

Archeology of the
Little Panoche
Reservoir
Fresno County,
California

By William H. Olsen
and
Louis A. Payen

ARCHEOLOGICAL

REPORT
II



STATE OF CALIFORNIA - RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION
Sacramento, California

Archeological
Resources Section

DIVISION OF RESOURCE
MANAGEMENT AND
PROTECTION

MAY 1968

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PREFACE

The report contained herein is another example of the progress being made in the preservation of archeological data and artifacts under what is sometimes called "salvage" conditions. California, as elsewhere, is experiencing an unprecedented construction activity and land modification and utilization. Such activities are generally detrimental to the archeological resources of the land. For this reason several state agencies have made provision for archeological service to sample sites endangered by construction. Leading in this endeavor is the State Department of Water Resources which has supported an active program of archeology in all areas of their development of the State Water Plan.

In several instances the Federal Government shared with the state in the construction of certain water facilities. The Little Panoche Detention Dam and Reservoir project was one such instance. In this case funds for excavation were made available from the Bureau of Reclamation through the National Park Service. The involvement of these several state and federal agencies clearly indicates the concern felt by public agencies toward the preservation of archeological resources.

The team of men who made the surveys and field excavations, and who made the laboratory and offices studies, are to be highly commended for a good job done. Their work is of a pioneer nature for this region of the state and exemplifies the need for such work in all areas of California.

The format for this present report is a reversion to an earlier one used for this series. A smaller format was used on the two reports immediately preceding this one but is not continued in order that production costs may be kept minimal. As the person responsible for this decision I ask forgiveness of the librarians who must bind and shelve these reports--only to find they come in two sizes.

Francis A. Riddell
Editor

STATE OF CALIFORNIA
Resources Agency
Department of Water Resources
Division of Right-of-Way Acquisition

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W. Stanley Young	Chief Right-of-Way Agent
Richard K. Ewing	Senior Land Agent and Coordinator of Archeological Investigations

TABLE OF CONTENTS

	Page
Introduction	1
Environment	1
Ethnographic Sketch	3
Historical Data	3
Ceremonial and Political Organization	4
Death and Burial	4
Material Culture	4
Summary	6
Archeological Remains at Site 4-Fre-128	6
Excavation Technique	7
Description of Site	7
Excavations	7
Description of Artifactual Remains	8
Beads and Ornaments	8
<u>Olivella</u> Bead Typology	9
Stone Beads	12
Glass Beads	12
Other Shell Artifacts	13
Artifacts of Bone	13
Chipped Stone Artifacts	16
Scraping and Chopping Tools	18
Ground Stone Artifacts	20
Miscellaneous Objects	24
Historic Material	26
Midden Constituents	26
Burials	27
Features	27
Summary of Features	29
Structures	29
House 1	29
Summary	31
House 2	32
Features of House 2	33
House 3	35
Houses 4 and 5	37
Comparative Notes on the 4-Fre-128 Structures	37
Summary	38
Conclusions	39
Archeological Remains at Site 4-Fre-129	40
Description of Site 4-Fre-129	40
The Midden Deposit	40
Excavation Techniques	41
Artifactual Material	41
Beads	41
<u>Olivella</u>	41

Beads other than <u>Olivella</u>	43
Summary	44
Other Shell Artifacts	44
Artifacts of Bone and Antler	44
Artifacts of Chipped Stone	46
Flake Scrapers and Heavy Flaked Stone Tools	49
Heavy Stone and Ground Stone Artifacts	50
Small Ground Stone Artifacts	53
Pottery and Baked Clay Artifacts	55
Midden Analysis other than Faunal Remains	56
Historic Material	58
Features	58
Burials	63
Summary of Site 4-Fre-129	65
The Salt Canyon Buried Midden Site	67
Artifacts	69
Conclusions	70
Bibliography	71
Tables	74
Explanation of Figures	114

INTRODUCTION

The Little Panoche Detention Reservoir was initially surveyed for archeological sites in 1961 by Francis A. Riddell, State Archeologist and Charles Hall, U. S. Bureau of Reclamation Geologist for the San Luis Dam Project. Two archeological sites were recorded at that time within the maximum project boundary. These sites were designated 4-Fre-128 and 4-Fre-129. No further work was contemplated then as the scheduled construction indicated that actual work on the project would not begin until 1967.

In the summer of 1965, William E. Pritchard, then engaged in the excavation program on the Los Banos Creek Project, was informed that construction had begun on the Little Panoche Detention Dam. The author and Mr. Pritchard subsequently made an inspection tour of the Little Panoche Project and discovered that it had indeed begun ahead of schedule. It thus became apparent that the salvage of the archeological remains within the reservoir, of necessity, would have to be scheduled for the spring and summer of 1966. To implement this program, funds were provided under the terms of a contract (#14-10-0434-3315) between the National Park Service and the State Division of Beaches and Parks. It should be noted at this time that without these funds and the cooperation of Mr. Paul J. F. Schumacher, National Park Service Archeologist, this project would never have been completed.

The actual field work was begun during Easter Vacation in 1966 and continued until July 29, 1966. The work was performed under the direction of Louis A. Payen, under the supervision of the senior author.

To Mr. Payen and the field crew should go the bulk of the credit for this report. The quality of the field work is indeed commendable and when the extremely difficult field conditions are considered; attests to the fact that the term "salvage" or "service" archeology should not, and does not inherently indicate partial or poor quality archeology.

ENVIRONMENT

Little Panoche Valley is one of a series of small valleys drained by intermittent streams situated along the extreme western edge of the San Joaquin Valley and bordered to the west by the Diablo Range. The area is characterized by a series of abruptly defined low mountains, rising to an elevation of 1,500 to 2,000 ft. and a broad alluvial fan which drops off to the east toward the center of the San Joaquin Valley. The hills are broken by a series of well-defined stream-cut valleys or canyons trending in an east-west direction which have cut into the alluvial fan for some distance out into the valley floor (Fig. 1 and 34). The area is wholly within the present confines of Fresno County and is situated some 20 miles south of the city of Los Banos and some 45 miles west of Fresno.

Little Panoche Creek is bordered to the south by the Panoche Hills which rise to an elevation of 2,092 ft., and to the north by series of dissected hills which average about 1,500 ft. in elevation. The valley floor along the creek in the reservoir area is situated at elevations of 500 to 600 ft. above sea level.

Geologically the Little Panoche Valley lies within an area composed of "sandstones, shales and conglomeration of cretaceous and tertiary (Eocene) age" (Harradine, et al 1956:86). Some influence from the slightly calcareous and metamorphic Franciscan formation is evident in the soils north of Little Panoche Creek (Harradine, et al 1956:86).

Three terraces are evident along Little Panoche Creek. The lowest terrace, now cut through by the present channel of the creek, apparently dates from Pleistocene times (William Bull, personal communication). It is on this terrace that sites 4-Fre-128 and 129 are situated. The soil on this very gently sloping terrace is classed as Ortigalita Clay Loam, which is characterized by "surface soil of brown or slightly reddish-brown non calcareous friable granular clay loam" (Harradine, et al 1956:43), underlain by a light reddish-brown calcareous subsoil. The basal soils appear to be old terrace deposits which have been covered by the Ortigalita series soils.

Little Panoche Creek is classed as an intermittent stream, although several local people stated that some water is available almost all year around in certain sections of the stream bed. During the period of excavation (March to July) the stream bed always had some water, but this in recent years could have resulted, in part, from irrigation runoff in the upper reaches of the stream. It is unlikely that in aboriginal times the stream flow was great. In fact, it is unlikely that even in flood years the stream ever reached the San Joaquin River drainage system (Harradine, et al 1956:4).

The climate of the area is arid with hot dry summers (April through October) and a relatively cool humid winter season. The bulk of the rainfall comes from January to March. Temperatures in the summer frequently reach 100° to 110° while in the winter the temperature frequently reaches the freezing point (Harradine, et al 1956:5). The coast ranges in the area form a natural barrier against coastal winds and fog and create a rainshadow, or area of low rainfall on the western side of the San Joaquin Valley. Vegetation is scant in Little Panoche Valley and in the general area. Typical vegetation includes various grasses such as salt grass (Distichlis spicata), alkali bunch grass or alkali sacaton (Sporobolus airoides), foxtail chess (Bromus rubens), filaree (Erodium cicutarium), peppergrass (Lepidium nitidum), plantain (Plantago erecta) and bur-clover (Medicago hispida), foxtail fescue (Festuca megalura). The few common shrubs include true sagebrush (Artemisia sp.) and saltbush (Atriplex sp.) (Harradine, et al 1956: 9-10).

Adjacent to site 4-Fre-128 was a dense stand of "arrowcane", Common Reed (Phragmites communis), which certainly was utilized by the inhabitants of the area. It may even have influenced the people to select that location for a living site as, other than water sources, no other apparent reason accounts for the specific site locations within the valley.

According to Soil Survey of the Mendota area "no trees native to the area have been known to exist during recent geologic times" (Harradine, et al 1956:9). The effect of sheep grazing over the past 100 years in the area is not known. Presumably it, along with some farming, has led to the reduction in the natural grasses in the area since 1850.

From the foregoing it might appear that the area was almost uninhabitable. It was, however, moderately rich in various seed producing grasses and it was not far-distant to the uplands of the Diablo range where pine, oak and buckeye occur with various other trees and shrubs. Also available were deer, antelope, elk and rabbits as well as a variety of other small mammals and reptiles. Quail and doves are frequent in the area, and in the valley to the east; fish as well as ducks and geese are still available in abundance in season. It is clear that many of the food resources mentioned here were not immediately local in nature. In fact, some effort was required to survive in the Little Panoche Valley, a fact which certainly kept the overall population to a minimal number. The population and utilization of the western edge of the valley apparently was relatively constant, however.

ETHNOGRAPHIC SKETCH

According to Kroeber (1925:475) the whole of the San Joaquin Valley was occupied by the Penutian speaking Yokuts. There is some doubt, however, due to lack of data, about the exact tribal attribution of the extreme west side of the San Joaquin Valley. This area has sometimes been included within the area of the Costanoans who lived immediately west of the Yokuts (Kroeber 1925:476). Kroeber feels that this marginal area was almost certainly Yokuts but the population was sparse, and the area in general was unimportant as regards occupation.

The Yokuts may be divided into two clear divisions, valley and foothills (Kroeber 1925:477). The Valley Division is subsequently divided into southern and northern groups. This division occupied the area west of the San Joaquin River, to the interior coast range and north from the Kings River to the Sacramento-San Joaquin Delta.

HISTORICAL DATA

The impact of the Spanish Mission system was felt at an early date along the west side of the valley. Among the known Spanish expeditions into the area was that of Fr. Jose Viader in 1810 and one in 1815 under Sergeant Jose Dolores Pico (Latta 1949:18-21). Other expeditions were known to have been sent out to capture Indians or to return them to the missions. According to Latta (1949:2) "as early as 1850, and probably long before that time, there were no living Indians occupying the entire west side plains, from Byron on the north to Paleta in Kern County. Concerning these west side tribes there is, of course, practically nothing known. This lack of data is due to the fact that the entire west side was stripped

of Indians upon the completion of the missions to the west, probably before the year 1806. With one or two exceptions, they never returned to that area, it being too open to the invasions of the Spanish whose advances were not welcomed by those primitive people" (Latta 1949:2-3).

According to Latta, who obtained a very limited amount of data on the west side Yokuts, the group who occupied the area were the Kau-watch'wah or Grass-nut people. They occupied the area between Panoche and Romero Creeks, a distance of about thirty miles (Latta 1949:14).

CEREMONIAL AND POLITICAL ORGANIZATION

Kroeber (1925:492) notes that the ceremonial structure of the northern valley Yokuts, though almost totally unknown, must have been much influenced by their neighbors, that is, the Costanoan and Miwok. Presumably they shared the *kuksu* and other ceremonies unknown to the more southern Yokuts.

Politically the Yokuts were distinctive in having a true tribal organization and distinct tribal boundaries. These groups were under the leadership of one or more chiefs, as many groups had a chief for each of the two exogamic moieties. In many instances these chiefs apparently had considerable authority (Kroeber 1925:492-496).

The Yokuts, like other California groups, held a rather elaborate annual mourning ceremony. It was apparently the most important ritual of the Yokuts (Kroeber 1925:499-501).

The second most important ceremony probably was the boys initiation which, with the Yokuts, centered around the use of Jimsonweed (*Datura meteloides*). This, it should be noted, is the northernmost extension of the Jimsonweed cult in California (Kroeber 1925:502).

DEATH AND BURIAL

The Yokuts both buried and cremated their dead, the primary objective was to inter the deceased where the person had lived (Kroeber 1925:499). In some groups those of importance were cremated, while burial generally prevailed for less important persons. The usual destruction of property took place at the time of the annual mourning ceremony or at the time of burial.

MATERIAL CULTURE

Money. The ordinary money among the Yokuts was shell disc beads which they acquired through visits to the ocean. Long *Tivella* clam shell beads were also used, these acquired from the south (Kroeber 1925:498). Latta (1949:69-73) notes three types of *Olivella* beads for the Yokuts including split shells with a punched perforation, whole spire-ground and the

roughly disc-like beads mentioned by Kroeber. Small disc beads were also made from the Olivella shell. Beads made of purple mussel shell and keyhole limpet shells also were used. Large clam shell disc beads with incised edges and various ornaments of Haliotis are recorded, also.

The only beads made of local materials were the small disc beads made of steatite. Latta (1949) notes one steatite quarry was located near Lindsay, California, but undoubtedly other sources were known.

Clothing. Many of the groups, at least the children, wore little or nothing (Kroeber 1925:519). The women normally wore a two piece skirt of bark or buckskin. Rabbitskin blankets were used for warmth. Crude moccasins of elk or deer skin were used on occasion.

Houses. At least five types of houses were built. This includes a mat-covered communal house large enough for up to 10 families. A second, but related form was similar but had separate sections for each family. The third form was smaller, oval in shape, with two posts and a ridgepole. Poles were then placed along the sides and tied to the ridgepole. The structure was finally covered with tule mats. Small slightly excavated conical houses made with poles tied to a hoop at the top and covered with tules are noted. Sometimes this form was bark covered.

Other structures include a sweat house and a simple shade with a flat roof on posts, used in the hot valley areas. The former was excavated to a depth of several feet, had two posts, one at each end, and a ridgepole. It was dirt covered and commonly was not over 15 ft. in length. The door is said to have faced south or toward the creek (Kroeber 1925:523). Latta, in describing the sweat house (1949:95-97), mentions that it was low-roofed and was situated at the lower end or downstream end of the village.

Foods. As in other areas of California the acorn was the staple, but wild game and various seeds were extensively used to supplement the diet. Specifically noted as important to the Yokuts was the buckeye, with the digger pine nut utilized where available.

Weapons. The bow and arrow was the usual weapon (Kroeber 1925:530). The arrows were frequently, but not invariably, made of arrowcane (Phragmites communis). Rectangular steatite arrow straighteners were used in connection with the cane arrows. Stone points were used only in deer hunting.

Containers. Shallow cooking pots of steatite are specifically noted for only one Yokuts group, but archeologically are not infrequent throughout the Yokuts area. In addition, a variety of basketry forms was used. The Yokuts, or at least certain groups, also made pottery. According to Kroeber, "The precise distribution of this industry remains to be ascertained. The southern hill tribes made pots; the adjacent valley tribes appear to have; on the lake tribes there is no information; the Chukchansi and probably other northern tribes did not follow the art" (Kroeber 1925:537). The practice of pottery making "...is not connected geographically with the pottery-making area of southern California,...so far as known; and the territorial gap is paralleled by a thorough diversity of the ware" (Kroeber 1925:537).

The pottery is described as excessively crude, probably made by a "rough fitting together of pieces of clay, or a pressing out of a lump: there is no evidence of the coiling and smoothing method. It is doubtful whether the clay contains tempering... The color is from light to dark grey" (Kroeber 1925:537). The uses of the vessels are not known, but they apparently were not for cooking.

Kroeber was cognizant of Mono-Yokuts pottery (cf. Gayton 1929) but seemingly viewed the pottery just described as a variant, or something different. Technologically Mono-Yokuts pottery is reasonably sophisticated and the foregoing description by Kroeber cannot be applied to it.

Pipes. Few stone pipes were used by the Yokuts, indeed they deny they used stone pipes at all. The reason for this apparently stems from the fact that tobacco was eaten and not smoked (Kroeber 1925:538).

Mortars. Where possible, the bedrock mortar was used, but in the valley portable wooden mortars were made. Stone bowl mortars were used when found, but were not made in recent times. The hopper mortar is reported, but apparently was not common.

SUMMARY

It is clear from the rather brief sketch presented that the Yokuts, in general, were typical Californians. They do, however, display variations from group to group based not only on differences in social culture (especially from north to south) but on the adaptation to the very different environment contained within the Yokuts area. On this basis it is clear that the northern valley people must have been somewhat different than those described by Kroeber and Latta, at least in their social culture. The material culture elements noted for the Yokuts in general seem to fit well with the archeological data being presented here. It is thus regrettable that the ethnographic data for the west side Yokuts are so meager.

ARCHEOLOGICAL REMAINS AT SITE 4-Fre-128

Site 4-Fre-128 is located at the upper (i.e., west) end of the Little Panoche Detention Reservoir at an elevation of 705 ft. (Fig. 1a and 34b). It is one of the two primary sites recorded within the confines of the reservoir proper.

As noted previously the site is situated on the lowest terrace in the valley, just above and north of Little Panoche Creek. The creek bed at this point is entrenched to a depth of some 15 to 30 ft. This entrenchment may, in part, date within the last several hundred years (William Bull, personal communication) but certainly is the pattern for the stream beds along the east side of the coast range. The creek presently is eroding away the occupation deposit in the area of the excavations. This suggests that conditions have changed from those prevailing when the site was occupied.

EXCAVATION TECHNIQUE

The site was laid out on the metric system with each of the excavation units measuring 2 by 2 m. in size. Though somewhat larger than the conventional 5 by 5 ft. units, they proved to be quite satisfactory under the circumstances. Timewise, we feel that a unit of this size takes only slightly longer to excavate than the smaller 5 by 5 ft. units.

The midden was initially loosened by trowel or shovel, loaded on wheelbarrows and screened through 1/4 or 1/8 in. mesh at the edge of the site. In this way no back dirt was left on the site proper. This was extremely advantageous in the excavation of two of the houses located in the main midden area of the site.

DESCRIPTION OF SITE

The site, in general, consisted of a thin, poorly-defined midden deposit which could be traced for a distance of some 1200-1400 ft. along the north side of the creek. At the west margin of this deposit were located three large housepit depressions, and two, or possibly three poorly-defined housepits were located in the central, and deepest portion of the midden area. The deposit in the area to the east was shallow and scattered (Fig. 7).

The original survey of the site indicated that 17 housepits were present, but subsequent excavation suggested that only five of these were actually house remains. Two of the housepits were poorly defined from surface indications which shows that some of those rejected on the basis of surface evidence may indeed be housepits. Without excavation of every depression over the entire area, however, it would be sheer speculation to estimate the original number of houses at the site.

EXCAVATIONS

It was clear from the initial survey that the depth of deposit was slight over much of the site. The only area which appeared productive from surface indications was situated near the center of the site area. In addition, two or possibly three housepits were apparent in this area.

In an effort to test as much area as possible, twenty 2 by 2 m. units were excavated. Of these, 18 were in the central area and two were placed some distance to the north and east to test the deposit in this area. In addition to these units two houses were completely excavated, one about 85% excavated and one tested with a 2 by 4 m. trench (Figs. 35 and 37).

The depth of deposit in the midden area averaged about 20 to 30 cm. in depth. The midden was gray in color, and contained little rock or shell. Chipping waste and faunal remains were not overly abundant, suggesting that the occupation was brief. The artifact yield was consistent but not high by volume, and consisted primarily of chipped stone artifacts and shell beads.

Underlying the greyish midden was sterile compacted yellow sand, apparently the original surface of the terrace. All of the houses were excavated into this material, a project involving considerable effort on the part of the site's former inhabitants.

DESCRIPTION OF ARTIFACTUAL REMAINS

In the following section the material has been tabulated separately for each individual house. The material from the midden not associated with house remains has been placed together. As the midden was shallow and obviously disturbed, it was felt that the vertical and horizontal distribution of midden artifacts could have but little validity. Indeed the low artifact yield almost precludes any comparison along these lines.

Beads and Ornaments.

Shell Beads. A total of 508 shell beads were recovered from the site including 11 types of Olivella beads, and one type each of Haliotis and clam shell, probably Saxidomus or Tivella (Fig. 13). The various types, general provenience and measurements of each is presented in Table 1. Tables 2 and 3 present the depth distribution of the beads and ornaments of all types. Surface specimens for convenience have been included as occurring in the 0-10 centimeter level.

The typology utilized in this report follows that established by Lillard, Heizer and Fenenga (1939:12) and modified by Bennyhoff and Heizer (1958:60-92). The clam shell bead types and one Olivella type follow Gifford's typology (1947).

Olivella Bead Typology

After Lillard, Heizer and Fenenga 1939
 Bennyhoff and Heizer 1958
 Gifford 1947

<u>Type</u>	<u>Name</u>	<u>Description</u>
1a	Small Spire Lopped	Whole shell spire removed, 4-8 mm. diameter.
1b	Large Spire Lopped	Whole shell spire removed, over 9 mm. diameter.
2a1	Thin Rectangular	Face and edge ground, central perforation.
3a1	Thin Lipped, Thick Lipped	Edge ground, oval in outline, central perforation.
3a2	Split, Punched	Split shell with shelf remnant, punched central perforation.
3d	Small Disc	Thin small flat disc with central perforation.
3e	Small Thick Disc	Cupped, thick central perforation under 5 mm. diameter, some have incised edges.
G1b	Spire and Orifice Ground	Whole shell with spire and orifice end removed.
Small Rough Disc		Same as Type 3d but has unground edge.
Large Disc		Large flat disc, irregular in outline.
Whole Sideground		Whole shell with orifice side ground completely through sidewall.
Large Rectangular Drilled		Large, squared sides and ends, drilled perforation.
Rough Drilled		Possibly variant Type 3al bead. Broken fragments with drilled perforation.

Olivella (Fig. 13a-o). Of the eleven Olivella bead types only four occurred frequently. In order of abundance these are small thick disc (3e), small cupped or thick lipped beads (3al), small thin disc (3d) and small rough-edged disc beads (no type designation). The remaining Olivella bead types all had 10 or less occurrences. Spire lopped Olivella beads including the small (1a) type and large (1b) type were rare. Possibly this is due to the local manufacture of other bead forms, however, fragments were not especially frequent. Of the 25 beads including large, small and fragments, 12 occurred in Housepit 2. Of the midden beads of both types, 5 occurred in a single unit (28N-22W). The significance of the latter concentration is not clear as they were not associated with a feature or burial.

A related bead form is the spire lopped and side ground whole shell. The side grinding on the beads is extreme and the presence of asphaltum in several of these beads indicates that they served as appliqué decoration for other objects. Of the seven beads of this type recorded, three came from House 2, two from House 1, and two from the midden. Typically they tend to be made from large shells; but no obvious reason for this is suggested. This bead type, at present, is confined to the San Joaquin Valley and southern California coastal region, but no detailed list of its occurrence is available. The other known occurrence in the immediate area is from Mer-3 (Pritchard 1966:144, Table 41) and Fre-129. They are also reported from Ker-74 by Riddell (1951:18), and from the south coast by Reinman (1961:18-19) and by Reinman and Townsend from San Nicholas Island (1960:17).

Type 2al, thin rectangular beads with central perforation, occurred twice in Housepits 2 and 3. This bead type is typical of the central California Late Horizon Phase I period (Bennyhoff and Heizer 1958:67). Their rarity at 4-Fre-128 suggests that they are not typical of the period represented at the site. They may indicate a large survival of an earlier bead form.

Two variants of the lipped Olivella bead (Type 3al) occur at Fre-128 (Fig. 13d and e). The bulk of the beads of this type at the site are small, oval in outline, with thick edges and a pronounced concavo-convex cross section. A very few larger beads of the same type occurred. These are of the thin lipped variant which is larger and exhibits less edge grinding than the smaller variant. The smaller form is comparable to the Type 3e beads (small thick disc) but is decidedly larger in size. They certainly are related bead forms, however. It may be significant that none of the larger beads occurred in the housepits, as the bulk of the small variant occurred in Housepit 2, including four associated with Burial 2. Type 3al beads are most frequent in the protohistoric period in central California (Bennyhoff and Heizer 1958:68).

Small thick disc beads, Type 3e, were numerically the most frequent bead form at the site. They occurred in quantity in all the excavated houses and were frequent in the midden as well. Fifteen of the beads of this type have edge incising in the form of simple diagonal lines or cross-hatched lines (Fig. 13o). This bead form occurs both in central California and southern California but the incised beads are more frequent in the San Joaquin Valley and southern California (Gifford 1947:36; Types X4, X5a and X5b).

