the 1800's, suggests that the last occupation of the site was at least partially protohistoric but probably extended several centuries back into time.

The more diagnostic artifacts associated with the late component consist of the burial pattern of cremation, of which all but two were recovered from the large ceremonial structure, Housepit 2. There was an increased emphasis in the later period in bone artifacts, which included whistles, awls, and large daggers. The *Olivella* Small Spire-lopped, Thin Lipped, Disc, Cupped and Amorphous bead types predominate in the ornamental assemblage. Other bead types include the steatite and *Saxidomus* disc beads (the latter rare), *Tivela* cylinder and tubular beads and small *Haliotis* callus disc beads. Diagnostic stone artifacts include small side-notched (Panoche Side-notched) obsidian points, a number of flake tool forms, and the smaller cobble mortars and the convex metates.

Easily the most important artifacts associated with the late component are Housepits 2, 4a, 5, 10, and 11. The very size and complexity of the ceremonial structure and the domiciles reveal that the builders had developed sufficient political organization to gather the materials and construct these structures, which was no small feat. Even more important, they must have learned to exploit their surrounding environment to such a degree as to have ample free time for non-food-producing tasks. Again, as in the earlier period, the evidence suggests that seed gathering was more important than hunting.

In general, the evidence presented in this paper leaves little doubt that Kroeber lacked the necessary demographic data to clearly establish that the west side of the San Joaquin Valley, in ethnographic times, was "unimportant" and had "few residents" (1925: 476). The Menjoulet site was undoubtedly a major village that was occupied on a year-round basis and was inhabited by a substantial number of people (I would estimate a minimum of 50 to 100 people at the peak of the protohistoric occupation). The existence of the large structure at the site suggests that not only were several large family groups living here, probably similar in kinship structure to the exogamous moieties of the Valley Yokuts (Kroeber 1925: 493-496), but that the site was probably a triblet center.

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TABLE I

Data on Projectile Points and Fragments, 4Mer-3

Type	Total	Length*	Width	Thickness	Weight*	Material
1a	7	16-23	8-12	2-4	0.2-1.0	6=Obsidian, 1=Chalcedony.
1b	1	23+	16+	7	-	1=Chert.
2	2	47-63	29-45	6-9	10.0-11.1	1=Chert, 1=Silicate.
3	2	46-55	18-21	8-12	6.1-13.6	1=Chert, 1=Basalt.
4	1	54	29	5	10.0	1=Chert.
<b>Subtotal</b>	<b>13</b>					<b>6=Obsidian, 4=Chert, 1=Silicate, 1=Basalt, 1=Chalcedony</b>
<b>Fragments:</b>						
Tips	11	10-26+	8-15	4-6	-	11=Obsidian.
Medial	48	10-27+	7-22+	5-11	-	42=Obsidian, 1=Chert, 1=Jasper, 4=Chalcedony.
Basal	6	11-26+	14-22+	5-12	-	6=Obsidian.
<b>Totals</b>	<b>78</b>					<b>65=Obsidian, 5=Chert, 5=Chalcedony, 1=Silicate, 1=Basalt, 1=Jasper.</b>

\*Measurements in Millimeters

\*\*Weight in grams.

**TABLE 2**

Distribution of Projectile Points and Fragments, 4-Mer-3.

Type	0-6*	6-12	12-18	18-24	24-30	30-36	36-42	H.P.2**	H.P.4a	H.P.10	H.P.11	B-1***	B-15	B-17	B-43	No Loc.	Total
1a	1	1	1	1	1		2				1						7
1b																1	1
2		1										1					2
3	2																2
4	1																1
<b>Subtotal</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>13</b>
<b>Fragments:</b>																	
Tips	4	2	1				3						1				11
Medial	11	3	9	2	2	3	2	10	1	1	1	1	1	1	1	1	48
Basal	2	2	1				1										6
<b>Subtotals</b>	<b>17</b>	<b>7</b>	<b>11</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>14</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>65</b>
<b>Totals</b>	<b>21</b>	<b>9</b>	<b>12</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>16</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>78</b>

\*Levels in Midden, \*\*House Pit Numbers, \*\*\*Burial Numbers

TABLE 3

Data on Miscellaneous Chipped Stone Artifacts, 4-Mer-3

Artifact Type	Totals	Length*	Width*	Thickness*	Range*	Ct.	Qut.	Ch.	Ba.	Material				Obs.	
										An.	Q.C.	Ja.			
<b>Drills &amp; Gravers:</b>															
Type 1	20	24-45	18-40	9-19	34-28-12	4		5	3					3	5
Type 2	19	25-63	20-62	8-24	48-38-20	9	2	3	2		1			2	
Type 3	16	27-96	16-61	7-30	45-43-13	5		5			6				
Knives:	13	52-135	30-67	15-22	68-54-17		1		3		9				
<b>Scraper Planes:</b>															
Large	27	62-105	53-65	25-31	75-67-30	8	2		3		12			2	
Small	46	20-53	14-42	10-23	43-38-21	16	4	13			8	1		4	
<b>Flake Scrapers:</b>															
Large	12	48-78	42-77	10-22	62-58-17	2	1				9				
Small (Thinned)	14	17-36	10-34	6-7	21-18-6	6		8						7	2
Tabular	45	25-60	20-39	6-15	44-27-9	23	3	8		2				3	
Turtle Back	26	18-65	17-51	6-21	39-35-19	9	2	6		6					
End	26	21-57	18-30	6-14	33-23-11	18	1	7						5	1
Side	60	18-44	9-23	9-19	32-13-11	29	8	14	2			1		1	
Spoke Shave	3	23-46	18-35	10-7	32-24-9	2								1	
Irregular	25	17-52	15-31	3-11	37-21-7	8		6		7					4
<b>Core Tools:</b>															
Biface Scrapers	40	41-62	35-47	22-35	49-42-25	25	2	1			12				
Choppers	90	70-103	55-65	40-63	84-80-35	37	9	13	3		16			12	
Hammerstones	76	48-154	47-85	36-60	66-64-50	7	12		4		53				
Small Scrapers	24	18-35	11-31	7-22	30-23-17	5	4	15							
Prepared Cores:	109	17-61	12-55	10-41	41-35-27	65		19	13		8			4	
Large Cores**	20	55-90	49-72	35-61	64-57-41	7	4	3			1			5	
<b>Totals</b>	<b>711</b>					<b>285</b>	<b>55</b>	<b>126</b>	<b>33</b>	<b>150</b>	<b>2</b>	<b>48</b>	<b>12</b>		

\*Measurements in millimeters

\*\*Not further utilized

Material = Ct. Chert, Qut. Quartzite, Ch. Chalcedony, Ba. Basalt, An. Andesite, Q.C. Quartz Crystal

TABLE 4

Distribution of Miscellaneous Chipped Stone Artifacts, 4-Mer-3

Artifact Type	0-6	6-12	12-18	18-24	24-30	30-36	36-42	H.P.2	H.P.3	H.P.4	H.P.10	H.P.11	No. Loc.	Total
<b>Drills &amp; Gravers:</b>														
Type 1	4	1	1	1	1	1		11						20
Type 2	3	4	1		2	1		7	1					19
Type 3	2	2	2		1			7			1		1	16
Knives:	2	2	1					6					2	13
<b>Scraper Planes:</b>														
Large	3	5	2	4		1		12						27
Small	8	6	9	3	2	1		14			3			46
<b>Flake Scrapers:</b>														
Large	1		2	1		1		5			2			12
Small (Thinned)	3		2			1		7			1			14
Tabular	7	6	3	2	2			23	1				1	45
Turtle Back	5	2	1	3	1	1		12					1	26
End	7	3	4	2	1			8					1	26
Side	12	5	5	6	1			27		1			3	60
Spoke Shave			1					2						3
Irregular	6	1	2	1	1	1	1	11		1				25
<b>Core Tools:</b>														
Biface Scrapers	3	6	3	5	2	1		12			5	1	2	40
Choppers	15	13	11	11	3	3		26		2	2	1	3	90
Hammerstones	6	4	14	11	5		2	18		1	6	2	7	76
Small Scrapers	6	1	2	1	1			12					1	24
Prepared Cores:	19	12	12	9	5	3		42		1	2	4		109
Large Cores:*	8	3		2	1	1		2		1	1		1	20
<b>Totals</b>	<b>120</b>	<b>76</b>	<b>78</b>	<b>62</b>	<b>29</b>	<b>16</b>	<b>3</b>	<b>264</b>	<b>2</b>	<b>7</b>	<b>23</b>	<b>8</b>	<b>23</b>	<b>711</b>

\*Not further utilized.

TABLE 5

Data on Mortars and Mortar Fragments, 4-Mer-3.

Mortar Types	Total	Outside			Depression			Shaped	Material
		Length*	Width	Height	Dia.	Depth			
Large Bowl Beveled Rims	6	212-305	126-298	125-218	136-217	39-119	6	6=Andesite.	
Cobble	6	254-328	140-264	156-249	158-211	30-112	4	6=Andesite.	
Small Bowl	27	75-189	65-144	43-106	46-118	9-74	12	27=Andesite.	
Rim Fragments	11	90+152+	80+149+	44-98	-	-	10	11=Andesite.	
Slab Mortar	4	185-502	110-361	106-148	96-168	18-38	-	3=Andesite, 1=Sandstone.	
Irregular Cobbles	7	81-191	53-161	21-92	53-86	7-28	-	7=Andesite.	
Steatite Bowl Fragments	6	59-137+	32-134	12-24	-	-	-	-	
<b>Total</b>	<b>67</b>						<b>32</b>	<b>60=Andesite, 1=Sandstone</b>	

\*Measurements in millimeters

TABLE 6

Data on Miscellaneous Ground Stone Artifacts

Artifact Type	Total	Length*	Width	Thickness	Shaped	An.	Sd.	Ba.	Qt.	Gr.	Material**								
											St.	Sr.	Cl.	Sl.	At.	Sc.			
<b>Pestles:</b>																			
Shaped	10	61+-378	62-94	40-89	10	10													
Cobble	37	67-267	37-117	30-84	-	19	11	6	1										
<b>Metates:</b>																			
Basin	14	61+-541	35+-320	30-120	-	3	11												
Slab	11	105+-575	64+-403	16-193	-	1	10												
Convex	14	93+219	72+243	42-85	4	14													
Irregular	7	104+-370	70+205	30-140	-	6	1												
<b>Manos</b>																			
Biface	24	75-178	60-118	43-70	13	21	1		1	1									
Uniface	36	114-144	100-132	33-50	-	35				1									
<b>Abrading Stones</b>	7	75+-90	46+-75	18-35	-		7												
<b>Anvil Stones</b>	4	93-106+	75-94	45-50	-	3	1												
<b>Charmstone</b>	2	77-91	34-38	30-31	-	2													
<b>Stone Rods &amp; Pins</b>	16	26-46	3-13	2-8	16		2				1	1	1	1	12				
<b>Ear Plugs</b>																			
Tapering	3	8-19	7-13	7-12	3														1
Con. Stem	3	15-18	12-15	8-11	3									2	1				
Spool	4	11-14	14-15	11-14	4									4					
<b>Steatite Beads</b>																			
Disc	25	4-9			25														25
Pebble	1	6	5	3															1
<b>Total</b>	<b>217</b>					<b>114</b>	<b>44</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>32</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>12</b>	<b>1</b>	<b>1</b>	<b>1</b>

\*Measured in Millimeters \*\* An.=Andesite, Sd.=Sandstone, Ba.=Basalt, Qt.=Quartzite, St.=Steatite, Sr.=Serpentine, Cl.=Calcite, Sl.=Slate, At.=Actinolite, Sc.=Scoria, Gr.=Granite.





**TABLE 8**

**Data and Distribution of Miscellaneous Baked Clay  
and Mineral Objects**

Artifact Type	Total	Length*	Width	Thickness	Diameter	Hole Diameter	0-6	6-12	12-18	18-24	24-30	30-36	H.P.2	H.P.4	H.P.10	B-1	B-33	B-43	No Loc.	
Impressed Clay	1	12	19	16	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-
Cylinders	4	11-30	-	-	5-14	-	1	1	-	1	-	-	1	-	-	-	-	-	-	-
Tubes	2	15-29	-	-	9-11	3-5	1	-	-	1	-	-	-	-	-	-	-	-	-	-
Pottery:																				
<i>Incised Sherd</i>	1	23	17	6	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
<i>Unmarked Sherd</i>	1	41	22	5	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-
Zooform	1	30	-	-	10	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
Spindle Whorls	3	19-35	18-32	12-12	-	1.5-3	-	-	2	-	-	-	1	-	-	-	-	-	-	-
Andalusite Crystals	2	17-20	-	-	4-5	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-
Polished Pebbles	14	25-46	18-37	14-26	-	-	3	2	2	-	2	-	2	-	1	-	1	-	-	1
Quartz Crystals	47	17-64+	13-27+	3-26+	-	-	11	3	5	3	2	1	13	1	-	2	-	1	-	5
<b>TOTAL</b>	<b>76</b>						<b>17</b>	<b>7</b>	<b>10</b>	<b>7</b>	<b>4</b>	<b>1</b>	<b>18</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>6</b>

\*Measurement in millimeters.

TABLE 9  
Data on Bone Artifacts, 4-Mar-3

Artifact Type	Total	Length*	Width	Thickness	Diameter	Material
<b>Bone Awls</b>						
Type Ale	1	71	11	7	-	1=mammal
Ale I	5	88-197	7-19	4-10	-	5=mammal
Ale II	1	75	16	10	-	1=mammal
Ale III	1	121	15	5	-	1=mammal
Ale I	1	195	15	7	-	1=mammal
<b>Bone Awl Tips</b>						
Subtype 1	2	14-19	7-7	3-5	-	2=mammal
	12	7-38	3-7	3-5	-	11=mammal, 1=rabbit
	5	12-22	4-5	3-4	-	5=mammal
	2	15-18	3-4	2-4	-	2=mammal
<b>Bone Awl</b>						
Midsection	7	9-40	7-11	4-5	-	7=mammal
<b>Bone Beads</b>	6	21-33	-	-	7-11	2=mammal, 4=bird bone
<b>Whistles</b>	7	31-108	-	-	6-13	2=bird ulna, 4=bird tibia, 1= <i>Lynx rufas</i>
<b>Tubes</b>	25	15-119	-	-	5-12	4=bird ulna, 3=bird tibia, 18=unidentified
<b>Incised Tubes</b>	25	18-121	-	-	4-13	3=bird ulna, 1=bird tibia, 19=unidentified 2=mammal
<b>Spatulas</b>	8	6-40	8-20	2-8	-	8=mammal
<b>Fishtail Objects</b>	2	13-33	6-8	3-4	-	2=mammal
<b>Bipointed Pin</b>	1	25	-	-	2	1=mammal
<b>Modified Bone</b>	24	18-80	8-12	5-6	-	13=mammal, 1=rodent, 10=unidentified
<b>Antler Wedges</b>	3	60-171	19-30	13-15	-	2=deer, 1=unidentified,
<b>Totals</b>	<b>138</b>					<b>68=mammal, 21=bird, 1=rodent, 48=unidentified</b>

\* Measurements in Millimeters

TABLE 10

Distribution of Bone Artifacts, 4-Mer-3

Artifact Type	0-6	6-12	12-18	18-24	24-30	30-36	H-2	H-3	H-10	H-11	B-1	B-4	B-11	B-13	B-15	B-19	B-33	B-36	B-37	B-43	B-49	B-56	No. Loc.	Total	
Bone Awls																									
Type Ale																									
Ale I				1				1					1	2										1	
Ale II			1																					5	
Ale III																								1	
Ale I														1										1	
Bone Awl Tips																									
Sub type 1																									
2		1	3		1		1	1																2	
3																								12	
4																								5	
																								2	
Bone Awl Midsections		1	1	1	1	1	1																	7	
Bone Beads		1	1	1																				6	
Whistles							4	1					1											7	
Tubes			4	2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	25	
Incised Tubes				2			18		2						1									25	
Spatulas		1	1	2		1	2					1												8	
Fish tail objects		1																						2	
Bipointed Pin							1																	1	
Modified Bone		6	3	2			6		2	1	1	1												24	
Antler Wedges							1																2	3	
Totals	10	14	12	4	4	2	54	2	5	1	1	2	4	3	1	1	1	2	2	2	7	3	1	2	138

TABLE 11

Distribution of Beads in Midden and Housepits, 4-Mer-3

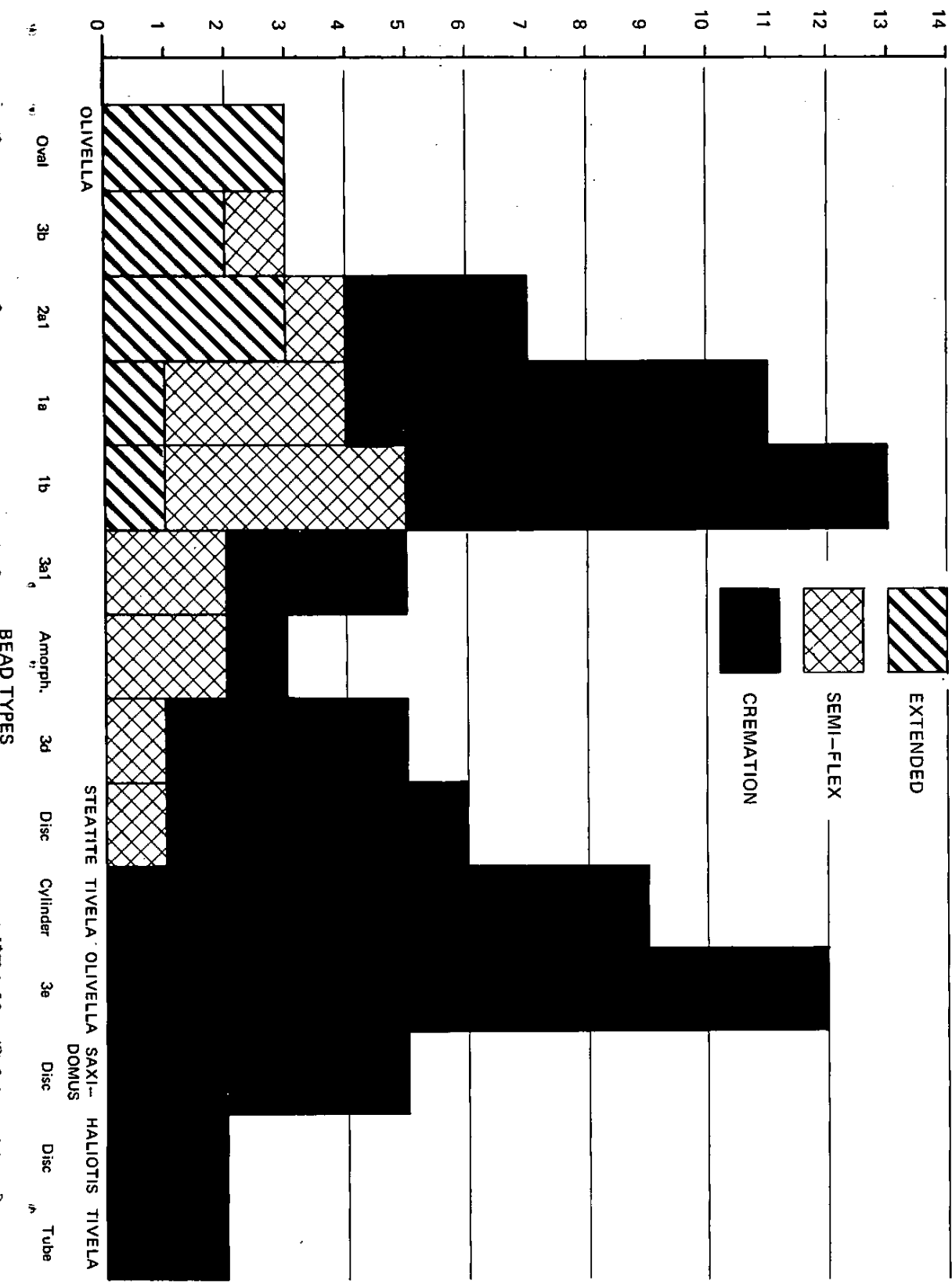
Bead Types	Location	Housepits, 4-Mer-3											Totals					
		0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-48	H.P. 1	H.P. 2	H.P. 3		H.P. 4b	H.P. 10	H.P. 11		
<i>Olivella</i> sp.																		
1a		1	2	4	1	3					28						20	59
1b		14	5	6	10	15				18		1					9	80
2a1			2	1	10	14			1	62	3							131
2a2									5	6								6
3a1										1								1
3a2										6				2				9
3b																		
3b2			1	3	1					3								3
3c										3	2							10
3d										53	1							54
Incised 3d										1								1
Incised 3e		2		2						220	3						42	269
Oval										6								6
Applique		12	22	26	20	34			8	1							6	204
<i>Tivella</i> sp.										1								7
Cylinder=V1a1																		22
Tubular=AV2b		1								22								2
<i>Saxidomus</i> sp.										1								1
Disc																		
<i>Mytilus</i> sp.										1								1
Disc																		
<i>Haliotis</i> sp.										1								1
Callus Disc		1								9								10
Steatite Disc		1	2	1	1	1				6								12
Steatite Pebble										1								1
Bone Bead		1	1	1						3								6
Totals		33	35	44	43	67	66	49	5	9	453	10	1	2	78			895



TABLE 13: BURIAL OCCURRENCES OF BEAD TYPES

TOTAL NUMBER OF  
BURIAL OCCURRENCES

BURIAL TYPE  
(One Occurrence Each)