The small thick, cupped bead is typical of the upper portion of the central California Late Horizon, Phase I (Bennyhoff and Heizer 1958:67). At Mer-3 this bead type occurs in association with clam shell disc or tubular beads and Type 3al Olivella beads indicating that they occur in the protohistoric period in the western San Joaquin Valley (Pritchard 1966: Appendix 2).

Small thin disc beads (3d) were the third most frequent beads at Fre-128. They were recovered from the fill in Houses 1 and 2 but were most frequent in the midden. It is unlikely that any real meaning can be attached to this in view of the total bead distributions at the site. This type was in use for a long period of time in central and southern California and is not a temporally diagnostic bead form (Bennyhoff and Heizer 1958:67).

The small, thin, rough-edged disc bead, though less frequent than the Type 3d beads, has much the same distribution. In many instances they were closely associated with Type 3d beads which could suggest that they are merely unfinished beads of this type. Bennyhoff and Heizer (1958:67) consider the small disc a diagnostic element of the protohistoric period in central California, but that it could be slightly earlier in southern California.

Two Olivella bead types are numerically poorly represented at the site and may represent the local manufacture of beads. One is the cap Olivella bead (Type 6lc) represented by two specimens, both from House 2. Both appear to be broken spire-end remnants of shells originally broken for raw material for use in the manufacture of smaller bead types. Typologically they are clearly of the cap Olivella bead form, however. Bennyhoff and Heizer (1958:83; end note 29) indicate that these beads, or related forms, were popular in southern California in a complex dated prior to 2000 B.P. This supports the hypothesis presented here that these beads are of local manufacture and have little temporal meaning. Gifford (1947:11) records the occurrence of Type 6lc in central California, but they appear to be extremely rare.

The second type, the large disc bead, probably is also a local bead form. It may simply represent a lipless variant of the thin lipped (Type 3al) Olivella bead. Saucer-shaped beads occur in quantity in other San Joaquin Valley sites, but are more uniform in size and manufacture than the specimens from Fre-128.

Clam Shell Beads (Fig. 13p). Two clam shell beads occurred in the site, both from the fill of Structures 1 and 2. The complete bead (from House 2) is a small flat disc with the corrugations on the exterior of the shell partially ground off. It may be made from Saxidomus but this is not certain. The fragmentary bead, also disc-shaped, is from Structure 1. It appears to be made from Tivella but this identification is only tentative as it may be of Saxidomus. Clam shell disc beads are typical of the protohistoric and early historic period in central California (Bennyhoff and Heizer 1958:61-62; Latta 1949:78).

Haliotis Callus Beads (Fig. 13r). These beads are made from the red-colored epidermis of the abalone (Haliotis rufescens). They

are variable in form but tend to be oval to subrectangular with a thin flat cross section. Gifford (1947:16; Type Kle II) lumps these small beads as well as larger beads made of Haliotis epidermis in the same class, thus it is difficult to make comparisons. They are, however, more frequent in southern California with but few occurrence in the Sacramento Valley and Delta areas. In central California they occur in a protohistoric context (Late Horizon Phase II) but the total range of their occurrence is not known. Beads of this type did not occur at Mer-3 although the larger disc beads made of the iridescent shell did occur in a context suggesting the same period as is represented at Fre-128 (Pritchard 1966: Table 41 and 42) which is roughly coeval with central California Late Horizon Phase II (Pritchard 1966:157). They also are reported from the Southern San Joaquin Valley by Gifford and Schenck (1926:60-61).

Stone Beads.

Steatite Disc Beads (Fig. 13a). Two types of stone beads occurred at Fre-128. The most frequent type was a flat disc bead made of light to dark green or grey steatite. These beads were recovered from the fill in Houses 1 and 2 and from the midden.

Steatite disc beads are frequent in the Sacramento-San Joaquin Delta region where they are diagnostic of the Late Horizon Phase II period (Lillard, Heizer and Fenenga 1939:80). Here they are associated with Type 3al Olivella beads and clam shell disc beads. At Mer-3 they occurred with less frequency than at Fre-128, but the association indicates a late protohistoric temporal placement (Pritchard 1966:65-108).

Pebble Disc Bead. The second type of stone bead is a small roughly disc-shaped pebble with a drilled central perforation. For all intents and purposes it can be lumped with the steatite disc beads.

Glass Beads. A total of 28 glass beads occurred at Fre-128 including two forms and five colors. The first form is a small cylindrical-shaped bead. The single example of this form is made of pink glass and was recovered from the midden.

The second form includes the remainder (27) of the glass beads. All are small globular-shaped beads, usually slightly larger in diameter than in thickness. Though small (Table 1) they should not be considered seed beads on the basis of size. Four colors are represented in the collection, including light blue (15), light green (7), black (4) and clear (1). The House 2 fill produced 10 of the blue beads, three of the green and all of the black beads. The remainder were recovered from the midden. In House 2 they occurred to the bottom of the fill (Table 2) and were most frequent in the upper 40 cm. of the fill. They thus parallel the distribution of the other bead types recovered from the fill.

The recovery of glass beads from the site certainly indicates post-contact occupation at Fre-128. It is possible that this could have resulted from reoccupation in post-Mission times, but in view of the lack of other post-contact material objects this is unlikely. It is suggested that these beads are probably from the Spanish Mission period of pre-1800 since the

beads appear to represent an item introduced into a pre-contact cultural assemblage. Bennyhoff regards these beads as early Mission period beads (personal communication). On the basis of evidence presented earlier in this paper it seems possible that the site was abandoned between 1815 and 1830, at the latest, and presumably the aboriginal material culture complex was disrupted prior to this time.

Other Shell Artifacts.

Included in this category are artifacts made of Haliotis, clam shell, and freshwater mussel shell. Only nine artifacts of shell, other than the beads, were recorded from the site and the bulk of them are fragmentary. The description and provenience of these artifacts are presented in Tables 1, 2 and 3.

Haliotis Fragments. Six specimens of Haliotis were recovered from the site, only one of which showed evidence of function. This was a broken fragment from the midden which had evidence of a perforation on one broken edge. The original form of the ornament was not determinable. The remaining five fragments were all small broken pieces. They may represent waste material from the manufacture of the Haliotis epidermis beads noted previously.

Clam shell Disc (Fig. 13u). A single imperforate clam shell disc was recovered from the fill of House 1. It is roughly circular with partially ground edges. It may be an unfinished bead, or may have been used as an appliqued decorative element (although no traces of mastic are now present). It apparently is made of Tivella; it definitely is not Saxidomus.

Mussel Shell "Spoons". Two edge-ground freshwater mussel shells were recovered from the fill in House 2. The larger is a Gonidea angulata valve which is slightly ground along the edges but it is otherwise essentially unmodified. The second is a Margaritifera valve which is extensively ground along the edge opposite the hinge. This specimen is rather small to have served as a spoon and may conceivably have functioned as a cutting or scraping tool.

Artifacts of Bone.

A total of 74 bone or antler artifacts was recovered from Fre-128, the majority of them from the fill in House 2. The great preponderance of the bone or antler artifacts are those items utilized in the day-to-day activities of the group. The only exception to this is a small series of bird bone artifacts which undoubtedly served decorative functions. Descriptive notes and provenience of the bone and antler artifacts are presented in Tables 4 and 5.

Bird Bone (Fig. 15g, j, h). Only nine artifacts of bird bone occurred, all but three in fragmentary condition. Four are split, probably fragments with one end neatly cut off and polished. Presumably these fragments represent plain tubes or whistles, but there is no evidence

to clearly demonstrate the latter. All of these specimens are from the fill in House 2.

Three short sections of cut, polished bird bone are classed as beads. For convenience they are tabulated with the other bead types in Tables 1 and 3. All the specimens classed here as beads are shorter than the projected length of the pieces described above as tubes. As with the tube fragments, all the beads derive from the fill in House 2.

Two small fragments of incised bird bone occurred; one in the fill of House 1 and the second in House 2. In both, the designs consist of simple encircling lines or crosshatched diamonds. Considering the number of incised bone specimens recovered from Mer-3, a short distance north of Little Panoche Creek, it is surprising that so few specimens occurred at Fre-128. One is strongly struck by the impression that this increase at Mer-3 is due to the large ceremonial structures at the site and its overall effect on the cultural pattern (Pritchard 1966:84).

Bone Skewer (Fig. 15d). A fragment of rabbit bone with one end ground obliquely to a point was associated with Burial 2 in House 2. It could have served as a perforator or awl, but the use wear suggests a heavy-duty use. This specimen is made in the same fashion as Gifford's Type A4 awl, but described examples are all made of bird bone (Gifford 1940: 169-170; 203-204).

Bone Awls and Fragments (Fig. 14). Four complete awls and 12 fragments were recovered from the site. The complete awls include three made from splinters of large mammal cannon bone, probably deer, and one fashioned from a split section of cannon bone with the original proximal articulation serving as the handle. In Gifford's typology (Gifford 1940: 168-169) they conform to Types A13 (proximal end of cannon bone) and A14 (mammal leg-bone splinter). Two of these have fine needle-like tips with a decided shouldered effect and the other two have a simple sharp point without shouldering.

The 12 fragments include seven tip fragments and five medial fragments. All the latter are burned. Of the seven tip fragments one is needle-like and shouldered and the remainder are sharp-pointed but lack shouldering. One of these is made from a splinter of bird bone. Its size and fragile nature suggests some light duty use.

Blunt-pointed Tools (Fig. 15e). Two small tip fragments probably constitute portions of tapered, blunt-pointed bone tools. Both are made of split large mammal bone. Presumably they could have functioned as basketery awls but more likely they were used in the making of heavier objects, such as matting or conceivably as flaking tools. Both have been burnt.

Bone Pin Fragments (Fig. 14i). Two small, subcylindrical pointed bone pieces, now fragmentary, are classed as pins. One is made from a worked-down splinter of mammal bone, the second is fashioned from a small mammal bone ground to a point. Presumably they served as perforators

or other purposes requiring a fine needle-like object.

Scapula Tools and Fragments (Fig. 15p). Two complete, or nearly complete, scapula tools were recovered along with fragments of at least four others. The fragments consist of small burnt sections of cut scapula with polish evident along one or more edges, which otherwise defy description.

The complete specimens are both right scapula, probably from deer. On both, the acromion and spine have been removed as well as the coracoid border. The utilized blade is gently curved but lacks serrations, or even undulations to indicate that serrations were originally present. The edge has been shaped by uniaxial grinding and the under side of the blade, opposite the spine, is slightly but noticeably abraded. Considerable polish is present along the axillary border on both the upper and lower surfaces.

It is clear that these tools were intended for use as cutting implements. The thin sharp edge and polish are presumptive evidence of use as grass or tule cutting tools. Bennyhoff's discussion of the serrated scapula tools or "saws" (Heizer 1953:268-269) from the Napa and San Francisco regions of California suggests the same function, although those pieces differ slightly in form from those described here. The distribution of scapula tools is spotty. Gifford (1940:172) notes their occurrence in the Sacramento Valley (rare), San Francisco Bay region (frequent) and in the Napa region (frequent; cf. Heizer 1953:268). One complete and three fragmentary scapula tools were recovered from nearby 4-Mer-14, excavated by F. A. Riddell in 1963 (State collections). The complete example has both borders cut away and the spine trimmed partially off. The side opposite the axillary border is serrated and highly polished. These specimens like many of those from other areas appear to date roughly within an upper Middle Horizon or Late Horizon Phase I context. The difference between them and the Fre-128 examples presumably then can be ascribed to temporal differences. In so far as can be determined this is one of the few late occurrences of scapula tools in central California. In view of the preponderance of grass or tule covered houses among the Yokuts, one can only wonder why they are lacking at other late sites in the general area.

Antler Tine and Antler Fragments (Fig. 16a). A single complete antler tine was recovered from the midden and three possibly worked fragments were recovered from House 2. The complete antler artifact is half of a Y-shaped antler cut at the juncture of the Y. The tip-end is well-polished and shows considerable abrasion, probably as a result of use in digging.

The fragments include a polished tip fragment, a split polished shaft fragment and one fragment with one end cut off obliquely and ground smooth. The latter possibly could have served as a wedge-like tool.

Polished Bone Fragments. A large number of small polished splinters and fragments of bone tools was recovered from the site. Some of these appear to represent waste material from the manufacture of bone tools, but the bulk probably represent broken basketry awls, flakers and other related utilitarian implements. Many of them are burnt indicating

they were discarded by the site occupants.

Chipped Stone Artifacts. A total of 239 chipped stone tools occurred at the site. (This includes a small number of cobble hammerstones for convenience, even though they are not normally included under this class.) The majority of the chipped stone objects, unlike other artifact classes, was recovered from the midden. Presumably this is because little value was placed on the bulk of the chipped stone artifacts. Many were probably discarded when their immediate use came to an end, or possibly they were used and lost in work areas outside of the houses.

The chipped stone inventory is divided essentially on a functional basis. The distribution and description of the various forms is presented in Tables 6, 7, 8 and 9. Especially noteworthy is the numerical frequency of the various scraper forms. This, it should be mentioned, is in direct contrast to the frequency of small scraping tools at other excavated sites in the Los Banos Creek and San Luis Reservoir areas just north of Little Panoche Reservoir.

Projectile Points. Nine more-or-less discrete projectile point forms occurred at Fre-128. Of these, seven are small points, that is, weighing less than 3 grams. Two are large points weighing over 3 grams. Of the total of 111 projectile points, both whole and fragmentary, weight data are available on only 48 specimens. The total weight range is from 0.4 grams to 11.4 grams. Eleven weigh less than 0.5 grams, 19 from 0.6 to 1.0 gram, 12 from 1.1 to 1.5 grams, 3 from 1.6 to 2.0 grams, 1 from 2.1 to 7.5 grams and 2 are heavier than 3 grams. The weight range fits rather neatly into the small point tradition as outlined and discussed by Fenenga (1953:317-318) who classes the points in this tradition as tips for arrows. As can be seen in other sections this is certainly the case at Fre-128.

The following notes describe the projectile point series from Fre-128. The pertinent data are presented in Tables 6 and 7.

Small Triangular (Fig. 26b). These are all basically triangular in outline with a slight to moderate basal concavity. They have a finely serrated or sawtoothed edge. The flaking ranges from poor to excellent, depending upon the amount of retouching. Apparently some of the triangular points represent blanks for other point forms but others are certainly finished specimens. Ten are made of various brightly colored silicates, including mineralized wood, jasper and chalcedony and one is of obsidian. Eight specimens are from the midden, the others from House 2.

Crude Triangular. These specimens are again basically triangular in outline but are short and have rather wide bases. All are poorly flaked and exhibit little care in retouching. Of the six examples, five have concave bases and one has a straight base. They are clearly differentiated from the small triangular points on the basis of size, weight and chipping technique. All but one are made of siliceous material, the latter is of obsidian. Two are from House 2, the remainder from the midden.

Small Side-notched (Fig. 26g, k, m, o). These points are triangular with a straight to deeply concave base. The side-notches tend to have a deep U-shape or bell-shape, producing a distinct waisted effect. As opposed to the other small point forms, all of the small side-notched points are made of various silicates. The lack of obsidian suggests that they are the dominant local projectile point form. This is borne out by their frequency (Table 6) not only at 4-Fre-128, but at the adjoining site, 4-Fre-129.

A study of small side-notched projectile points, termed "Desert Side-notched" (Baumhoff and Byrne 1959:32-33) defined four more-or-less discrete subtypes on the basis of geographical distribution, size and material. The description of these types (Baumhoff and Byrne 1959:37-38, Pl. 1) indicates that the side-notched points of the type described here are somewhat different than those previously studied. This difference also is apparent from the Desert Side-notched points illustrated in this report. It is of interest to note that the sample utilized by Baumhoff and Byrne did not include specimens from the western edge of the San Joaquin Valley. They do note, however, that the Desert Side-notched (general subtype) point "is definitely of minor importance" in the San Joaquin Valley (Baumhoff and Byrne 1959:59) while the Delta subtype distribution in the same area is not well-established. It may be inferred, then, that the classic Desert Side-notched point is not typical of the San Joaquin Valley, at least in its southern portions, where it is replaced by the variant type herein reported.

Points identical to those described here have been recovered from southern California, but the distribution data are not available at this time. Those illustrated by True (1962) from Cuyamaca Rancho State Park, San Diego County, are clearly of the same type (True 1962: Pl. 11, 12, 13). One suspects that further work along the coast range south of Little Panoche will indicate a more-or-less continuous distribution of this point type, possibly ultimately derived from Southwestern sources. Though they were known prior to the excavations of 4-Fre-128, we feel justified in terming this point the Panoche Side-notched. It then becomes the fifth subtype in the established classification for the side-notched concave-based points.

Crude Side-notched (Fig. 27a). A small series of five poorly-chipped basal fragments comprise this type. They have straight sides with a shallow notch and a flat base. All are small, apparently less than 20 mm. in length when complete. They presumably represent rejected, partially finished points or indicate a lack of skill on the part of the maker.

Desert Side-notched (Fig. 26p, q). Six points are classed in the Desert Side-notched form. In general they would be most similar to Baumhoff and Byrne's general subtype in that they all have concave bases; however, five of the six measure over 29 mm. in length and three are made of silicate. They, thus, do not conform to the definition of the general subtype, which measures less than 26 mm. in length (Baumhoff and Byrne 1959:37).

The two largest points, both of obsidian, are certainly trade pieces and the recovery of one of these from the fill in House 1 suggests that

they may not have been functional in nature (see discussion of House 1). Presumably, the silicate example could be local, but it is possible that it represents a trade item, as the classic Desert Side-notched form, though known, was of minor importance at the site.

Serrated Points (Fig. 26r, s, t). Two forms of serrated points (six specimens) were recovered from the site. The first form is leaf-shaped with a series of square edge serrations. This point type is clearly a trade item from the Late Phase II occupation of the Stockton Delta region to the northeast (Lillard, Heizer and Fenenga 1939:79-80, Pl. 24, Nos. 23-55). Presumably they occur some distance south of the Delta in the valley proper but no data are available.

The second serrated point form has a concave base but in all other respects is identical to the leaf-shaped point. They appear to be locally reworked points as leaf-shaped points do not occur in the Little Panoche assemblage. No serrated points made of silicate occur in the area, again substantiating this hypothesis that the serrated examples are intrusive.

Small Point Fragments. A large number of small tip or medial point fragments occurred in the site. The great bulk of these are of silicate but six obsidian fragments, including one serrated fragment, occurred. In one instance a tip and base fragment were fitted together from units 22 m. apart. This illustrates the horizontal rather than vertical distribution of the deposit.

Large Points and Fragments (Fig. 27f, h, k). Two large points are included in the collection. The first is a crude square-based blade of green-red Franciscan chert. It is completely percussion flaked and may represent a knife or point blank. The second large point is a fragmentary concave-based blade. It presumably also served as a knife.

A small number of fragments appear to represent large points. For the most part they are poorly chipped suggesting that they were unfinished points or roughed-out blanks of raw material. Several well-chipped fragments indicate that large blades are included in the cultural inventory at the site. None are large enough to reconstruct the form of the whole piece, however.

Scraping and Chopping Tools. Included with this class are the small scraping tools, drills, graters and the heavier chopping tools. The bulk of these consist of small flake scrapers of various types which have been segregated on the basis of number of utilized edges, form and size. As with the projectile points, the favored materials were various silicates, but obsidian and basalt also were used (Tables 8 and 9).

Simple Flake Scrapers (Fig. 28c, e-h). This type includes all the small scrapers with unifacial retouch on only one edge. For the most part these scrapers are fashioned on elongate flakes apparently struck from a prepared core. They clearly represent a formalized tool type and not the utilization of waste flakes from the production of

other tool types. The specimens which show only slight use wear, as opposed to purposeful retouching, include all of the obsidian and several of the basalt specimens, apparently due to a preference for silicate in the manufacture of these scrapers.

The single bottle glass scraper from the site is of this type (Fig. 28h). It is a surface specimen and of dubious validity, but has been included in the tabulations. Other than a few glass beads, no historic objects definitely can be attributed to the aboriginal occupation of the site. The scraper, along with other glass fragments from the site, appears to derive from within the last 50 years and certainly post-dates the aboriginal occupation by some years.

Multi-edged Scrapers (Fig. 28i, k). These scrapers are identical in most respects to the simple flake scrapers, but have been retouched along two or more edges. Some of these are also of the type struck from a prepared core, but this form is not as frequent as in the single-edged type. Functionally they appear to have been used interchangeably.

Bi-facial Scrapers (Fig. 29c). Six crude, bifacially-flaked pieces are classed as scraping tools. All appear to have primary flaking on one side and crude retouching along the opposite edge. The flaking is confined to the edges and does not extend across the face of the specimen, unlike the specimen classed as large points. Most of these are too small to have functioned as knives, and in all instances the edge is poorly suited for cutting, as opposed to scraping.

Concave Scrapers (Fig. 28p, q). These pieces are essentially scrapers but additionally have one or more concave scraping areas chipped into one edge. The concavity ranges from 10 to 17 mm. in width with an average of 12 mm. All would have served nicely for scraping cylindrical wooden or cane objects such as arrow foreshafts or various bone artifacts.

Gravers and Drills (Fig. 27m, n). A small series of chipped stone pieces represent graving or piercing tools. The graver-like tools all are scrapers with a small, sharply-pointed projection chipped on a corner or end. They appear to have functioned for fine perforating uses or for incising such materials as bone or wood.

The drills include two T-shaped examples with almost cylindrical shanks, one completely chipped triangular example, and one flake with retouching only on the pointed end. None show a great amount of wear, but all are heavy enough to have served as drills rather than as graving tools.

Heavy Flake Scrapers and Steep Scrapers (Fig. 29e). Two large heavy flakes with unifacial percussion flaked edges have been segregated from the smaller flake scrapers. Both are made of coarse-grained material and appear to have served as heavy-duty scraping tools. The steep-angle scrapers are made from thick flakes or small cores. The edges are chipped at a steep angle (almost 90°) to the horizontal plane

of the specimens. They could have functioned as small heavy-duty scrapers or scraper planes. Functionally the heavy flake scrapers would not differ from steep-angle scrapers. Both have working edges that could withstand considerable heavy use.

Cobble Choppers (Fig. 31a). Two ovoid cobbles have been bifacially percussion flaked along one side. The resultant edge is fairly thick and shows some blunting from use. They could have served equally well as hammerstones, but differ from them in that the working edge is narrower and sharper. Both would serve nicely for working other stone artifacts, for example in roughing the surface of grinding slabs or handstones. Such a use would leave little evidence of wear as the bulk of the grinding tools from the area are made of sandstone.

Hammerstones and Cores (Fig. 31b). The hammerstones include those made from cores and natural cobbles. Of the seven examples, three are cobbles and four are cores. All are battered along the edges or along the angles produced by the removal of percussion flakes. The core hammerstones originally could have served as choppers but are now considerably blunted from use and would no longer function as such. None of the hammerstones exhibit extensive battering which suggests that they were used only casually then discarded.

The cores, almost all of silicate, range in shape from globular to tabular. Many are cobbles from which flakes were struck. A small number exhibit some preparation of a striking platform utilized in the manufacture of blades from which flake scrapers could be made. It would appear that many of the cores result from the removal of random flakes to determine the quality of the material. It is evident that some of the cores were not utilized due to the intractable nature of the material.

Ground Stone Artifacts. A total of 54 ground stone artifacts of all types were recovered from 4-Fre-128. Of these, 40 consist of various food or tool preparation implements and seven of the 14 remaining artifacts are steatite vessels or fragments of vessels. It is clear that stone was not a favorite material for ornamental objects excluding the steatite disc beads.

Twenty of the ground stone artifacts were from the fill or floor of Houses 2 and 3, and six from the surface of the site. Thus, the structures produced almost half of the excavated ground stone artifacts. This contrasts sharply with the various chipped-stone artifacts which tend to be from the midden, and the beads which predominantly come from the structure fill. The pertinent data on the ground stone artifacts are presented in Tables 10 and 11.

Ground Stone Discs (Fig. 16h). Two small flat ground stone discs (limestone?) probably represent ornaments. Presumably they were affixed to some other artifact as decoration, but neither now show any evidence of mastic. The unifacially-beveled edges suggest that they may have served as insets or facings of some sort.

Actinolite Splinters (Fig. 16d). Three splinters of green translucent actinolite were recovered, one of which has been ground to a blunt point on one end. The others may have been polished but otherwise show no evidence of modification.

Worked or unworked actinolite splinters have been recovered from most sites in the area. At 4-Mer-3, they cluster in the late period, especially from the large ceremonial structure, and several occurred with a cremation from this structure (Pritchard 1966:66-67). They also occurred at 4-Fre-129 and examples were common at 4-Mer-S94. The latter site certainly predates the late occupation in the area and provides some time depth for the use of these splinters.

Steatite Bead Blank. This is a small football-shaped piece of greenish steatite which has been ground to shape, then polished. It presumably is an unfinished bead of unique form.

Steatite Arrow Straightener (Fig. 17a). This artifact is a rectangular steatite vessel rim sherd which has a ground U-shaped groove across its short axis on the convex side. The groove is highly polished as contrasted to the other surfaces of the sherd. The edges are rough and unfinished. The width and depth of the groove indicate use with a shaft about pencil-sized in diameter. This, it should be noted, is about the diameter of the arrowcane (*Phragmites communis*), a stand of which is located at the edge of the site. The abundance of scrapers as well as the site location in proximity to this plant indicate extensive use of arrowcane here.

A second sherd arrow straightener was recovered from 4-Fre-129, but no others are known from the area. They did occur in the upper three feet of Buena Vista Lake Site 1 and are attributed to the late Buena Vista occupation (Wedel 1941:54, Table 8, Pl. 33V). Both Kroeber (1925:530) and Latta (1949:55-56) associate the steatite arrowshaft straightener with the use of cane arrow shafts. They functioned not only as straighteners but for the smoothing and polishing of the shaft.

Steatite Vessels and Sherds (Fig. 18). Two broken, but restorable, steatite vessels and five fragments representing three other vessels were recovered from 4-Fre-128. One fragment and one vessel are from House 2, the remainder are from the surface or from the midden.

The fragments appear to represent vessels of the same form as the complete specimens, but the description here is only of the two complete vessels. Both vessels are ovoid in outline with almost vertical walls and a rounded, flattened base. The rounded rim has a series of short vertical lines cut laterally to its axis, but no other decorative features are present. One vessel has a groove cut, or ground, across the base at right angle to the long axis of the vessel. Its function, if any, is unknown but it might have been the beginning of the repair of the vessel which is longitudinally split in half.

Both vessels are carbon-smudged on the exterior, and traces of carbon also show on the interior. The vessel which is split in half has carbon on the broken edges. The base of the larger vessel is badly burnt to the extent that the steatite is now decomposing. This undoubtedly explains its fragmentary condition when recovered (see section on Feature 8).

Archeologically, steatite vessels are of frequent occurrence in the San Joaquin Valley. They occur rarely in the Delta Region (Schenk and Dawson 1929:384) but become more frequent in southern portions of the valley. Here they are reported from the Buena Vista Lake area (Wedel 1941: 58-60, 97, Pl. 35-36; and Walker 1947:7). Small cooking pots of steatite also are reported ethnographically for the Chukchansi and other Yokuts groups (Kroeber 1925:527; Latta 1949:100).

The scarcity of vessels and sherds at 4-Fre-128 suggests that these pieces represent trade items from further south. There is little or no evidence for the local manufacture of steatite vessels in the Western Merced-Fresno County area on the basis of the present archeological evidence. This is also supported by their scarcity at 4-Mer-3 where only six vessel sherds were recovered (Pritchard 1966:42-43).

Bowl Mortars. All of the evidence for the use of the bowl mortar is in the form of broken fragments. Of the ten fragments, two are interior or wall portions which provide no clue as to the original shape of the mortar. One from House 2 is coated with red pigment, probably from secondary use after breaking. One fragment from the surface apparently is from a cobble mortar which had minimal exterior shaping. The remaining fragments are all of exterior-shaped bowls with rounded rims. Of these, three are from Features 8 and 9, where they were included with burnt rock concentrations indicating reuse as cooking stone after breakage. The other three fragments from Houses 1 and 2 are also badly burnt. The wear on the largest fragment from House 2 suggests that it was used for grinding after breakage.

The overall evidence suggests that bowl mortars were used only occasionally at 4-Fre-128. The fragments were apparently picked up in the area and secondarily utilized. This non-use of bowl mortars is supported also by the recovery of shallow slab and boulder mortars at the site, although their scarcity is difficult to explain.

Cobble Mortar (Fig. 20). A single example of a shallow boulder mortar was recovered in situ at the edge of House 2. It had been placed on the rim of the house firmly embedded in the sterile soil. The pecked depression is the only modification, and its size and shallowness (120 mm. dia., 13 to 23 mm. deep) suggests that it was used with a hopper basket. Evidence for this in the form of an adhesive are lacking on the specimen. The lack of wear outside the depression, however, suggests that a hopper may have been used.

Kroeber (1925:528) denies the use of the hopped stone mortar for the Yokuts, although examples are known. The ethnographic accounts also indicate that wooden mortars were the more frequent (Kroeber 1925:888).

Hopper mortars were recovered from Buena Vista Lake Sites 1 and 2, however, which indicates that their use did extend into the San Joaquin Valley (Wedel 1941:69-70, 102-103). All of these specimens are assigned by Wedel to the late occupation (Wedel 1941:144).

Slab Mortars (Fig. 22b). Two flat sandstone slabs with mortar depressions were recovered from the surface of the site. Both apparently were discarded after breaking across the mortar pit. In one example the depression was worn completely through the slab and the reverse side had been used as a grinding surface. The depression on both examples suggests that they were used with a hopper basket but again no clear evidence of such is present.

Slab mortars were recovered with the earliest burial complex (equivalent to Late Horizon Phase I) at 4-Mer-3 and Pritchard (1966:41) suggests they may be diagnostic of this period in the western Merced County area. Recent work at San Luis Reservoir (at Site 4-Mer-S94) suggests that this mortar type is more diagnostic of the preceding period and probably temporally equivalent with the central California Middle Horizon. At this point it seems premature to speculate on the temporal limits of this mortar type, but possibly the 4-Fre-128 examples indicate retention of reintroduction of a predominantly earlier mortar type.

Pestles (Fig. 23a, b). Only six pestles or pestle fragments occurred at 4-Fre-128, all of which were recovered during the excavations. The two complete examples include a completely shaped conical pestle from the floor of House 2 and a partially shaped cobble pestle from the midden. The cobble type has been used on both ends, while the conical type was used only on the broad end.

The four fragments include two medial sections of fully shaped pestles, one rounded distal end fragment, and a pointed proximal end fragment from a conical pestle. Three of the four occurred in the fill of House 2 and the other was in the midden.

Both shaped conical and cobble pestles are frequent in the Merced-Fresno County area. Pritchard (1966:45-47) reported both types from 4-Mer-3 but the cobble variety out-numbered the shaped form by 3.7 to 1. Present evidence from other excavated sites (4-Mer-14 and 4-Mer-S94) suggests that temporal differences may be present, but the analysis of the specimens is not yet complete.

Manos (Fig. 24a, c). Two types of manos occurred at 4-Fre-128. The first, with but a single example, has battered edges and was used on both sides. The amount of wear is slight, suggesting only casual use.

The second and most frequent form has wear only on one side and lacks shaping along the edges or ends. All but one are simply oval, flattish cobbles which have been slightly roughened by pecking to provide a grinding surface. This specimen, from Feature 5 in House 2, is distinctly plano-convex in cross section and the utilized surface is

flat and well-ground. This piece is almost identical in form to the specimens termed "convex metates" by Pritchard (1966:50). The 4-Fre-128 example, however, exhibits some use-wear along the edge, which suggests that it was used as a mano rather than as a small metate. It is possible, of course, that the piece did function as a small grinding slab as only one large grinding slab (see section on Slab Mortars) was recovered from the site.

Plano-convex or cobble manos are extremely frequent in the area under consideration. At 4-Mer-3, both shaped and cobble manos occurred, with the latter most frequent (Pritchard 1966:54-61). At 4-Mer-14 (with late Horizon Phase I affiliations) both uniface and biface manos occurred, but the percentage of bifacial manos is somewhat higher. At 4-Mer-S94 this trend increases considerably with bifacial manos in the preponderance. These data suggest that the terminal mano form is the unshaped unifacial cobble mano. The Little Panoche area data bear this out.

Small Grinding Slabs (Fig. 25c). These are all unshaped thin rectangular-to-oval-shaped slabs of sandstone which have been abraded on one (six specimens), or both (two specimens) surfaces. Only two exhibit pecking to roughen the grinding surface, the remainder were used without modification.

Two slabs were used for pulverizing red pigment. One, from Feature 9, had pigment traces embedded in the ground surface. The second, over Burial 2, had a small pit on the reverse of the ground side which exhibited traces of pigment.

Whetstones. Three small irregular sections of sandstone smoothed on one or both sides are classed as whetstones. None have been shaped or pecked on the ground surfaces. Presumably they served to smooth bone, wood or shell objects as they exhibit little wear. They might well be termed abraders, but the flat surfaces closely resemble our own whetstones; thus the use of that term is the more appropriate.

Miscellaneous Objects.

Baked Clay. From just above the floor of House 2 (Unit 16N-22W, 40-50 cm.) came a fragmentary baked clay "spindle-whorl", or discoidal (Fig. 13bb). It originally was about 18 mm. in diameter. The cross section apparently was biconical or plano-convex. The perforation was formed by either pushing a small stick through the center when the clay was plastic, or by leaving the stick in place and burning it out when the object was fired.

Two similar-shaped "spindle-whorls" were recovered from 4-Mer-3 (Pritchard 1966:70, Fig. 12x-y). The smaller of these (Fig. 12x) is probably identical to the 4-Fre-128 example.

Though the term "spindle-whorl" is used here, and by Pritchard, there is no evidence of function for these objects. In form they closely resemble the spindle-whorls from the Southwest, however.

Baked Clay Fragments (Fig. 13cd). Twenty-four burnt fragments of clay were recovered from the site. Of these, three are from the midden (Units 16N-38W, 4N-30W) and the remainder are from the fill in Houses 1 and 2. Six of the fragments are simply burnt chunks of clay while the remaining 18 fragments exhibit impressions of tule (?), grass and small poles.

These impressed fragments may represent mud plastered on the structure covering, possibly around the smoke hole. It is also possible that they represent mud used inside the dwelling, where it accidentally came in contact with grass, etc., on the floor and later was accidentally baked. Our present evidence on the structure forms in the area does not allow further speculation on the meaning of these impressed clay fragments, but they consistently occur in limited amounts in the fill in all the structures so far excavated,

Polished Pebbles. Two small egg-shaped, or roundish pebbles with some polish or grinding occurred in the site. One is andesite and the other is of a granitic material. The larger specimen (50 mm. by 45 by 40 mm.) is definitely ground. It may represent a game ball such as those mentioned by Latta (1949:128), or could have been used as a small hammerstone.

Concretions. Three small concretions or nodules were recovered, two from the surface and one from the fill in House 1. One is circular with a flattened cup-like cross section. An identical fossil was recovered from 4-Mer-3 (Pritchard 1966:72).

From House 1 came a small, oval sandstone concretion. It appears unmodified but the softer inner portion may have been partly gouged out.

A weathered calcite nodule was recovered from the surface of the site. It is either battered or weathered, but is otherwise unmodified. Presumably it represents a curio collected for its appearance.

Red Pigment. Small chunks of red pigment, most of which are approximately pea-sized, were recovered from the midden and in three of the houses (1, 2 and 3). As shown in Table 15, they were especially common in House 2, and in the upper 20 cm. of the midden. Presumably the material is local, possibly related to the reddish-colored sandstone native to the area.

Carbonized Material. A small number of carbonized, broken pinenut shells were noted during the excavation. Most of these could not be recovered due to their fragile nature. One came from the 30 to 40 cm. level of the fill in House 2.

From Houses 1 and 3 came burnt twigs ranging from pencil-size to about the diameter of a man's index finger. Burnt grass also occurred on the floor of House 1 and several small burnt fragments of arrowcane came off the floor of House 3.

Historic Material. Almost every unit in the midden and from the fill of Houses 1 and 2 produced historic objects. In the main these consisted of broken glass fragments attributable to brown or clear glass bottles. The bulk of the bottle glass appears to date from post-1900. The historic objects include primer caps, cartridge cases, both rim and center fire, and a large caliber lead bullet.

The bulk of the historic material was in the upper 10 cm. of the deposit, but historic objects were recovered in lesser quantity down to ca. 40 cm.; presumably due to rodent disturbance. Other than one possible glass scraper and the glass beads there is no evidence of contact material directly attributable to the aboriginal occupation of the site.

Midden Constituents. The waste material recovered from the excavation has been only partially analyzed for this report. All of the shell has been identified and tabulated and some chipping waste has likewise been roughly segregated and tabulated. The faunal remains have not been analyzed as the identification by species is greatly complicated by the large amounts of recent sheep bone from carcasses deposited in the site area by recent sheep ranching operations.

As may be seen in Table 16, the deposit contained limited amounts of shell and almost all that occurred was in small fragments. The identifiable fragments were all of Gonidea angulata. No freshwater clams were noted in Little Panoche Creek during our excavations. Presumably these bivalves came from the San Joaquin Valley or were at one time living in Little Panoche Creek. It is clear, however, that the inhabitants of the area made little use of clams as a dietary supplement.

Chipping waste was analyzed from only four units (Tables 12, 13 and 14). This includes Unit 2N-OE (House 1), 16N-20W (House 2) and two from the midden; Units 10N-34W and 18N-OE. The vertical distribution (number and weight), of the midden chippage indicates that the upper 20 cm. of the deposit contains the bulk of waste material. Below this point the chipping waste drops appreciably. This presumably is due to the greater admixture of sterile non-midden soil. In the house fill, the amount of chippage is more-or-less constant down to the floor in the case of House 2. The fill just above the floor was not screened in House 1, but the results of the tested deposit suggest the same for the fill in this structure. It is of interest to note the increase in chippage from House 2 as contrasted to House 1. This would clearly indicate a functional difference in the two structures.

The material utilized at 4-Fre-128 is mainly silicate, including fine-grained quartzite, chalcedony, agate and opalized material. They range in color from translucent yellow or reddish, to various greens and bluish tints. Other material includes dense red or red-green jasper of the Franciscan series; basalt (usually from cobbles) and obsidian. The latter occurred in small amounts and was certainly imported into the area. The quartz, for the most part, consists of large percussion flakes, probably resulting from the manufacture of heavy tools. Much of the coarse-grained quartzite and the basalt chippage also resulted

from percussion flaking. Apparently all of the material utilized, except obsidian, was collected as nodules or cobbles in the area. The abundance of silicate waste indicates that all of the cobbles returned to the site were not of suitable quality for the manufacture of small chipped stone tools. Thus the discarded material could indicate more intensive use of the site area than may have indeed actually been the case. Certainly other evidence does not indicate any great time depth or population for 4-Fre-128 even though chipping waste is relatively abundant.

BURIALS

Only two burials were recovered from 4-Fre-128; both were infants and both were buried in structures. Burial 1 was located in the fill of House 1 at a depth of 22 to 28 cm. The skeletal material includes one femur, both tibias, and a few small bone fragments. It apparently was in a fully-flexed position. No grave goods were associated. Burial 2 was in a small pit excavated through the floor of House 2 at a depth of 40 to 55 cm. from the surface. The skeletal material present included the skull, one femur and several smaller bones. Over the top of the burial had been placed a small grinding slab and a large cobble, while in the mouth were four Type 3a1 Olivella beads. Unfortunately, a rodent tunnel had passed through the grave pit and some of the skeletal remains and possibly artifacts had been carried away.

Both burials obviously post-date the abandonment of the houses. The few artifacts with Burial 2 suggest that this burial was made not long after the house was abandoned. The burial in the fill of House 1 indicates that the depression had been filled-in while the site was still occupied. As the entire occupation is relatively recent, this suggests that the depression was purposefully filled after the structure was no longer in use.

It is clear that these two burials do not represent anything more than the almost casual disposal of the remains. Human bone, again the remains of an infant, were noted from a rodent burrow some distance north of House 3. This area possibly represented a cemetery but this hypothesis could not be tested in the time available.

FEATURES

Eighteen features were recorded at 4-Fre-128. Of these, eight were in the midden units, eight in House 2 and two in House 1. As the structures will be discussed in a separate section, only those features in the midden units will be discussed here. Their location can be seen in Fig. 37.

Feature 4 (Unit 4S-16W, 40 cm. deep). This feature consisted of two concentrations of fire-fractured cobbles in shallow irregular depressions into the sterile base soil. They presumably represent hearths but no great amount of charcoal was present.

Feature 8 (Unit 16N-34W, 16-38 cm. deep). This feature consisted of a badly fragmented steatite vessel which had been placed on top of a small hearth. The hearth contained a charcoal lens underlain by a reddish burnt area just upon the sterile base soil. The vessel is described in the section on ground stone.

Feature 9 (Unit 14 and 16N-38W, 32 to 60 cm. deep). This feature, consisting of a large, roughly circular depression into the sterile base soil, measured ca. 130 cm. N-S by 122 cm. E-W. The center of the depression was bisected by the line between Units 14N-38W and 16N-38W. The central area of the depression contained a large number of fire-fractured cobbles, or sandstone chunks suggesting that the depression was lined with rock. Two smaller concentrations of cobbles occurred, one at the north edge of the depression and one at the southwest edge. The latter contained abundant charcoal. A burnt ashy area continued ca. 80 cm. to the north of this latter concentration, adjacent to the large depression. The cobble fill contained several ground stone artifacts (Table 11) and a few shell beads were in possible association.

Feature 10 (Unit 14N-30W, 2 cm. deep). This feature consisted of a small concentration of fire-fractured cobbles entirely within the midden. The feature measured 55 cm. N-S by 65 cm. E-W. Some charcoal was scattered among the cobbles indicating that it represented a hearth.

Feature 11 (Unit 28N-22W, 9 cm. deep). This feature consisted of a small, apparently circular area of burnt twigs, grass and pinenut shells underlain by a scattered concentration of fire-blackened cobbles. As it extended into the adjacent unexcavated unit to the north, its full dimensions are unknown. The exposed area measures 19 cm. N-S by 35 cm. E-W. Presumably it represented a small hearth or refuse pit.

Feature 12 (Unit 2N-30W, 36 cm. deep). Feature 12 consisted of a basin-shaped depression (ca. 100 cm. in diameter) into the sterile soil and adjacent, on the north, to an irregular depression. The depressions contained few fire-fractured cobbles, charcoal and ash. The sterile soil had been burnt to an orange-pink color from the heat, especially under the basin-shaped depression.

Though undoubtedly these functioned as hearths like the other features described, the circular basin differs in that it is more symmetrical and was excavated with greater care.

Feature 13 (Unit 4N-30W, 40 cm. deep). This feature is undoubtedly related to Feature 12 as it was located in the unit just to the north and about on the same level. It is also a symmetrical basin-shaped depression (50 cm. in diameter) excavated into the sterile base soil. The interior of the basin had been completely lined with fist-sized cobbles. A considerable amount of charcoal and ash was above and between the rock lining. The sterile soil under the rock and around the edges of the basin had been burnt to a reddish-orange color.

Feature 14 (Unit 2-4N-30W, 10 to 12 cm. deep). This feature consisted of a charcoal lens containing a large quantity of burnt, badly fragmented, large mammal bone. It extended in a NE to SW direction with its southwest end directly over Feature 12. It continued into the east wall of Units 2-4N-30W, thus its full extent is unknown. The excavated area measured ca. 90 cm. wide by 170 cm. long. A few fire-fractured cobbles were included in the lens, but no concentration was noted such as in the other features. This feature may be associated with Features 12 and 13, although it was some 20 cm. above them. It undoubtedly represents a large cooking area or refuse pit.

Summary of Features. All of the features in the midden at 4-Fre-128 appear to represent cooking hearths, refuse pits, or firepits used to heat rocks for cooking. The symmetrical basins appear to have served some specific function on the basis of form and care in excavation. Latta (1949:101) notes that at most villages several fires were kept burning at all times for the disposal of waste. These are described as "a hole several feet across and a foot or more in depth containing burning coals and cooking rocks". Even with but a short span of occupation it is clear that refuse pits of this type, plus other types of pits, would soon produce an abundance of features such as those described above.

STRUCTURES

The initial survey of the site suggested the existence of a large number of structural remains on the basis of the more-or-less visible depressions scattered over the site area. It became apparent upon fuller examination that at least some of the depressions were probably nothing more than deflated areas produced by the strong prevailing westerly wind. In two instances, Houses 1 and 2, it was only after excavation that it became clear that structures were represented. One depression, identical to the two which did define houses, contained no evidence of a structure. Another slight depression, east of House 2, is thought to represent a house but it was not tested.

As opposed to the structural remains located in the central portion of the site, those commented on above, three well-defined depressions with definite encompassing rims were located along the western edge of the site (Houses 3, 4 and 5) as seen in Fig. 7a and b. Only five structures are specifically numbered but others, not readily definable by surface indications, are presumably present.

House 1 (Fig. 9a-d; Fig. 39). This structure was initially tested during Easter Week of 1966 with the excavation of two 2 by 2 m. units approximately in the center of a shallow depression some 2 m. in diameter (Units 2 and 4N-OE). These two units were excavated to a depth of 60 cm. except along the north end of Unit 4N-OE where sterile soil was noted at a depth of 20 to 30 cm. This sterile area eventually turned out to be the edge of the pit excavated for the structure.

Two features were recorded in the house fill. Feature 1 was a bowl

mortar fragment in Unit 2N-OE at a depth of 38 cm. Feature 2 consisted of a concentration of elk bones including a mandible fragment and a number of vertebra, some of which were still in an articulated position. Just south of the bone material was a small concentration of ash and charcoal, with evidence of burning in situ. This feature was at a depth of 60 cm. and was situated in the center of the structure and some 30 to 40 cm. above the floor.

Burial 1 was located directly above Feature 2 at a depth of 22 to 28 cm. from the surface. The grave pit for this burial was noted in the 10-20 cm. level, suggesting that the grave pit originated from close to the present surface at the time of excavation. It thus clearly post-dates the abandonment and filling of the structure.

Work on this structure was halted after Easter due to the need to complete the excavation at 4-Fre-129. In the summer of 1966 the final phase of the work was completed. It was at this time that the final clearing of the structure was undertaken. Due to the size of the crew and time limitations, the remaining fill in the structure was not screened. Ultimately, the clearing involved the excavation of six units (2-4N-2W-OE and 2E) and portions of five bordering units.

The structure is small, measuring slightly over 4 m. wide and about the same in length. Its outline is best described by the term "kidney-shaped", but the reader should refer to the plan view (Fig. 39) for clarity. At the southwest side of the house is a lateral sloping "vent" at the base of which is a basin-shaped firepit. This vent, situated as it is, produces a break in the basically circular nature of the structure.

The walls of the structure are almost vertical in their upper portion. Where the floor and the walls merge is gently rounded. In several areas along the upper edge of the pit excavation impressions of roofing poles were noted. These will be discussed further in a consideration of the superstructure.

The floor proper drops gently from the area where it meets the walls, levels out, then raises slightly toward the center of the structure in the area around the center post. Peripheral post holes are located on each side of the basin-shaped firepit at the base of the inclined vent. An earth ridge separates the poles and the firepit, apparently to protect them from the heat. The center post hole, measures 23 cm. in diameter at the floor surface and tapers to a diameter of 12 cm. at a point 15 cm. below the floor level. The total depth of the hole is 27 cm.

The two peripheral post holes on each side of the firepit measure 15 cm. in diameter and are 30 cm. deep. They apparently were dug through a ridge of sterile soil purposely left in place between the firepit and the edge of the floor where it curves in to encompass the firepit. Reference to the plan of the structure presents this more clearly than a verbal description.

The floor when first exposed had a polished appearance resulting from intensive use. No layering was noted but the surface was slightly gray in color, probably resulting from midden being tramped into the sterile yellow soil into which the structure was excavated. Possibly water was also sprinkled on the floor to produce a smoother more durable surface.

Three features were associated with the floor. Two fire-fractured cobbles were lying directly on the floor near the southeast edge of the wall. A short distance northwest of them was a circular deposit of ash and burnt red earth. The floor under this material was not burnt. Presumably this material represents one cleaning of the firepit. The third feature was an elongate oval depression situated almost exactly halfway between the center post and the edge of the firepit. It measures 94 cm. long, from 17 to 24 cm. wide and was 4 cm. deep. The fill in this depression was gray midden. Apparently the depression had been filled-in while the structure was in use as the fill had acquired some polish. Its function is not at all clear, but it definitely was not a filled-in firepit.

The vent and associated firepit are of considerable interest in that this is the first occurrence of such a feature in the area. As discussed above, the firepit is situated at the southwest edge of the floor in a circular depression. It measures 73 cm. in diameter and 15 to 20 cm. deep as measured from the floor surface. The fill in the firepit consisted of white ash with small flecks of charcoal intermixed. A deposit of white ash had been dumped on the floor adjacent to the pit. This undoubtedly represents the terminal, unfinished cleaning of the firepit.

The lower end of the enclosed vent terminates where it drops off into the firepit. It inclines up at a 17° angle from the level of the floor to a point 55 cm. from the surface and ca. 25 cm. below the level of the sterile soil. At this point the exterior end of the vent rises vertically and can be traced upward to the point where the midden rests on sterile. The vent extends one meter out from the firepit and is 50 cm. wide with a gently rounded bottom. This surface has acquired considerable polish and in this respect is much like the floor proper.