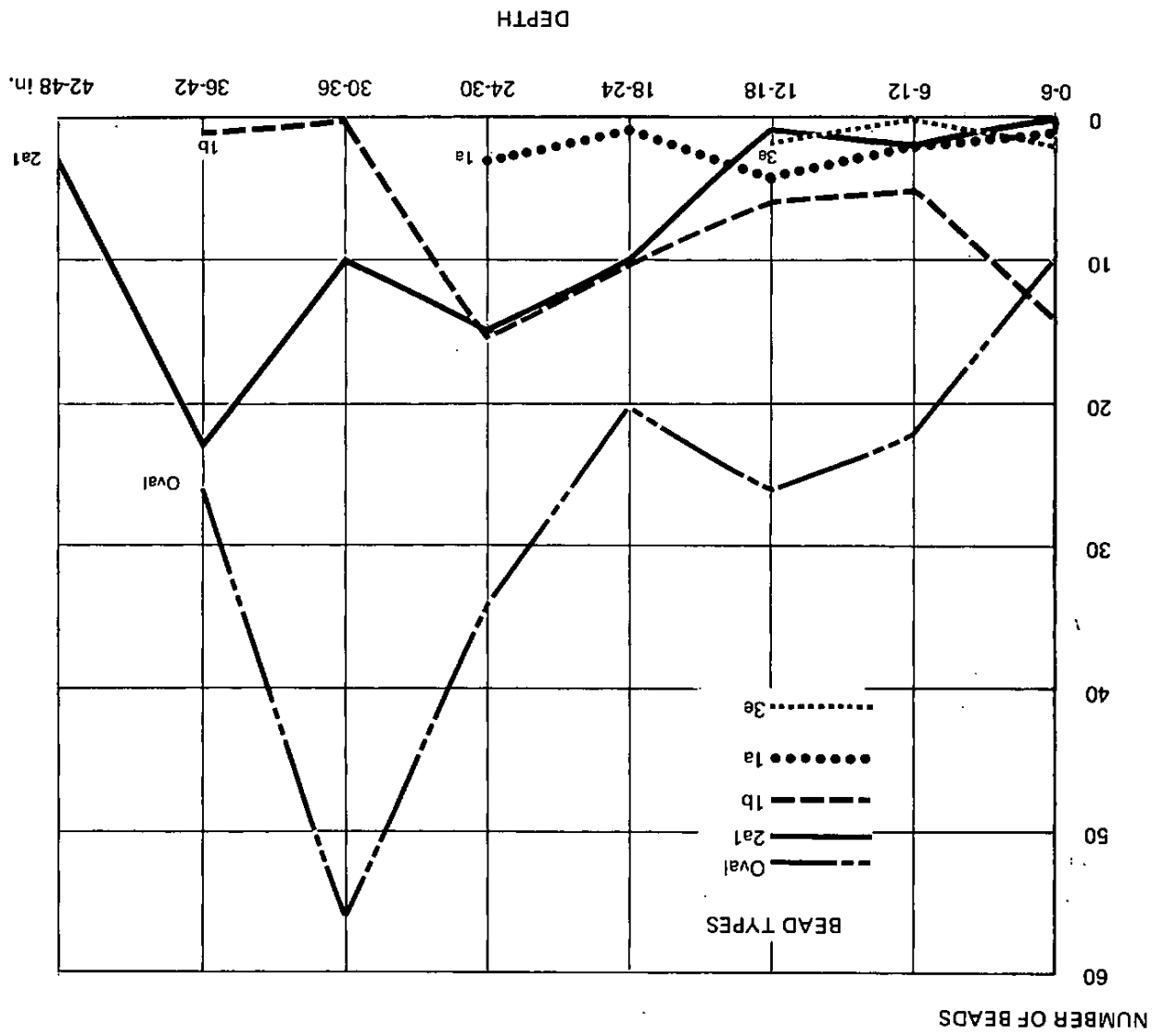


TABLE 14  
 FREQUENCY OF SELECTED OLIVELLA  
 BEAD TYPES IN MIDDEN BY LEVEL



TABLE 15  
Burial Data and Associated Artifacts, 4-Mer-3

Burial No.	Location	Depth (in.)	Sex	Age*	Interment	Orientation**	Grave Pit	Cairn***	Associated Artifacts
1	25N-45W	45	?	A	Supine Extension	E	x	22	Proi. Point Type 2, Mortars and Metates, <i>Olivella</i> beads Type 2a1 and Oval, Quartz crystal, Bead Pattern of <i>Olivella</i> Type 2a1 and Oval beads, mortars and metates, pestle.
2	36N-50W	45	?	A	Supine Extension	NE	x	24	
3	78N-50W	21	?	Inf.	?	?	x	13	Pestles, Anvil stone, bone spatulas.
4	75N-50W	32	?	Inf.	?	SE	x	13	Pestles, <i>Olivella</i> Type 3a1 and Steatite disc beads, Asphaltum on right hand.
5	35N-40W	31	M	A	Semi-flex ?	SW	x	14	Slab Mortar, Oval <i>Olivella</i> and Type 1b beads.
6	35N-40W	11	M	A	Supine Extension	NE	x	16	Bevered Rim Mortar, Slab Mortar.
7	50N-85W	27	?	A	Cremation	?	x	2	H.P. 2, <i>Olivella</i> Type 3d, 3e, <i>Tivela</i> cylinder, and Steatite disc beads.
8	55N-85E	25	?	A	Cremation	?	x	2	H.P. 2, <i>Olivella</i> Type 1b, 2a1, 3d, 3e, CSDB, <i>Tivela</i> cylinder beads.
9	55N-105E	13	?	A	Cremation	?	x	2	H.P. 2, Steatite pipe, <i>Olivella</i> Type 1b, 2a1, 3e beads.
10	55N-105E	23	?	A	Cremation	?	x	2	H.P. 2, Type Alel bone awl, bone whistles and tubes, <i>Olivella</i> Type 1a, 1b, 3e, and steatite disc beads.
11	50N-100E	26	?	A	Cremation	?	x	1	H.P. 2, <i>Olivella</i> Type 3e beads.
12	50N-95E	33	?	A	Cremation	?	x	1	H.P. 2, Type Alel and Alel bone awls, <i>Olivella</i> Type 1a, 1b, 3e, and CSDB beads.
13	45N-90E	24	?	A	Cremation	?	x	1	<i>Haliothis</i> ornament.
14	50N-85E	14	?	A	Cremation	?	x	1	H.P. 2, Basketry, <i>Olivella</i> Type 1a, 1b, 3d, 3e, <i>Haliothis</i> callus, <i>Tivela</i> cylinder, and steatite disc beads.
15	55N-100E	28	?	?	Cremation	?	x	1	H.P. 2, <i>Haliothis</i> ornament, awl tip, point fragment.
16	50N-95E	13	?	?	Cremation	?	x	1	H.P. 2, <i>Olivella</i> Type 1a, 2a1, Amorphous beads.
17	70N-85E	17	?	?	Cremation	?	x	1	H.P. 2, Point fragment, Steatite disc ornament, <i>Olivella</i> Type 3d beads.
18	50N-95E	11	?	A	Cremation	?	x	3	H.P. 2, <i>Haliothis</i> ornament, <i>Olivella</i> Type 1a, 3e, and <i>Haliothis</i> callus beads.
19	55N-85E	11	?	A	Cremation	?	x	3	H.P. 2, Basketry, Convex metate, incised bone tube and modified bone object, <i>Tivela</i> cylinder and steatite disc beads.
20	Housepit 10	23	M	A	Semi-flexed Cremation	NW	x	1	H.P. 10, <i>Olivella</i> Type 1a, 3a1, 3e, CSDB, and steatite disc beads.
21	55N-50W	18	?	A	Primary(?) Cremation	?	x	1	<i>Olivella</i> Type 1a beads.
22	60N-50W	28	?	Adol.	Primary(?) Cremation	?	x	3	<i>Olivella</i> Type 1a, 1b beads.
23	60N-50W	28	?	Inf.	?	?	x	2	<i>Olivella</i> Type 1a, 1b beads.
24	45N-50W	37	?	A	Cremation	?	x	2	
25	60N-50W	40	M	A	Supine Extension	NW	x	17	
26	80N-50W	30	?	Adol.	Supine Extension	SW	x	9	Bevered rim mortar, cobble mortar, slab and basin metates, <i>Haliothis</i> ornaments, <i>Olivella</i> Type 1b, 3b beads.
27	45N-50W	30	?	?	Supine Extension(?)	SE	x	8	Small bowl and mortar rim fragments, slab and basin metates.
28	45N-50W	34	M	A	Supine Extension	NE	x	12	Mortar rim fragment.
29	65N-45W	16	F	A	Semi-flexed	NW	x	3	<i>Haliothis</i> ornaments, Bevered rim mortar, <i>Olivella</i> Type 1a, 3b beads.
30	50N-55W	30	?	Adol.	Semi-flexed	?	x	5	<i>Olivella</i> Type 1a beads.
31	45N-60W	24	F	A	Semi-flexed	SW	x	7	<i>Olivella</i> Type 3b and 3d beads.
32	95N-85E	14	?	A	Cremation	?	x	1	Bevered rim mortar, shaped pestle, basin metate, <i>Olivella</i> Type 3a1 and Amorphous beads.
33	85N-100E	14	?	A	Cremation	?	x	1	H.P. 2, Polished pebbles, <i>Olivella</i> Type 3e beads.
34	Non-human bone	?	?	?	?	?	x	1	H.P. 2, Digging stick marks on grave pit, Mortar rim fragment, bone tube, "Venus de Manjoular".
35	80N-100E	10	?	A	Cremation	?	x	1	H.P. 2, <i>Olivella</i> Type 3e, and <i>Tivela</i> cylinder beads.
36	85N-100E	15	?	A	Cremation	?	x	1	H.P. 2, Antler wedges.
37	80N-100E	12	?	A	Cremation	?	x	1	H.P. 2, Bone tubes.
38	75N-105E	18	?	A	Cremation	?	x	1	H.P. 2, <i>Tivela</i> cylinder bead.
39	70N-95E	15	?	Adol.	Cremation	?	x	1	H.P. 2, <i>Olivella</i> Type 2a1 beads.
40	55N-100E	17	?	?	Cremation	?	x	1	H.P. 2, <i>Olivella</i> Type 1b.
41	55N-95E	16	?	Inf.	Primary(?) Cremation	?	x	1	H.P. 2, Small mortar, <i>Olivella</i> Type 2a1 and Amorphous beads. (Bone 6 in. below floor.)
42	70N-65E	28	?	A	Cremation	?	x	2	H.P. 2, Point fragment, Quartz crystal, Bone awl fragments, tubes.
43	70N-70E	11	?	A	Cremation	?	x	2	H.P. 2, <i>Olivella</i> Type 3e, <i>Tivela</i> cylinders and tube beads.
44	50N-95E	6	?	?	Cremation	?	x	1	H.P. 2, Mortar fragment, <i>Olivella</i> Type 3e, and <i>Tivela</i> Cylinder beads.
45	70N-65E	18	?	?	Cremation	?	x	1	H.P. 2, <i>Tivela</i> tube bead.
46	50N-90E	8	?	A	Cremation	?	x	1	H.P. 2, Stone Rod or Pin, <i>Olivella</i> Type 1a, 1b, 3a1, 3d, and CSDB beads.
47	75N-85E	13	?	A	Cremation	?	x	1	H.P. 2, Stone Rod or Pin, <i>Olivella</i> Type 1a, 1b, 3a1, 3d, and CSDB beads.
48	50N-90E	7	?	?	Cremation	?	x	1	H.P. 2, <i>Haliothis</i> ornaments, <i>Olivella</i> Type 1b, 3a1, <i>Tivela</i> cylinder and CSDB beads, Contracting stem steatite earplug.
49	90N-100E	16	?	?	Cremation	?	x	1	H.P. 2, <i>Tivela</i> cylinder and CSDB beads, bone fish tail object.
50	Canine burial associated with Housepit 11.	?	?	?	Cremation	?	x	1	<i>Olivella</i> Applique beads.
51	Housepit 11	26	?	Inf.	Primary Cremation	?	x	1	H.P. 2, Basketry.
52	60N-70E	22	?	A	Cremation	?	x	1	H.P. 2, <i>Olivella</i> Type 3d beads.
53	80N-70E	35	?	A	Cremation	?	x	1	H.P. 2, <i>Olivella</i> Type 3d beads.
54	80N-65E	14	?	A	Cremation	?	x	1	H.P. 2, <i>Olivella</i> Type 3d beads.
55	Housepit 3	23	F	A	Semi-flexed	SW	x	17	H.P. 3, <i>Olivella</i> Type 1a and 1b beads.
56	Housepit 4b	18	?	Adol.	Primary	?	x	1	H.P. 4b, Bone whistle.

\* A = Adult, Adol. = Adolescent Inf. = Infant

\*\*Cranium.

\*\*\*Number of rocks in cairn.

FIGURE I

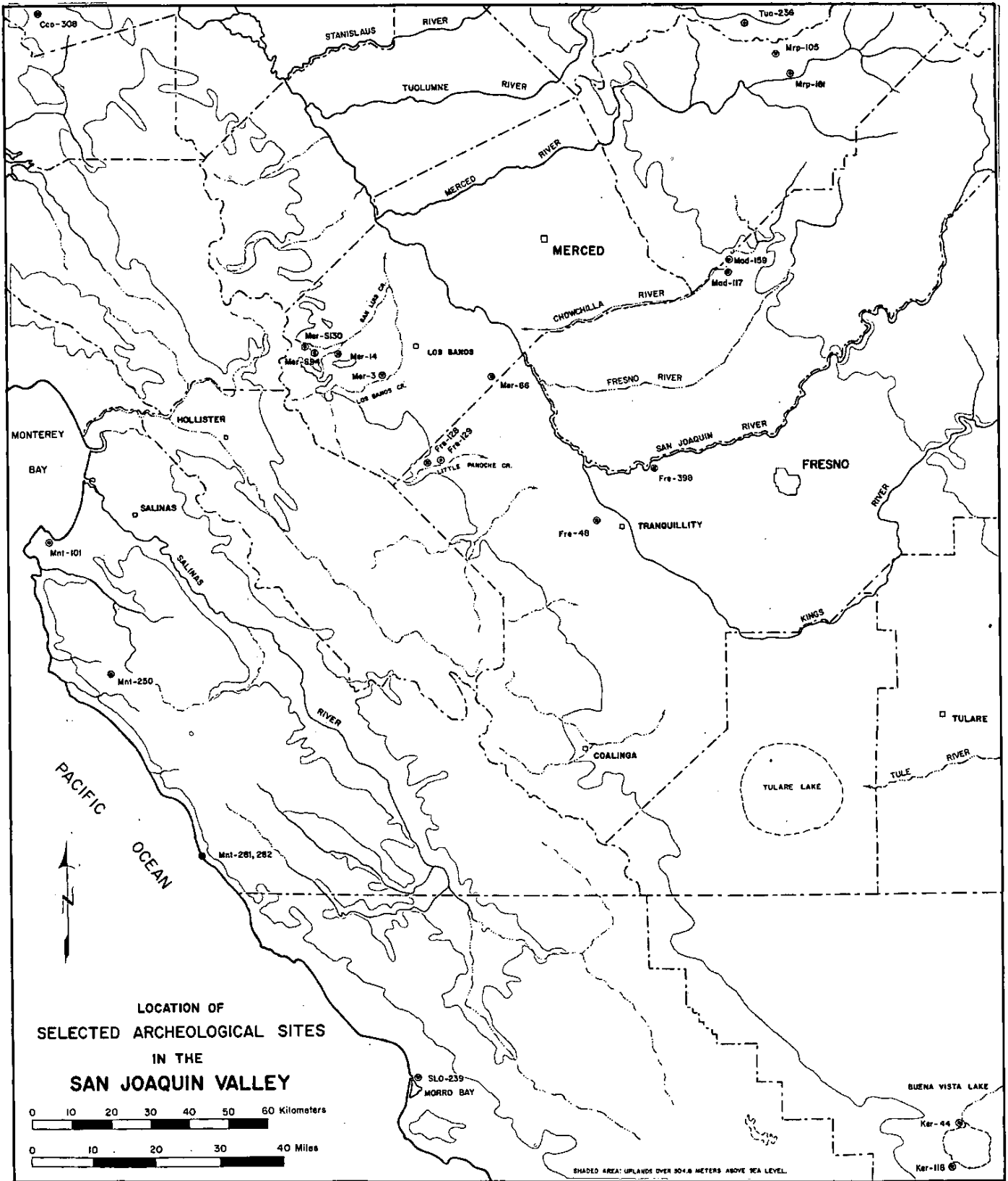


FIGURE 2

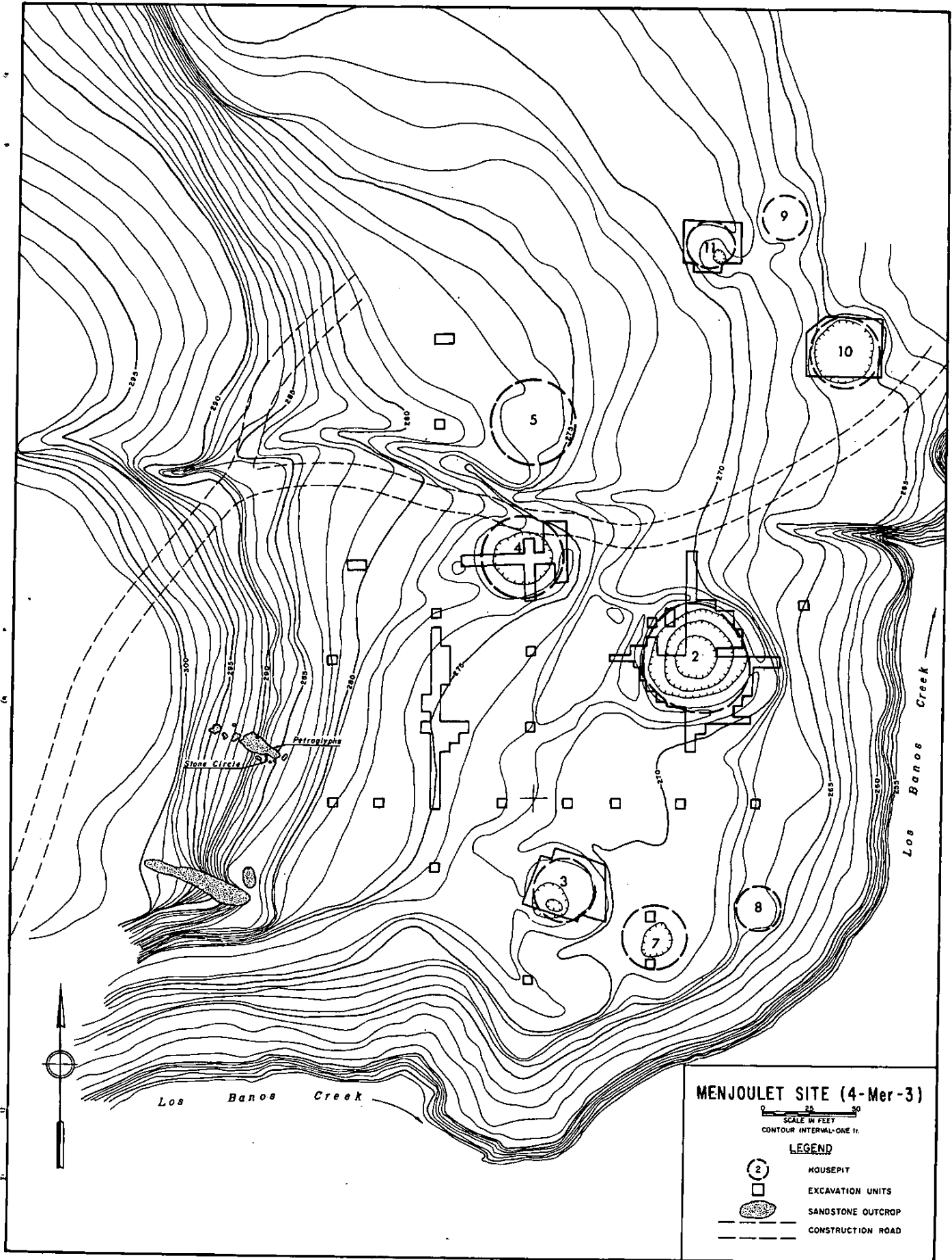


FIGURE 3

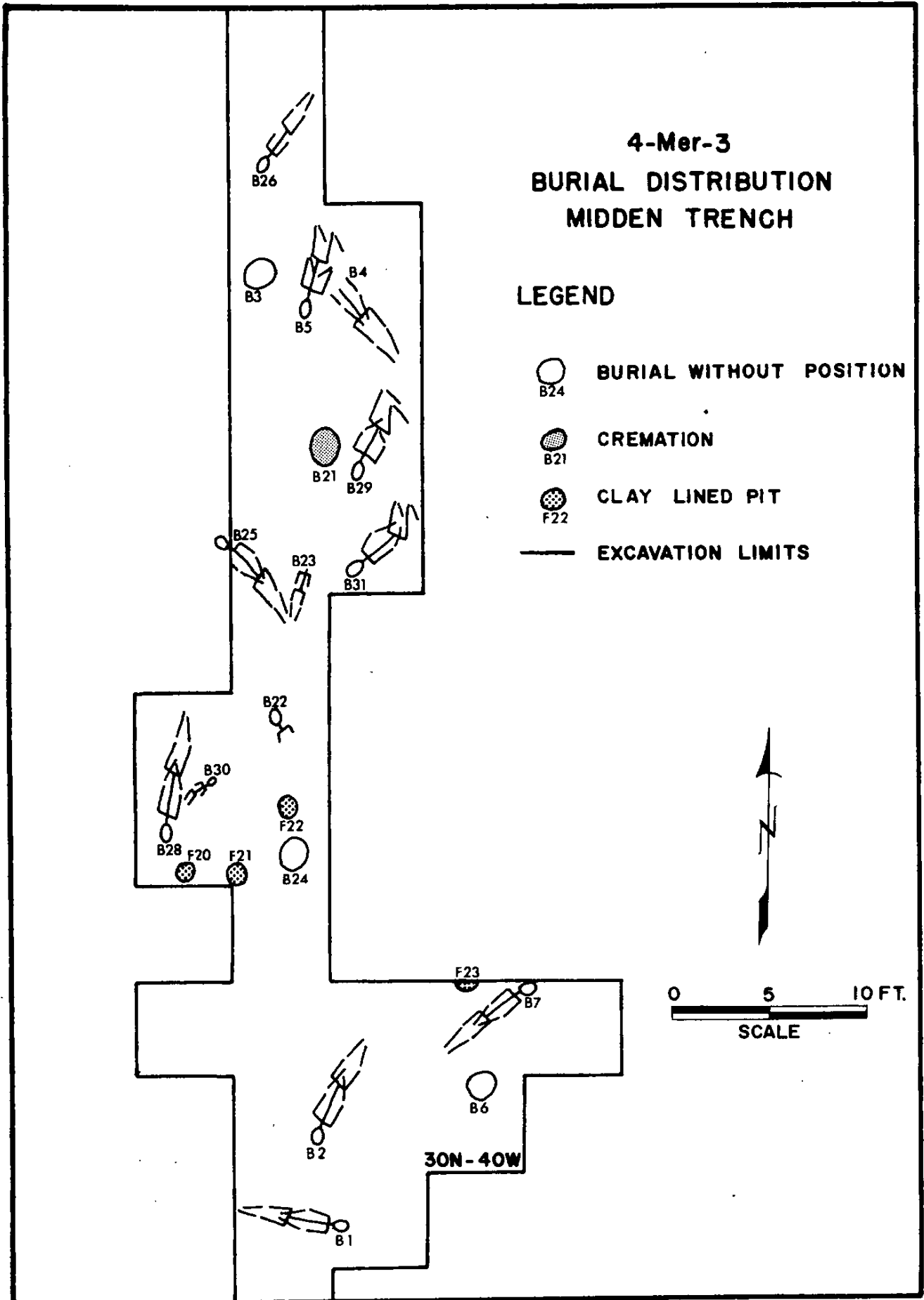
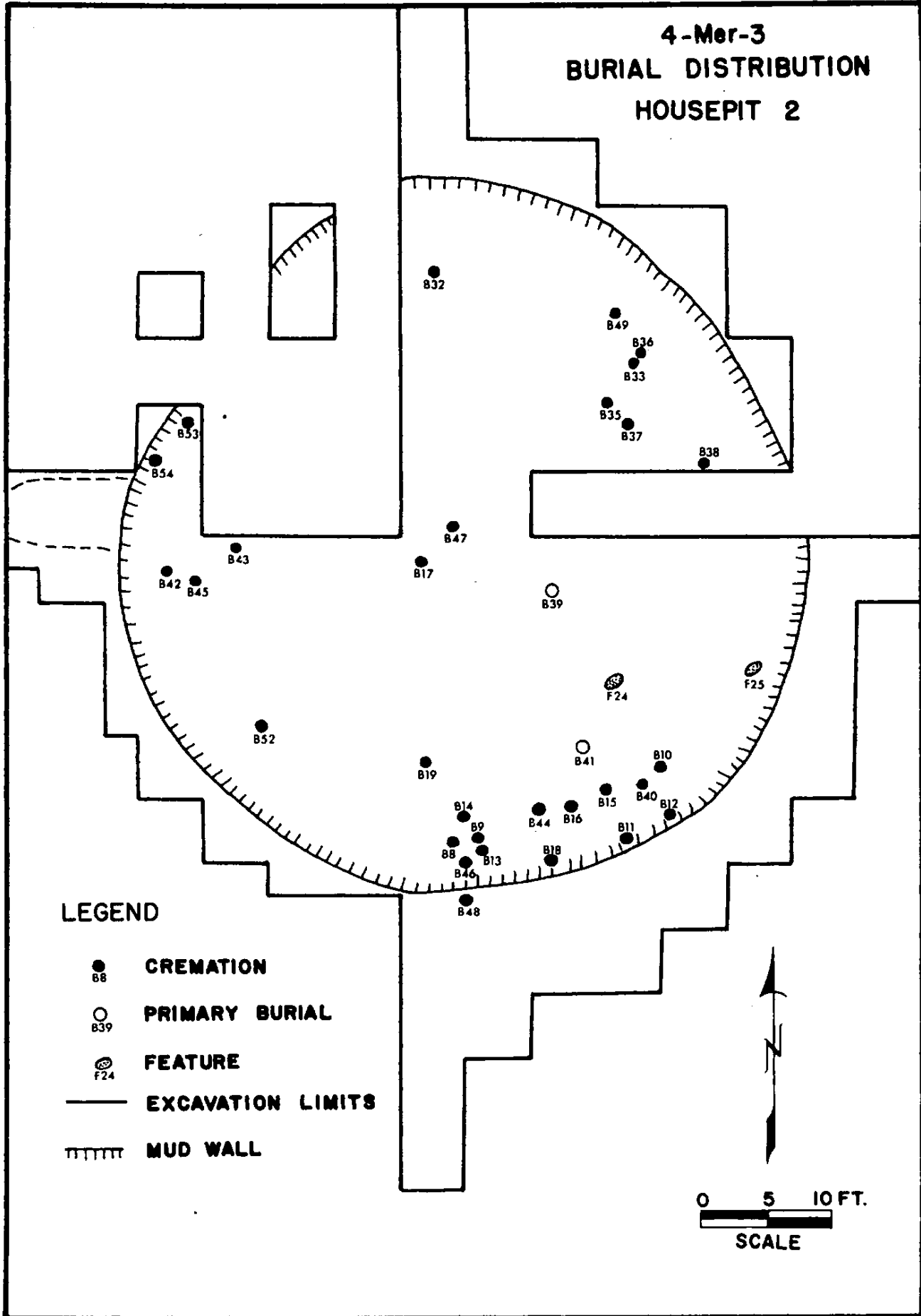


FIGURE 4

4-Mer-3  
BURIAL DISTRIBUTION  
HOUSEPIT 2



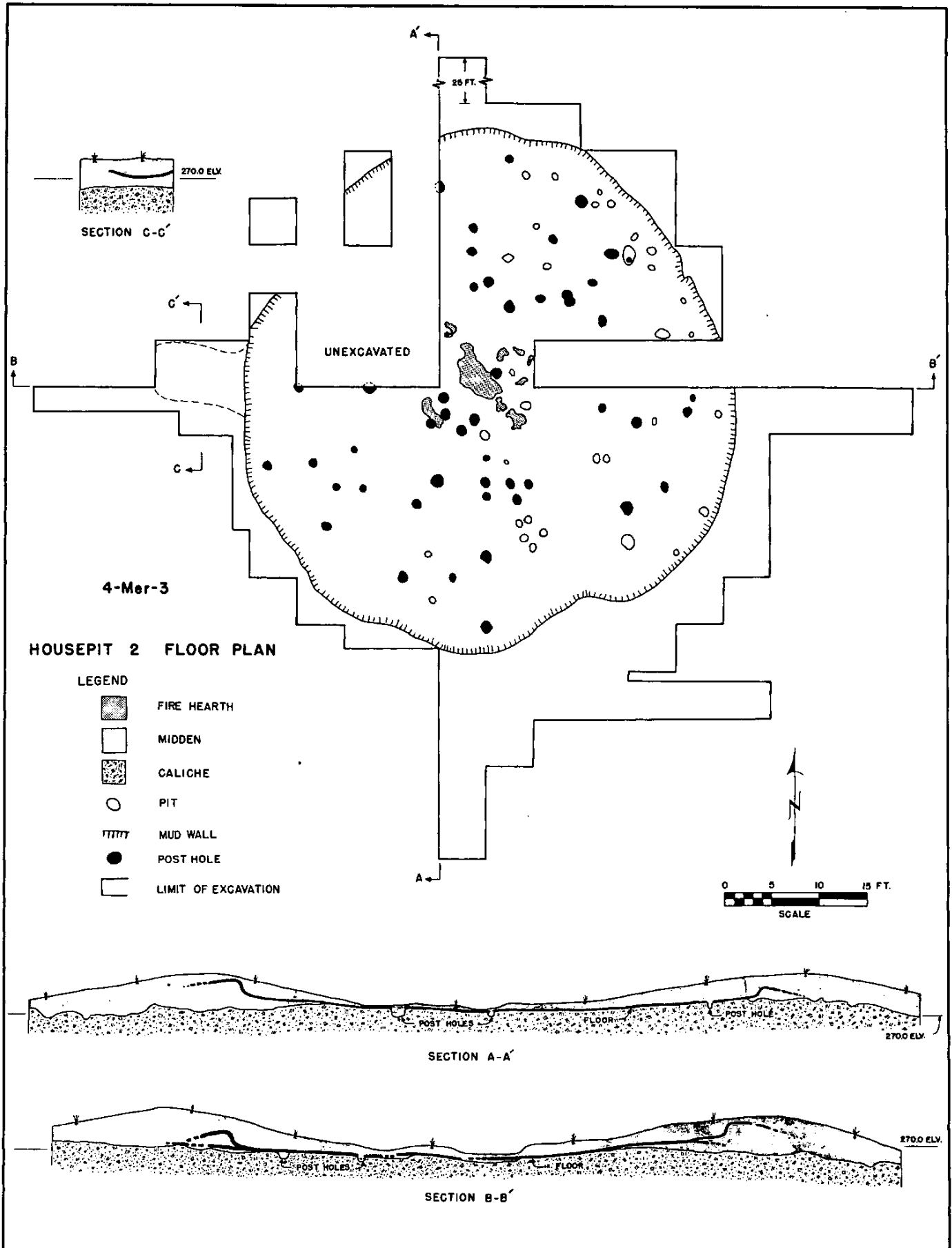


FIGURE 6

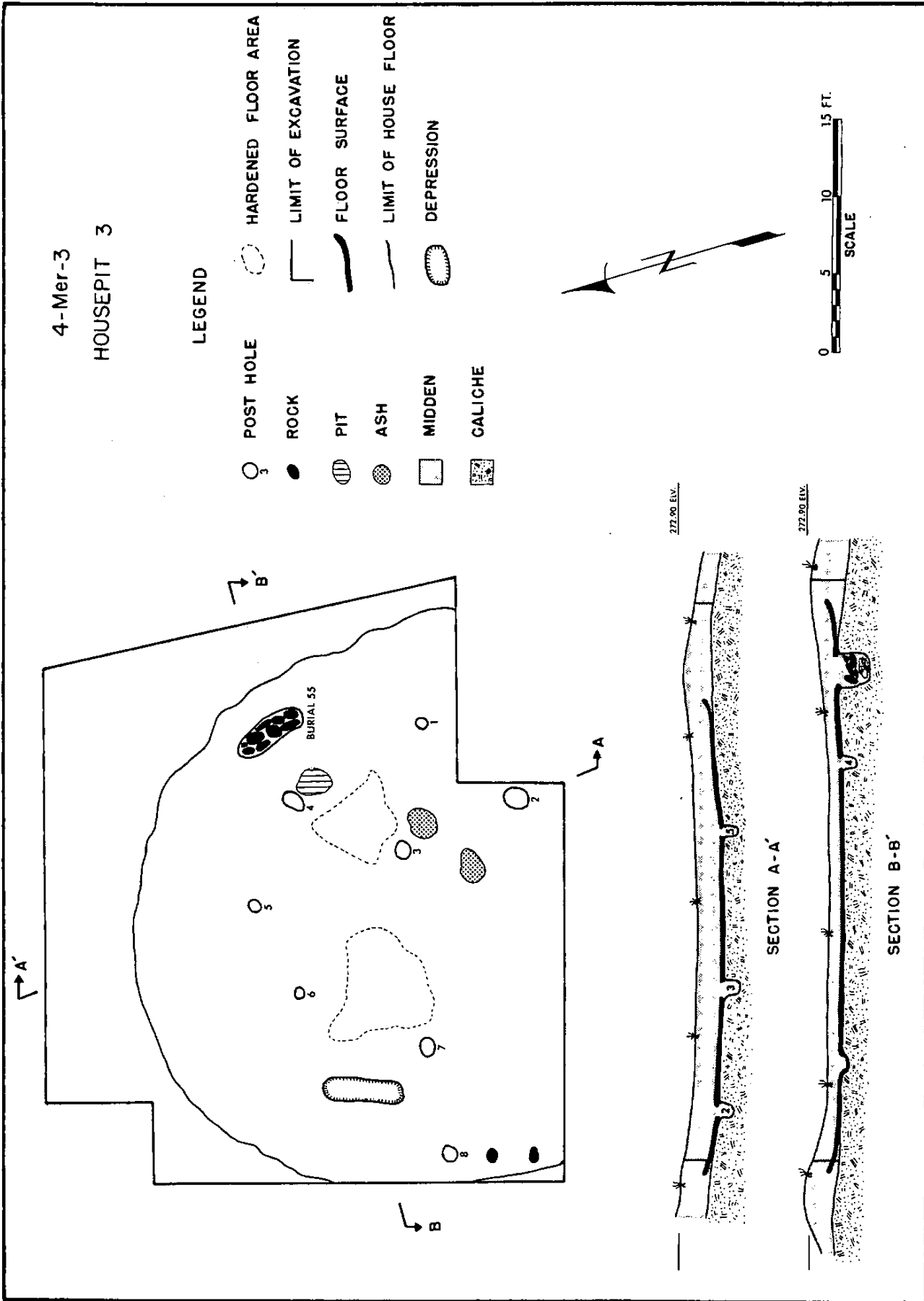


FIGURE 7

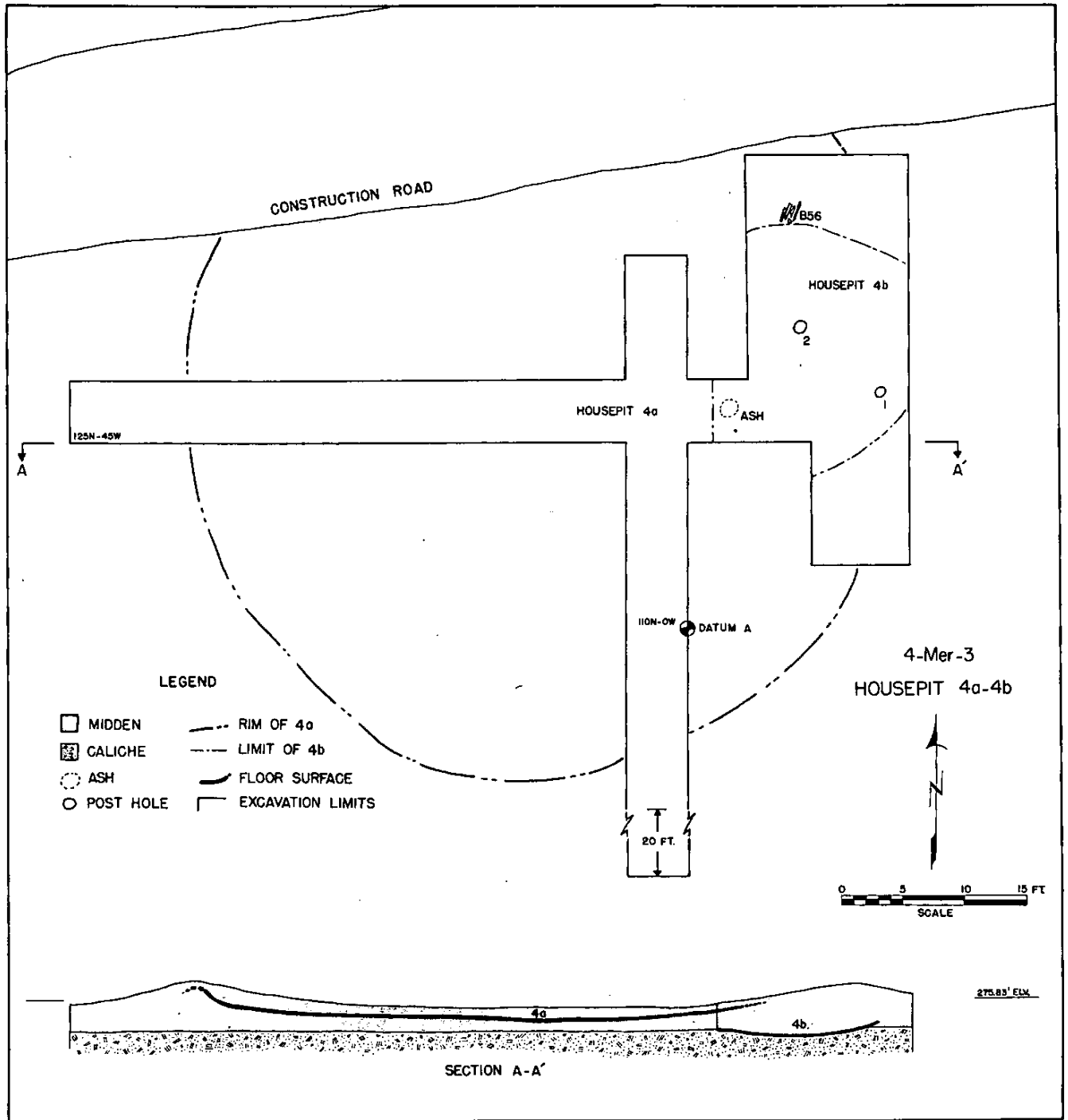




FIGURE 8

4-Mer-3  
HOUSEPIT 10

LEGEND

- POST HOLE
- ASH
- ROCK
- MIDDEN
- CALICHE
- FLOOR SURFACE
- ┌ LIMIT OF EXCAVATION
- ~ LIMIT OF HOUSE FLOOR
- HARDENED FLOOR AREA

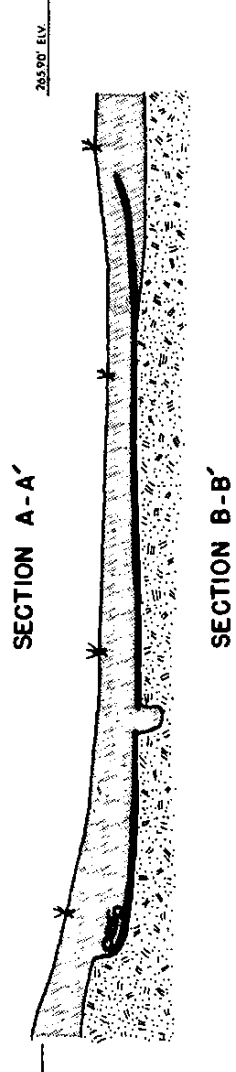
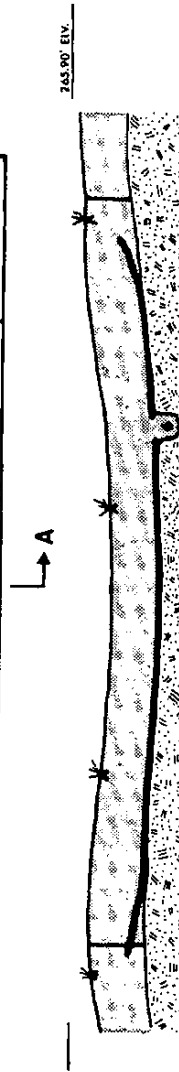
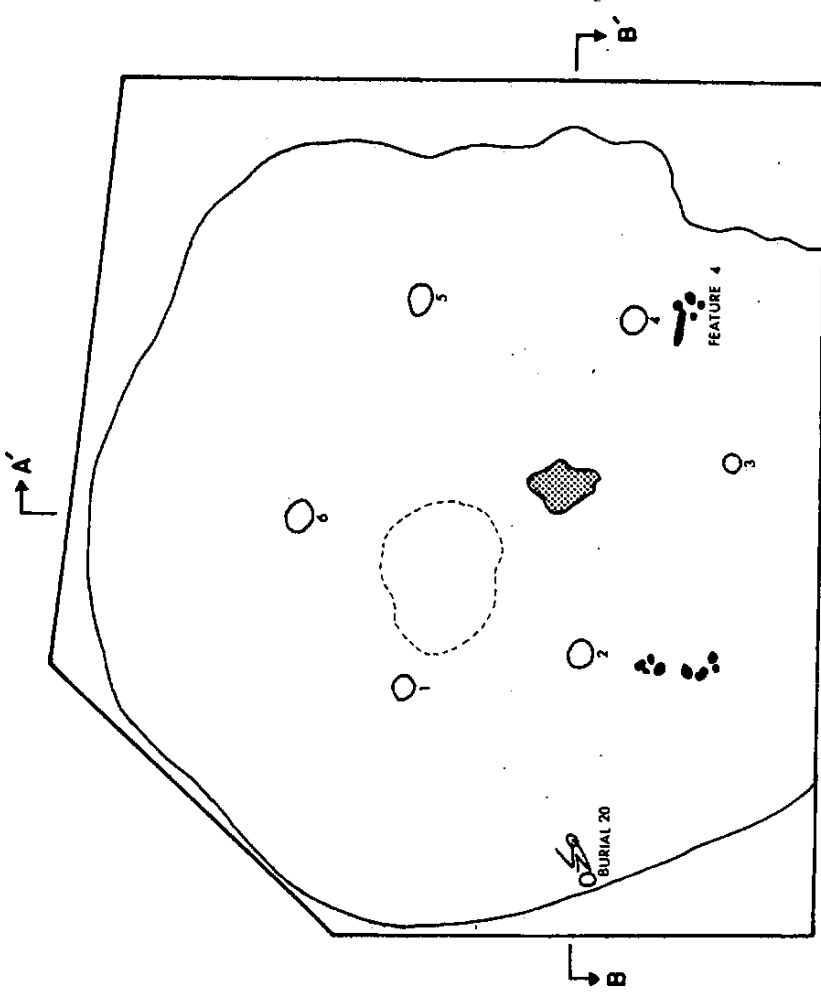


FIGURE 9

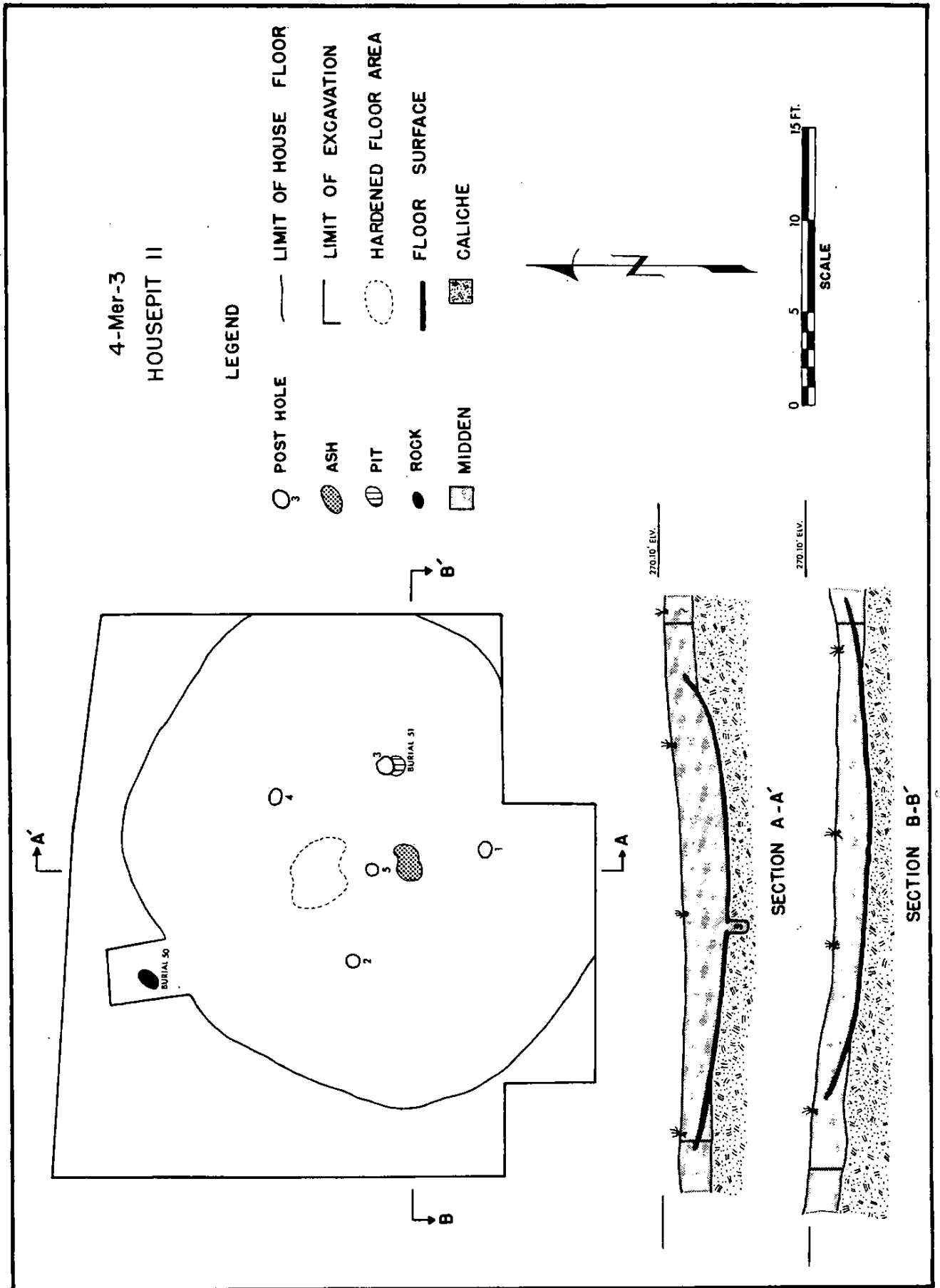
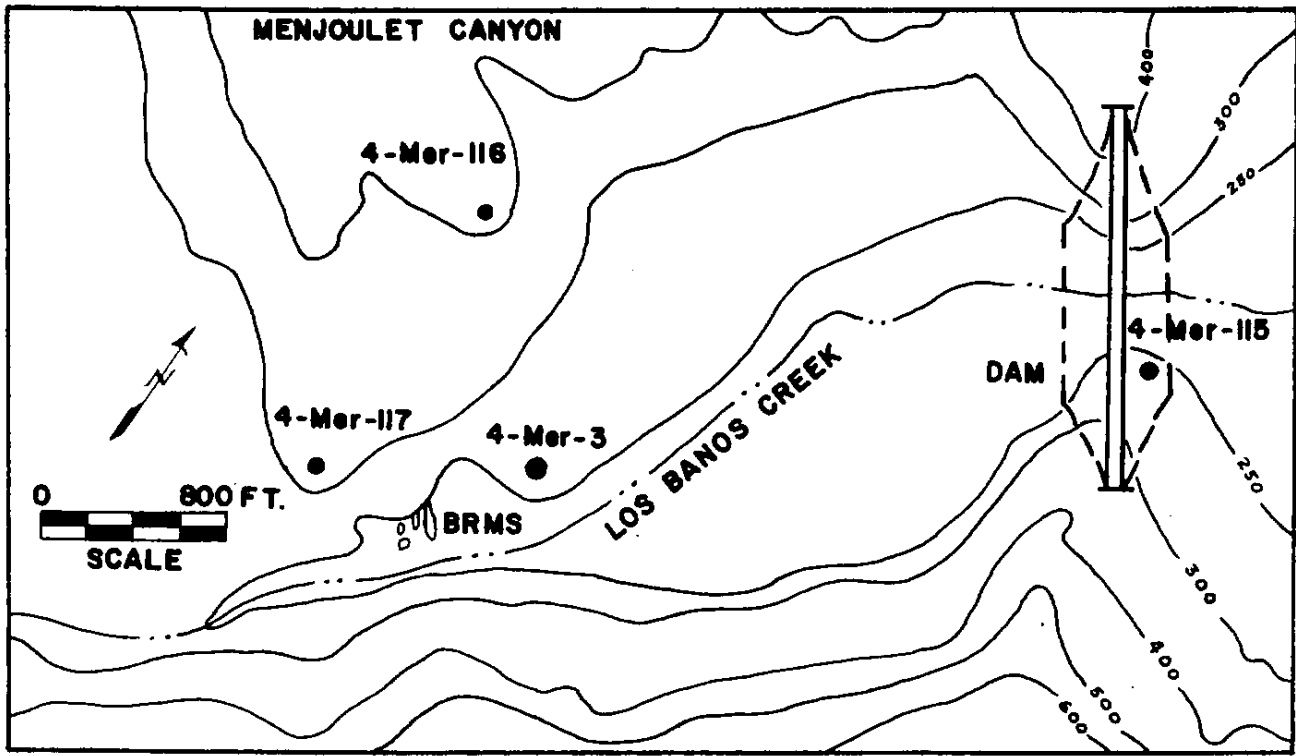
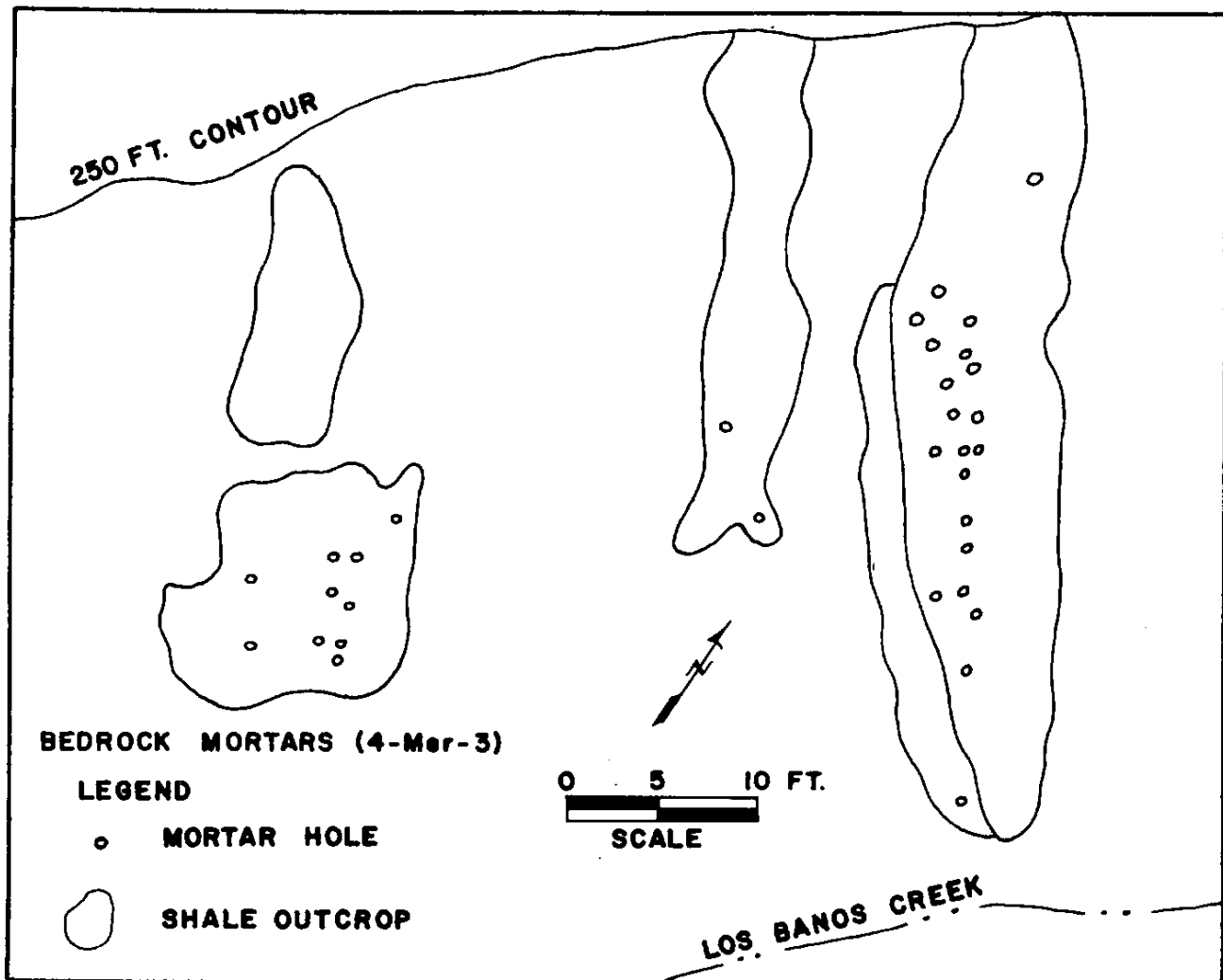