The overall configuration of the vent is that of a sloping trough which at the lower point drops off slightly into the firepit. It was excavated into the sterile base material, like the rest of the structure and thus the vertical walls are traceable only to the point where the midden and sterile soil meet. Whether it continued above this point is not known. Investigation of the area around the top of the vent suggests that it did continue slightly into the softer midden but no trace of this is now evident.

Summary. House 1 obviously is a specialized structure form. This is apparent not only on the basis of its depth, as contrasted to the other structures, but on the post arrangement and the use of an

exterior vent. Presumably the latter served as a ventilator shaft for the firepit and possibly as the entranceway. The post pattern suggests that two lateral beams extended from the center post to the peripheral posts. These may have also anchored a covering for the vent. The roof was of small poles which butted around the edge of the excavation and laid on the lateral beams or center post. The fill, rather sterile in nature, suggests that this framework was earth-covered, but this could not be absolutely determined. There may also have been a roof entrance but this again is nothing more than speculation as no evidence of such was present.

Functionally, House 1 is closely allied to the ethnographic "sweat houses" used by the Yokuts. The descriptions by Latta and Kroeber, presented in a preceding section, compare favorably with the details of this structure. The differences (post patterns, external vent and/or entrance) may be due to regional variation within the Yokuts, or possibly the stimulus for this form was from southern California to be ultimately related to certain of the older Southwest (U.S.) house forms. The answer to this question, of course, lies in further excavations in the intervening areas.

House 2 (Figs. 7d; 8b-d; 10a-d; 40). This structure, like House 1, was initially investigated during Easter Week of 1966 with the excavation of two 2 by 2 m. units in the center of a shallow surface depression. No definite floor was uncovered, but in several areas hard surfaces were noted which we assumed (justifiably, it turned out) to be floor surfaces. The final excavation of this house began in May and lasted until early July, 1966. In all, the excavation encompassed the area bordered by grid lines 12N to 22N and 15W to 24W, totaling 15 completely and six partially excavated units.

When cleared of fill, House 2 was revealed as a shallow basin-shaped floor area, 8 m. in diameter. Near the edges, the hard-packed floor rose until it merged into the midden overlying the sterile base material into which the basin had been excavated. The edge of the floor was well defined for the most part. Along the north and west quadrants of the depression the edge rose almost vertically for a distance of about 20 cm. The remaining portion of the rim sloped up more gradually to merge into the midden.

The edge of the floor, at the highest point of the rim, was 15 to 20 cm. below the present surface. In the central part of the floor area the deposit reached a depth of 50 to 60 cm.

The fill material was distinctly gray in color but the profile through the house shows color differences within the deposit (Fig. 11). In part, this may be due to rodent disturbance, but it is also possible that it may be accounted for by differential intentional or natural filling. No direct evidence for intentional filling of the depression was noted, but it is difficult to conceive how natural filling would so completely obliterate the original depression.

The post pattern in House 2 was not entirely clear. Six post holes were located, four situated along the north and west periphery, and two more or less in the central area of the structure. No post holes were found along the south and east quadrants of the structure. It was also in this area that the rim of the structure dipped for a distance of 1.4 m. This area could represent the door area but additional evidence for this is lacking.

The post holes, as originally excavated, measure from 18 to 25 cm. in diameter and from 32 to 43 cm. in depth from the floor surface. Two of the holes still exhibited the post mold. These features measured 14 and 15 cm. in diameter indicating posts of this size were probably used in all but the smallest post hole. The only trees in the area at the present time of this size are sycamore and cottonwood. Both grow in the bed of Little Panoche Creek adjacent to the site.

It would appear that the post pattern for House 2 consisted of a circle of posts set roughly half-way between the center of the structure and the outer edge of the floor. The two posts located more or less centrally actually may have served as center posts, or are related to the possible entrance on the southeast edge. The lack of posts along the southeast quadrant of the structure is puzzling. It was felt at the time of excavation that posts were located in this area but were simply not noted due to rodent disturbance or natural sealing over of the holes in post-occupation times.

Features of House 2. Eight features directly or indirectly associated with the floor were recorded for House 2. In addition, a number of artifacts were recovered on the floor, and one pit (cache pit?) through the floor was recorded.

Feature 3 was in the fill above the floor in Unit 16N-20W at a depth of 20 cm. It consisted of a concentration of fire-fractured cobbles with ash and charcoal intermixed. It measured 90 cm. N-S by 78 cm. E-W. Presumably this hearth marks a period of occupation later than the use of House 2. The entire use span is certainly of relatively short duration.

Feature 17 was a concentration of fire-fractured cobbles in the northwest corner of Unit 14N-22W at a depth of 10-20 cm. This feature was on sterile soil and immediately west of the rim of House 2. It presumably is coeval with the structure and may represent a garbage pit as noted above by Latta for the ethnographic Yokuts.

Feature 15 was a cobble mortar located immediately adjacent to the south edge of the upturned rim. It had been set in a depression excavated into the sterile subsoil; the area around the mortar was thus filled with midden. The mortar was still firmly embedded at the time of excavation.

The exact location of this mortar sheds some light, if our inferences are correct, on the nature of the superstructure of the house. It is clear that the sides must have been either open or of a temporary, i.e.

portable, nature to allow the use of the mortar. It is illogical to assume that the occupants would put the mortar outside the house, especially right next to the wall, if the walls were of a permanent nature. Presumably then, the covering of the structure was of tule or grass (matting?) tied to a framework of poles which rested on the beams supported by a circle of posts.

Features 6, 7, and 16 were burnt areas or concentrations of carbonized twigs on the floor. Features 7 and 16 were probably both part of one large burnt area which was located along the northern edge of the floor between the posts and the floor rim. Feature 6 was situated adjacent to a posthole on the western side of the structure. As can be seen in the plan drawing (Fig. 40), other burned areas occurred on the floor, all between the postholes and the edge of the structure. Possibly these represent evidence for the house having accidentally burned during use, or they may have been small fires used for heating or cooking purposes.

Feature 5a was a steatite vessel, broken in half, which was lying upon the floor. It apparently had broken during use and was saved for repair or for raw material. Just below the vessel was a large uniface mano made of red andesite.

Feature 5b was a large rock-filled depression located just east of the center of the floor area. The pit had been excavated to a depth of 10 to 20 cm. below the floor level and was oval in outline. It measured 1.6 m. N-S by 1.1 m. E-W. The northern half of the pit was filled with fire-fractured cobbles. The outline of the southern portion of the pit was poorly defined due to rodent disturbance, but there is little doubt that it was larger than the concentration of fractured cobbles.

The immediate area around the north and west edges of feature 5b was extremely compacted and smoothed. It almost certainly marks a location of some type of intensive use. Immediately north of this compacted area was a shallow, circular pit intrusive through the floor. It measured 32 cm. in diameter by 18 cm. deep. Presumably it represents a cache pit. The dimensions do not indicate that this feature served as a posthole. The fill was barren and sheds no light as to function.

The last association with the floor was Burial 2, previously discussed in a separate section (Fig. 12a). It should be emphasized here, however, that a posthole may have been partially utilized for the grave pit, or at least such appears to be the case. Rodent activity in the grave pit unfortunately ruined any exact determination. It was our conclusion at the time of excavation that the burial post-dated the structure, however.

A few other artifacts were recovered from the floor during the excavation and are located on the plan (Fig. 40). A cylindrical pestle was located near the southwest edge of the floor in the vicinity of the cobble mortar, with which it appeared to have been used. Two bowl mortar fragments, on opposite sides of the floor, appear to be fragments of the

same vessel. Both are badly burnt and it seems that they do not represent a mortar broken in the house, but rather fragments picked up for reuse.

House 3 (Figs. 8a; 12c; 41). This structure, located at the western edge of the site, differed from Houses 1 and 2 in that it had a well-defined depression enclosed by a built-up rim area. At the high point of the rim, the depression measured ca. 16.4 m. (54 ft.) in diameter and the surface of the depression was 60 to 70 cm. deep as measured from the top of the rim.

Our initial investigation in House 3 consisted of an east-west trench 2 m. wide. One unit (2 by 2 m.) was screened, and the level just above the floor was screened in an adjacent unit. Though the total screened sample is small, it nevertheless is clear that the artifact yield from the fill in House 3 is less than that from Houses 1 and 2.

The floor proper was hard-packed clay with a definite polish in some areas. Preservation was only moderate, as rodents had heavily damaged the floor in certain areas making it difficult to trace.

The fill in House 3 was noticeably more sterile than the fill in Houses 1 and 2. The field notes for Unit 23N-34W in the center of the structure suggest that the bulk of the fill was of natural origin. The strata from top to bottom were: 1) a thin layer of humus; and sterile, somewhat yellow soil, 2) a thin layer of hard-packed clayey soil, 3) a slightly thicker layer of sandy, looser-textured soil, 4) a thin-bedded strata of clay, sand, clay and sand (obviously of alluvial deposition), and 5) a thick layer of rather tough, clayey, light-colored midden with an admixture of small gravel containing some charcoal and other refuse. This sequence suggests that the fill is of both alluvial and aeolian origin. The lack of midden build-up, even on the floor proper, indicates little or no use after the structure was abandoned. The lack of specimens suggests that even if post-occupation did occur it was of brief duration.

Four features were noted in House 3, all definitely associated with the floor. These include hearths, burnt areas and a raised inner "ring".

All the burnt areas occurred around the northern periphery of the floor, between the inner ring and the edge of the floor. They consisted of small patches of burnt twigs, grass and arrowcane. The interpretation of these burnt patches is difficult. They could be remnants of small heating fires, or possibly represent evidence of a fire which destroyed the structure.

Two features were recorded inside the raised inner ring. An oval-shaped pit filled with fire-fractured cobbles was located about 2 m. north of the center of the structure. It measured 70 cm. long by 60 cm. wide. The sides of the pit were reddened from heat and ash, and charcoal was intermixed with the rock lining the pit. A second large irregular depression also served as a firepit, but in this instance no rock lining

was used. It was located slightly east of the center of the structure, but its exact limits were difficult to determine due to rodent disturbance. It measured about 2 by 2 m. with some doubt as to the northern and western limits. The bottom and edges of the pit were reddened by fire and both ash and charcoal were noted in the fill.

The last and most important feature is that referred to above as the inner "ring". It consisted of a raised concentric embankment set about 2 m. in from the actual edge of the floor. The floor was rather flat with a minimum of curvature, and this only near the extreme edges. The "ring" thus broke the contour of the floor into two discrete portions. Whether the ring is made up of applied soil on the floor, or was excavated in this manner at the time of building is unknown. In either case, it presumably functioned in the same manner. The ring, where better preserved, measured ca. 30 cm. wide and from 8 to 10 cm. high. As can be seen in the plan of the structure (Fig. 41) it was not continuous, but this is entirely due to factors of preservation. The evidence at the time of excavation indicates that it was a closed circle when built.

The function of this raised ring is not at all clear. One can only assume that it was definitely a functional part of the house and not evidence of a second superimposed structure placed in an abandoned, already excavated pit. On this basis it could refer to the Yokuts pattern of multi-family or extended family dwellings. It is also possible that it was simply used to sit upon or to delimit use areas within the structure. Any or all of these are plausible but the latter seems the most likely at the present time.

The post pattern is not at all clear from the evidence at hand. The plan view suggests that two concentric rows of posts, one outside the raised ring and one inside, supported the edges of the roof; and beams, in turn, rested on a group of center posts. Three central post holes were located and one may have been situated adjacent to the central firepit. The confused situation regarding this area precludes any conclusion on this matter. It is, of course, possible that rows of posts across the structure are represented, but here again the available data do not support one post plan over another.

It is clear that this structure differs from House 2 not only in size, but in the addition of a secondary structural feature in the raised inner ring, evidence of alluvial filling and lastly, the paucity of artifactual remains in the fill. It is difficult to visualize how Houses 3, 4 and 5 were affected by flooding when Houses 1 and 2 showed no evidence of such fill. Possibly this reflects a temporal difference in the structures, or it may indicate that the raised outer rim of the depression formed a catch basin for alluvial deposited sediment. Evidence for such a rim around Houses 1 and 2 was lacking, and flooding could have removed such a build up if it was less consolidated. The nature of the fill in Houses 1 and 2 clearly indicates occupation after the structures were abandoned, whereas the fill in House 3 indicates little or no occupation after abandonment. Our present data are

interpreted to suggest that all the structures reflect one occupation period, and the differences noted above may simply indicate seasonal occupation or sporadic occupation over a relatively short duration.

Houses 4 and 5. House 4 was briefly tested during Easter Week of 1966 with the partial excavation of two 2 by 2 m. units. These were never completed due to time limitations. House 4 measured about 10 m. in diameter and House 5 was somewhat larger. Thus they are intermediate between Houses 2 and 3 in size.

Comparative Notes on the 4-Fre-128 Structures. The details on the ethnographic Yokuts houses have been presented in a previous section, thus no specific reference will be used in this section. Pertinent archeological data will be noted where applicable.

Only four excavated sites in the San Luis-Los Banos-Little Panoche area have produced structural remains. These include 4-Mer-3, 4-Mer-14, 4-Mer-S94, and 4-Mer-S105. Site 4-Mer-S94, excavated in the summer of 1966, produced only fragments of hard-packed floors in a very rocky midden deposit. These provide no data of value in this discussion and will not be further mentioned.

Two visible structures were tested at 4-Mer-S105. One proved to be of little value in that it had served as a modern trash dump (Pritchard 1966:22). The second, though partially destroyed by heavy equipment, proved to be a structure about 18 ft. in diameter (ca. 5.6 m.) with a hard-packed floor consisting of plastered midden and clay. No post holes were located, and no features associated with the floor were noted (Pritchard 1966:22).

Two superimposed floors were excavated at 4-Mer-14 by F. A. Riddell in 1962-63. They, like the 4-Mer-S94 fragments, were in the midden deposit and showed no visible surface indications. The upper floor at 4-Mer-14 was at a depth of about 18 in. from the surface. It was essentially flat, but apparently rose slightly near the edges where, due to aboriginal disturbance, it could only be traced in profile. One possible post hole, or postmold, was located near one edge, but no other evidence of the superstructure was obtained. This floor measured ca. 25 by 30 ft. Upon stripping off the upper floor surface, a second surface was uncovered, directly under the first. The extent of this earlier floor could not be traced, but the surviving fragment indicates a structure of ca. 20 ft. long, and somewhat less in width. Plastered on the floor was an earthen or mud ring some 10 ft. in diameter with a height of 4 in. Apparently it was a complete enclosure when made. A hearth built into one side of the "ring" also was made of plastered mud. No post holes or molds were associated with this remnant surface. It is clear, however, that though much smaller, this floor is identical to House 3 at 4-Fre-128. The grave goods associated with burials intrusive through the 4-Mer-14 floors indicate a dating equivalent to the Late Horizon Phase I period in central California. This should imply time depth of some 500 to 1,000 years B.P. for the 4-Mer-14 structure, and

suggests that it considerably predates, and is ancestral to House 3 at 4-Fre-128.

A raised inner "ring" feature is reported by Clemmer (1962:21-23, Fig. 13 and 13a) from a site at Morro Bay. Here the ring was inside a circle of posts around the outer periphery of the floor area. There is little doubt that this structure corresponds in its essential details with the floor from 4-Mer-14 and House 3 at 4-Fre-128.

Further south Harrison (1965:151) has reported a raised ring or ridge from a historic Chumash house, and indicates this fixture is also known from other Chumash sites. This may relate to the Chumash practice of dividing their structures into rooms, as noted by Kroeber (1925:557-558), but, as discussed by Harrison (1965:155), these house forms probably represent specialized dwellings of some sort.

The 4-Mer-3 structures, with the exception of the largest, resemble in most details Houses 2 and 3 at 4-Fre-128. The largest structure at 4-Mer-3 (House 2) almost certainly does not represent a family (or extended family) dwelling and will not be further considered here.

Houses 3, 10 and 11 at 4-Mer-3 are closely comparable to those from 4-Fre-128. They range in size (floor area) from 26 by 27.5 ft. to 38.5 by 28.7 ft. Like the 4-Fre-128 structures they tend to be slightly oval, but only House 3 is definitely of this configuration. All have well-compacted floors which turn up near the rim. No evidence of side entryways were noted. Evidence of hearths or burnt floor areas occur in all these structures, normally in a more or less central location. None, however, had the cobble-filled hearths noted from 4-Fre-128.

The post patterns are variable. House 11 had four posts in a squared pattern with a single center post. House 10 had six posts in an oval or squared-oval arrangement. House 3 resembles House 10 but has a center post and extra peripheral post, conceivably it could also represent a circular pattern with a single center post.

Summary. Our present data suggest that the typical house for the area under consideration measures from ca. 25 to 40 ft. (8 to 13 m.) in length, and somewhat less in width, and tends toward a circular pattern. The floor was excavated to a depth of about 2 ft. (60 cm.) and was relatively flat other than at the edge, which turns up rather abruptly. The post patterns apparently relate in general to the size of the structure, but one or more center posts are frequent, with a variable arrangement of posts set out from these. These secondary posts, in plan, appear as a circular arrangement, but conceivably could represent matching sets of peripheral posts. This arrangement makes it clear that the useable area of the structure, and therefore the roof, began at the edge of the depression. The roof was supported by cross beam and probably smaller poles were placed over these.

While Pritchard (1966:143) suggests earth-covered structures, such may not have been the case. There is little doubt, however, that some

houses had earth heaped around the base of the structure or a built up rim. The implication of a roof entry on the basis of hardened floor areas may simply represent specific use areas within the house. It is clear that further data on these and other questions must await future excavations.

CONCLUSIONS

The evidence presented here for site 4-Fre-128 indicates that the occupation was by a relatively small group of people who occupied the area in protohistoric and early contact times. The artifactual material, for the most part, appears to date within the protohistoric period, and the few glass beads suggests a later overlay on an entirely aboriginal culture pattern. The differential filling-in of the house depressions, indicates seasonal occupation of the site, presumably over a relatively short period of time.

An estimate of the duration of the entire span of occupation is supported by the few glass beads and the apparent lack of occupation in the area after ca. 1810 to 1820. We would suggest then that the span of occupation for the site is from ca. A.D. 1700 to 1800.

Culturally, the assemblage appears to have definite links with groups to the south or west, rather than to the north. The familiar clam shell disc bead from the Sacramento-San Joaquin Delta area is essentially lacking, indicating the Little Panoche region was outside the sphere of influence of the Delta region. Clearly a local or regional late culture variant is represented which, to be fully understood, must be approached as a distinct entity and not as a peripheral Delta manifestation.

ARCHEOLOGICAL REMAINS AT SITE 4-Fre-129

DESCRIPTION OF SITE 4-Fre-129

Site 4-Fre-129 is situated on a low terrace (Terrace 2) some distance north of Little Panoche Creek proper (Fig. 1b). A spring is located just east of the site at the foot of the terrace which probably explains the placement of the site at a distance from the primary water source in the valley.

This spring, according to William Bull (U.S.G.S. Geologist, personal communication) results from a fault zone which trends generally north-south across the valley at a point just east of the site. It is abundantly clear that without the existence of this spring the location would be undesirable for a site. Presumably the spring was a more dependable water source than the adjacent areas of Little Panoche Creek. Possibly the surface flow of water in the creek was sporadic in the past as is the case at the present time.

THE MIDDEN DEPOSIT

The midden deposit at 4-Fre-129 averages only 20 to 30 cm. in depth but horizontally occupies a considerable area (Fig. 36). Though its original extent is now difficult to determine (due to farming and sheet erosion) it may be traced for an extent of at least 80-90 m. north and south along the edge of the terrace and some 40 to 50 m. west of the brow of the terrace. On much of this area the deposit is extremely superficial, but the considerable extent suggests rather intensive occupation for a limited time span. This hypothesis was supported by the results of our excavations; in fact, almost every unit produced at least one feature.

The midden deposit was a distinct gray or gray-brown in color as contrasted to the yellow-brown subsoil and surrounding surface soil. It contained little rock of a sizeable nature, that is, fist-sized or larger, but large quantities of pea-sized pebbles were present. Presumably these were derived from the underlying terrace fill. The bulk of the larger cobbles were fire fractured indicating that they were imported for use as cooking stones. The overall impression one gains from study of the deposit is that the occupation did not add greatly to the natural soil. With the exception of staining from charcoal and the addition of a limited amount of fist-sized cobbles the deposit differs in no way from the surrounding area. The profiles (Fig. 42 and 43) show typical sections of the deposit as well as the intrusive grave pits.

EXCAVATION TECHNIQUES

The site was laid out on the usual north-south, east-west base lines with the metric system used throughout. The excavation units measured 2 by 2 m. (ca. 6 ft. square). In an effort to test the site as completely as possible the units were eventually scattered at random over the areas of the deposit which appeared to have the greatest depth (Fig. 38). The shallow nature of the deposit and its essential uniformity soon indicated that this was the best approach.

At first we purposefully placed the units in areas not disturbed by rodent activity. It became clear after a few days that the rodents had chosen the deeper areas of the site for their burrows. We found that almost invariably the deep area resulted from intrusive grave pits. If we had completely ignored the rodent disturbed areas we would have missed the bulk of the burials finally recovered from the site.

ARTIFACTUAL MATERIAL

Our initial impression of the site, based on surface indications, was that only minor testing was necessary. It soon became evident, however, that the artifact yield was greater than we had anticipated. It very forcibly pointed out the fallacy of testing only those sites which, on the basis of possible depth, or abundant surface artifactual material, appear worthy of excavation. We do not, of course, advocate the excavation of every small or superficial site, but in the area under consideration one clearly cannot rely on the usual criteria of what constitutes a site worthy of excavation.

The bulk of the artifact assemblage from the site consists of shell and chipped stone artifacts. Ground stone, of all classes, is in the minority and the bulk of the larger ground stone artifacts are fragmentary.

Beads. Eighteen types of beads occurred at 4-Fre-129 including twelve of Olivella and two each of clam shell, Haliotis and stone. A short bone tube is also included here, though it may not have functioned as a bead.

The descriptive and distribution data are presented in Tables 17 and 18. The distribution segregates those specimens from the burial areas and those from non-burial areas. It is clear from this that though the types in each are identical the frequency is greater in the grave pit areas.

Olivella (Fig. 13). Only three of the Olivella bead types occurred with frequency in the site. These include large and small spire-lopped (1a and 1b), two variants of the lipped Olivella bead (3a), and small thick disc beads (3e).

Small and large spire-lopped Olivella beads occurred primarily in the burial pits with only ten occurring in the midden. Of the burial pit beads, five occurred in the pit fill for Burial 14 (Unit 28S-14E) and 46 occurred in the area of Burials 1 to 11 (Units 2-6N/12 and 14E). Twenty-six Type 1a

beads occurred in the 60 to 75 cm. level in Unit 2N-12E associated generally with fragments of an infant skull. Though the fragments were not classed as a burial presumably the beads comprise a discrete lot.

The size distribution of the spire-lopped Olivella beads, predominately under 10 mm. in diameter, suggests that large shells were primarily used in the local manufacture of other bead types. The occurrence of considerable shell waste supports this hypothesis.

The second most frequent bead form is the thick-lipped Olivella (Type 3a1). Two variants of this bead occurred. The first is a large oval-shaped form with one thickened rim, while the second is smaller and the edges are completely ground down. The small variant resembles the small thick disc bead (Type 3e) in form but is considerably larger and tends to be oval rather than circular in outline. The large form occurred frequently in the grave pits but the small variant occurred in four of the five burial areas.

The third most frequent form is the small thick disc (Type 3e). This bead form occurred in two of the five grave pit areas, but the majority came from the midden. As all of the deposit was not screened through 1/8 in. mesh the sample does not truly reflect their actual frequency at the site. There is little doubt, however, that they were less popular at 4-Fre-129 than at 4-Fre-128. Two of these beads appear to be made of mussel shell (Mytilus) rather than Olivella. One bead has diagonal incising along the edges. Again this trait is more frequent at 4-Fre-128 than at 4-Fre-129.

The remaining Olivella bead types were poorly represented, numerically speaking. The thin centrally-perforated rectangular Olivella (Type 2a1) had four occurrences, three from the midden and one from the area of Burials 1 to 11. As this type is typical of the early portion (Phase I) of the Late Horizon in the Delta it is doubtful that they are truly part of the bead complex at Fre-129. They, along with other evidence, do suggest that the period represented at Fre-129 is somewhat older than that represented at Fre-128.

The split-punched Olivella (Type 3a2) as tabulated is of minor importance as it includes only the complete examples. A great number of the broken Olivella fragments were definitely of this type, however. It is clear that either this bead was locally produced, or they were imported as raw material to rework into smaller bead types. Latta (1949:69) records the manufacture of this bead type by the Yokuts which supports the data presented from 4-Fre-129.

The split-punched bead in the Sacramento-San Joaquin Delta region is typical of the Late Horizon Phase I (Bennyhoff and Heizer 1958:66-67) but it is clear that they lasted well into the protohistoric period in the San Joaquin Valley.