FIGURE 10



a

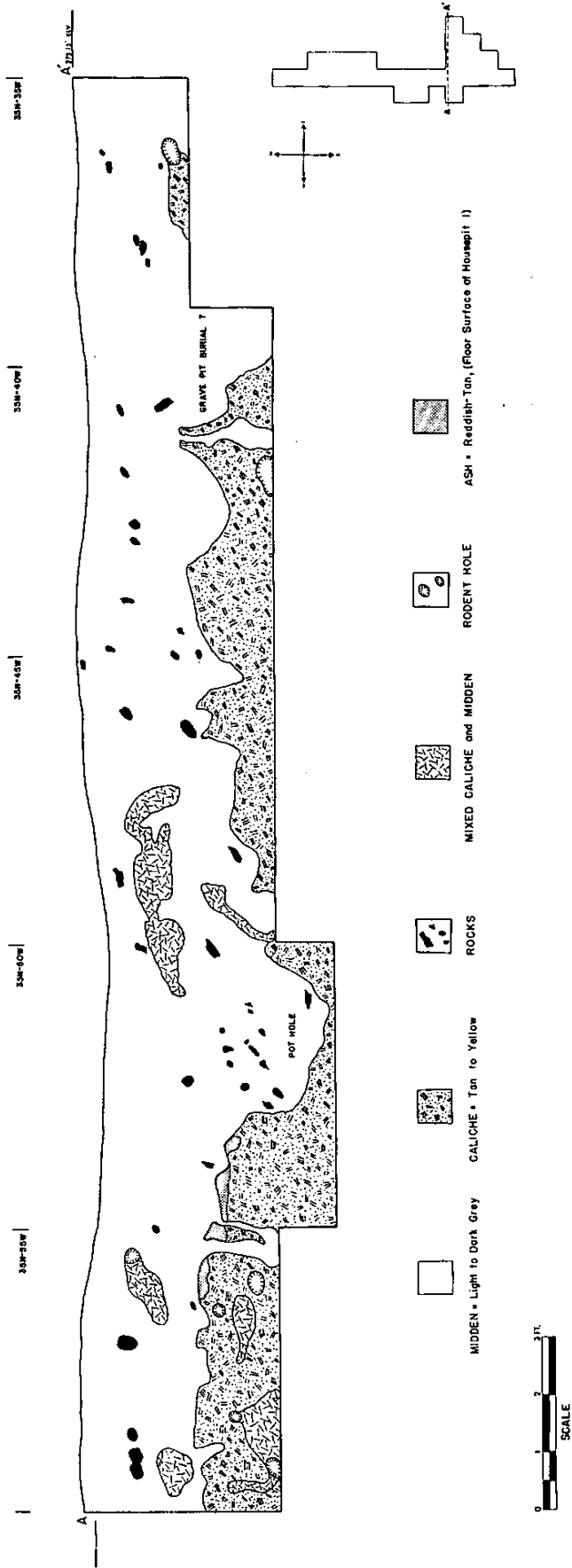


b

FIGURE II

4-Mer-3

PROFILE OF EAST-WEST TRENCH (35N)



**FIGURE 12**

**Features Associated with 4-Mer-3.**

- a)* Rock circle on south side of sandstone outcrop.
- b)* Sandstone outcrop on west side of site with rock circle in foreground.
- c)* Petroglyph on west side of site.
- d)* Bedrock mortars on outcrop south of 4-Mer-3.

FIGURE 12



b



d



a



c

**FIGURE 13**

**Special Techniques Used at 4-Mer-3.**

- a)* Use of backhoe on Housepit 10.
- b)* Sweeping mud floor of Housepit 3, note rectangular depression in floor.
- c)* Taking profiles of east rim of Housepit 2.
- d)* Slide screen operation at 4-Mer-3.



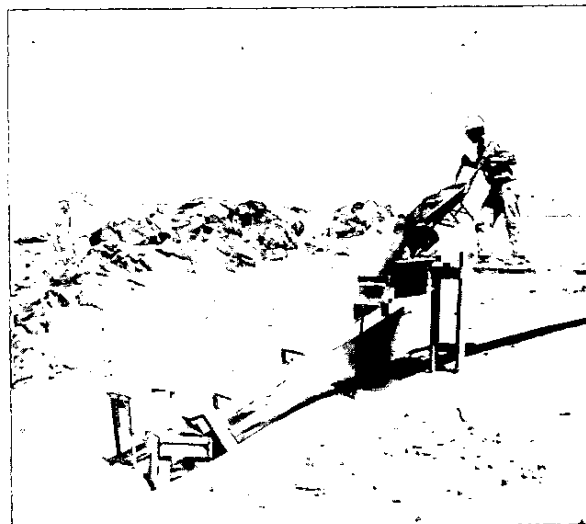
a



b



c



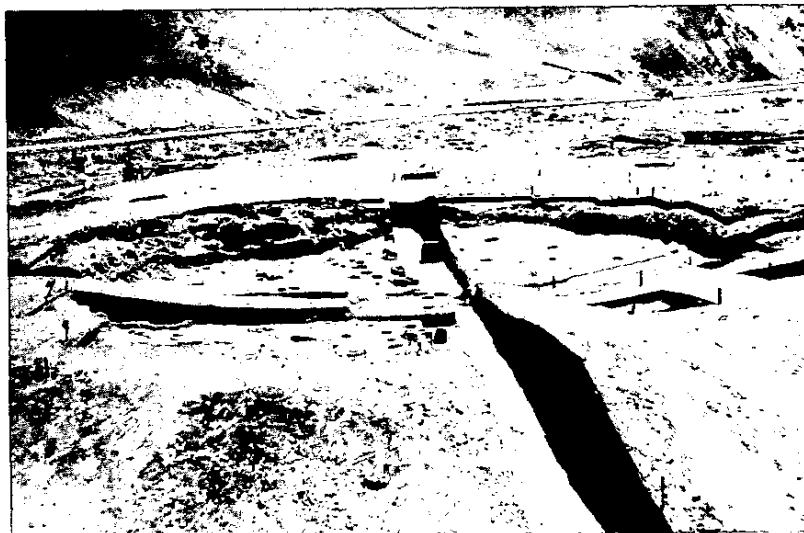
d



**FIGURE 14**

**Housepits at 4-Mer-3.**

- a)* Housepit 2, looking south, Trench A in foreground.
- b)* Housepit 3, looking east, note gravepit of Burial 55 in background, and seven post holes.



a



b

**FIGURE 15**

**Housepits at 4-Mer-3.**

- a)* Housepit 10, looking east; note six post holes, and portion of upper floor surface in right rear.
- b)* Housepit 11, looking north, note five post holes, and square-cut unit around canine burial (Burial 50).



a



b

**FIGURE 16**

**Features in Midden and Housepits 2 and 10 at 4-Mer-3.**

- a)* Midden trench, looking north.
- b)* Feature 4, Housepit 10, note pestle on left and inverted mortar fragment on right.
- c)* Housepit 10, note Burial 20 in west rim.
- d)* Housepit 2, looking south, initial trench over south rim, note mud wall emerging.
- e)* Housepit 2, layered mud wall, south rim.
- f)* Housepit 2, post hole pattern on north rim, two smaller holes slanted in supporting position to the larger hole.

FIGURE 16



c



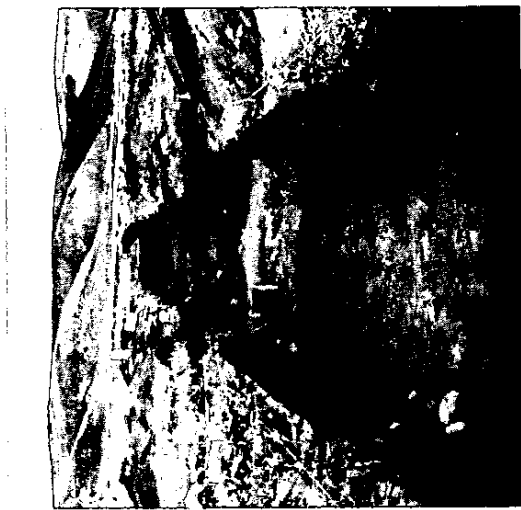
f



b



e



a

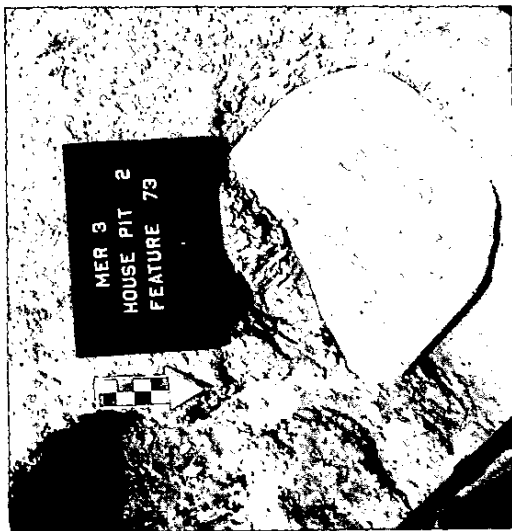


d

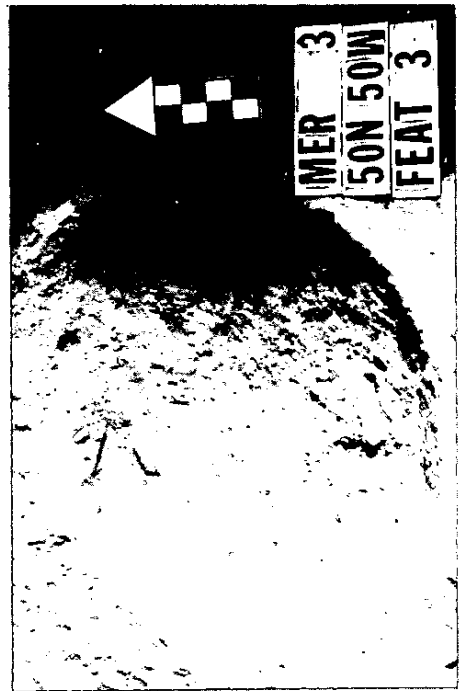
**FIGURE 17**

**Features and Clay-Lined Pits at 4-Mer-3.**

- a)* Feature 24, metate beneath floor of Housepit 2.
- b)* Feature 25, reed impressions in floor of Housepit 2.
- c)* Feature 26, rock concentration, Housepit 2.
- d)* Feature 20, clay-lined pit, 45N-55W, 30 in.
- e)* Feature 23, clay-lined pit, 35N-40W, 28 in.
- f)* Feature 21, clay-lined pit, 45N-50W, 25 in.



c



b



e

a



d

f

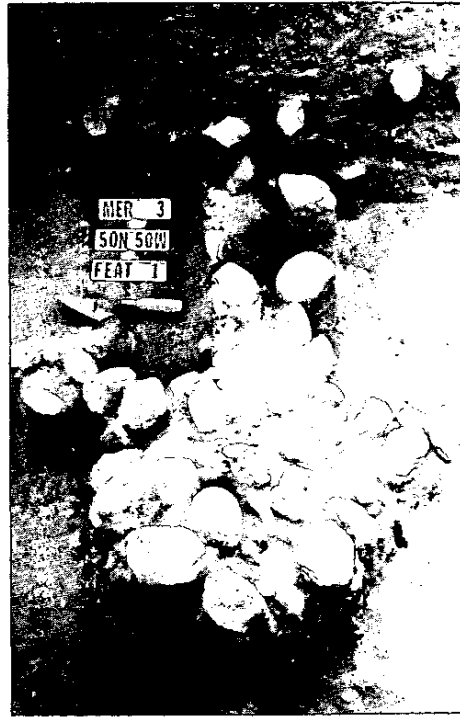
FIGURE 17



**FIGURE 18**

**Rock Concentrations at 4-Mer-3.**

- a)* Feature 15, 50N-50W, 18 in.
- b)* Feature 17, 45N-50W, 14 in.
- c)* Feature 14, 45N-50W, 6-12 in.



a



b



c

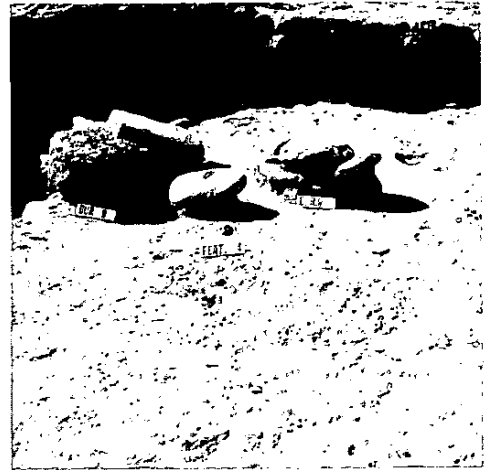
**FIGURE 19**

**Cairns and Features Associated with Burials at 4-Mer-3.**

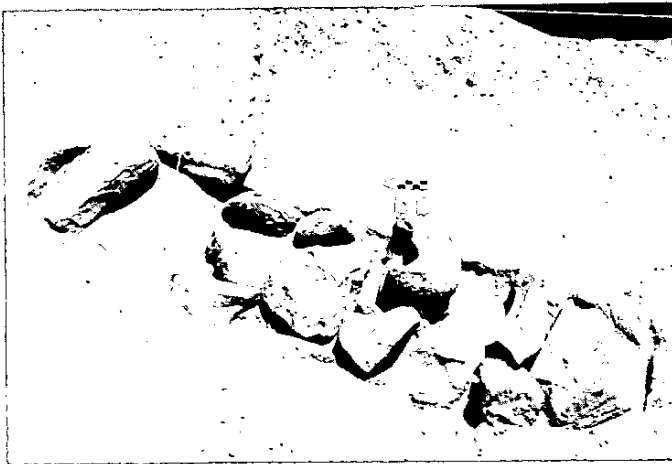
- a) Feature 8, rock cairn for Burial 25.
- b) Features 28 and 27, rock cairns for Burials 8 and 9 respectively, cremations in Housepit 2.
- c) Feature 2, rock cairn for Burial 2.
- d) Bead pattern, Oval *Olivella* beads, Burial 2.
- e) Feature 4, mortar and pestle over skull of Burial 31.
- f) Canine burial with rock cairn in Housepit 11, Burial 50.



a



b



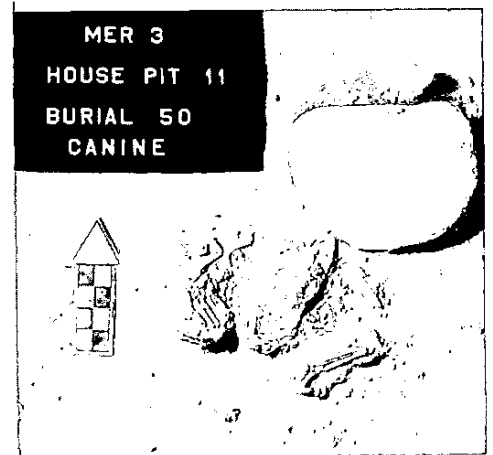
c



d



e

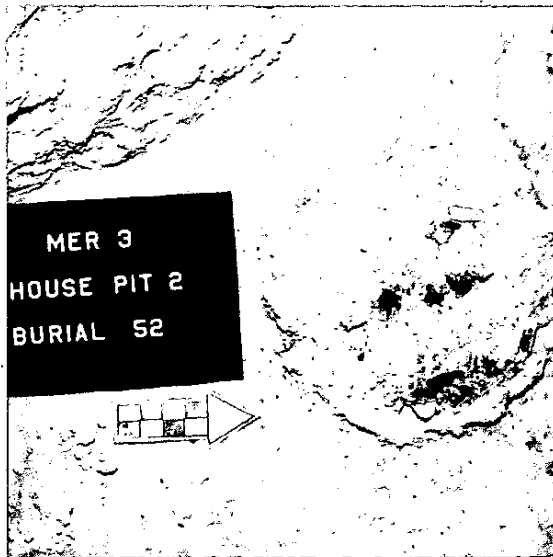


f

**FIGURE 20**

**Cremated Burials in Housepit 2 at 4-Mer-3.**

- a)* Burial 52, note carbonized basketry fragments.
- b)* Burial 9, note association above floor surface.
- c)* Burial 13, large bone awl associated.
- d)* Burial 49, note association into floor surface.
- e)* Burial 17, large steatite ring associated.
- f)* Burial 10, steatite pipe associated.



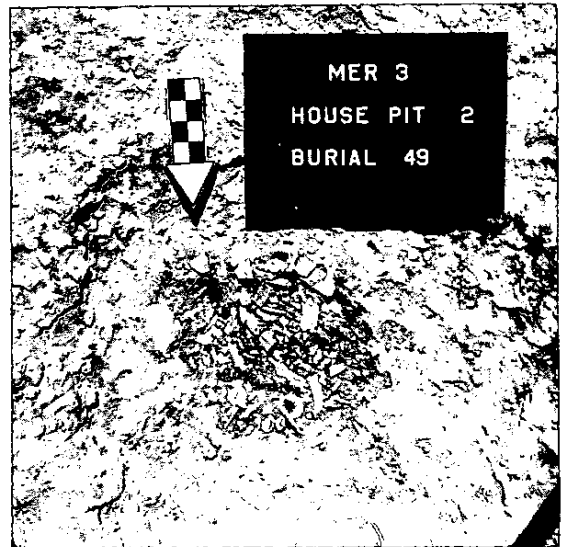
a



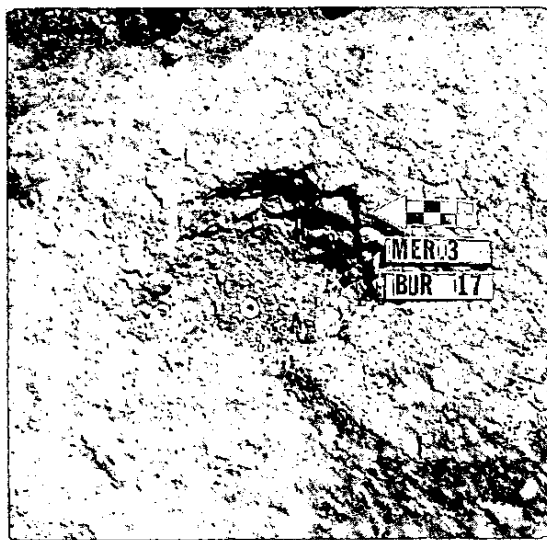
b



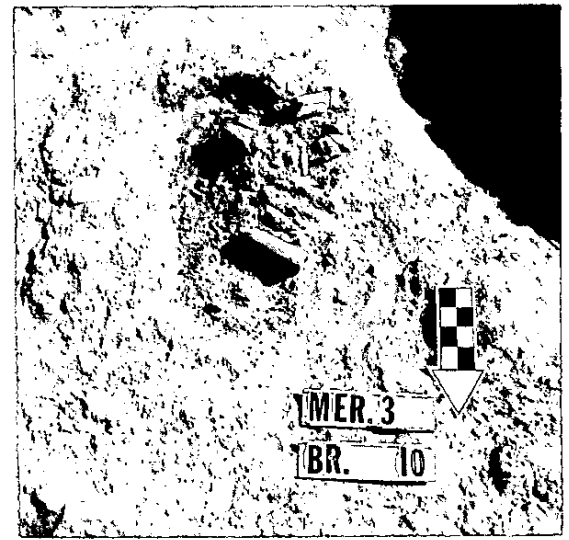
c



d



e



f

**FIGURE 21**

**Burials at 4-Mer-3.**

- a)* Burial 28, closeup of *Haliotis* shell ornaments.
- b)* Burial 20, associated with Housepit 10.
- c)* Burial 28, note extended position.
- d)* Burial 29, note semiflexed position.
- e)* Burial 55, associated with Housepit 3.