The remaining bead types include no letter-number designated forms. The small rough disc bead had two occurrences at the site. It is a late protohistoric type in the Sacramento Delta region and elsewhere (Bennyhoff

and Heizer 1958:62). Two large side-ground spire-lopped Olivella beads were recovered. One was filled with asphaltum indicating use as appliqué decoration.

The large disc beads include all those beads lacking a lip remnant. Typologically they would be included with saucer beads (Type 3c) of central California. This type, however, has temporal implications which are not valid in the present context. They probably represent lipless variants of the Type 3a1 beads which did occur at 4-Fre-129.

The large rectangular bead is probably a local form, possibly related to the 3a2 split-punched Olivella beads, or it may be a finished example of a rare local bead form. This is suggested as five rough-drilled Olivella beads occurred. These certainly represent unfinished beads made at the site.

A number of broken Olivella fragments were recovered from the site. Of the 50 pieces, 32 are broken split-punched Type 3a2 fragments, eight are whole shell fragments, three are fragments with ground edges and seven are unidentifiable Olivella shell sections. The occurrence of such shell refuse clearly indicates the local manufacture of shell beads at the site. As noted previously Latta indicates that several types of Olivella beads were made in ethnographic times by the Yokuts.

Beads other than Olivella (Fig. 13). Two types of Haliotis beads occurred at the site including one made of red Haliotis epidermis and one made from the iridescent portion of the shell. The latter are flat disc-shaped beads averaging about 8 mm. in diameter. They were also recovered at 4-Mer-3 in a late protohistoric context (Pritchard 1966:143-144; Table 41). The epidermis beads are identical to those recovered at 4-Fre-128.

The single clam shell disc bead appears to be made of Saxidomus but this is not definite. It is clear, at any rate, that clam shell beads, though known, are exceedingly scarce throughout the area.

The tubular clam shell beads, presumably made of Tivella or some other large clam, are certainly derived from the southern San Joaquin Valley and ultimately from southern California. Though rare, they make up a distinctive part of the shell bead complex. They also occurred at 4-Mer-3 (Pritchard 1966:92), predominantly with the Late period cremations. They are also frequent in the Sacramento and San Joaquin Valley and southern California (Gifford 1947:46, Type AV2b).

Two types of stone disc beads occurred. The most frequent of the two was the well-finished steatite disc bead, which, it may be noted, was the most numerous bead at the site. It also occurred, though less frequently, at 4-Mer-3 (Pritchard 1966:64-65) and at 4-Fre-128. At 4-Mer-3 they clearly are part of the Late bead complex. The second stone bead type is made from a biconically-drilled squarish, flat pebble. It is a unique form without observable diagnostic implications.

A single bone bead was recovered. It is made from a short section of bird bone cut off on both ends (Fig. 15h). It also lacks any temporal sensitivity.

Summary. It is clear that the bead complex (shell and stone) from 4-Fre-129 is essentially the same as that from 4-Fre-128. There are differences, primarily quantitative, which suggest the sites are not fully coeval, however. This is reflected in the occurrence of the Type 3a2 split-punched beads and Tivella clam tubes only at 4-Fre-129, and by the increased frequency of large Type 3a1 beads, spire-lopped Olivella beads and steatite disc beads. Some of the differences are probably due to sampling but nonetheless the differences do seem significant. We feel that the sites represent a continuum with 4-Fre-129 slightly preceding 4-Fre-128 in time. This point will be discussed further in the final summary section.

Other Shell Artifacts. Only 11 shell artifacts, other than shell beads, occurred at 4-Fre-129. These include eight of Haliotis and three of freshwater mussel shell, probably all of Gonidea angulata (see Tables 19 and 20).

Of the Haliotis shell ornaments only two are complete. These include a small squarish example (Type B1) with a single edge perforation and a small rectangular ornament perforated at both ends with fine line edge incising (Type B2a, Fig. 13v, w). Neither are identifiable as to species of Haliotis. Ornament Type B2a is frequently found in a Late Horizon Phase II context in the Delta region, but is not, by itself, diagnostic of that period.

The remaining Haliotis specimens include a fragment of a large circular ornament (Fig. 13x) and four broken fragments of Haliotis shell. Only one of the latter is worked (Fig. 13y) but presumably all are remnants of badly fragmented ornaments.

The freshwater mussel shell artifacts include an irregular, drilled pendant (Fig. 13aa), a complete valve with polished or ground edges (classed as a "spoon") and a small broken fragment with a ground saw-tooth edge (Fig. 13z). The ornament is undoubtedly of local derivation, probably due to the scarcity of Haliotis shell. The ground shell "spoon" is not infrequent in central California, but more often are made of Margaritifera which did not occur at 4-Fre-128 or 129. The saws are reported from the Delta region and San Francisco Bay region by Gifford (1947:9). It may have functioned like the scapula saws from 4-Fre-128 discussed previously.

The last shell ornament is a fragmentary imperforate disc of clam shell, probably Tivella stultorum. Both faces are ground smooth and one exhibits a series of radially incised lines along the edge. A complete decorated disc was recovered from 4-Mer-3, but is identified as fossil squid (sic) (Pritchard 1966:96-97). As the 4-Mer-3 example was associated with a cremation in the large ceremonial structure it is attributed to the Late occupation. Presumably these pieces were facings or decorative elements affixed to some perishable artifact. No mastic is present on the 4-Fre-129 example, however.

Artifacts of Bone and Antler. A total of 64 bone and antler artifacts were recovered from 4-Fre-129. Of these, 27 are from the midden and 37 are from the fill in the burial areas. It should be pointed out that of the 64 tabulated bone artifacts, 19 are merely polished or ground

fragments and thus provide little useable data. The pertinent data on the bone and antler artifacts are presented in Tables 21 and 22, with the exception of the single bone bead already discussed.

Incised Bone Artifacts (Fig. 15j, n). Two incised bone fragments were recovered from the site. The first is a small segment of bird bone with two scored lines across one end; the second is a spatulate mammal bone fragment. It has been completely worked down and has a V-shaped incised design on one side. The form and decoration suggest that this piece had some special function.

Incised bone artifacts in general are rare in the area, but incised bird bone fragments were recovered from both 4-Fre-128 and 4-Mer-3. At the latter site the bulk of the incised bone specimens are from the large ceremonial structure and on this basis are considered part of the Late complex (Pritchard 1966:83-84). No other incised bone spatulas are known from the immediate area, but they do occur in the Stockton region.

Bird Bone Whistle. A very small fragment of cut, polished bird bone appears to be a whistle fragment. The section comes from the area of the hole which is seen at one end of the fragment. Our sample suggests that whistles were rare in the Little Panoche area, but this is probably due to sample limitations.

Mammal Bone Tube Fragment (Fig. 15i). A short, split fragment with one end ground down is the single example of this artifact type. The configuration of the fragment suggests a tube of some length, possibly twice that of the fragment. It could have served as a gaming piece or a sucking tube.

Bone Awls and Fragments (Fig. 14a, c, g). Three complete and 27 fragmentary bone awls were recovered at the site. Of the complete examples all are made of split deer (?) metapodial sections with the proximal end of the bone serving as the base. Two have ground, polished bases, the third is unmodified other than by the original splitting. One complete awl has a sharp needle-like tip and a definite worn shoulder just above the point. This wear indicates use in the manufacture of coiled basketry.

The fragments include 20 tip sections and seven medial sections. They appear to have been derived from specimens identical to the complete awls. One fragment apparently was associated with Burial 15, or at least was in close proximity to the remains.

Polished Ulna (Fig. 14f). This specimen, broken during excavation, apparently was a complete ulna which had been ground off at the distal end. The extent of the modification is now, unfortunately, unknown. The wear suggests that it served as a perforator, however. No comparable examples are known from the area.

Bone "Pin" Fragments (Fig. 14h). Two small, slender pointed fragments are classed as pins. Both are too fragile to have served as awls. The sharp points suggest use as piercing tools, or pins used as decorative

elements. The term "pin" is used here as a descriptive term and does not necessarily imply function.

Bone "Pin" (Fig. 15f). This single specimen generally conforms closely to the term "pin". It has a rectangular cross section, a blunt rounded proximal end and tapers evenly to a sharp point. The short length (38 mm.) and sturdy shaft suggest use as a composite barb or perforator. The shaft still exhibits considerable polish and lacks abrasion or scoring which would suggest rough useage.

Bone "Spurs" (Fig. 15a-c). Five so-called bone "spurs" were recovered from the site, all from the area of Burials 1 to 11. All are made from split worked sections of heavy mammal bone. They have a short, blunt point fashioned on one end and the top edge is polished and transversely notched or scored, apparently to facilitate binding. The basal, or bottom, portion is unworked other than by the original splitting operation. The reader is referred to the illustrations for clarification of the description.

The function of these "spurs" is not all clear. No identical specimens are known, either from the immediate area or from central California in general. A possibly related artifact type is Gifford's U3 (Gifford 1940: 177-178 and 223) which is described as a "pointed, more-or-less blunt-based object, suggesting barb or toggle point for fishing devise or barb for stick used in extracting rodents from burrow". Type U3 has lashing grooves but is longer and thinner than the 4-Fre-129 pieces. It is possible that they served similar functions, however, as suggested by the lashing grooves on both artifact types. The general impression is that they probably served as a hook affixed to a wooden shaft, but the blunt point seems poorly suited for a rodent hook.

Polished Bone and Antler Fragments (Fig. 15o). The remaining bone and antler items are all small, cut, polished or ground fragments. Only two exhibit characteristics which allow definition of the original artifact type. The first is a cut, polished large mammal scapula fragment. It seemingly represents a scapula grass or tule-cutting tool like those from 4-Fre-128. The second is a polished segment of antler. The wear suggests that it is from a digging implement such as the complete antler tine from 4-Fre-128.

The remaining fragments are all small split fragments of heavy bone implements. They probably represent awls for the most part, as few other objects made of heavy bone occurred in the site. They indicate a far greater frequency of awls than is reflected by the identifiable fragments.

Artifacts of Chipped Stone. As with site 4-Fre-128 the bulk of the collection, not counting shell beads, is composed of various chipped stone artifacts. These primarily include projectile points, scrapers, choppers and cores. Here, again, the presence in large numbers of a variety of scraping tools suggests that the area was occupied for the purpose of arrow manufacture.

Projectile Points. Like the projectile point series from 4-Fre-128 the bulk of the points from 4-Fre-129 are small, light in weight, and made of various silicates.

A total of 88 whole or fragmentary projectile points were recovered from the site, of which 34 are classifiable. The unclassifiable fragments have been divided into large and small classes. Of the total sample only 15 (ca. 17%) are classed as large points. In this respect the sample from both 4-Fre-128 and 129 are very similar.

Material-wise the preference at 4-Fre-129 is again akin to 4-Fre-128. Of the total sample ca. 35% are made of obsidian and 61% are made of various silicates. It is interesting to note that of the 34 points of obsidian only seven are typeable. Presumably all the obsidian artifacts at the site arrived in finished form as only small amounts of obsidian chipping waste were recovered.

Eight point types or classes have been segregated from the site. These include four distinct small point types plus a few miscellaneous small points and three large point types. All the small points weigh less than 2 grams and the large ones are all above 4 grams. The description and distributional data are presented in Tables 23 and 24.

Small Triangular Points (Fig. 26a, c). The seven small triangular points include three with concave bases and four with straight or irregular bases. They range from small delicately chipped pieces to the largest which is rather crudely flaked. Two fragments are of obsidian, the remainder are of various silicates. Presumably the larger crude examples are unfinished but several small specimens clearly are finished points. All of the triangular points are from the midden and they occur most frequently in the upper 15 cm. of the deposit.

Small Side-notched Concave Base (Panoche Side-notched) (Fig. 26f, i, j, l, m). Sixteen points of this type occurred at 4-Fre-129. Two have almost straight bases, the remainder have the typical concave base. The complete examples (8) all have deep bell-shaped or U-shaped side-notches, a wide flaring base and narrow delicate tip. The obsidian specimens include two base sections, both appear to be typical. As at 4-Fre-128 they tend to cluster at about 1 gram in weight.

Of the 16 points of this type, 10 are from the midden and six from the burial areas. The midden specimens are evenly distributed in the deposit, but the burial area examples tend to occur rather deep in the grave pit fill. None were in direct association with a burial, however.

Small Serrated Point. A single fragmentary Stockton serrated point occurred here in the grave pit fill in Units 2 and 4N-12 and 14E. It has the distinctive square serration and rounded base like the complete example (Fig. 26t) from 4-Fre-128. Like the bead complex, the essential lack of Delta point types at 4-Fre-129 probably indicates a slight temporal difference between the sites.

Small Stemmed Point (Fig. 27d). A single point appears to have been stemmed rather than side-notched. It has rounded shoulders but the stem itself is now missing. If this point does actually represent a stemmed form it is unique for the site. Small, stemmed points of any form are extremely rare in the area and in the San Joaquin Valley in general. Conversely large, stemmed points are fairly frequent, but the bulk of these certainly predate the occupation at 4-Fre-129.

Small Side-notched Miscellaneous (Fig. 26h). This class comprises the various side-notched concave-based points which are not included in Panoche side-notched type. These are short side-notched points with slightly concave bases. The two obsidian examples both have notched edges. All these are poorly chipped and probably differ from the larger form only on typological grounds.

A second type is a base fragment from very poorly chipped side-notched points. It is identical to the crude side-notched points already described from 4-Fre-128.

The last two points included in this class (Fig. 27b, c) are both reworked side-notched concave-based points. In both examples the tip has been rechipped, and the wear on both specimens indicates that they last saw service as hafted drills or reamers.

Large Projectile Points (Fig. 27g, i, j). Three large, heavy points were recovered from the site, all from two of the five areas where burials occurred. The first is a basal fragment of a large side-notched point with a rounded base. It is made of tan-colored silicate. The second has a triangular blade, straight shoulders and a tapered stem. It is made of a dense chert. The last is a badly broken fragment of a wide-stemmed point with weakly developed shoulders and a triangular blade. It is made of red jasper.

Like the few large points from 4-Fre-128 all the types are unique at the site in the sense that only one example of each occurred. Comparable specimens are not frequent among the collections available for study. Large side-notched and wide-stemmed points were recovered from 4-Mer-S94 in a context suggesting considerable antiquity. A large tapered-stemmed point is known from 4-Mer-3 (Pritchard 1966: Fig. 17h) and several other large, stemmed points also occurred. The tapered-stemmed point type, as noted by Pritchard (1966:32), is most frequent along the south coast of California. With one exception, the large points from 4-Mer-3 could date from the late occupation as four of the five were in the upper 12 in. of the deposit. This, plus the data from 4-Fre-128 and 129, suggests that a few large points were used in late times, presumably as spear points or knives.

Fragments (Fig. 27e). The bulk of the fragments, both large and small, are tip or medial sections. They are about evenly divided between the midden units and the burial units and occur at all depths in each.

Only two of the fragmentary points are of interest. One basal fragment has a concave base and the remnants of a side-notch. Apparently the

point snapped off during manufacture and it was discarded.

The second fragment is a medial section of a large blade of cream-colored silicate. It has been badly burnt and thermal fractured but still suggests that when complete it was larger than any of the classifiable points from the site.

Flake Scrapers and Heavy Flaked Stone Tools. Including the unused cores a total of 145 scraping or chopping tools were recovered from 4-Fre-129. These include 88 flake scrapers of various types, six beaked scrapers or reamers, 32 heavy scraping tools and 19 unused cores. The great bulk of these tools are made of various silicates, but glass and obsidian examples also occur. The latter material is far less frequently used for scraping tools than for projectile points, however. The distribution of the scraping-chopping tools are presented in Table 26 and the descriptive data in Table 25.

Flake Scrapers (Fig. 28a, b, d, g, j, l, m, n). Two scraper types comprise the bulk of the flake scrapers from 4-Fre-129. These include flakes with one unifacially chipped edge or those with two or more chipped edges. Of the 68 scrapers in these two types, 59 are made of jasper, mineralized wood or brightly-colored silicates; six are made of glass, and one each of obsidian and basalt. The better-made examples are fashioned from elongate straight-sided percussion flakes retouched on one or both sides. Like those from 4-Fre-128 they appear to have been struck from a prepared core specifically for use as scraping tools. A number are nothing more than reject waste flakes slightly retouched or use worn, but these are definitely in the minority. It is clear that the flake scrapers made up a basic part of the tool assemblage at both 4-Fre-128 and 129. This suggests, along with the relative abundance of projectile points, that the primary resource of the area was the arrow cane and that the artifact assemblage reflects an industry of arrow manufacture.

The remaining small scraper types, serrated and bifacial (Fig. 28o, Fig. 29a, b) are less frequent. They both may have had specific functions, but also could have been used as simple scraping tools. The serrated scrapers tend to have ovate working edges while the bifacial scrapers have straight working edges. The bifacial pieces presumably functioned as scrapers rather than knives as the use-wear tends to be in evidence only on one surface.

Discussion of Glass Scrapers. Though the above comments and the tables include the six glass scrapers from 4-Fre-129 some comments as to their validity are clearly in order. Several things suggest that these specimens may not be of aboriginal manufacture. First, they are the only items which could indicate historic occupation of the site. It is puzzling, if they are valid artifacts, that no additional contact goods were recovered from the site, other than from the disturbed surface area. Secondly, abundant glass fragments were present in the upper portion of the grave area which produced five of the six glass scrapers. In fact, other historic material, obviously rodent intrusive, came from deep in the grave pit fill. If the site, as is suspected, predates the occupation at

4-Fre-128, then it is impossible for the glass scrapers to be of aboriginal manufacture. On this basis, plus extensive rodent activity, it is felt that the glass specimens are probably fortuitous and should be classed with considerable reservation as part of the cultural assemblage.

Beaked Scrapers, Reamers or Drills (Fig. 271, o, p, r, s). Only six small tools suggesting use as graving or drilling tools occurred in the site. The beaked scrapers had small projections chipped on one corner or edge. They suggest use as gouging or graving tools. The reamer or drill-like tools include one triangular specimen which apparently served as a drill, a reworked broken obsidian point fragment with a heavy ground tip and a silicate flake modified along one narrow projecting end.

It is clear that well-made drills are not typical of the inventory from the Little Panoche area. Possibly projectile points served this function in part, as may be indicated by the two reworked examples from 4-Fre-129.

Heavy Scraping Tools (Fig. 29d, f, g, h, i). The heavy-duty scraping tools include large percussion-flake scrapers and small, core scrapers. The total of these types (24) includes 20 of various silicates and four of basalt.

The heavy, flake scrapers are large elongate flakes, many struck from cobbles, which are unfacially flaked along one edge. They could easily have served as knives, but the irregularity and wear on the edges suggests they were used as scrapers. The use of basalt is primarily limited to heavy tools as it does not break down under heavy use like the various silicates. Apparently basalt was imported in cobble form as many of the flakes and artifacts still exhibit areas of the original cobble surface.

The small core scrapers tend to be plano-convex or block-like in outline. The utilized surface has been steeply chipped to produce a thick heavy working edge. They lack standardization and apparently many were used when needed, then discarded.

Choppers (Fig. 30, 32b, c, 33a). The choppers are all heavy ovate cores or cobbles with use-wear or chipping along one side or end. Of the eight specimens, five are cobbles, one a large percussion flake and two are cores. The cobbles have been split with the resulting sharp edge used with but minimal retouch. The two cores are slightly shaped and used all around the periphery. Like the chopping tools from 4-Fre-128 these are unstandardized and scrappy in appearance and none have been extensively used.

Cores (Fig. 33b, c, d, e). The cores, in the main, are of silicate with smaller numbers of quartz, quartzite or basalt examples. They tend to be globular or slightly flattened in form. All have had percussion flakes struck from one or more edges or sides. It is clear that many of the choppers and hammerstones are simply cores utilized along thin or sharp edges. They show no notable concentration within the site and seven are from the surface.

Heavy Stone and Ground Stone Artifacts. A total of 102 artifacts are considered as ground stone artifacts. This total includes 55 artifacts

from the grave areas and 47 from the midden or surface of the site. These tools consist of utilitarian items such as mortars, pestles, metates and manos, etc., the bulk of which are in fragmentary condition. The hammerstones also are included in this section, though they are technically not ground stone. The pertinent data are presented in Tables 27 and 28.

Bowl Mortars (Fig. 19, 21a). Four complete or nearly complete bowl mortars were recovered from the site. Two are made of globular andesite cobbles partially shaped on the exterior and two are completely shaped sandstone examples. The latter are from a vandalized area on the east edge of the site.

The two andesite mortars were associated with Burial 3. One had been placed directly over the chest area and the second was placed on the edge of the grave pit above the remains. The interior of this specimen was stained with red pigment. The specimen inverted over the body exhibited considerable pestle wear and polish along the interior rim area indicating a circular motion.

The largest sandstone mortar is essentially similar to the andesite specimens, but the exterior is better shaped. The smaller sandstone mortar is exceptionally well-shaped and finished, but is now in poor condition due to decomposition of the stone. The size and wall thickness suggest that this specimen was not used for food preparation.

Miniature Mortars (Fig. 22a). Two small mortars are included in the collection. One is a somewhat flattened ovoid cobble with a well-worn pit on one face. The second example is a small rim section from a thin-walled stone vessel. The diameter and height cannot be estimated from the fragment, but at the point of greatest width the wall is only 15 mm. thick. Presumably it served as a container as the material, siltstone, is too soft for use as a grinding implement.

Mortar Fragments. Of the 21 mortar fragments, six are small sidewall fragments and the remainder are rim fragments from shaped bowls or cobble mortars. One of the sidewall fragments has been shaped on the exterior.

Of the 15 rim fragments, two are flat slab-like mortars, four are from unshaped cobble mortars and the remainder are from bowl mortars with external shaping. Curiously, all of the andesite fragments are from shaped bowl mortars. Apparently the local mortars of sandstone, for the most part, were not considered worthy of careful finishing.

Pestles and Pestle Fragments (Fig. 23c, e). Four complete and 12 fragmentary pestles were recovered from 4-Fre-129. Three of the complete pestles are nothing more than cobbles with flattened ends and a minimum of shaping along the sides. One has been used on both ends and two on one end. The last complete specimen is well-shaped along the sides, and both ends are bluntly rounded and worn. Red pigment is smeared over one end indicating that it was used with the pigment-smeared mortar (noted above) found nearby.

The pestle fragments include four medial fragments and eight terminal fragments. Two of the medial sections are cylindrical in section, the remainder are partially-shaped cobbles. One of the latter has seen reuse as a hammerstone on one of the broken ends. Of the eight end fragments, one is a tapered distal fragment, two are cylindrical rounded proximal end fragments and the remainder are fragments of rounded or flattened-end cobble pestles. Many of the fragments are badly burnt indicating reuse as cooking or hearth stones.

Metate Fragments (Fig. 25a). Five badly fragmented sections of large slab metates were recovered from the site, all made of sandstone. Four are fragments of thin, flat natural slabs, under 60 mm. in thickness, with evidence of pecking and grinding on one side. Two have slightly concave ground areas and two are almost flat. The last and most complete example is a heavy block of dense sandstone. It now measures 18 mm. wide, 115 mm. thick and was probably over 200 mm. long when complete. The ground area is concave and well worn.

Four of the five metate fragments are from deep in the burial areas, suggesting that they were prized enough to be included with the burials. They were not included in burial cairns, however.

Manos and Mano Fragments (Fig. 24a, b, d, 25d). Like the other heavy stone tools the manos, for the most part, were in fragmentary condition. Of the 21 specimens, only 7 are more-or-less complete. Three mano types may be segregated in the collection. These include uniface and biface cobble forms, and a single edge shaped biface.

The bifacial cobble manos include five complete specimens and two fragments. All are moderately or slightly ground on both faces. In several instances they were made from tabular sections of andesite, thus the grinding surface was flat or even slightly concave. The sandstone specimens usually have a convex or flat cross section. It is clear from a study of these specimens that no preferred mano type was in use. It is also apparent that the use of individual specimens is not clear-cut, and for the most part, a decision as to function must be made on the basis of size and material.

Uniface manos (12 examples) are the most frequent forms at the site, but only two are complete. Typically they are made from unshaped sandstone cobbles with one flat or convex side used for grinding. In most instances the amount of wear is slight and many of the fragments are burnt from subsequent reuse as cooking stones.

The last mano is a small fragment of quartzite with slight evidence of grinding along one side. Its type is not determinable.

Small Grinding Slabs (Fig. 25b). Six irregular-to-ovoid, thin slabs have been pecked and ground on one or both sides. They are larger and thinner than the manos but clearly are smaller than the metate fragments. Presumably they served the same purpose as the metates, however. The use of these small slabs indicates the essential lack of suitable material for the making of large slab metates. Of the six, five are

of fine-grained cemented sandstone and one is of meta-siltstone. One from the fill around Burial 17, was used in the pulverizing of red pigment.