FIGURE 21



a



b



c



d



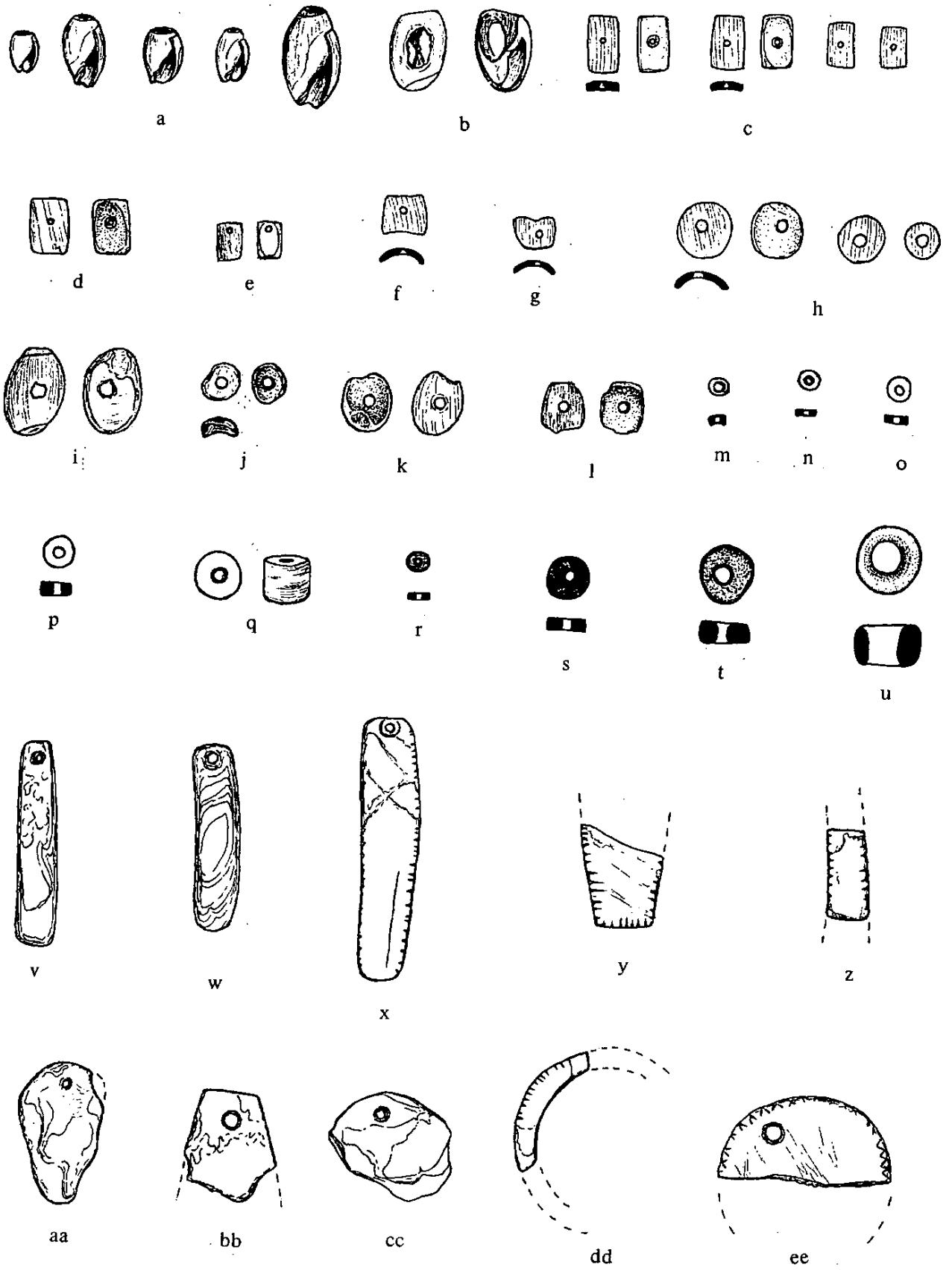
e



## FIGURE 22

### Shell and Stone Beads and Ornaments at 4-Mer-3 (Actual Size).

- a) Large and small Spire-topped *Olivella* beads, Type 1a and 1b, Burial 55.
- b) Applique *Olivella* bead, Housepit 2.
- c) Thin Rectangular *Olivella* bead, Type 2a1, Burial 44.
- d) Large Thin Rectangular *Olivella* bead, Type 2a1, Housepit 2.
- e) Thin Rectangular, end-perforated *Olivella* bead, Type 2a2, Housepit 2.
- f) Variant of Thin Rectangular *Olivella* bead, Type 2a1, Housepit 2.
- g) Variant of Thin Rectangular *Olivella* bead, Type 2a1, Housepit 2.
- h) Oval *Olivella* bead, Burial 2.
- i) Split and punched *Olivella* bead, Type 3a2, Housepit 2.
- j) Thick-lipped *Olivella* Bead, Type 3a1, Burial 21.
- k) Modified Saddle *Olivella* bead, Type 3b2, Housepit 2.
- l) Amorphous *Olivella* bead, Burial 41.
- m) Small thick Cupped *Olivella* bead, Type 3e, Burial 14.
- n) Small thin Disc *Olivella* bead, Type 3d, Burial 30.
- o) Thin disc *Haliotis* epidermis or callus bead, Housepit 2.
- p) Calmshell disc bead, *Saxidomus* sp., Burial 13.
- q) Thick cylinder *Tivela* bead, Type VIa1, Burial 8.
- r) Steatite disc bead, Housepit 2.
- s) Steatite disc bead, 6-12 in.
- t) Steatite disc bead, Housepit 2.
- u) Steatite ring, 12-18 in.
- v) *Haliotis* ornament, Type Z2aIII (W-31-3141), Housepit 11.
- w) *Haliotis* ornament, Type Z2aIII (W-31-3126), Housepit 11.
- x) *Haliotis* ornament, Type Z2aII (W-31-3127), Housepit 11.
- y) *Haliotis* ornament fragment with edge incising (W-31-3148), Housepit 11.
- z) *Haliotis* ornament, Type Z2aII (W-31-2257), Housepit 11.
- aa) *Haliotis rufescens* ornament, Type Pla (W-31-1778), Housepit 2.
- bb) *Haliotis rufescens* ornament, Type Q1aIV (W-31-3347), Burial 48.
- cc) *Haliotis* ornament fragment (W-31-1214), Housepit 2.
- dd) *Haliotis cracherodii* ornament, Type J2bII (W-31-723), 30-36 in.
- ee) *Haliotis rufescens* ornament, Type K2bII (W-31-3147), Housepit 11.

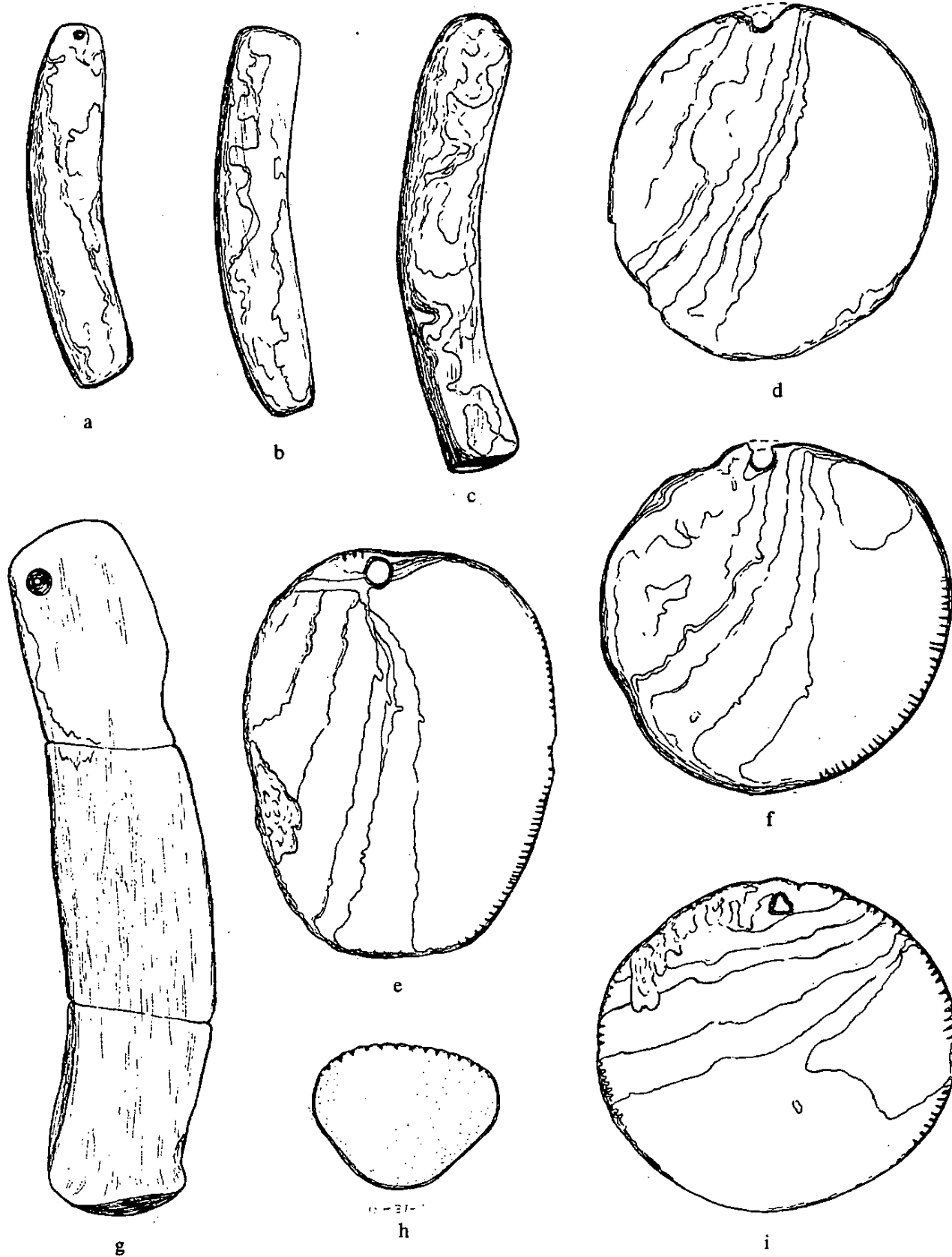


## FIGURE 23

### Shell ornaments at 4-Mer-3 (Actual Size).

- a) *Haliotis rufescens* ornament, Type AP2aII (W-31-1817), Burial 13.
- b) *Haliotis* ornament, Type AP1b (W-31-1818), Burial 13.
- c) *Haliotis* ornament, Type AP1b (W-31-3348), Burial 48.
- d) *Haliotis rufescens* ornament, Type K2bII (W-31-1902), Burial 28.
- e) *Haliotis rufescens* ornament, Type K2bII (W-31-1900), Burial 28.
- f) *Haliotis rufescens* ornament, Type K2bII (W-31-1901), Burial 28.
- g) *Haliotis Rufescens* ornament, Type Q1aIII (W-31-1819), Burial 13.
- h) *Haliotis cracherodii* ornament, Type A2aI (2-31-2148), 0-6 in.
- i) *Haliotis rufescens* ornament, Type K2bII (W-31-1903), Burial 28.

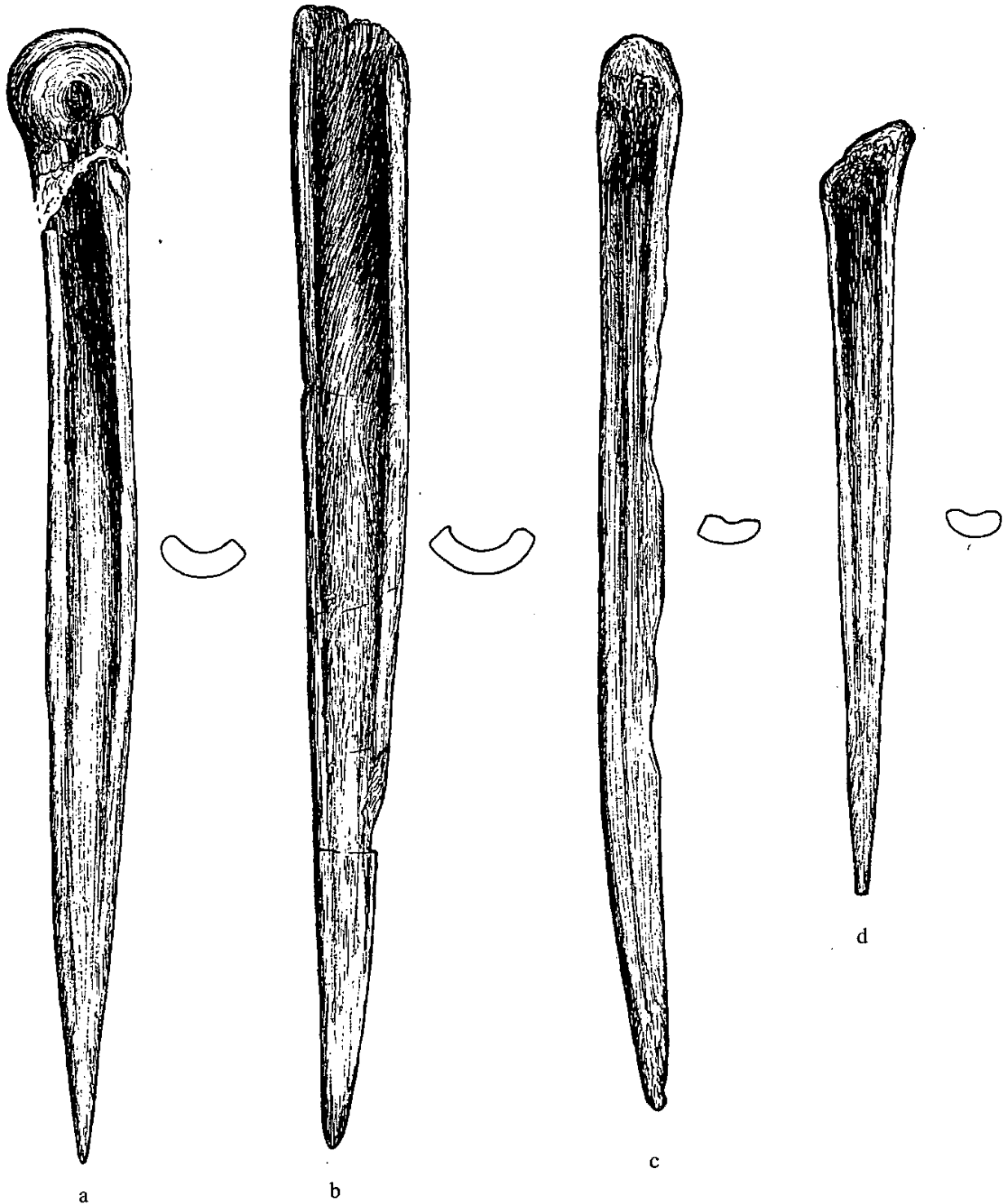
FIGURE 23



**FIGURE 24**

**Bone Awls from 4-Mer-3 (Actual Size).**

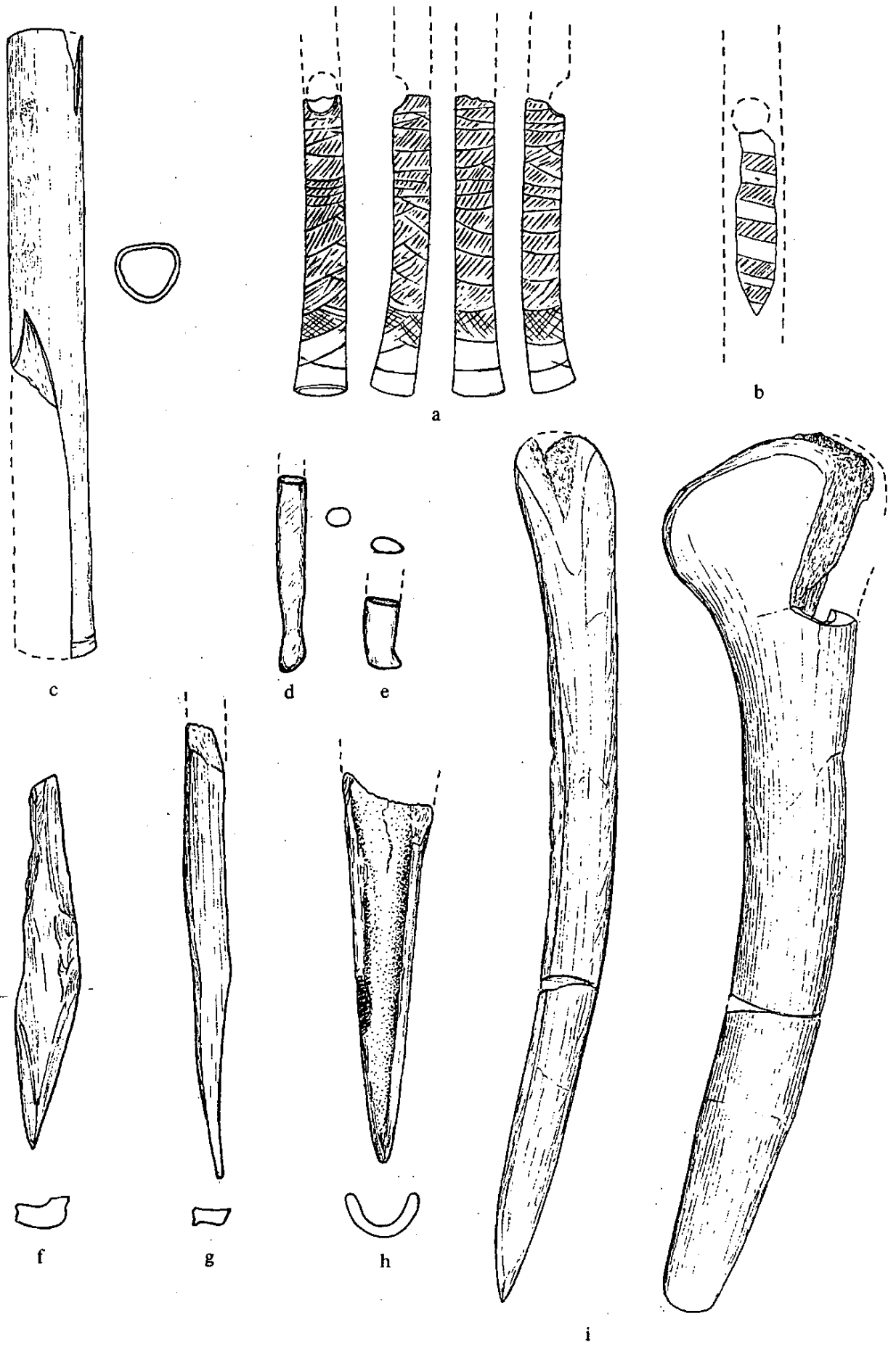
- a)* Bone awl, Type A 1cI (W-31-1862), Burial 13.
- b)* Bone awl, Type A 1eI (W-31-1860), Burial 13.
- c)* Bone awl, Type A 1eI (W-31-1863), Burial 11.
- d)* Bone awl, Type A 1eI (W-31-1861), Burial 13.



**FIGURE 25**

**Bone and Antler Artifacts from 4-Mer-3 (Actual Size).**

- a)* Bird tibia whistle fragment, Incised Pattern 5 (W-31-3388), Housepit 2.
- b)* Bone whistle fragment, Incised Pattern 3 (W-31-3494), Housepit 2.
- c)* Bird ulna tube fragment (W-31-1961), 12-18 in.
- d)* Bone fishtail object (W-31-3830), Burial 49.
- e)* Bone fishtail object (W-31-1871), 0-6 in.
- f)* Bone awl, Type A1e (W-31-111), surface.
- g)* Bone awl, Type A1eI (W-31-3502), Housepit 3.
- h)* Bone awl, Type A1eII (W-31-776), 12-18 in.
- i)* Antler wedge (W-31-3861), Burial 36.



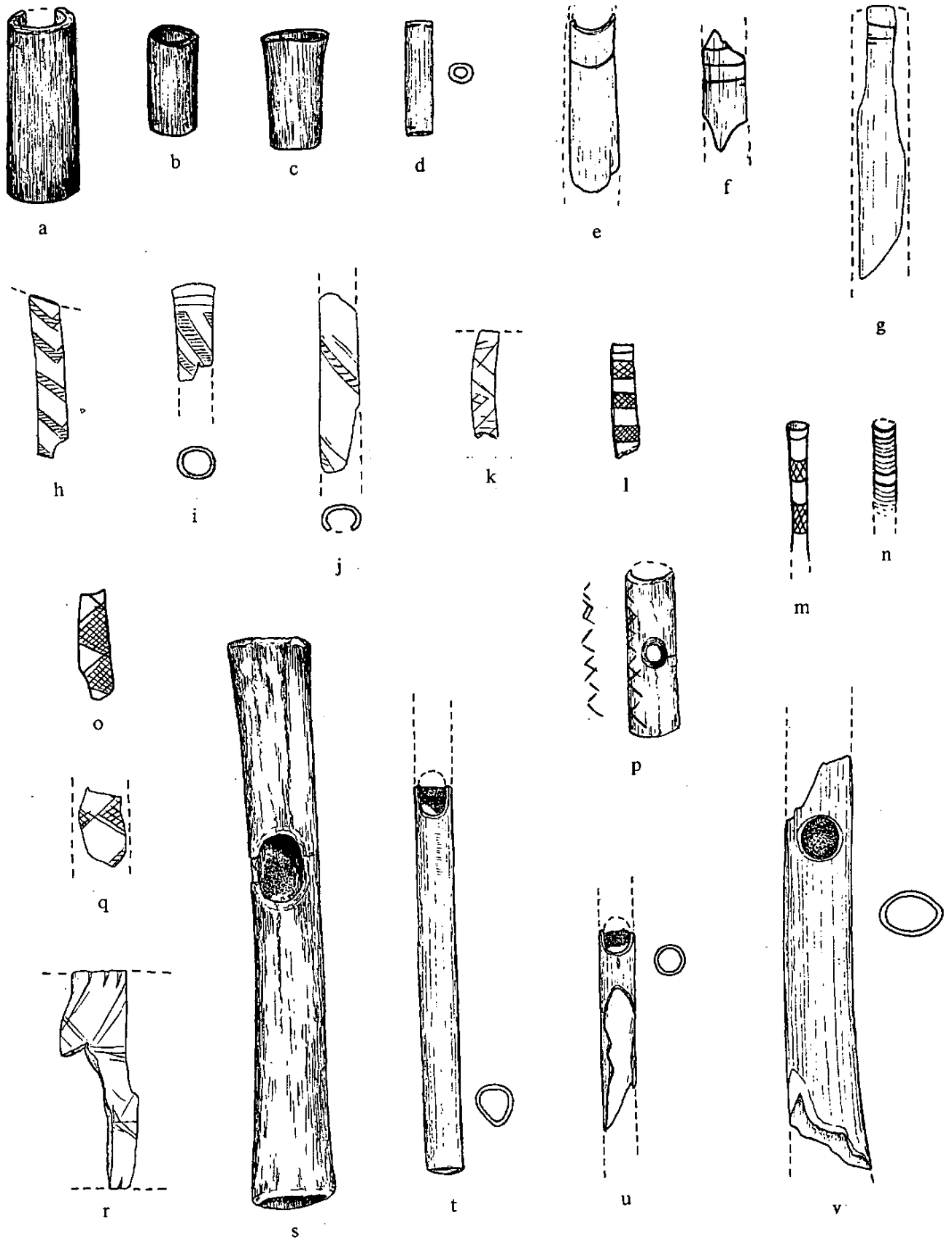


## FIGURE 26

### Bone Artifacts from 4-Mer-3 (Actual Size).

- a) Bone bead fragment (W-31-1942), 6-12 in.
- b) Bone bead (W-31-1409), Housepit 2.
- c) Bone bead (W-31-3609), Housepit 2.
- d) Bone bead (W-31-2160), 12-18 in.
- e) Incised tube, Pattern 1 (W-31-3376), Housepit 2.
- f) Incised tube, Pattern 1 (W-31-1542), Housepit 2.
- g) Incised tube, Pattern 1 (W-31-3495), Housepit 2.
- h) Incised tube, Pattern 3 (W-31-1850), Burial 19.
- i) Incised tube, Pattern 3 (W-31-1403), Housepit 2.
- j) Incised tube, Pattern 3 (W-31-3889), Housepit 2.
- k) Incised tube, Pattern 3 (W-31-3800), Housepit 2.
- l) Incised tube, Pattern 4 (W-31-1428), Housepit 2.
- m) Incised tube, Pattern 4 (W-31-3855), Burial 43.
- n) Incised tube, Pattern 4 (W-31-3855), Burial 43.
- o) Incised tube, Pattern 2 (W-31-1461), Housepit 2.
- p) Bone whistle, Incised Pattern 5 (W-31-1448), Housepit 2.
- q) Incised tube, Pattern 2 (W-31-1467), Housepit 2.
- r) Incised tube, Pattern 5 (W-31-1854), Housepit 10.
- s) Ulna whistle, *Lynx rufus* (W-31-1884), Burial 11.
- t) Bird tibia whistle (W-31-3834), Burial 56.
- u) Bird tibia whistle (W-31-1608), Housepit 2.
- v) Bird tibia whistle (W-31-3344), Housepit 3.

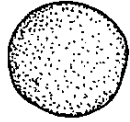
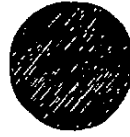
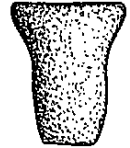
FIGURE 26



**FIGURE 27**

**Ground Stone Artifacts from 4-Mer-3 (Actual Size).**

- a) Steatite earplug, spool type (W-31-1500) associated with *Haliotis* ornament (W-31-1842), Housepit 2.
- b) Steatite earplug, spool type (W-31-1167), Housepit 2.
- c) Steatite earplug, contracting stem type (W-31-3346), Burial 48.
- d) Steatite earplug, contracting stem type (W-31-3464), Housepit 2.
- e) Steatite earplug, contracting stem type (W-31-1665), Housepit 2.
- f) Steatite earplug, tapering stem type (W-31-1414), Housepit 2.
- g) Slate earplug, tapering stem type (W-31-2266), 18-24 in.
- h) Slate earplug, tapering stem type (W-31-1246), Housepit 2.
- i) Globular concretion, "Venus de Menjoulet" (W-31-3840), Burial 33.
- j) Serpentine ring (W-31-1837), Burial 17.
- k) Steatite pipe (W-31-1804), Burial 10.

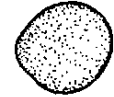
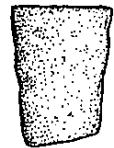
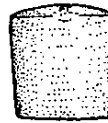


a

b

c

d

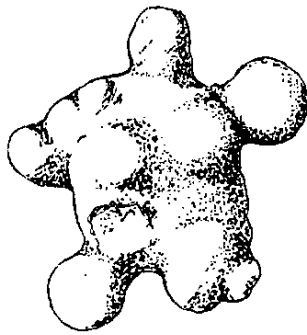


e

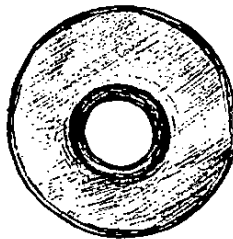
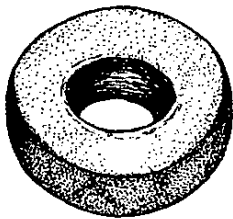
f

g

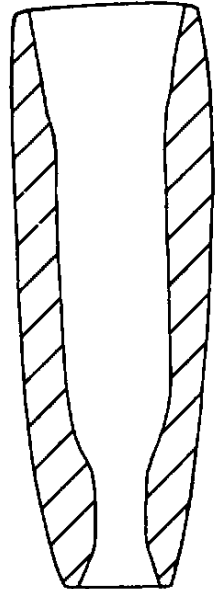
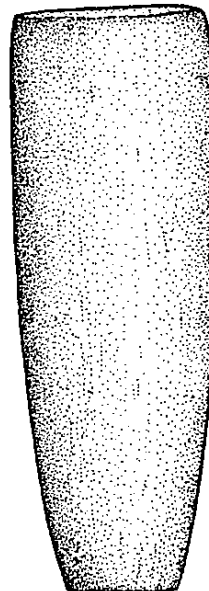
h



i



j

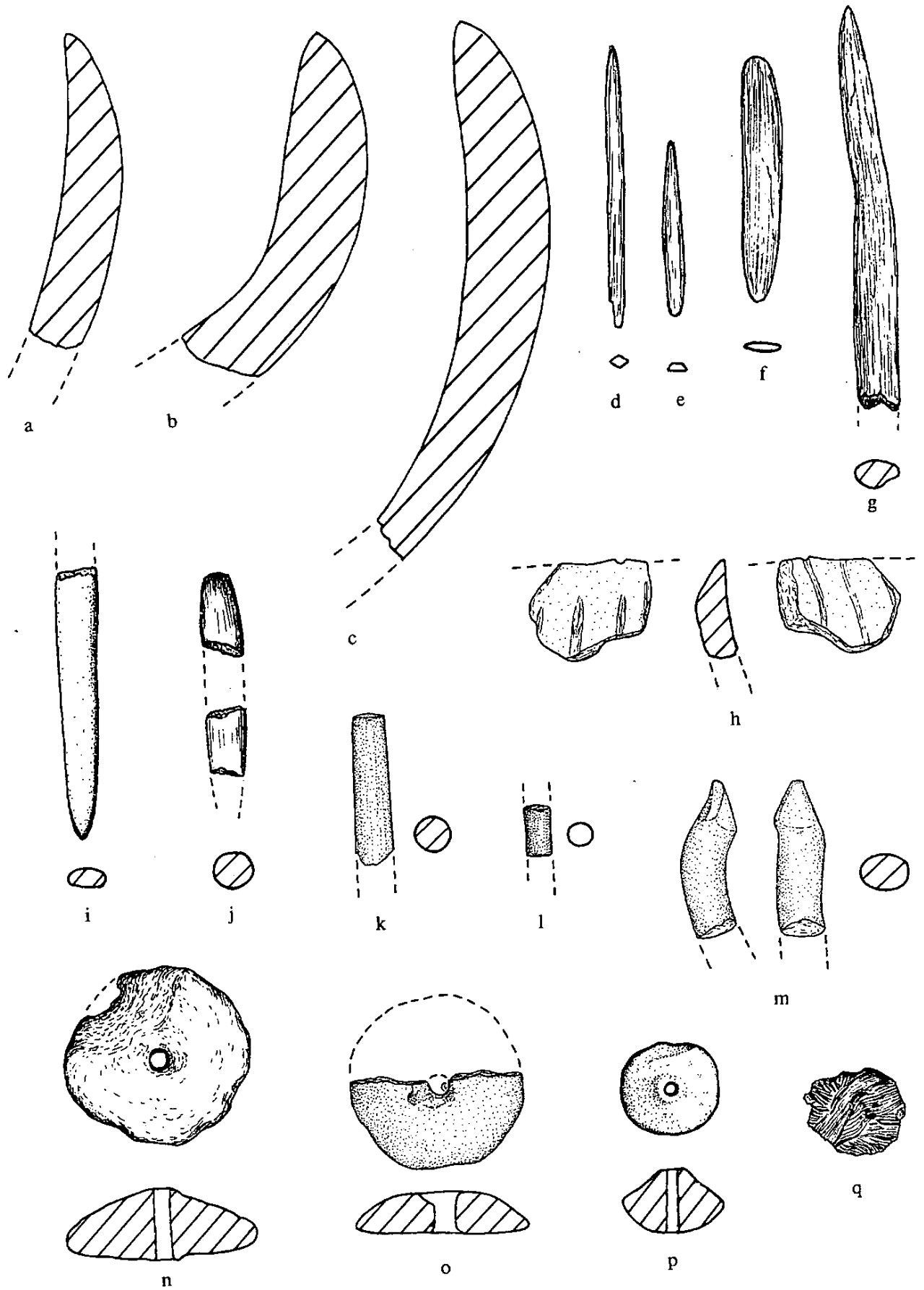


k

## FIGURE 28

### Ground Stone and Baked Clay Artifacts, 4-Mer-3 (Actual Size).

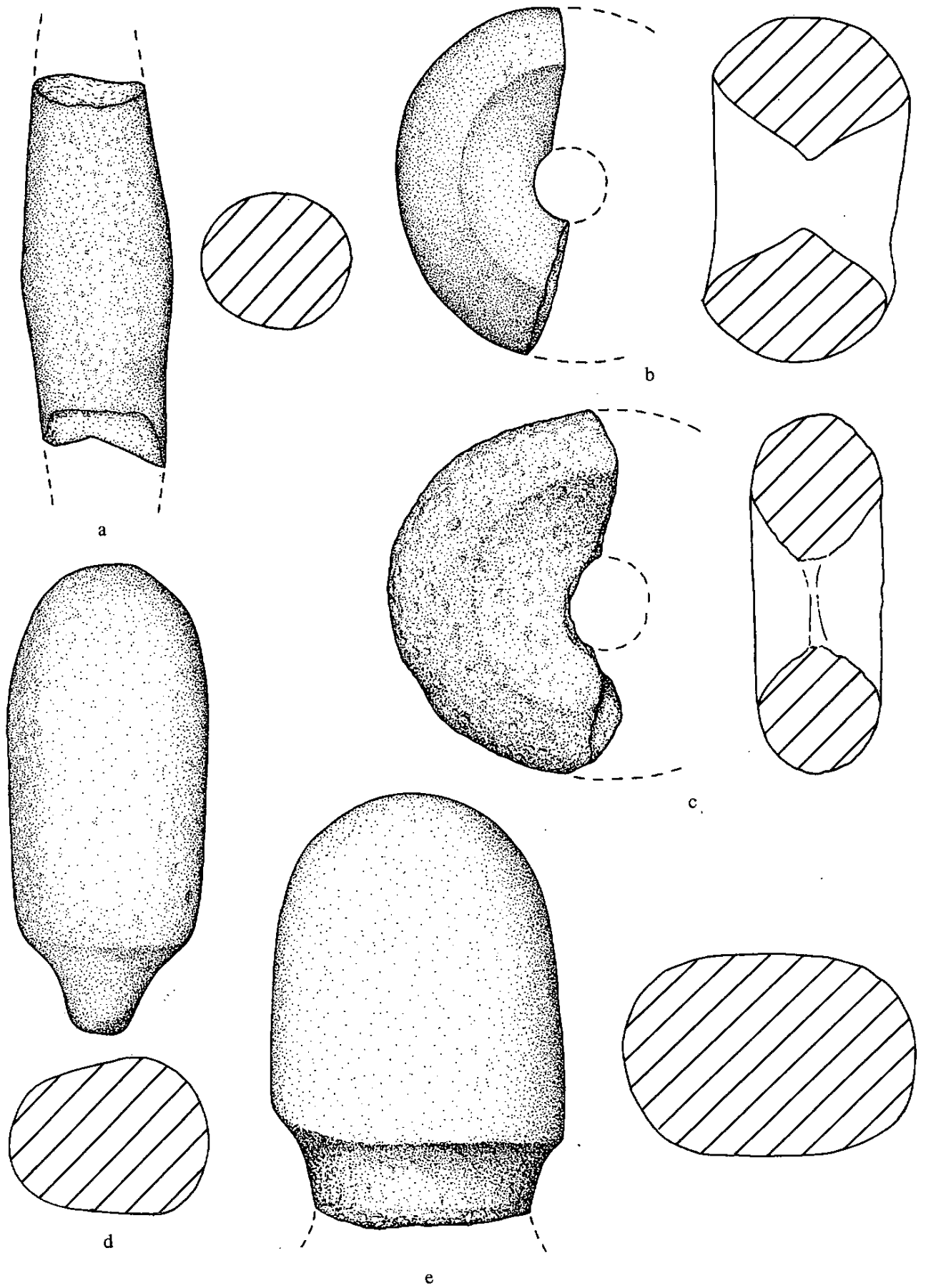
- a)* Steatite bowl fragment, cross section of rim (W-31-1700), Housepit 2.
- b)* Steatite bowl fragment, cross section of rim (W-31-2468), 50N-50W, 6-12 in.
- c)* Steatite bowl fragment, cross section of rim (W-31-1914), surface.
- d)* Actinolite rod or pin (W-31-3530), Housepit 2.
- e)* Actinolite rod or pin (W-31-3648), Housepit 2.
- f)* Actinolite rod or pin (W-31-3401), Housepit 2.
- g)* Actinolite rod or pin (W-31-3500), Housepit 3.
- h)* Baked clay vessel, rim fragment (W-31-101), 25N-45W, 18-24 in.
- i)* Ground sandstone rod or pin (W-31-3380), Burial 46.
- j)* Ground sandstone rod or pin (W-31-3338), Burial 46.
- k)* Baked clay cylinder (W-31-679), 30N-50W, 0-6 in.
- l)* Baked clay cylinder (W-31-3703), Housepit 2.
- m)* Baked clay zooform object (W-31-1993), 45N-50W, 6-12 in.
- n)* Baked clay spindle-whorl (W-31-367), 35N-45W, 12-18 in.
- o)* Baked clay spindle-whorl (W-31-777), 35N-45W, 12-18 in.
- p)* Baked clay spindle-whorl (W-31-1492), Housepit 2.
- q)* Baked clay object with reed impressions (W-31-2078), OS-45W, 12-18 in.



**FIGURE 29**

**Ground Stone Artifacts from 4-Mer-3 (Actual Size).**

- a)* Charmstone fragment, andesite (W-31-637), 5S-50W, 0-6 in.
- b)* Discoidal fragment, andesite (W-31-3471), Housepit 2.
- c)* Discoidal fragment, conglomerate (W-31-1746), Housepit 2.
- d)* Charmstone, andesite (W-31-2), surface.
- e)* Ground stone object, andesite (W-31-2822), 60N-50W, 12-18 in.



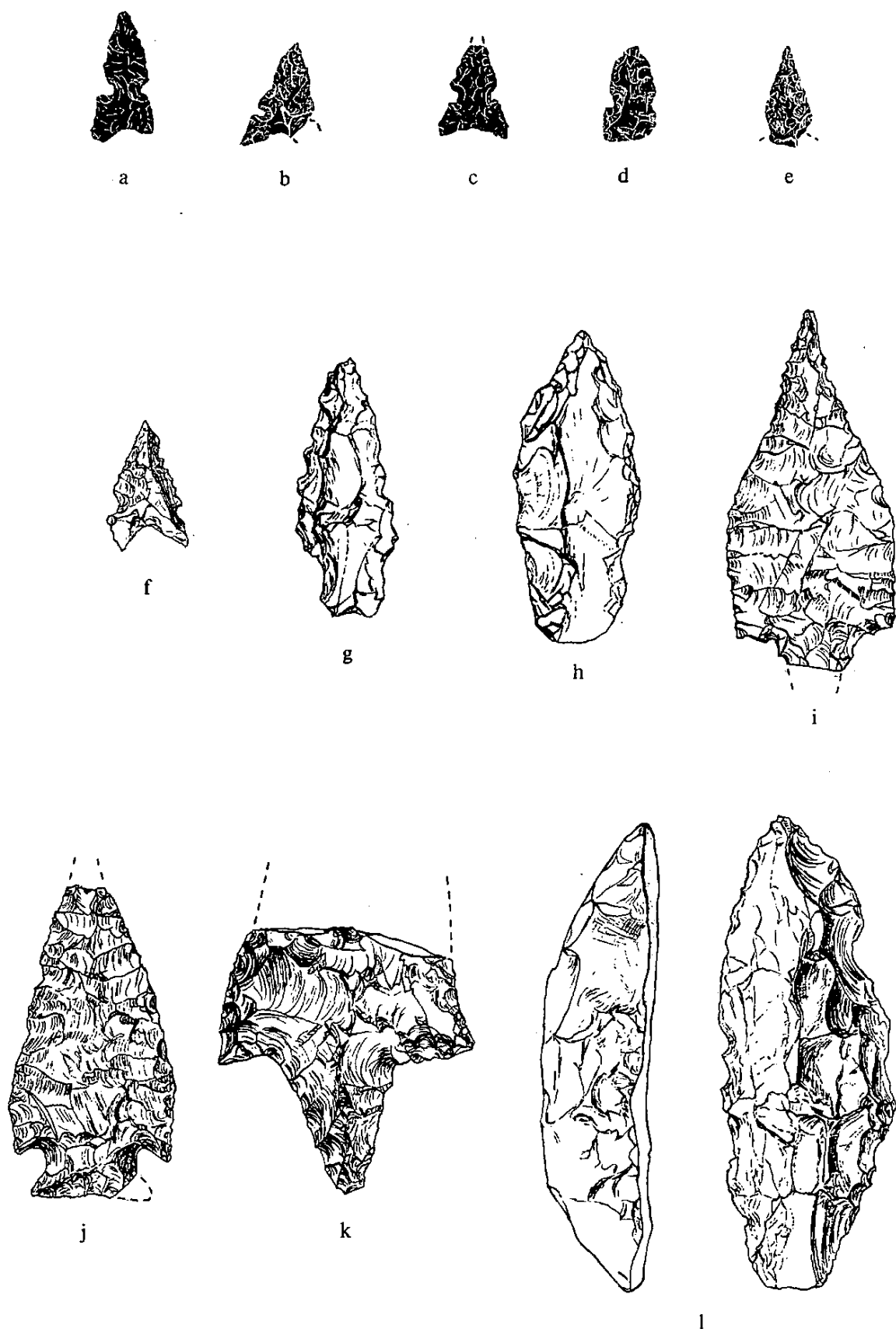


**FIGURE 30**

**Chipped Stone Projectile Points from 4-Mer-3 (Actual Size).**

- a)* Type 1a, obsidian (W-31-3812), surface.
- b)* Type 1a, obsidian (W-31-3284), Housepit 11.
- c)* Type 1a, obsidian (W-31-2373), 45N-50W, 24-30 in.
- d)* Type 1a, obsidian (W-31-1427), Housepit 2.
- e)* Type 1a, obsidian (W-31-1415), Housepit 2.
- f)* Type 1a, chalcedony (W-31-387), 35N-45W, 0-6 in.
- g)* Type 2, basalt (W-31-2127), 15N-50W, 0-6 in.
- h)* Type 3, chert (W-31-948), 5S-105W, 0-6 in.
- i)* Type 2, chert (W-31-199), Burial 1.
- j)* Type 4, chert (W-31-2754), 90N-50W, 0-6 in.
- k)* Type 2, silicate (W-31-2508), 50N-55W, 6-12 in.
- l)* Core scraper plane, chert (W-31-1762), surface.

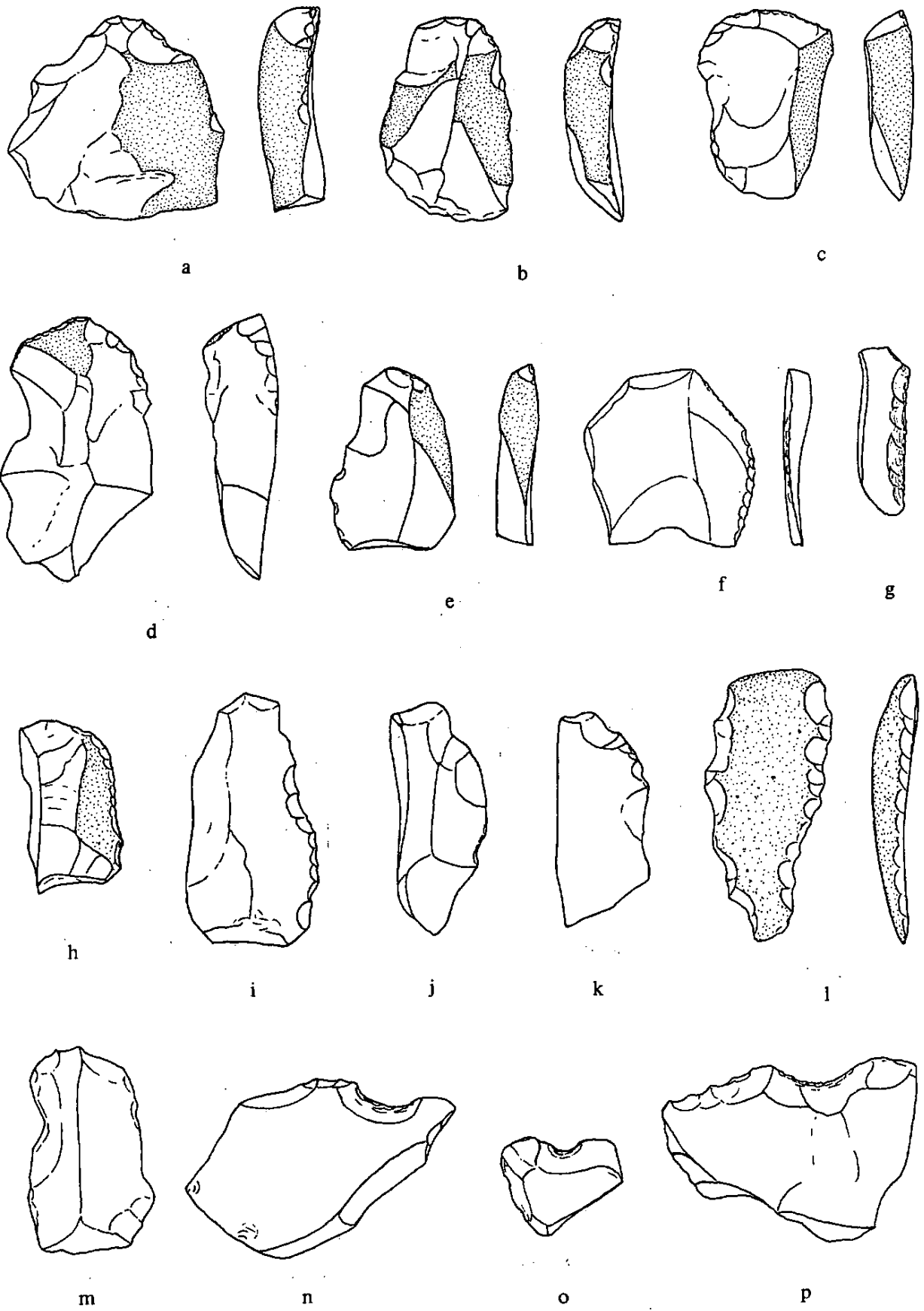
FIGURE 30



**FIGURE 31**

**Chipped Stone Scrapers from 4-Mer-3 (Actual Size).**

- a)* End scraper, quartzite (W-31-3295), Housepit 2.
- b)* End scraper, chert (W-31-1773), surface.
- c)* End scraper, chert (W-31-4119), Housepit 2.
- d)* End Scraper, chalcedony (W-31-4166), Housepit 2.
- e)* End scraper, chert (W-31-2793), 85N-50W, 0-6 in.
- f)* Small thinned flake scraper, chert (W-31-1366), Housepit 2.
- g)* Side scraper, chalcedony (W-31-1379), Housepit 2.
- h)* Side scraper, chert (W-31-1273), Housepit 2.
- i)* Side scraper, quartzite (W-31-55), 25N-45W, 0-6 in.
- j)* Side scraper, chert (W-31-3700), Housepit 2.
- k)* Side scraper, chert (W-31-2267), 20N-30W, 18-24 in.
- l)* Side scraper, basalt (W-31-1070), 120N-90W, 18-24 in.
- m)* Side scraper, chert (W-31-4120), Housepit 2.
- n)* Spokeshave, jasper (W-31-4202), Housepit 2.
- o)* Spokeshave, chert (W-31-4067), 35N-35W, 12-18 in.
- p)* Spokeshave, chert (W-31-1000), Housepit 2.