Two examples, including the one illustrated, were secondarily used as chopping tools. Both have been bifacially flaked along one end and the resulting edge is now partially blunted from use.

Whetstones and Miscellaneous Ground Stone Fragments. Four small tabular, fine-grained sandstone fragments are smoothed from use on one side. They appear to have served as polishing stones or whetstones. Tabulated separately are three broken sandstone fragments with evidence of grinding on one or more sides. Possibly they are fragments of manos, or even metates, but are too small to classify.

The last ground stone object is a broken schist cobble which has been ground on one of the broken faces. It appears too irregular to have served as a mano, but could have seen service as a smoothing stone.

Miscellaneous Stone Artifacts. The remaining stone objects, not counting hammerstones, consist of a small stone "ball" of andesite, a pigment-stained andesite cobble and a pitted sandstone cobble. The "ball" is of natural origin but appears to have been slightly polished. The pitted cobble is slightly battered along the edges indicating primary use as a hammerstone.

Cobble and Core Hammerstones. Though hammerstones are not classifiable as heavy ground stone artifacts, they have been placed in this section for convenience. The bulk of the hammerstones are simply ovate cobbles slightly battered on the ends or along one side. Most of them were only slightly used and some of the sandstone examples are slightly ground on one or more surfaces.

The core hammers and cobbles of dense material are battered along the sharpened edges resulting from the removal of flakes prior to their use as hammerstones. Most of these are of chert or quartzite cobbles poorly suited for producing flakes which could be utilized in the manufacture of smaller chipped stone items.

Small Ground Stone Artifacts. Only 14 ground stone artifacts of unusual or non-utilitarian nature were recovered from 4-Fre-129. These include all the specimens of steatite, slate and actinolite and one of sandstone. The data on these artifacts are presented in Tables 29 and 30.

Slate and Serpentine "Pins" (Fig. 16b, c). Four whole or fragmentary stone pins were recovered from the site. Two have rectangular cross sections, two are essentially cylindrical in cross section and all are about half the diameter of a lead pencil in size. The two complete pieces differ in outline. One is flattened at the base and tapers to a sharp point at the opposite end. The second is bar-shaped with flat ends. The two fragments include a pointed end section and a cylindrical flat-based fragment, the latter made of serpentine.

Similar stone "pins" have been recovered from 4-Mer-3, although these are larger and the material is different in all instances (Pritchard 1966: 66-67, Table 26). The bulk of the sample at 4-Mer-3 presumably dates from the late occupation. Several slate pins or rods are also included in the collection from 4-Mer-S94. The context here suggests that these items have considerable time depth, possibly comparable to those attributed to Sacramento-San Joaquin Delta Middle Horizon sites (Beardsley 1954:72).

Steatite Ear Spools (Fig. 16f, g). Two complete and one fragmentary ear spools were recovered from the site. All are of a distinctive gray-green steatite. In form they are slightly conical with a central constriction, and with slightly concave or flat faces. The two complete examples have an incised X on the largest diameter face, and traces of parallel gouge marks around the grooved edge. Traces of asphaltum are evident on the wide end of both complete specimens, primarily in the incised X across the face. Apparently this incised design served not as decoration, but to help in holding a (shell ?) facing in place. The fragmentary specimen is split in-half lengthwise, lacks the incised X on the wide face, but is otherwise identical to those described above. Its occurrence in the midden, not in a burial area, suggests that it was discarded after breaking.

Comparable specimens ("plugs") are reported from Buena Vista Lake Site 1 (Wedel 1941:56-57, Pl. 31), all from the upper levels of the site. Only the smallest has a constricted center and none have the incised X on the face.

From 4-Mer-3 came nine ear spools, two of which (spool type) are almost identical to those from 4-Fre-129 (Pritchard 1966:67-68, Table 27) but lack the incising on the face. The tapered cylindrical and contracting stem forms, typical at 4-Mer-3 did not occur at 4-Fre-129.

Identical examples (even to the incised X on the face) are known from 4-Mer-14 in the San Luis Reservoir area where they occur in a Late Horizon Phase I context. This suggests that the use of these objects has considerable time depth in the San Luis-Little Panoche region. None are known from the earliest site (4-Mer-S94) yet excavated, however.

From the limited comparative data available it is probable that the use of the ear spool is essentially late in the Merced-Fresno County area. They are noted ethnographically for the Yokuts by Latta (1949:58), however, which lends support to their late use in the area.

Steatite Pipe Fragments. A single worked steatite fragment suggests, on the basis of curvature and polish, that it is from the sidewall of a pipe. Unfortunately, the piece is not large enough to indicate length or diameter of the original specimen.

Simple conical pipes are known from 4-Mer-S94 and 4-Mer-3, the latter in a late context (Pritchard 1966:64). Both appear to be larger than the specimen represented at 4-Fre-129. The 4-Mer-3 specimen was definitely in a late context, but the temporal affinities of the 4-Mer-S94 example are unknown.

Steatite Arrowshaft Straightener (Fig. 17b). Adjacent to, or included with Burial 1, was an arrowshaft straightener fashioned from a steatite vessel fragment. It had ground edges and two shallow V-shaped grooves across the short axis of the sherd on the convex side. A broken out perforation at one end probably is the remnants of a hole used for crack sewing on the original vessel. The grooves show little or no evidence of use, thus they have retained a V-shaped configuration rather than the U-shape noted on the specimen from 4-Fre-128. Comparative notes on this artifact type have been presented for the 4-Fre-128 example.

Actinolite Splinters and Lumps (Fig. 16e). Two small splinters of green-colored actinolite and a lump of the same material came from the site. The splinters may have been ground, but are not especially shaped. The lump is unmodified.

Actinolite splinters are frequent in all sites investigated in the general area, but for the most part they are not modified.

Steatite Lump. A small thumb-sized fragment of steatite from one of the burial areas may represent raw material or a broken, burnt, vessel sherd. It is of interest as few steatite objects came from the site.

Painted Pebble. A small elongate flattened sandstone pebble coated with red pigment was recovered from the grave pit fill in Units 12E-12 and 14N. It apparently represents an object painted with pigment rather than one which acquired the pigment from use as a grinding tool. It may in some way be related to the charmstones known from the central valley, but this is admittedly speculative.

Pottery and Baked Clay Artifacts. Other than potsherds, baked clay artifacts were extremely rare at 4-Fre-129. The only other items which occurred were a few small cylindrical baked clay objects. The distribution of baked clay artifacts are presented in Table 33 and other data are presented in Tables 31 and 32.

Cylindrical Baked Clay Objects. Four small, pencil-sized, baked clay cylinders were recovered from the site. All are broken on the ends, but are smoothed and carefully fashioned. Similar objects, but with squared off ends, occurred at 4-Mer-3 (Pritchard 1966:69, Table 28); their purpose is unknown.

Pottery. A total of 104 potsherds were recovered from 4-Fre-129, with about 70% of these coming from the midden. None of the fragments is large enough to indicate vessel forms, but on the basis of workmanship it is doubtful that the vessels were large in size.

The exterior color of the sherds ranges from gray or grayish yellow to dull red or brownish red. Most frequently they are the latter color. Occasionally the exterior of the sherds is vitrified or carbon smudged. The core color is brownish or orange. The temper, where noticeable, seems to be sand, as particles of angular quartz are visible.

The interior and exterior are smoothed, but irregular, suggesting that they were molded by hand. A number of sherds also are smeared with red pigment on the interior. The thickness of the sherds averages from 4 to 17 mm. but as can be seen in Table 32 they tend to fall within the 4 to 10 mm. range and peak at 6 and 7 mm. Other measurements are not available due to the small size of the bulk of the fragments.

The pottery recovered from 4-Fre-129 agrees in all respects to that described by Kroeber (1925:537) for the Yokuts: "The distinctive feature of this pottery is its excessive crudeness. It appears to have been made by a rough fitting together of pieces of clay, or a pressing out of a lump: there is no evidence of the coiling and smoothing method. It is doubtful whether the clay contains tempering. Glue, blood, or a sticky substance may have been introduced as binding material. The color is from light to dark gray. There is no slip, wash, or pattern, except now and then a rude incision obviously modeled on a basket pattern. The shapes are infinitely varied, without approach to standardized forms". Kroeber notes that most of the vessels have been burnt, but are not cooking vessels. One group indicated that they kept tobacco in "hollowed clay balls" (Kroeber 1925:537). The ultimate derivation of the Yokuts pottery, as indicated by Kroeber, is undoubtedly the Southwest.

The evidence from 4-Fre-129 suggests that the Little Panoche area was on the extreme limit of the pottery manufacturing area. It appears to be peripheral even to the more southern Yokuts pottery as illustrated by Kroeber (1925, Pl. 51), but does extend the known range of Yokuts pottery somewhat to the north of its previously recognized limits. Gifford and Schenk (1926:55) record pottery from several sites in the Tulare Lake region, apparently of the same type. It is extremely rare even in this area, however.

Few central California sites produce evidence of pottery. Several sherds came from 4-Mer-3, one from 4-Mer-14 and it occurs sporadically in the Sacramento-San Joaquin Delta region.

Midden Analysis Other Than Faunal Remains. This section considers objects of a miscellaneous character, included are red pigment, quartz crystals, shell, etc., and the analysis of the chipping waste from four excavation units. In the latter instance three midden and one burial area units were utilized.

The distributional data for this section are presented in Tables 34, 35 and 36. Such descriptive data as are required are presented in the text.

Baked Clay Fragments. A number of burnt chunks of clay were recovered from the midden, none of which were shaped, but some had various grass (3), or stick impressions (1). The pieces range from about fist-size to very small fragments. Presumably they are derived from cooking fires as no obvious house remains were present to suggest earth-covered dwellings.

Red and Yellow Pigment. A large number of small fragments of red or yellow pigment (presumably all iron oxide), were recovered. A

few of them had clear-cut evidence of use in the form of grinding facets. Others, however, were simply raw chunks. It is possible that some of the material is native to the area, as burnt sandstone closely resembles pigment lumps.

Quartz Crystals. A number of whole or battered clear quartz crystals were recovered, none in burial association, however. Some were clearly derived from the local soils, as they were noted in the sterile material underlying the midden. The larger crystals are reported by the local inhabitants to come from the hills west of the Little Panoche Canyon. Locally they are known as "Panoche Diamonds". Most of the large crystals from the site are fractured or battered which could indicate an essentially utilitarian function. At any rate they are not frequently found as grave goods in the area. The complete crystals range in size from 54 by 40 by 25 mm. to 14 by 7 by 7 mm.

Concretions and Fossils. A small number of fragments of fossilized shell, one fossil shark tooth and three small sandstone concretions were recovered. Other than the shark's tooth all these objects could be natural to the site area. The shark's tooth is from the surface of the site and may not, therefore, represent an aboriginal specimen.

Freshwater Mussel Shells. As may be seen in Table 35, the midden contained little freshwater molluscan remains. For the most part shell occurred in small fragments and no obvious clusters occurred in one unit or area of the site. As a single valve of the only species recovered (*Gonidea angulata*) weighs from 10 to 15 grams, it is clear that mussels made up a minor portion of the site inhabitants' diet. It seems entirely possible that mussels were imported into the Little Panoche area. There is no evidence that mussels originally lived in Little Panoche Creek and none were noted in or along the creek during the period of our excavations.

Chipping Waste. In an attempt to determine the preferred lithic material the chipping waste was tabulated by material from four 2 by 2 m. excavation units excavated in 10 cm. levels. The data presented in Table 36 indicates that the dominant raw material from the site consisted of various silicates. The bulk of these include jasper, chalcedony, mineralized wood (opalized ?) and fine-grained quartzite. They most frequently are clear, white, yellow, orange or reddish in color, but a few examples of banded dark or brownish cherts also occur.

The other two lithic materials, obsidian and basalt, are far less frequent. It is clear that both were imported into the area, while the silicates were certainly located close by. The few obsidian flakes are small, indicating that they are possibly the result of reshaping broken artifacts. No evidence for the introduction of raw obsidian is indicated. Basalt also is infrequent, but this is in part due to the fact that it was of limited value to the inhabitants as the local quartzite was suitable for some of the heavier tools.

Quartz, which occurs with some frequency, is in part, native to the site area. Most of it occurs in natural pebbles, but some of the

finer-grained material is present in the form of large percussion flakes.

Historic Material. Historic objects, derived from the recently removed ranch building on the site, were found in all units and with varying frequency throughout the midden. These items are mostly from the upper 15 cm. of the deposit but were recorded sporadically to the base of the grave pits (ca. 75 to 100 cm.).

The few dateable objects, mostly bottles, appear to date prior to 1900 but post 1860 or 1870. These are made of clear, green or brown glass. A variety of buttons occurred, including mother of pearl and metal. A few porcelain fragments, all white with a blue floral design, were present. Wire, nails, "tin" scraps, etc., were also frequent in the deposit.

It is clear that all of the historic debris is of recent origin and clearly postdates the aboriginal occupation by some time. Its occurrence deep in the midden and in the grave pit fill is clearly a result of late digging activity, such as rubbish pits, post holes, etc., or from the extensive rodent disturbance. The latter is clearly evident in the profiles and from the field notes (Fig. 42 and 43).

FEATURES

A total of 40 features were recorded during the excavation of 4-Fre-129. Review of the field notes in the laboratory indicated that Feature 18 was the upper limits of Feature 20, thus only 39 features were actually recorded. One additional feature is unnumbered. Several of these include two or more parts, but all of these instances are a result of historic features intruding into an older aboriginal feature.

The features will be discussed in groups of related form, since to discuss all individually would be unduly repetitious. Basically three types of features occurred: recent fence remnants; rock or ash concentrations in the midden; and burnt pits into the sterile base. Possibly a fourth type represented by hard, smooth areas, may be several poorly defined floors or work areas. All of the features are shown in the plan view of the excavations (Fig. 38).

Historic Features. All of the historic or recent features consist of modern post holes or remnants of wooden posts. Feature 1 (Unit 6E-2S) consisted of three small wooden stakes in a vertical position resting just on the sterile base. Features 4, 7 (Fig. 3d) and 14 were all post holes intrusive into the sterile base soil. These holes were all situated in units along the east edge of the site, on the bluff, and probably are the remains of a corral fence which enclosed the site area in modern times. In one instance a hardened surface was associated with the post hole, at a depth of 2 to 4 cm. from the present surface. It undoubtedly marks the floor of the corral.

Ash Concentrations. Two small areas or concentrations of white ash were recorded. Feature 2 (Unit 12E-2S) was at a depth of 60 by 120 cm.

from the surface and rested just upon the sterile base soil (Fig. 3c). It occupied an area of about 60 to 120 cm. Just to the east was a small concentration of fire-fractured cobbles. Feature 10 (Unit 10E-14S) consisted of a small white ash concentration in the northwest corner of the unit. It measured 46 by 30 cm. and was 5 cm. thick. It was 15 cm. from the surface.

Floor Areas. In two units the base material had been smoothed off and polished, producing the distinct impression that these were floor or work area surfaces. Both are far smaller and less well defined than the house floors uncovered at 4-Fre-128, however.

Feature 18 and 20 (Unit 10E-10N) consisted of a hard-packed surface 120 by 170 cm. in size with an oval basin-shaped hearth filled with fire-fractured cobbles along the south edge. A second pit was located at the north east edge of the hardened surface.

The hard surface slopes gently from the edges toward the center and the hearth area. Along the edges it is ca. 34 cm. from the surface and in the center it was about 38 cm. deep. The hearth is roughly oval in outline measuring 90 cm. long by 55 cm. wide. At the bottom it was 55 cm. deep. It was lined and filled with fire-fractured cobbles about fist-sized or smaller. The sides and bottom were burned to a reddish color due to the heat of the fire. A second small rock-filled depression was located at the east edge of the hard surface. It was roughly 40 cm. in diameter and 12 cm. in depth from the "floor". The pit at the northeast edge of the hard surface was 25 cm. in diameter and penetrated 11 cm. into the sterile base soil. It had only midden in the fill. A mortar fragment and cobble mano fragment were included in the fill of the large pit.

This feature in some ways is reminiscent of the house floors from 4-Fre-128, even to the hearth area. Its size does not suggest a house, but this cannot be ruled out as the small pit on the northeast edge could represent a post hole. Possibly it represents a small temporary dwelling of a type not easily defined on the basis of present evidence.

The second hard surface, not assigned a feature number, is located in Unit 8E-8S. Here the sterile subsoil had been smoothed and packed along the north edge of the unit. This surface sloped to the north into the adjacent unexcavated unit. No associated features were noted, thus its relationship, on the basis of form, to Feature 18 and 20 is not clear.

Burnt or Lined Pits. These features consist of circular basin-shaped pits excavated into the subsoil. In almost all cases the sides and bottom of the pit are oxidized to a dull red color from fire within the pit. Some of the pits contained a layer of fire-fractured cobbles or flat sandstone slabs which served as a lining. Small amounts of charcoal and ash usually occurred in the upper portions of the pit fill, but in several instances they apparently had been cleaned out as the fill consisted of midden.

A brief description of the occurrences of these feature types follows:

Feature 5 (Unit 6E-2S) (Fig. 4b). Two pits 46 and 49 cm. diameter, depth to top 24 cm., depth to bottom 36 cm. Flat slabs or cobble lining on bottom. Sides and bottom burnt to reddish hue. Fill contained burnt pine-nut hulls and fish vertebrae.

Feature 12 (Unit 2E-8S). One pit 30 cm. diameter, depth to top 18 cm., depth to bottom 30 cm. No rock fill, but sides and bottom were burnt to reddish color.

Feature 13 (Unit 4E-8S) (Fig. 4c, d). One pit 50 cm. diameter, depth to top 17 cm., depth to bottom 25 cm. Filled with burnt fist-sized cobbles, some charcoal and ash. Two beads in fill were not burnt.

Feature 22 (Unit 14E-18S). Slightly oval pit 70 cm. wide and 60+ cm. long, depth to top 30 cm., depth to bottom 35 cm. Fire-fractured cobbles around limits of pit. Interior not burnt.

Feature 25 (Unit 8E-4N). One pit, ca. 48 cm. diameter, extends into north wall, depth to top 33 cm., depth to bottom 45 cm. No rock fill or lining. Sides and bottom burnt to orange-red color.

Feature 26 (Unit 14E-2N). One small pit 20 cm. diameter, depth to top 20 cm., depth to bottom 25 cm. Located entirely within the midden. Sides and bottom burnt to a dull red, no rock fill.

Feature 27 (Unit 14E-2N). One small pit 30 cm. diameter, depth to top 30 cm., depth to bottom 34-35 cm. Filled with burnt cobbles and charcoal. Carbonized twigs noted in the fill. Sides and bottom of the pit burnt, but not discolored.

Feature 29 (Unit 14E-2N). One circular pit ca. 50 cm. in diameter, depth to top 35 cm., depth to bottom 45 cm. Filled with midden, ash and charcoal. Sides and bottom burnt to a dull red color.

Feature 31 (Unit 12E-14N). One pit 68 cm. in diameter, depth to top 51 cm., depth to bottom 70 cm. Pit outline extends slightly above sterile base soil. The area above the sterile appears to have been lined or plastered with clay. Fire-fractured cobbles (one a hammerstone), around edge of pit and in the bottom of the pit. The fill consisted of midden, white ash and charcoal.

Feature 33 (Unit 8E-26S). One oval-shaped basin, 59 cm. long by 35 cm. wide; depth to top 39 cm., depth to bottom 50 cm. The fill consisted of sandy midden mixed with charcoal and ash. The sides and bottom of the pit were burnt to a dull reddish color.

Burnt Cobble Concentrations. This section includes the most frequent feature type uncovered at the site and in the general area. For the most part they consist of small concentrations of fire-fractured cobbles either within the midden or upon or slightly into the sterile base soil. Some exhibit clear indications of use as hearths while others, though the cobbles are burnt, show no evidence of fire such as ash or charcoal.

Feature 3 (Unit 12E-2S). Small concentration of fire-fractured cobbles within the midden at a depth of 10 cm. from the surface.

Feature 4 (Unit 18E-2S). Irregular depression into the sterile base 70 cm. long by 53 cm. wide, 20 to 36 cm. from the surface. Fill consisted of midden and cobbles. A modern post hole extended through one end of the feature.

Feature 6 (Unit 16E-14S) (Fig. 3d). A cobble concentration 84 cm. long by 50 cm. wide at a depth of 4 cm. from the surface. The fill consisted of burnt bone and charcoal.

Feature 7 (Unit 16E-14S) (Fig. 3d). Concentrations of cobbles resting on sterile soil. It measures 50 cm. long by 35 cm. wide and was 9 cm. deep. A modern post hole had partially obliterated the feature.

Feature 8 (Unit 10E-14S). A cobble concentration measuring 60 cm. long by 40 cm. wide at a depth of 4 cm. in the midden. Some charcoal and ash was noted in the fill.

Feature 9 (Unit 4E-14S). A roughly circular cobble concentration resting on the sterile base soil. It was 50 cm. wide by 78 cm. long and was at a depth of 11 to 20 cm. from the surface. No charcoal or ash was noted in the fill.

Feature 11 (Unit 2E-8S). Two adjacent shallow irregular depressions just into sterile base filled with fire-fracture cobbles. Together they measure 140 cm. long by 50 cm. wide. The feature extends into the north wall of the unit. Depth from the surface is 15 cm. and depth to the bottom is 15 to 25 cm. Some ash and charcoal was associated.

Feature 14 (Unit 18E-8N). This was a small concentration of fire-fractured cobbles just south of two modern post holes. It was at a depth of 4 cm. from the surface. It measured 80 cm. long by 10 cm. wide, but continued to the south into an unexcavated unit. No charcoal or ash was noted in the fill.

Feature 15 (Unit 18E-8S). An irregular concentration of fire-fractured cobbles resting just on the sterile soil. It measures 110 cm. long by 60 cm. wide and was 7 cm. from the surface. Small pockets of charcoal were noted in the fill.

Feature 16 (Unit 12E-8S). A small concentration of cobbles resting just on the sterile base. The fill contained ash, charcoal and fragments of mammal bone. It measured 50 by 70 cm. horizontally and was 14 cm. deep from the surface.

Feature 17 (Unit 12E-8S). Same as Feature 16, but measured only 40 by 45 cm., extends into adjacent unit to west.

Feature 19 (Unit 18E-8S). Small concentration of cobbles, some fire-fractured. Measured 50 by 50 cm. and was 4 cm. deep from the surface. This feature was entirely within the midden. A mano fragment was included in the feature.

Feature 21 (Unit 6E-20S). Cobble concentration measuring 40 by 45 cm., 20 cm. deep from the surface in a shallow pit intrusive into sterile base. Some charcoal was noted in the fill.

Feature 24 (Unit 14E-4N). Cobble concentration in midden measuring 30 by 27 cm. at a depth of 23 cm. from the surface. It was located in the grave pit fill for Burials 6 and 11 and the lack of charcoal or ash suggests that it is not a hearth. It may have been associated with the burials.

Feature 28 (Unit 12 and 14E-2N). A group of fire-fractured cobbles measuring 60 by 50 cm. at a depth from the surface of 35 cm. It was entirely within the midden. Some charcoal was in association. May possibly relate to the burials in this area.

Feature 30 (Unit 2W-8S). Cobble concentration in midden above sterile base. It was 38 cm. deep and was 69 cm. long north-south and 46 cm. wide east-west. No ash or charcoal was noted in the fill. In the same area as Burials 12 and 13.

Features 32, 33, 34 and 35 (Unit 14E-28S). These four features were all small concentrations of fire-fractured cobbles which essentially encompassed the entire unit. All were on, or just into the sterile base material and ranged in depth from 3 to 13 cm. from the surface at the top and 13 to 30 cm. in depth at the deepest point. They ranged in size from 24 by 25 cm. to 48 by 96 cm. horizontally. All had some charcoal or ash associated. Features 33 and 34 both had cobble hammerstones and mortar fragments included among the cobbles.

Though located adjacent to Burial 14 none of the features were in apparent association. The grave pit did not disturb any of the features.

Feature 37 (Unit 8E-26S). Arrangement of cobbles in a circular (?) pit entirely within the midden. It measured 70 by 64 cm. but continued into the west wall of the unit. It was 14 to 47 cm. deep and the fill contained charcoal and bone fragments.

Feature 38 (Unit 26E-22N) (Fig. 5a). This was a cobble concentration in a depression 85 cm. long, 45 cm. wide and 19 to 39 cm. deep. It had been excavated into the sterile base, but no evidence of burning was present. Included with the cobbles was a miniature cobble mortar. This feature may have been associated with Burial 15, on the basis of proximity. The lack of burning certainly suggests some purpose other than use as a hearth.

Features 39 and 40 (Unit 12E-12N). These features consisted of small cobble concentrations in the midden. Feature 39 was 21 by 22 cm. in size and 26 to 51 cm. deep. Feature 40 was 31 by 46 cm. in size and 36 to 60 cm. in depth. Both contained concentration of charcoal and ash, but the entire unit at the level of the feature had a high ash and charcoal content. A mortar and metate fragment were included among the cobbles in Feature 40.