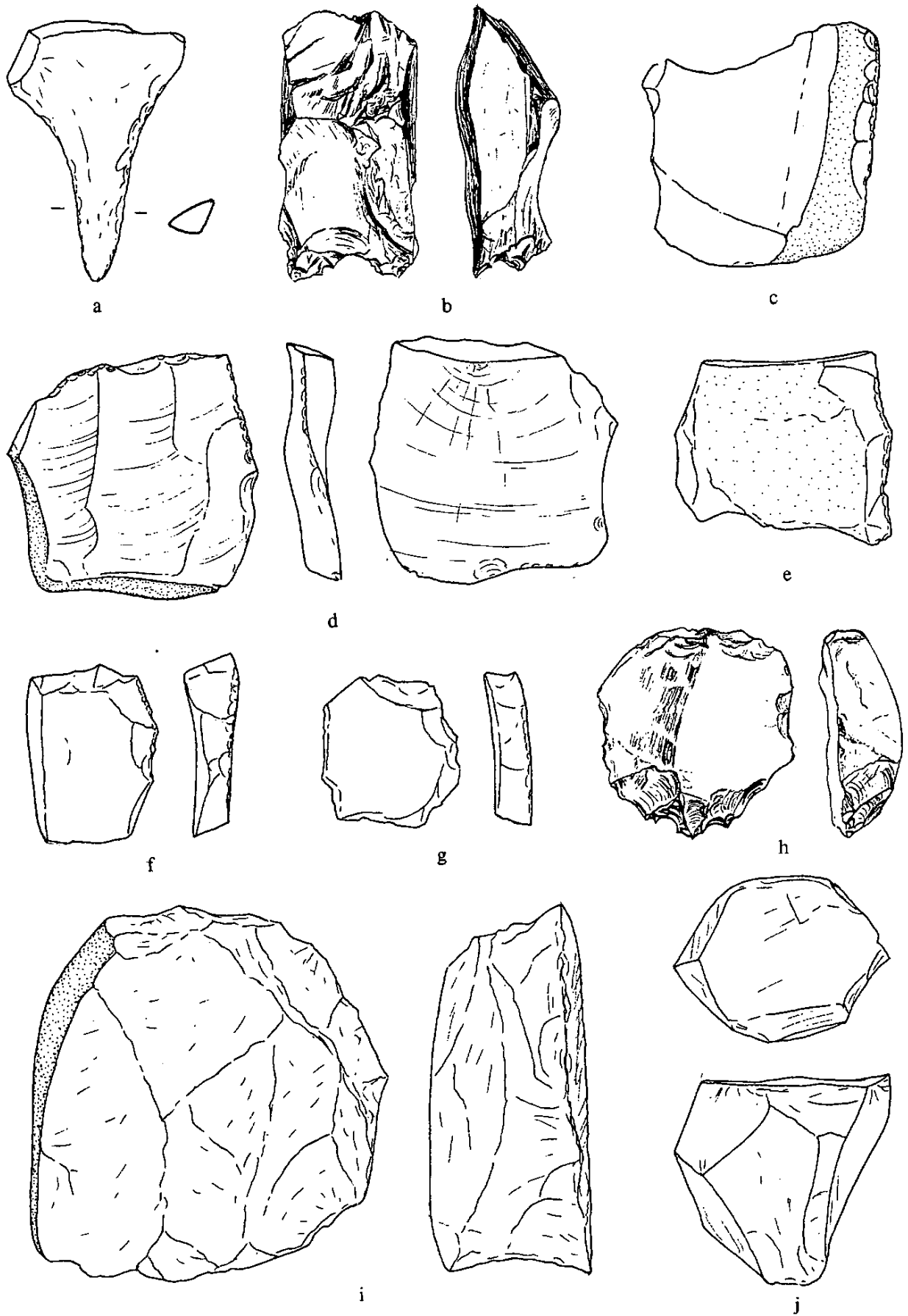


**FIGURE 32**

**Chipped Stone Artifacts from 4-Mer-3 (Actual Size).**

- a)* Perforator, basalt (W-31-2921), Housepit 2.
- b)* Graver, chert (W-31-3462), Housepit 2.
- c)* Tabular flake scraper, jasper (W-31-3507), Housepit 3.
- d)* Tabular flake scraper, jasper (W-31-281), 75N-50W, 0-6 in.
- e)* Tabular flake scraper, quartzite (W-31-413), surface.
- f)* Tabular flake scraper, chert (W-31-4161), Housepit 2.
- g)* Tabular flake scraper, chert (W-31-3718), Housepit 2.
- h)* Turtleback flake scraper, chert (W-31-1907), 45N-55W, 6-12 in.
- i)* Core scraper plane, basalt (W-31-3619), Housepit 2.
- j)* Prepared core, chalcedony (W-31-883), Burial 2.

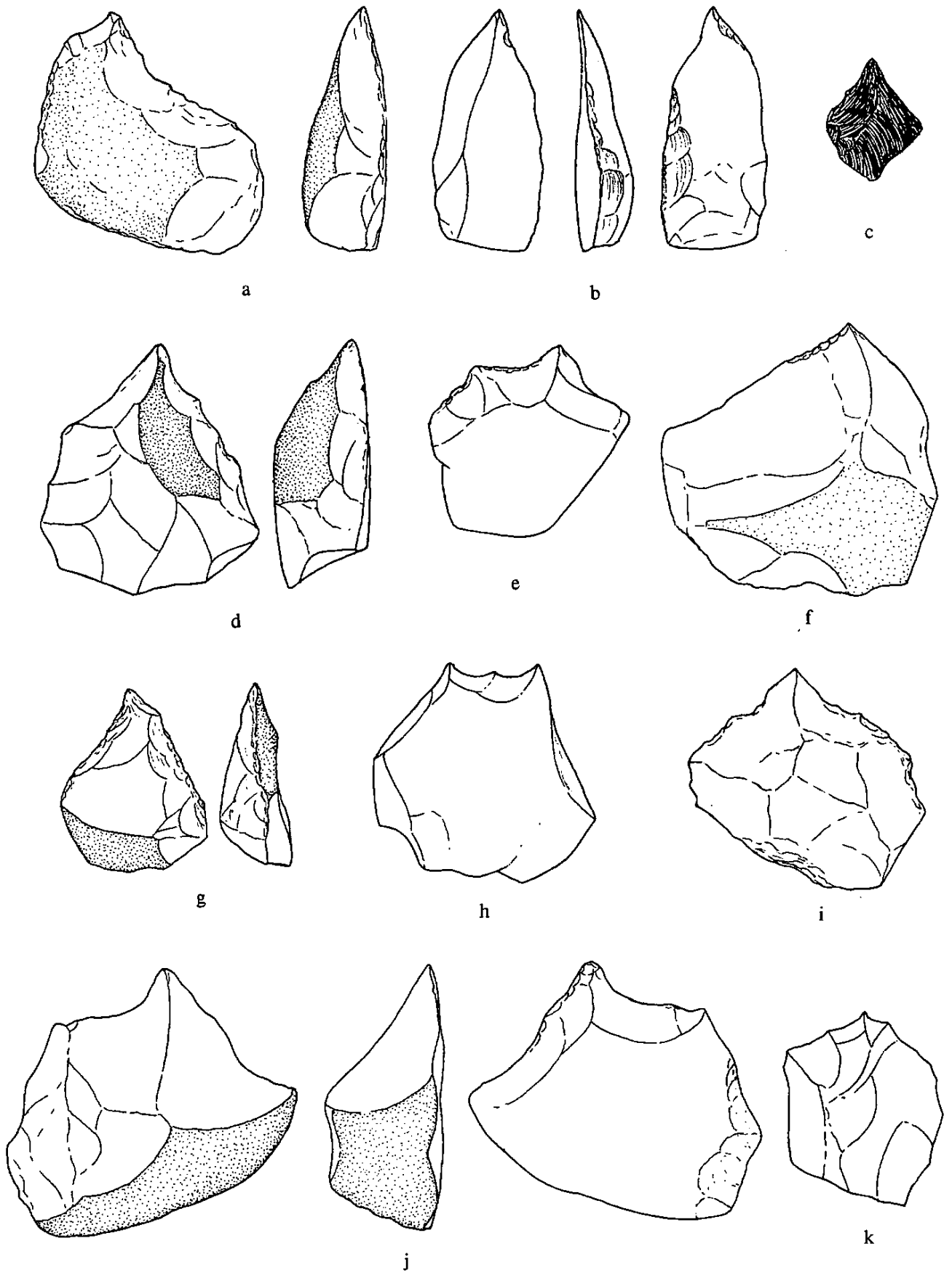
FIGURE 32



**FIGURE 33**

**Chipped Stone Artifacts from 4-Mer-3 (Actual Size).**

- a)* Reamer, chert (W-31-4075), 75N-0W, 12-18 in.
- b)* Perforator, chert (W-31-4124), 5N-45W, 0-6 in.
- c)* Perforator, obsidian (W-31-4039), 60N-50W, 0-6 in.
- d)* Reamer, chert (W-31-4218), 75N-50W, 0-6 in.
- e)* Graver, chalcedony (W-31-2818), 60N-50W, 12-18 in.
- f)* Reamer, chert (W-31-2926), 125N-15E, 0-6 in.
- g)* Reamer, chalcedony (W-31-730), 240N-50W, 0-6 in.
- h)* Reamer, jasper (W-31-1689), Housepit 2.
- i)* Graver, basalt (W-31-4073), 125N-10W, 6-12 in.
- j)* Graver, chert (W-31-2908), 125N-10W, 6-12 in.
- k)* Reamer, quartzite (W-31-1449), Housepit 2.

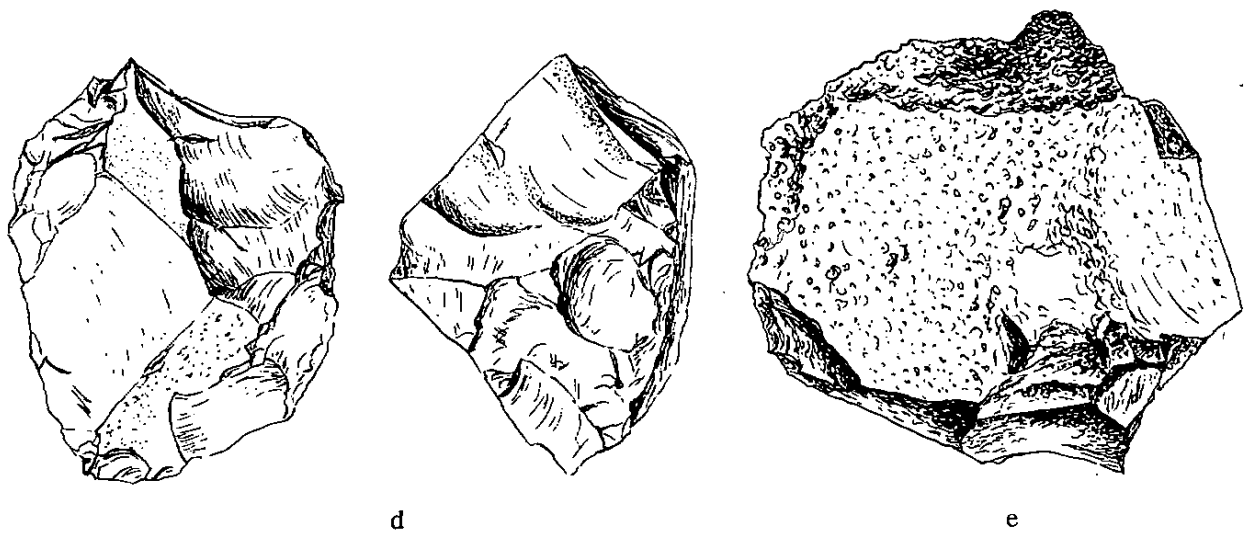
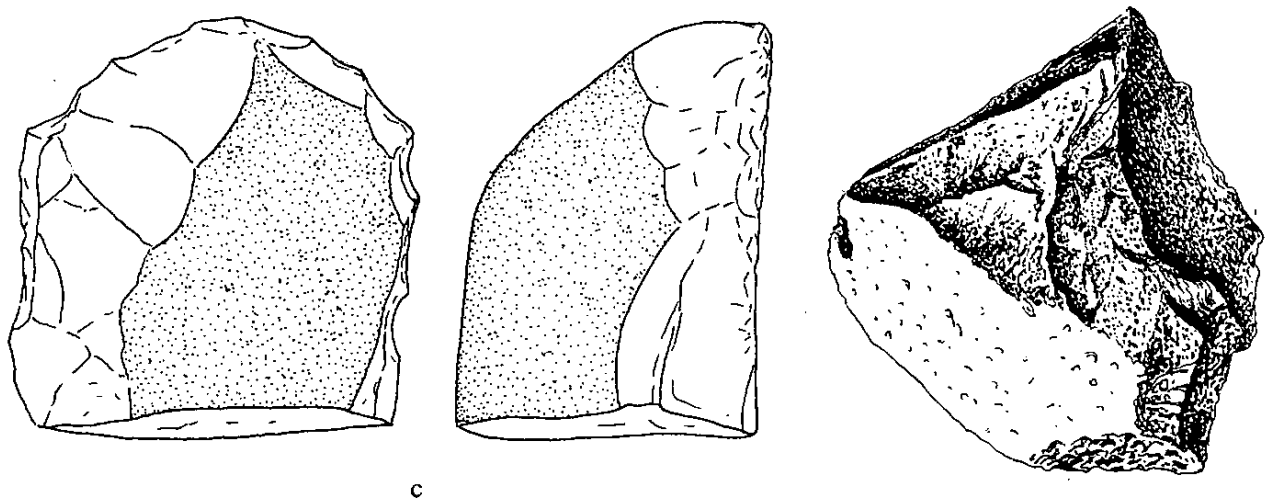
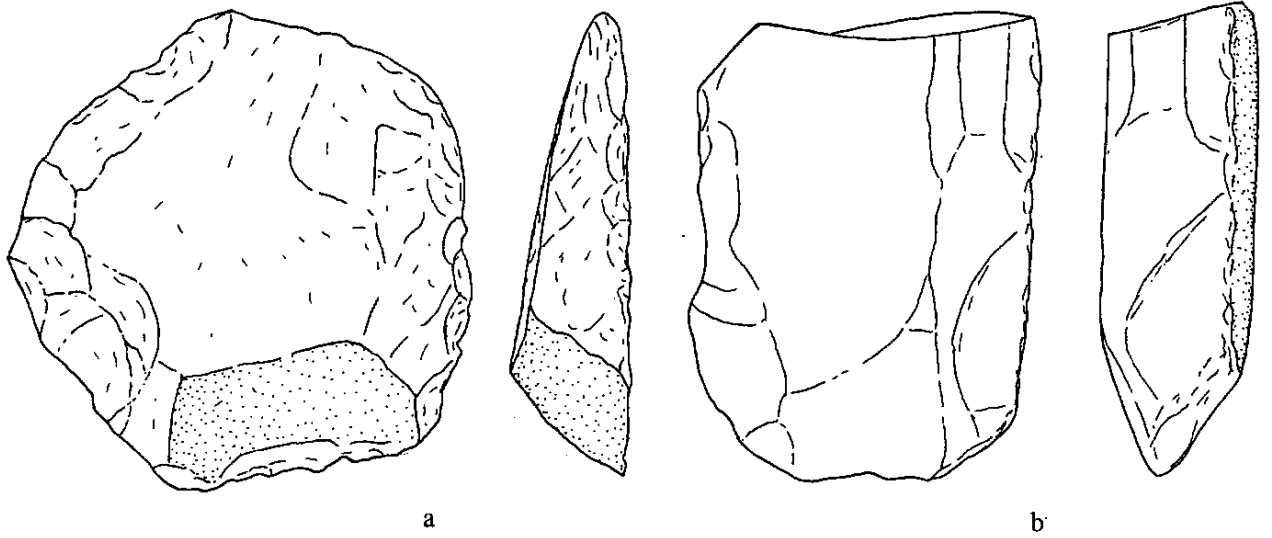




**FIGURE 34**

**Chipped Stone Artifacts from 4-Mer-3 (Actual Size).**

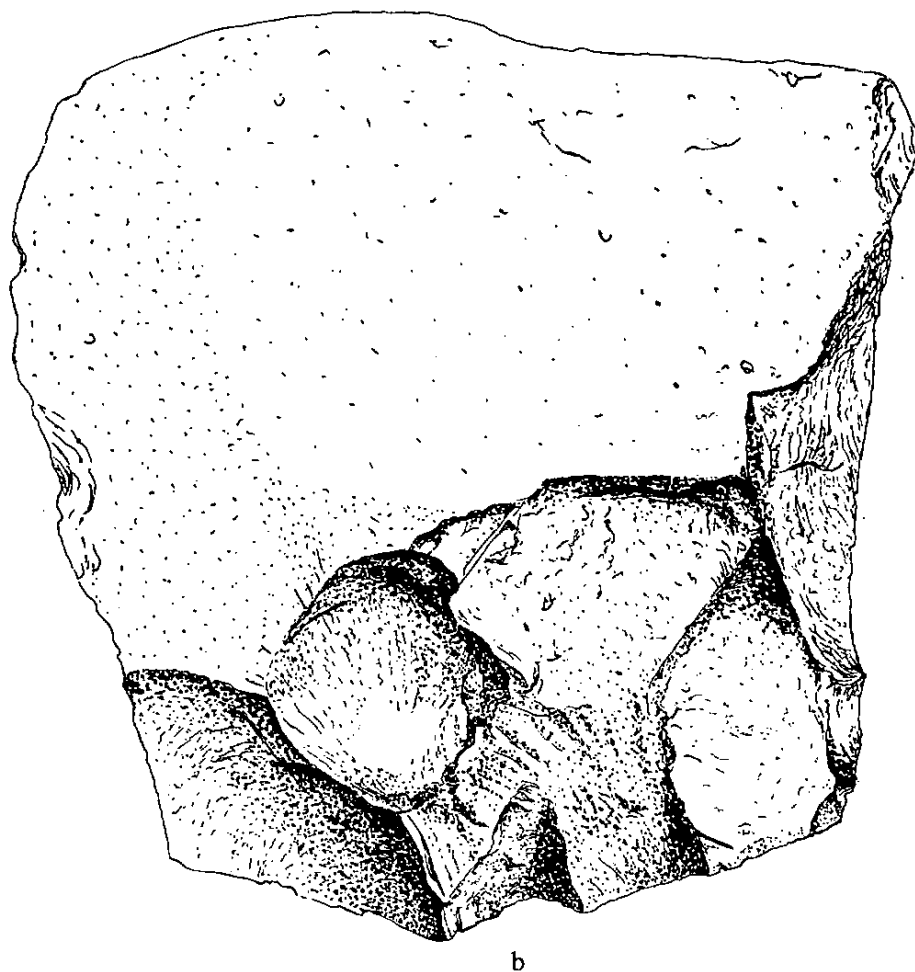
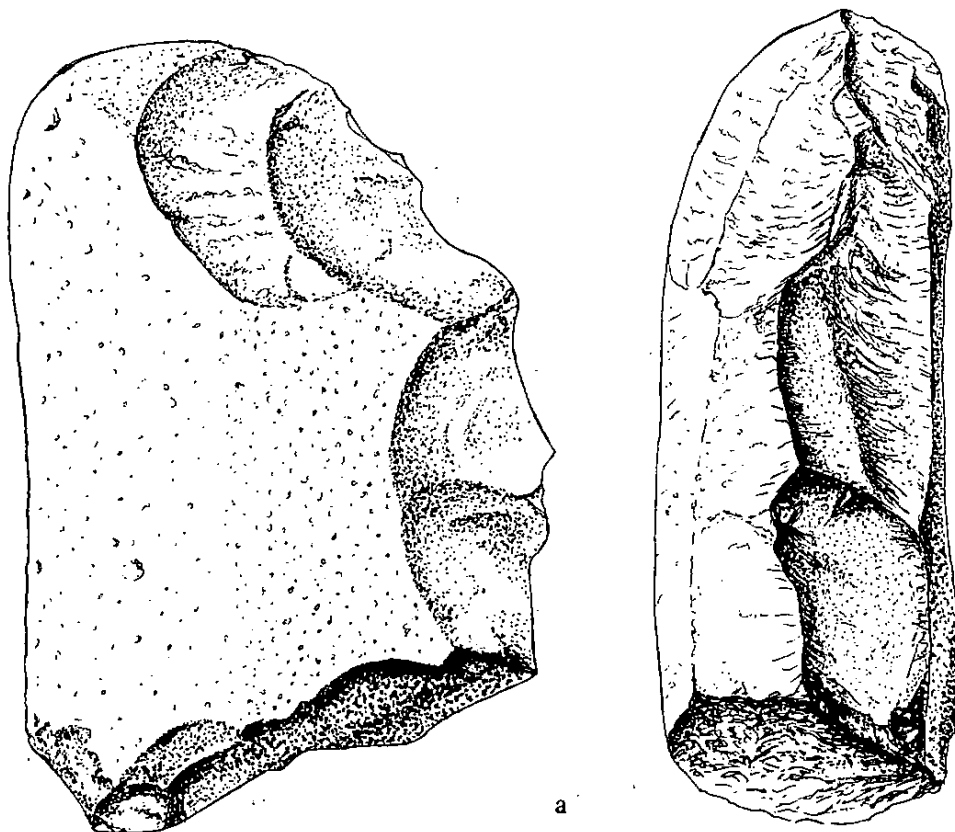
- a)* Flake knife, basalt (W-31-1666), Housepit 2.
- b)* Flake knife, basalt (W-31-3693), Housepit 2.
- c)* Core scraper plane, quartzite (W-31-2406), 50N-50W, 0-6 in.
- d)* Biface scraper, chert (W-31-1522), Housepit 2.
- e)* Biface scraper, basalt (W-31-502), 35N-40W, 18-24 in.