These features were immediately north of Feature 18-20 and may relate to this possible floor area. Conceivably they could also relate to Burial 17 which was in the same units as Features 39 and 40.

Comparative Notes on the Features. All of the excavated sites in the area have produced features akin to the cobble hearths and ash or charcoal deposits described above. The only unique features at 4-Fre-129 are the burnt or lined pits. They occurred at both 4-Fre-128 and 129, but not at 4-Mer-14 or S94. At 4-Mer-3 four small (ca. 25 to 45 cm. diameter) circular pits were recorded, all intrusive into the sterile base soil (Pritchard 1966:153-154, Table 42). Other than the fact that they are described as being lined with a thin coating of clay and lack evidence of fire, they are identical to those from both 4-Fre-128 and 129. Functionally there is a very real difference, however, as the pits at 4-Fre-129 and 128, were clearly burnt around the side and bottom. As the 4-Mer-3 pits were fairly deep, it is possible that they simply represent the basal portion of deep pits which originated at a point well up in the midden. They would not, in this case, be comparable to those at 4-Fre-129, which clearly originated, at most, just above the sterile base soil.

The features described as "fireplaces" by Wedel (1941:85) from Buena Vista Site 2 are almost identical to those described here as cobble concentrations. The clay-lined pits or basins, from Buena Vista Site 2 are also similar to the burnt basins found at 4-Fre-129. Such correspondence over considerable distance suggest that these features may be consistent late protohistoric traits in the upper San Joaquin Valley.

BURIALS

A total of 16 burials were recovered from 4-Fre-129. Due to a confusion in the recording (Burial 13 was recorded twice) 17 burial numbers were assigned. Thus, after reworking the data, Number 16 is not assigned and has been left off Table 37, which presents the data on the burials. Representative burials are shown in Figures 5b, c, d and Figure 6a and b.

As may be seen on Figure 38 and Table 37, one area produced 11 of the 16 burials recovered from the site. A second area produced two burials and the other three were lone occurrences. This could suggest that family burial areas were in vogue by the site residents, although such is not verified by the available ethnographic data. Graveyards are noted by Kroeber for several groups (1925:499) but these apparently served for the entire villages.

Orientation of the burials is variable, although a tendency toward an easterly or westerly direction apparently was preferred. As the data on orientation include only 12 burials this remains speculative, however.

The age grouping is of interest. Of the 16 burials, seven are younger than ca. 15 years and eight are adults, though none are especially elderly. This indicates the mortality rate of juveniles was high and the life span rather short.

Burial position was rather consistent. All of the interments were in some state of flexure, usually rather tight, with the knees drawn up toward the chest. Three burials were semi-flexed, that is with the legs at right

angles to the torso but bent at the knees. These burials, in part, may be variant due to the fitting of the body into the confines of a small grave pit.

Depth of individual burials has little stratigraphical meaning. As all of the grave pits were excavated from near the present surface, the depth of the pits up to 120 cm., is surprising as the subsoil is extremely tough and required the use of heavy tools during the archeological excavation. Several of the grave pits still had digging stick scars on the side walls. Considerable effort, therefore, is indicated by the larger and deeper grave pits.

The paucity of artifactual remains actually associated with the burials is curious and indeed somewhat dismaying. The few objects in association are not those which are temporally sensitive and even the associations noted in Table 37 are not always clear cut. The increased artifactual yield in the grave pit fill and the areas around the pits suggests that the grave goods were placed on the surface after the grave pit was filled or that artifacts were thrown into the pit during the filling operation. In any event, the artifactual material from both the grave pits and the general midden excavation is almost identical indicating that the burials are contemporaneous with the midden deposition.

Comparative Data. Three sites in the San Luis and Los Banos Reservoirs have produced significant numbers of burials or cremations. The two sites in San Luis Reservoir, 4-Mer-14 and S94, produced from 40 to over 80 burials while site 4-Mer-3 in Los Banos Reservoir produced 56 burials and cremations.

The two sites from San Luis Reservoir both appear, on the basis of the artifact assemblage, to essentially predate the occupation at 4-Fre-129. The prehistoric component at 4-Mer-3 obviously predates the 4-Fre-129 occupation, but the late protohistoric component at 4-Mer-3 exhibits a definite relationship to the complex reported here for 4-Fre-128 and 129. The pattern at 4-Mer-3 includes both cremation and primary burial, but clearly cremation and subsequent burial in the large ceremonial structure was the dominant method of disposal of the dead (Pritchard 1966:102-103, Table 40). The few semi-flexed burials at the site (4-Mer-3) probably relate to this same period or a slightly earlier one. On the basis of our present evidence cremation was not invariably the rule during the protohistoric period. This could suggest that the primary flexed or semi-flexed burials from 4-Mer-3 and 4-Fre-129 mark a late, but pre-cremation period, or that cremation and burial were contemporaneous with the exact method of disposal based on cultural criteria within the group. The latter suggestion is felt the most plausible with the data at our disposal. Relationships to the north, in the Sacramento-San Joaquin Delta, are not especially clear. Disregarding the distinct areal artifact differences it is clear that the late pattern in the San Luis-Little Panoche area is very similar to that in the Delta region. Here in Late Horizon Phase II times cremation and flexed burial occur, usually in definite cemetery areas. The artifact associations in the Delta are usually abundant, however, as contrasted to the area under consideration (Beardsley 1954:76-80). Clearly linking.

traits do occur, but until the intervening area is investigated, the exact relationship of the two areas in the Late period cannot be defined.

To the south of San Luis-Little Panoche only the Buena Vista Lake area has produced significant numbers of burials. Wedel (1941) reported burials from four sites along the south shore of Buena Vista Lake. All of these four sites produced material which has some correlation with those from Little Panoche. Burial posture was typically flexed or semi-flexed in excavated grave pits. Associations were rare and consisted primarily of shell beads.

The limited data presented by Gifford and Schenk for burials from the southern San Joaquin Valley are of little comparative value (1926:45-51, Table 6). All of the burials from this area were flexed, and some had grave goods in association. As noted elsewhere some of the artifact forms are similar to those from 4-Fre-128 and 129.

A discussion of the burial pattern and a suggested temporal sequence for the southern San Joaquin Valley has been presented by Warren and McKusick (1959:19-21). This suggests that the Early period (4000 B.P. or earlier) is marked by extended burials, the Middle period (3500 to 1500 B.P.) by supine semi-flexed burials and the Late period (1500 B.P. to ethnographic present) by tightly flexed or supine burials. The latter burials, that is Late supine, are attributed to Christianization of the burial patterns. Few grave goods occur with the Early and Middle burials and in the Late period only moderate grave goods occur. Wedel's data, cited previously, indicates that few burials are lavishly equipped with grave goods, however, even during the late protohistoric period. The 4-Fre-129 burials rather clearly are related to the Late period in the southern San Joaquin and also to the Late Horizon Phase II manifestations of the Sacramento-San Joaquin Delta region. Further work should better define the spheres of influence of these distinctive cultures within the central valley.

SUMMARY OF SITE 4-Fre-129

It is clear from the data presented that site 4-Fre-129 was not a permanent village site in the strict sense. That is, no structural remains were apparent and the midden accumulation lacked appreciable depth. The evidence instead supports the suggestion that the site was an intensively used campsite, probably in the summer months. The spring located just off the site, and the lack of houses we feel supports this contention.

The burials represent evidence of a definite cemetery, only a small portion of which was investigated. The burial complex and artifact assemblage indicate that these burials are probably typical of the late occupation of the area.

Typical elements of the complex, and those which indicate both the way of life and temporal period include the use of steatite and Olivella shell beads, small arrow-sized projectile points, typically of silicates, and an abundance of seed or acorn processing tools. Both the mano-metate and mortar-pestle combinations were utilized. Steatite vessels, as well

as baskets, presumably were used for cooking. The frequency of small scrapers and several steatite arrow straighteners indicate the existence of arrow manufacture.

The frequent occurrence of small circular pits or rock concentrations agrees rather well with the ethnographic data. They are definitely a distinctive element for the Late period occupation.

The economy must have been based on hunting and seed or acorn gathering. (The latter were probably imported to the Little Panoche area from the west ca. 15 miles.) The occurrences of arrowcane near site 4-Fre-128 was certainly an inducement to occupy this rather desolate region. Presumably at sites 4-Fre-129 and 4-Fre-128 we have clear evidence of proto-historic occupation by a western San Joaquin Yokuts group. As suggested before, the certain minor differences in bead forms set off 4-Fre-129 from 4-Fre-128. As the latter has glass beads we assume that it marks the terminal aboriginal occupation in the Little Panoche area. The entire occupation, probably of a continuous or near continuous nature, must date from ca. A.D. 1500 or A.D. 1600 to about A.D. 1820. A charcoal sample from the fill in Feature 5 returned a radiocarbon date of 185 years B.P.; or less than A.D. 1765 (Sample I-3164). This date, along with an identical date from site 4-Mer-3 (Sample I-3163) indicates that the late occupation in the western Merced County as known from Little Panoche and the Los Banos areas probably dates well within our original guess dates of A.D. 1500-1600 to about A.D. 1820 and that this termination date is also accurate.

THE SALT CANYON BURIED MIDDEN SITE

The existence of the Salt Canyon buried midden site was first noted by L. A. Payen while making a survey near site 4-Fre-129 in search of semi-fossil molluscan remains. Our initial investigation of the Salt Creek Canyon revealed a series of midden zones detectable along both sides of the arroyo for a distance of about 150 to 200 ft. (Fig. 1c and d, Fig. 2a to d).

Three distinct occupation zones could be determined at the time. The upper midden (Zone A) ranged from 3 to 5 ft. from the present surface. A sparse and discontinuous zone (Zone B) could be noted at about a depth of 7 to 8 ft. from the surface. The deepest zone (Zone C), also poorly defined, was located at a depth of 10 to 12 ft. from the surface (Fig. 44).

In an attempt to better define the occupation zones and to determine the value of hand excavation we decided to bulldoze two trenches along the west side of the arroyo and also to clean out the material along the sides and base of the stream bed. The first trench was ca. 10 ft. wide, 75 ft. long and reached a depth of 7 to 10 ft. A second trench intersected the first trench and was about 5 to 7 ft. west of, and parallel to, the stream bed. It was approximately 35 to 40 ft. in length and was excavated to a depth of ca. 10 ft.

The profile of the occupation zones made after the trenches had been bulldozed agreed well with our initial findings, but it also became clear that the cultural material was not always confined to clear-cut zones. Scattered evidence, such as hearths or burnt areas, local concentration of charcoal and broken cobbles indicate sporadic occupation throughout the deposit, but the concentrated occupation debris is confined to the three zones previously described.

Study of the profiles indicates that the occupation zones sloped slightly to the southeast, that is, toward the confluence of Salt Canyon with Little Panoche Creek. The cultural material then was deposited on the active alluvial fan of Salt Canyon and became buried as it continued to build up. In an effort to better understand the geological considerations we called upon Mr. William B. Bull, Geologist with the United States Geological Survey in Sacramento. Mr. Bull kindly consented to visit the site with the senior author and his comments follow:

"A deeper and apparently older site occurs about one-third mile downstream from site 4-Fre-129. This site is exposed in a 10-foot bulldozer trench and in gullies tributary to Salt Canyon. The site is on a small alluvial fan that has been built out in the valley of Little Panoche Creek by the stream of Salt Canyon. Deposition of this fan has been intermittent, which makes it difficult to estimate the time that has elapsed since the deposition of various horizons. In the past, deposition has occurred only to be swept away as the channel of Little Panoche Creek

meandered and migrated from side to side of its valley floor. Trenching of the channel of Little Panoche Creek probably causes trenching of the channel of Salt Canyon into its fan, thereby causing cessation of deposition on the fan surface. This is the situation that prevails at the present time.

"Two distinct lithologic units are present in the exposures at this downstream site. A lower unit consists mainly of light brown organic silts and clayey sands. Above this is a unit consisting of loose light yellow-brown sands with a few discontinuous gravel layers that were laid down in former stream channels. Charcoal and evidences of hearths are present in both units, but the greatest concentration of these materials is in the upper part of the lower unit. The upper unit most likely was derived from Salt Canyon and consists of part of an alluvial fan built into the valley of Little Panoche Creek. The toe of this fan has been removed largely by Little Panoche Creek. The lower unit could have been derived from either the Panoche Creek drainage basin or from Salt Canyon. The fragments of roots and reeds, and disseminated organic matter, indicate that the material was wet part of the time. However, the deposits have an oxidized color, instead of a blue or a gray color, which suggests that wetting of these organic deposits may have been seasonal.

"Only a rough impression of the age of the charcoal-bearing sediments in the top of the lower unit can be obtained. No indication of soil-profile development is present in the upper unit, and these sediments appear to have been deposited in the recent past. Based on my studies of the rates of fan deposition in western Fresno County, I would estimate that 500 to 2,000 years were necessary to deposit the upper unit. The breadth of the estimated range is due to lack of knowledge of how much of the time Salt Canyon was incised into its fan. An upper limit of only 2,000 years is made mainly on the basis of the thickness of the unit and the lack of even incipient soil-profile development.

"The abruptness of the contact between the upper and lower units indicates that the stream of Salt Canyon was incised into the lower-unit deposits for an unknown period of time during which sediments from Salt Canyon were carried directly into Little Panoche Creek. The top of the lower unit does not have a visible soil profile except for incipient soil-profile development in clayey material containing efflorescent salts. The lack of a soil profile suggests that the hiatus between the deposition of the upper and lower units was not long. An estimate cannot be made concerning the age of the lower unit, but I would guess that the charcoal-bearing materials in the upper part of the lower unit are less than the 6,000-year age of importance to you, and that they may be even less than 3,000 years old. I will be interested in the age of the charcoal if you are able to obtain radiocarbon dating of charcoal from the lower zone.

"The main factors responsible for cessation of deposition of the lower unit, channel trenching, and initiation of deposition of the upper unit probably were climatic. For example, within the last 115 years, trenching of ephemeral and intermittent stream channels in western Fresno County has been associated with changes in the annual and daily amounts of rainfall.

Channel trenching has been associated with periods of above normal amounts of annual and daily rainfall, during which small flows distributed sediment along the stream channels, but did not flush all the material out of the channels. Exposures in present-day arroyos show that repeated trenching and backfilling occurred before 1850, also."

In reference to Mr. Bull's comments the sterile deposits shown in profile (Fig. 44) as A and A¹ equate to the upper, more recent, lithological unit and B, B¹ and B² equate to the lower unit. The age estimate for the occupation zones as estimated by Mr. Bull are of interest in that they indicate no extreme antiquity, even though the lowest cultural zone is 10 ft. below the present surface. The estimate of ca. 3,000 years for this earliest zone unfortunately cannot be cross dated on the basis of our present archeological knowledge. No diagnostic artifacts were recovered from the lowest cultural zone. The upper zones produced several cobble pestles and a fragment of incised bird bone. The latter especially is good evidence for a late dating of the cultural deposits. From this slim evidence, a date of 1,000 years at the most and probably less than 500 years would be in order for the upper zones.

ARTIFACTS

From Zones A and B there are only four definite artifacts. Two pestles, one complete and one fragment are included. The complete specimen is made from a dense tapered sandstone cobble and has a rounded blunt end. It measures 161 mm. long, 68 mm. wide and 50 mm. thick. The edges have been partially pecked to shape (Fig. 23d). The fragment is also made of sandstone, and is thermal fractured. It is now 130 mm. long, and 55 mm. in diameter and has been battered on one end. The sides are well ground suggesting that it also saw service as a mano after breaking.

The chipped stone inventory includes seven large percussion flakes, one possibly used core of brown chert and a bifacially-flaked scraper of red jasper. The latter measures 38 mm. long, 29 mm. wide by 12 mm. thick.

A small polished fragment of bird bone has been incised with parallel bands of diagonal lines (Fig. 15m). It apparently was part of a tube or whistle. A small collection of broken large mammal bones also were collected. All were weathered, but nonetheless, have a "fresh" appearance. In this respect they are identical to the faunal remains from 4-Fre-129 a short distance to the west.

From Zone C came a badly burnt mortar fragment, apparently from the sidewall of a small globular shaped bowl. The specimen is from 42 to 44 mm. thick, and is made of gray andesite. Shaped bowl mortars are known from all the excavated sites in the area including 4-Mer-14, 56 and S94 in the San Luis Reservoir, Mer-3 on Los Banos Creek (Pritchard 1966) and from both Fre-128 and 129 in the immediate area of the Salt Canyon site. While they appear to have considerable time depth, they in no way provide any indication of antiquity.

CONCLUSIONS

Though our testing of the buried Salt Canyon occupation deposit did not indicate any value in further excavation it did point out several important points. Firstly, the human occupation of the Little Panoche Valley certainly began considerably before our evidence from Sites 4-Fre-128 and 129 had indicated, even though we know almost nothing of this earlier period. The assumption, not at all conclusive, is that conditions have not changed a great deal in the area since this early occupation. It is, and apparently was, a marginal area for man's occupancy. Secondly, it is of great importance to realize that sites such as this exist in the semi-arid regions of the San Joaquin Valley. Certainly in the future such buried sites will provide data not only of value for the archeological record, but could provide considerable information on climatic changes or stream channel depositional and erosional changes over the last few thousand years. It indicates too, that earlier sites than this could be covered with many feet of alluvial deposit, a fact of great importance in the search for Early Man sites in this area.

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Kern County, California. Bureau of American Ethnology,
Bulletin 130. Washington, D. C.

TABLE 1: Shell, Stone and Bone Bead Data 4-Fre-128

Bead Type	Number of Specimens					Length (mm.)	Width (mm.)	Thickness (mm.)	Diameter (mm.)
	Midden	HS1	HS2	HS3	Total				
Olivella 1a	4		6		10				4-7
Olivella 1b	5		2		7				9-10
Olivella 1a Ground	1				1				6
Olivella 1b Ground		1	2		3				ca.10
Olivella 2a1			1	1	2	7	6		
Olivella 3a1 (small)	34	2	78	1	115	6-8	5-7		
Olivella 3a1 (large)	7				7	10-11	8-10		
Olivella 3e	61	30	97	4	192			2-3	3-5
Olivella 3d	35	7	14		56			1	4
Olivella Cap (Glc)			2		2			4-5	5-7
Olivella Large Disc			4		4			1-2	7-8
Olivella Small Rough Disc	19		12		31			1	4
Olivella Broken Ground 1a & 1b	1	1	1		3				
Olivella Broken 1a & 1b	2	1	4	1	8				
Clam Disc (V1a1) (?)		1	1		2			2	4
Haliotis Callus Disc	28	22	15		65			1-3	3-5
Steatite Disc	23	5	12		40			1-4	3-9
Pebble Bead	1				1			2	7
Tubular Bone Bead			3		3	13-22			6-7
Glass Beads	11		17		28			2-5	3-5
Haliotis Fragments	2		3	1	6				
Imperforate Clam Disc		1			1			3	12
Mussel Shell "Spoons"			2		2	45-65+	26-38	10-15	
Total	234	71	276	8	589				

TABLE 2: Depth Distribution of Midden Beads 4-Pre-128

Bead Type	(cm) 0-10	10-20	20-30	30-40	40-50	50-60	Total
Olivella la	2*	2					4
Olivella lb	1	2	2				5
Olivella la Ground	1*						1
Olivella 3al (small)	12	11	7	3		1	34
Olivella 3al (large)	7						7
Olivella 3e	26	21	10	4			61
Olivella 3d	9	7	8	11			35
Olivella Small Rough Disc	5	4	3	7			19
Olivella la & lb Fragments	1	1					2
Haliotis Callus Disc	8	12	7	1			28
Steatite Disc	11	7	4	1			23
Pebble Disc	1						1
Glass Beads	2	5	4				11
Ground la or lb Fragments	1						1
Haliotis Frag- ments			1	1			2
Total	87	72	46	28		1	234

*Surface

TABLE 3: Depth Distribution of Beads in Housepits 4-Fre-128

Bead Type	0-10			10-20			20-30			30-40			40-50			50-60			60-70			70-80			No Location				
	HS	1	2	HS	1	2	HS	1	2	HS	1	2	HS	1	2	HS	1	2	HS	1	2	HS	1	2	HS	1	2	3	
Olivella la	1						4			1																			6
Olivella lb			2				1	1		1																			2
Olivella lb (Ground)								1																					3
Olivella 2al								1																					2
Olivella 3al (Small)	17			1	17	1	16		11	10											1								81
Olivella 3e	1	12		17	22	1	17	2	25	1	1	7									5	1							131
Olivella 3d				3	4		7		2		1																		21
Olivella Cap (Glc)									2																				2
Olivella Large Disc						1	3																						4
Olivella Small Rough Disc	3					4	3																						12
Olivella Broken la & lb (Ground)									1	1																			2
Olivella Broken la & lb																													6
Clam Disc								1																					2
Haliotis Callus Disc	1	2		4	10		3		1												2								37
Steatite Disc				4	5		3																						17
Tubular Bone Beads	1						1																						3
Glass Beads	1					9	3			2																			17
Haliotis Fragments	1																												4
Imperforate Clam Disc									1																				1
Mussel Shell "Spoons"	1																												2
Total	2	39	1	29	76	2	1	64	3	3	48	1	2	23	8	22	7	2	14	5	2	1	5	2	1	355			

*From 50-70 cm. level

TABLE 4: Data on Bone Artifacts 4-Fre-128

Artifact Type	Number of Specimens				Length (mm.)	Width (mm.)	Thickness (mm.)
	Midden	HS1	HS2	Total			
Incised Bird Bone Fragments		1	1	2			
Polished Bird Bone Fragments			4	4			
Rabbit Bone Skewer			1	1	48+	8	5
Bone Awls	1	1	2	4	61-129	5-14	4-7
Bone Awl Fragments	2	2	8	12	34+-60+(4)	5-7	3-6
Blunt Pointed Tool	1		1	2			
Bone Pin Fragments			2	2	26+-37+	3	2
Scapula "Tools"	1		1	2	120+-188	29-33	13-16
Scapula "Tool" Fragments	2		5	7			
Polished Antler Tine	1			1	260	64	27
Polished Antler Fragments			3	3			
Polished Bone Fragments	10	2	19	31			
Total	18	6	47	71			

TABLE 5: Depth Distribution of Bone Artifacts 4-Fre-128

Artifact Type	10-20		20-30		30-40		40-50		50-60		60-70		Total		
	Mid.	HS1 HS2	Mid.	HS1 HS2	Mid.	HS1 HS2	Mid.	HS1 HS2	Mid.	HS1 HS2	Mid.	HS1 HS2			
Incised Bird Bone Fragments		1											1		
Polished Bird Bone Fragments		1		1									2		
Rabbit Bone Skewer													1		
Bone Awls		1		1									2		
Bone Awl Fragments		1	2	2	1	2	1	3					12		
Blunt Pointed Tools				1									1		
Bone Pin Fragments													2		
Scapula "Tools"				1									1		
Scapula "Tool" Fragments		1		3		1	1						7		
Polished Antler Tine													1		
Polished Antler Fragments				3									3		
Polished Bone Fragments		2	3	1	1	6	5	3	2	1	5	1	31		
Total	4	1	6	4	2	17	7	1	7	3	2	8	7	1	71

TABLE 6: Projectile Point Data 4-Fre-128

Point Type	Provenience		Length (mm.)	Width (mm.)	Thickness (mm.)	Weight (grams)	Material
	Midden	HSL HS2					
Small Triangular	8	3	17-31	9-20	3-5	.4-1.9	Silicate 10, Obsidian 1
Crude Triangular	4	2	14-19	12-15	3-5	.5-.6	Silicate 5, Obsidian 1
Small Sidenotched	25	6	20-33	12-20	3-5	.4-1.25	Silicate
Crude Sidenotched	4	1	ca.20	8-13	3-4	ca. .4-.7	Silicate
Desert Sidenotched	5	1	29-51	12-17	3-5	1.0-2.4	Silicate 3, Obsidian 3
Delta Serrated	1		39	14	4	1.5	Obsidian
Concave Base Serrated	5	1	24(1)	11-14	3-4	.7-1.0	Obsidian
Serrated Fragments	1	1	---	18	5	---	Obsidian
Large Concave Base	1	1	46*	19	7	11.4	Green Chert
Large Square Base	1	1	---	22	12	---	Silicate 7, Basalt 2
Large Point Frags.	6	2	---	13-19	5-7	---	Silicate 25, Obsidian 5,
Small Point Frags.	22	4	---	9-11	3-5	---	Basalt 1
Total	83	8	110				