**FIGURE 35**

**Chipped Stone Artifacts from 4-Mer-3 (Actual Size).**

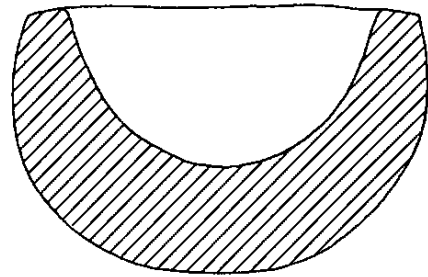
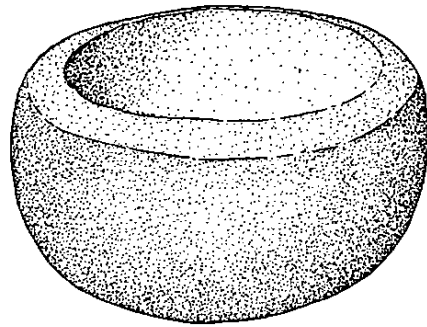
- a)* Biface core scraper, andesite (W-31-892), 35N-50W, 0-6 in.
- b)* Biface core scraper, andesite (W-31-1374), surface.



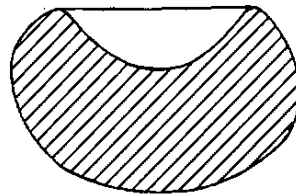
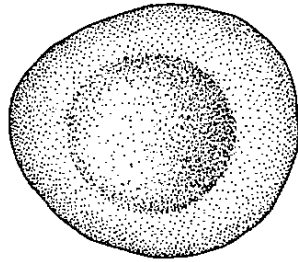
**FIGURE 36**

**Bowl Mortars from 4-Mer-3 (1/4 Actual Size).**

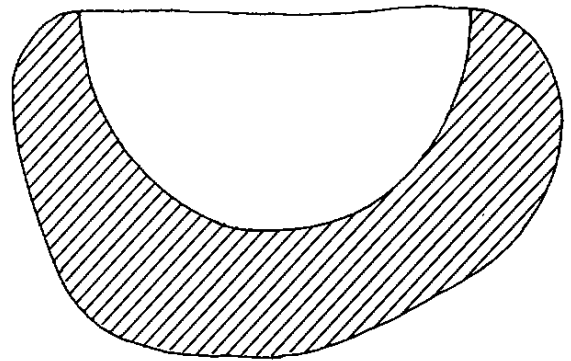
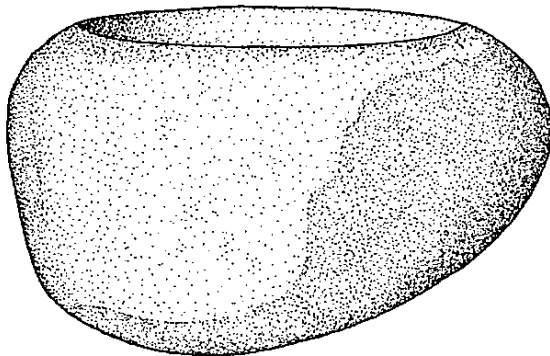
- a)* Large beveled rim mortar, andesite (W-31-1916), Burial 28.
- b)* Small cobble mortar, andesite (W-31-390), 35N-50W, 12-18 in.
- c)* Large shaped mortar, andesite (W-31-3866), Burial 25.



a



b

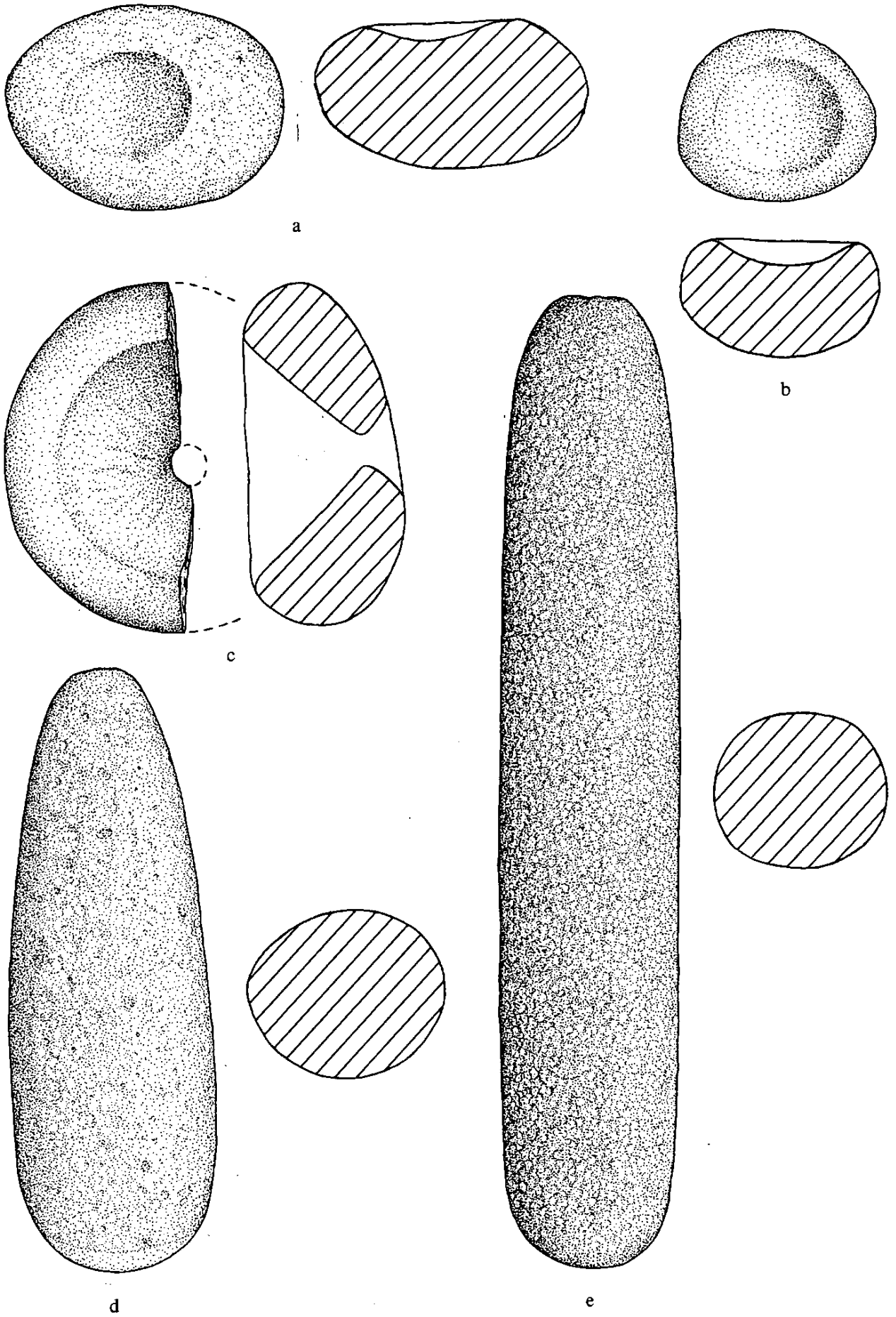


c

**FIGURE 37**

**Mortars and Pestles from 4-Mer-3 (1/2 Actual Size).**

- a)* Pitted cobble, andesite (W-31-342), 70N-50W, 24-30 in.
- b)* Small mortar, andesite (W-31-3624), Housepit 2.
- c)* Small mortar, andesite (W-31-3071), Housepit 10.
- d)* Shaped pestle, andesite (W-31-3318), Burial 31.
- e)* Shaped pestle, andesite (W-31-3114), Housepit 10.



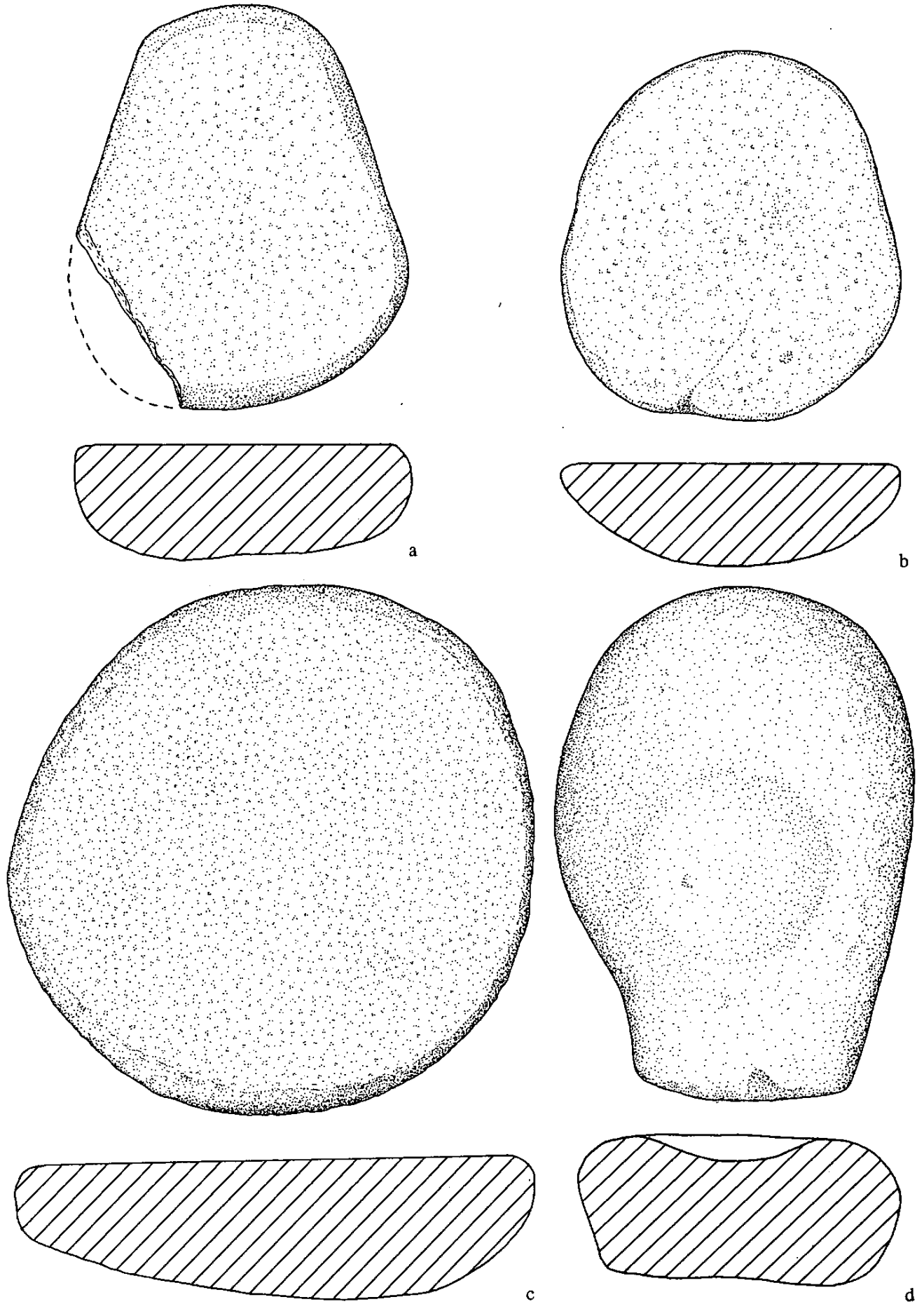


**FIGURE 38**

**Metates and Pestle from 4-Mer-3 (1/2 Actual Size).**

- a)* Convex metate, andesite (W-31-3470), Housepit 2.
- b)* Convex metate, andesite (W-31-3157), 65N-45W, 0-6 in.
- c)* Convex metate, andesite (W-31-351), Housepit 1.
- d)* Mortar/pestle combination, andesite (W-31-3186), 45N-50W, 6-12 in.

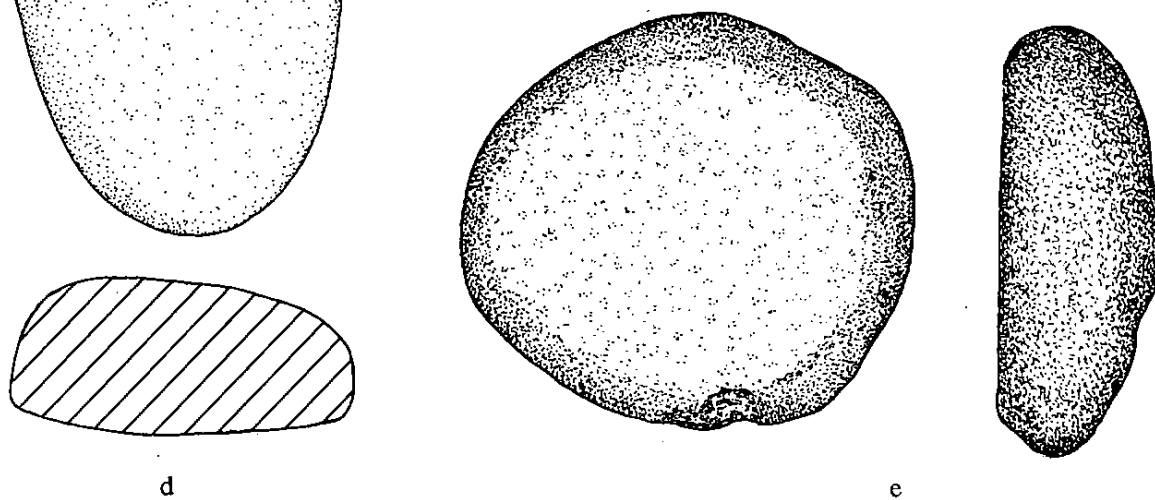
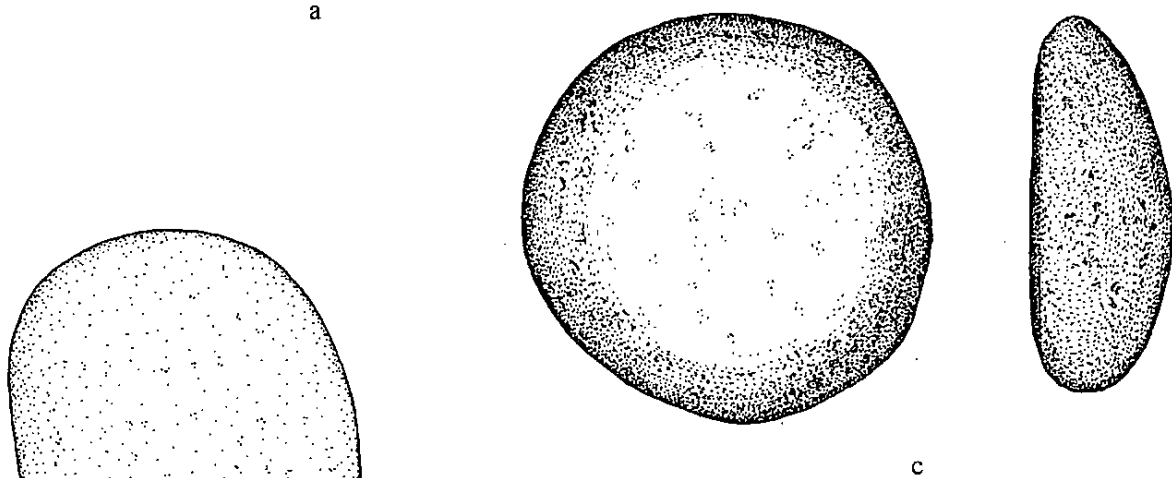
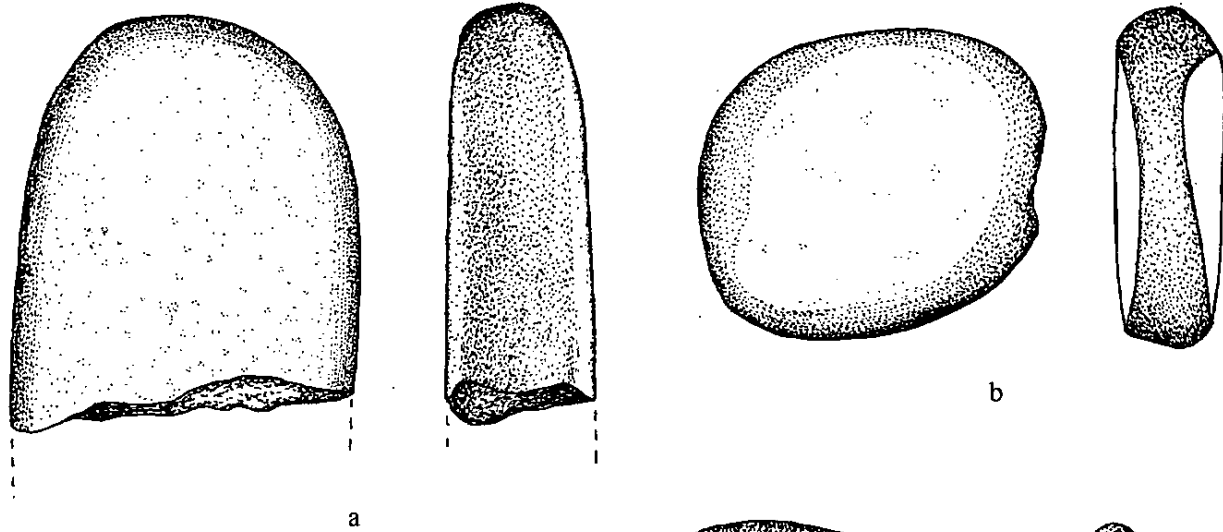
FIGURE 38



**FIGURE 39**

**Manos from 4-Mer-3 (1/2 Actual Size).**

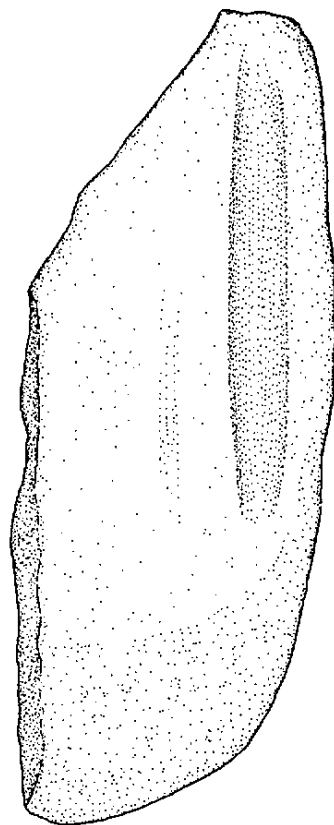
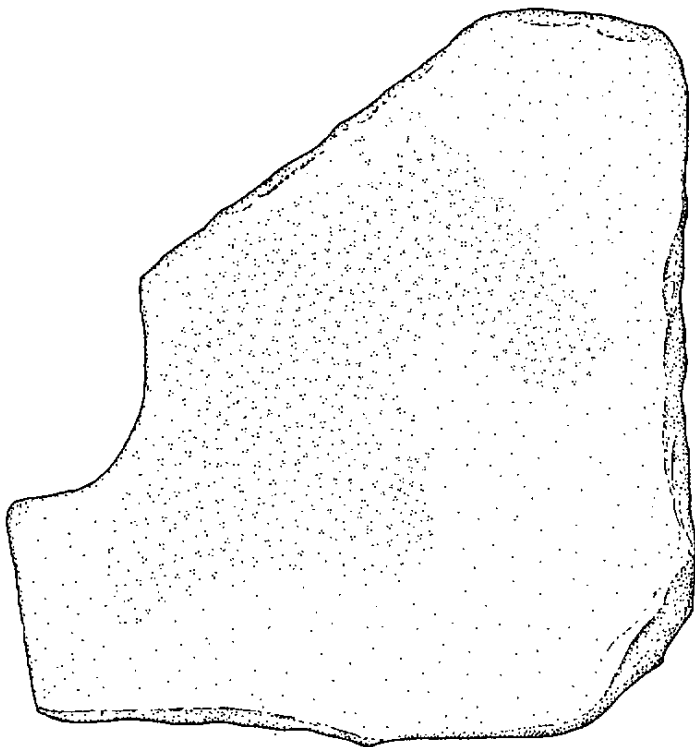
- a)* Biface mano fragment, andesite (W-31-325), 70N-50W, 6-12 in.
- b)* Biface mano (left hand torque), quartzite (W-31-1949), 45N-55W, 24-30 in.
- c)* Uniface mano, andesite (W-31-46), 25N-45W, 0-6 in.
- d)* Uniface mano, andesite (W-31-3157), 65N-45W, 0-6 in.
- e)* Uniface mano (flat facet), andesite (W-31-3557), Housepit 10.



**FIGURE 40**

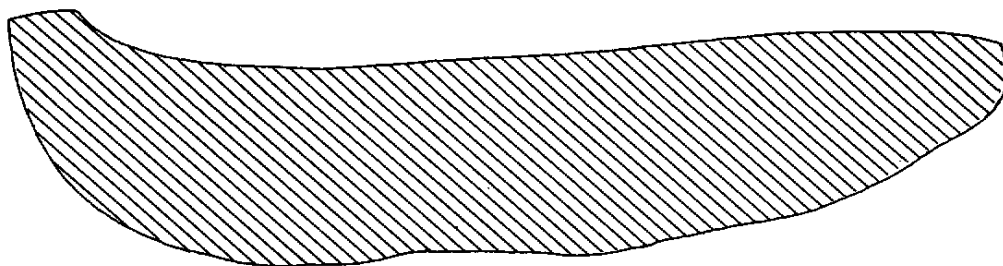
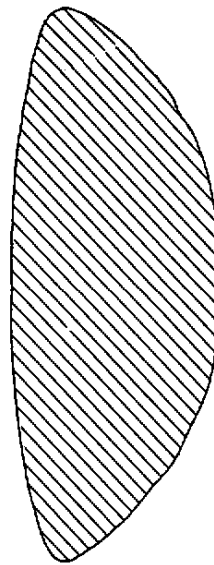
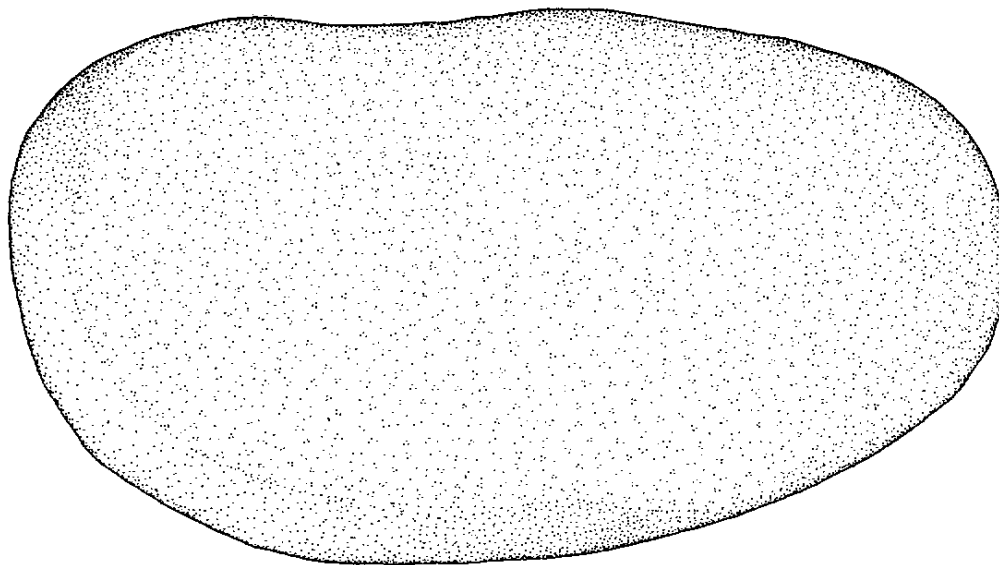
**Metates from 4Mer-3 (1/4 Actual Size).**

- a)* Slab metate, sandstone (W-31-4), 25N-45W, 12-18 in.
- b)* Slab metate, sandstone (W-31-5), Burial 1.
- c)* Convex metate, andesite (W-31-3867), Burial 26.



a

b



c