TABLE 7: Depth Distribution of Projectile Points 4-Fre-128

Point Type	0-10 (cm)		10-20		20-30		30-40		40-50		50-60		Total
	Mid.	HSL HS2	Mid.	HSL HS2	Mid.	HSL HS2	Mid.	HSL HS2	Mid.	HSL HS2	Mid.	HSL HS2	
Small Triangular	4	1	1		2		1						11
Crude Triangular	2	1	2										.6
Small Sidenotched	14	1	7		4		1					1	34
Crude Sidenotched	1		1		1		1						5
Desert Sidenotched	2		3										6
Delta Serrated	1												1
Concave Base Serr.	2												1
Serrated Fragments	1												1
Large Concave Base	1												1
Large Square Base	1												1
Large Point Frags.	3	1	2	1	4	1	2	1					9
Small Point Frags.	11	3	5	2	3	2	5	3					31
Total	43	1	21	2	7	1	6	5	3	2	3	2	111

TABLE 8: Scrapers - Choppers - Hammerstone Data 4-Fre-128

Artifact Type	Mid.	Provenience			Length (mm.)	Width (mm.)	Thickness (mm.)	Material	
		HS1	HS2	HS3					HS5
Simple Flake Scraper	30	5	6	1	1	43	13-42	4-13	Silicate 33, Obsidian 3
Multiedged Flake Scrp.	12	2	6			20	13-32	2-11	Silicate 18, Basalt 1, Obsidian 1
Bifacial Scraper	4	1	1			6	18-36	4-10	Silicate 5, Basalt 1
Concave Scraper	5		1			6	19-31	7-15	Silicate
Graver-Scraper	4					4	15-30	6-12	Silicate
Drills	3		1			4	10-19	4-7	Silicate
Scraper Fragments	4	2				6	---	---	Silicate
Heavy Flake Scraper	1		1			2	40-49	19-27	Andesite 1, Quartzite 1
Small Steep Scraper	4	1	5			10	15-39	11-30	Silicate 1, Basalt 1
Cobble Chopper	2					2	72-89	40-75	Quartzite 1, Basalt 1
Cobble-Core Hammerstn.	4		3			7	42-94	29-58	Silicate 5, Andesite 1, Sandstone 1
Unmodified Core	6	2	9	1		18	33-120	30-87	Silicate 16, Basalt
Total	79	13	33	2	1	128			

TABLE 9: Depth Distribution of Scrapers, Choppers and Hammerstones 4-Fre-128

Artifact Type	Midden and Houses															Total										
	0-10			10-20			20-30			30-40			40-50				50-60			60-70			70-80			
	Mid.	1	2	3	5	Mid.	1	2	3	Mid.	1	2	3	Mid.	1		2	3	Mid.	1	2	3	Mid.	1	2	3
Simple Flake Scraper	14	1	1	1	1	5	2	1	9	2	1	1	1	1	1											
Multiedged Flake Scrp.	6	1				3	2	2	2		1	1					1									
Bifacial Scraper	2					1			1		1															
Concave Scraper	2					2		1																		
Graver-Scraper	1								2		1															
Drills	2					1		1																		
Scraper Fragment	2					2																				
Heavy Flake Scraper	1													1												
Small Steep Scraper	3		1			1	2	1	1																	
Cobble Choppers	2																									
Cobble-Core Hammerstn.	4		1			1	1	1	1																	
Unmodified Core	4	1	6			1	1	1	1				1													
Total	43	2	10	1	15	6	8	16	3	2	4	3	4	1	1	3	5	1	1	2	1	1	2	1	1	128

TABLE 10: Description of Ground Stone Artifacts 4-Fre-128

Artifact Type	Provenience			Length (mm.)	Width (mm.)	Thickness (mm.)	Notes
	Mid. HS1	HS2	HS3 Total				
Limestone Disc	2		2	18-19(dia.)		2-3	
Actinolite Splinters	2	1	3	22-24	2-4	2	
Steatite Bead Blank	1		1	9		5(dia.)	
Steat. Arrow Straight.		1	1	94	48	14	Groove 10 mm. wide, 2-3 mm. deep. Ves- sel sherd.
Steatite Vessel	1	1	2	240-300	167-210	120-160	
Steatite Vessel Sherds	4	1	5	---	---	22-26	
Bowl Mortar Fragments	6	4	10	---	---	---	Andesite 6, Sandstone 4
Cobble Mortar		1	1	285	245	115	Andesite, depression (120 dia., 23 deep)
Slab Mortar	2		2	320-470	240*	65-115	Sandstone, depression (120 dia., 33- 60 deep)
Conical Pestle		1	1	250	60		Andesite
Cobble Pestle	1		1	207	62	50	Sandstone
Pestle Fragments	1	3	4	---	60(dia.)	---	
Bifacial Mano		1	1	---	---	55	Andesite
Unifacial Mano	5	3	9	147-170	100-135	32-78	Sandstone 6, andesite 2, granite 1
Small Grinding Slab	6	2	8	168-279	57-160	14-38	Sandstone
Whetstones	1	2	3	58-76	40-45	7-14	Soft sandstone
Total	32	20	54				

82

TABLE 11: Depth Distribution of Ground Stone Artifacts 4-Fre-128
(Midden and Houses)

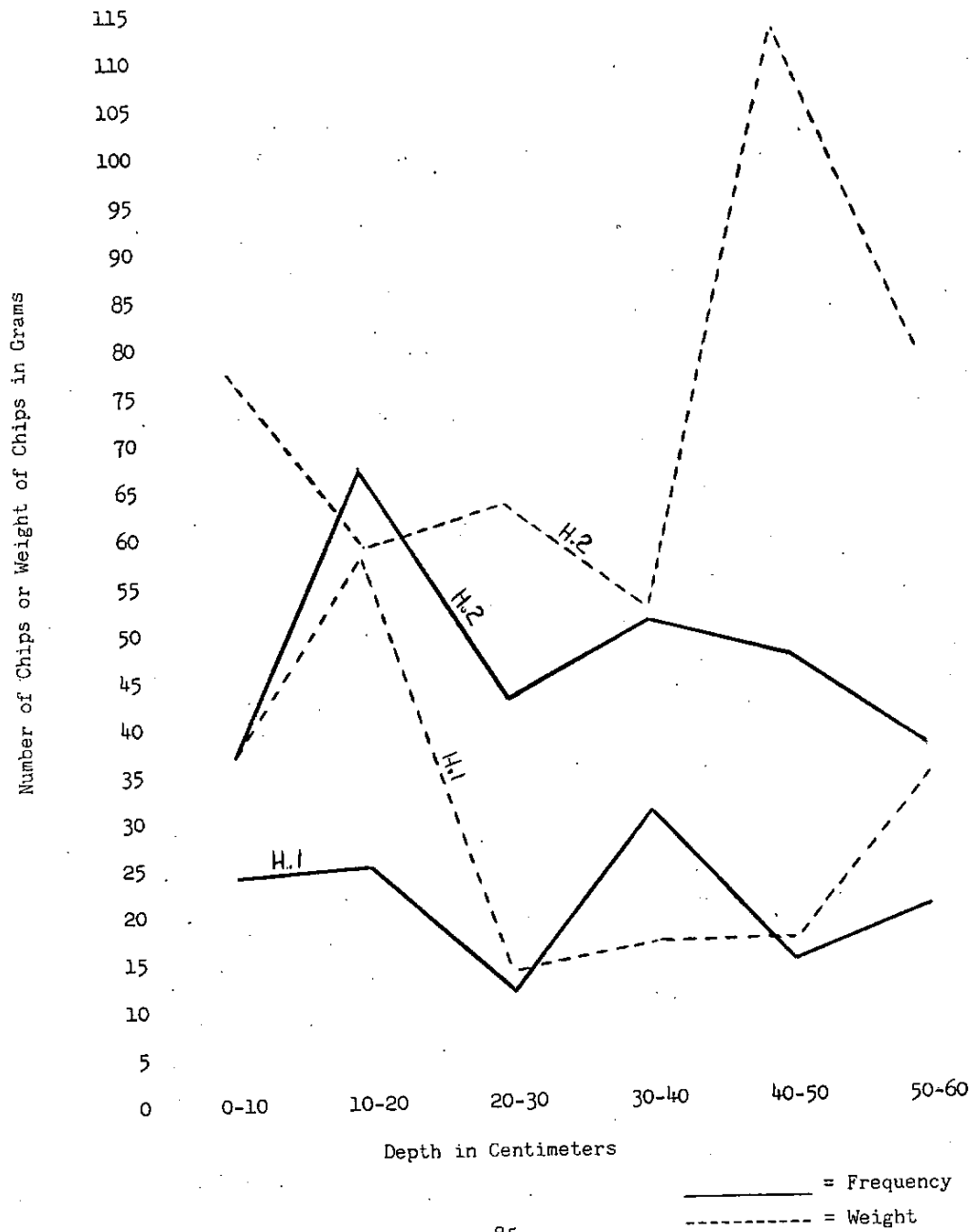
Artifact Type	0-10 (cm)			10-20			20-30			30-40			40-50			50-60			Total			
	Mid.	1	2	3	Mid.	1	2	3	Mid.	1	2	3	Mid.	1	2	3	Mid.	1		2	3	
Limestone Disc	1				1																2	
Actinolite Splinter	1				1																	3
Steatite Bead Blank				1																		1
Steatite Arrow Straightener					1																	1
Steatite Vessel								1														2
Steatite Vessel Sherd	2			1	1																	5
Bowl Mortar Fragments	2	1			2			1	3	1												10
Cobble Mortar										1												1
Slab Mortar	2																					2
Conical Pestle																					1	1
Cobble Pestle																						1
Pestle Fragments																						4
Bifacial Mano																						1
Unifacial Mano	2			1	1			1	1	1												9
Small Grinding Slab					2			1														8
Whet Stone					1			1	1	1												3
Total	10	3	5	4	10	4	3	1	2	4	1	5	5	5	1	5	5	1	5	1	5	54

TABLE 12: Chipping Waste Analysis 4-Fre-128

Depth (cm.)	House 1		House 2		Midden		Midden		Total	
	Unit N2-EO Number	Weight ¹	Unit N16-W20 Number	Weight	Unit N10-W34 Number	Weight	Unit N18-EO Number	Weight	Number	Weight
0-10	Silicate	15	22.5	31	57.8	65	59.0	11	122	162.0
	Jasper	3	10.1	1	5.5	6	11.3	3	13	59.4
	Quartz	4	3.9	4	1.2	9	25.0	5	22	32.0
	Basalt	1	.5	1	12.5	13	15.7	2	17	42.9
	Obsidian	1	.3	--	---	--	---	--	1	1
10-20	Silicate	19	48.7	41	30.4	37	45.0	19	116	165.0
	Jasper	5	7.5	12	9.4	4	1.7	3	24	38.5
	Quartz	1	1.1	10	5.5	1	.3	1	13	7.6
	Basalt	--	---	3	13.8	6	5.5	--	9	19.3
	Obsidian	--	---	--	---	1	Tr	--	1	Tr
20-30	Silicate	7	11.2	32	46.0	10	40.6	7	56	117.3
	Jasper	2	1.7	2	Tr	--	---	4	4	1.7
	Quartz	2	1.4	6	5.3	2	1.9	4	14	10.6
	Basalt	--	---	2	12.4	4	4.9	--	6	17.3
	Obsidian	--	---	--	---	1	Tr	--	1	Tr
30-40	Silicate	16	9.8	41	45.3	29	21.3	3	89	79.6
	Jasper	7	8.3	--	---	1	.3	1	9	15.6
	Quartz	5	2.8	5	3.5	--	---	--	10	6.3
	Basalt	--	---	4	3.0	4	13.9	--	8	16.9
	Obsidian	2	.3	1	Tr	--	---	--	3	.3
40-50	Silicate	12	20.4	27	57.5	--	---	--	39	77.9
	Jasper	2	.5	6	43.5	--	---	--	8	44.0
	Quartz	--	---	6	3.8	--	---	--	6	3.8
	Basalt	--	---	7	7.8	--	---	--	7	7.8
	Obsidian	--	---	1	.9	--	---	--	1	.9
50-60	Silicate	14	27.4	26	58.0	--	---	--	40	85.4
	Jasper	2	1.3	1	4.6	--	---	--	3	5.9
	Quartz	2	5.2	7	9.0	--	---	--	9	14.2
	Basalt	1	.3	4	2.0	--	---	--	5	2.3
	Obsidian	1	.3	--	---	--	---	--	1	.3
Total	124	185.5	281	438.7	193	246.4	59	164.5	657	1035.1

¹Weight in Grams

Frequency Distribution of
 TABLE 13: Chipping Waste in Houses 1 & 2 4-Fre-128



Frequency Distribution of
 TABLE 14: Chipping Waste in Two Midden Units 4-Fre-128

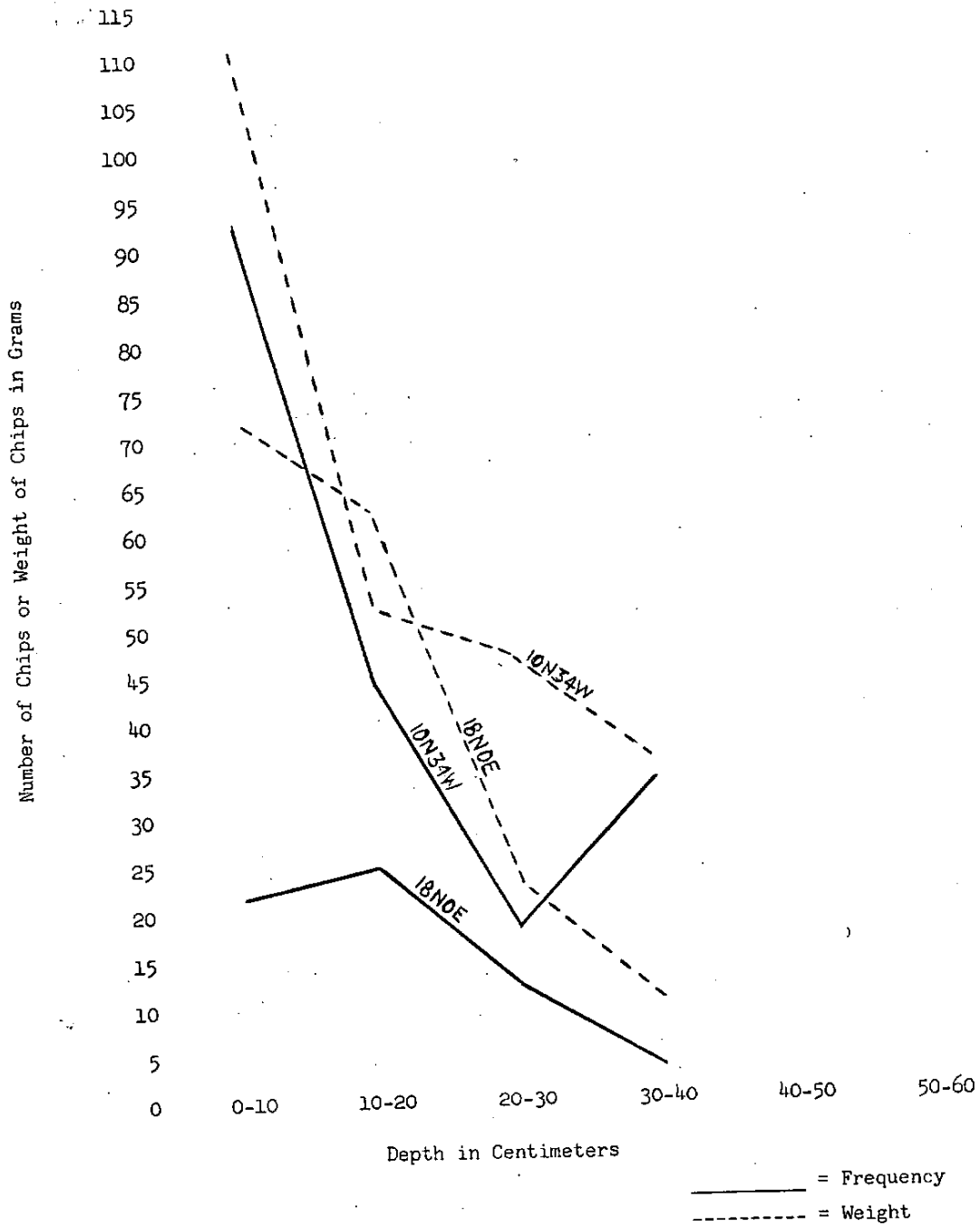


TABLE 15: Depth Distribution of Red Pigment Lumps* 4-Fre-128

Provenience	(cm) 0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
Midden	10	11	2	1				24
House #1				3			1	4
House #2	12	10	2	6	6	9		45
House #3	1							1
Total	23	21	4	10	6	9	1	74

*All lumps smaller than thumb-sized

13

TABLE 16: Mussel and Fossil Shell¹ 4-Fre-128

Provenience	(cm) 0-10	10-20	20-30	30-40	40-50	50-60	Total
	No.	No.	No.	No.	No.	No.	No.
	Wt.	Wt.	Wt.	Wt.	Wt.	Wt.	Wt.
Midden	5	1.0	17	4.0	7	2.0	34
House #1	4	Tr	1	Tr			8
House #2		6	Tr	1	Tr	2	11
Total	9	1	24	4	8	2	53

¹Fossil Shell traces located in:

Midden (0-10)3 Tr (10-20)3 Tr (20-30)1 Tr (30-40)1 Tr
 House 1 (40-50)2 Tr (70-80)1 Tr
 House 2 (10-20)1 Tr (40-50)1 Tr

²Weight in Grams

TABLE 17: Data on Bone, Shell and Stone Beads 4-Fre-129

Bead Type	Midden	Grave Pits	Total	Length (mm.)	Width (mm.)	Thickness (mm.)	Diameter (mm.)	Notes
Olivella la	4	48	52				5-8	Broken spires
Olivella lb	6	4	10				9-11	Broken spires
Olivella la Sideground	1	1	2				7	Interior filled with asphalt
Olivella lb Sideground	3	1	4	7	5		10	
Olivella 2a1	17	10	27			3-5	6-9	Oval, almost no lip, ground edge
Olivella 3a1 (small)	8	14	22			4-6	10-14	Well defined lip
Olivella 3a1 (large)	1	6	7	12-16	9-11		3-5	Poorly made, crude
Olivella 3a2	22	14	36			2-3		
Olivella 3e	4	5	9				6-9	Thin, no lipping
Olivella Large Disc (variable)	1	1	2				4	Broken edges, ground
Olivella Small Rough Disc	1		1					
Olivella Large Cupped Rectangular	1		1	12	12			Weathered looking
Olivella Rough Drilled	1	4	5	10-12	3-5			Broken, drilled fragments
Olivella Broken 3a2	10	22	32					Not measured
Olivella Broken Spire-lopped	11	7	18				6	Not measured
Saxidomas Disc	1	1	2			2	6-7	
Tivella Tube	3		3	7-12				
Haliotis Disc	4	1	5	7-10		2-4		
Steatite Disc	48	33	81			2-4	5-9	Square drilled in center
Pebble Disc	1	1	2	9	9	2	7	
Tubular Bone Bead	1	1	2	22				Some possibly made of stone
Haliotis Callus Disc	7	8	15			1-2	3-5	
Total	153	181	334					

TABLE 18: Depth Distribution of Shell, Stone and Bone Beads 4-Fre-129

Bead Type	(Midden)					Midden Total
	0-10	0-15	10-20	15-30	30-60 (cm)	
Olivella 1a	1*		2	1		4
Olivella 1b	1		4		1	6
Olivella 1a Sideground						1
Olivella 1b Sideground	1*					1
Olivella 2a1	1			1	1	3
Olivella 3a1 (small)	5*		8	1	3	17
Olivella 3a1 (large)	2		6			8
Olivella 3a2			1			1
Olivella 3e	4**		11	6	1	22
Olivella Large Disc (variable)	1		2	1		4
Olivella Small Rough Disc				1		1
Olivella Large Cupped Rectangular	1					1
Olivella Rough Drilled				1		1
Olivella 3a2 Broken	3*	1	3	2	1	10
Olivella Spirelopped Broken	3	1	3	4	1	12
Saxidomas Disc				1		3
Tivella Tube	1		1	1		4
Haliotis Disc		1	2	1		4
Haliotis Callus Disc	1		4	2		7
Steatite Disc	8	2	24	10	4	48
Pebble Disc						1
Tubular Bone Bead				1		1
Total	33	5	71	33	12	154

* One found on surface
 ** Two found on surface

TABLE 18 (continued): Depth Distribution of Shell, Stone and Bone Beads 4-Fre-129

Burial Area (cm)	Depth Distribution of Shell, Stone and Bone Beads									
	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+
	14E-28S	2M-8&10S	12&14E-2&4N							
Bead Type	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+
Olivella la	2	3				1	13	2	28	1
Olivella lb										
Olivella la Sideground			1							
Olivella lb Sideground										
Olivella 2a1	2	2	1			1	3	1	1	
Olivella 3a1 (small)						4	6	2	3	
Olivella 3a1 (large)						5	3	4		
Olivella 3a2	1			1						
Olivella 3e										
Olivella Large Disc (variable)							3	2		
Olivella Small Rough Disc										
Olivella Large Cupped Rectangular										
Olivella Rough Drilled							2			
Olivella 3a2 Broken	2		1			1	7	1	2	5
Olivella Spirelopped Broken						1	3	1	1	1
Saxidomas Disc										
Tivella Tube							1			
Haliotis Disc										
Haliotis Callus Disc						6	10	4	1	1
Steatite Disc			1			6				
Pebble Disc	1									
Tubular Bone Bead										
Total	8	5	1	1		29	54	17	37	8

TABLE 18 (continued): Depth Distribution of Shell, Stone and Bone Beads 4-Fre-129

Bead Type	Burial Area 12E-12&14N		26E-22N		Total
	(cm) 0-20	20-40	0-20	20-40	
Olivella la		1			48
Olivella lb					4
Olivella la Sideground					1
Olivella lb Sideground					1
Olivella 2a1					1
Olivella 3a1 (small)		1			10
Olivella 3a1 (large)		1			14
Olivella 3a2					6
Olivella 3e					14
Olivella Large Disc					5
(variable)					1
Olivella Small Rough Disc					4
Olivella Large Cupped					22
Rectangular					4
Olivella Rough Drilled					22
Olivella 3a2 Broken					7
Olivella Spirelopped					1
Broken					1
Saxidomas Disc				1	1
Tivella Tube					1
Haliotis Disc					8
Haliotis Callus Disc					33
Steatite Disc		2		1	1
Pebble Disc					1
Tubular Bone Bead					1
Total	5	1	2		181

TABLE 19: Data on Shell Artifacts 4-Fre-129

Artifact Type	Midden	Grave Pits	Total	Length (mm.)	Width (mm.)	Thickness (mm.)	Diameter (mm.)	Notes
Incised Clam Disc	1		1			ca. 12-13		Incised edge, not perforated
Haliotis B.l.		1	1	8	8			Perforated at one edge
Haliotis B.2.a.		1	1	21	8		ca. 35-45	Incised edges
Haliotis Circular (?)	1		1					Small edge fragment
Haliotis Fragment	1	3	4					Not measured
Mussel Pendant		1	1	20	12			Drilled at one end
Mussel Spoon		1	1	90	44			Ground edges
Mussel Saw Fragment	1		1	18*	8*			Sawtoothed edge
Total	5	6	11					

TABLE 20: Depth Distribution of Shell Artifacts 4-Fre-129

Artifact Type	(cm)						Midden Total
	0-10	0-15	10-20	15-30	30-60	Total	
Incised Clam Shell Disc							1
Haliotis B.l.							
Haliotis B.2.a.	1						1
Haliotis Circular (?)			1				1
Haliotis Fragments							
Mussel Shell Pendant				1			1
Mussel Shell Spoon					1		1
Mussel Shell Saw Fragment							
Total	2		1	1	1		5

TABLE 20 (continued): Depth Distribution of Shell Artifacts 4-Fre-129

Artifact Type	Burial Area 14E-288				Burial Area 2W-8&10S				Burial Area 12&14E-2&4N						
	(cm) 0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+
Incised Clam Shell Disc															
Haliotis B.1.										1					
Haliotis B.2.e.															
Haliotis Circular (?)															1
Haliotis Fragments															
Mussel Shell Pendant															
Mussel Shell Spoon															
Mussel Shell Saw Fragment															
Total						1									1

TABLE 20 (continued): Depth Distribution of Shell Artifacts 4-Fre-129

Artifact Type	Burial Area 12E-12&14N				Burial Area 26E-22N				Total	
	(cm) 0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60		60-80
Incised Clam Shell Disc										
Haliotis B.1.										1
Haliotis B.2.a.										1
Haliotis Circular (?)										
Haliotis Fragments										3
Mussel Shell Pendant										1
Mussel Shell Spoon										
Mussel Shell Saw Fragment										
Total						1				6

TABLE 21: Data on Bone Artifacts 4-Fre-128

Artifact Type	Number of Specimens		Length (mm.)	Width (mm.)	Thickness (mm.)	Notes
	Midden	Burial				
Incised Bird Bone Fragment	1	1	---	---	---	Two lines across one end of fragment
Incised Bone Spatula Fragment	1	1	---	---	5	"V" shaped design on convex side
Bird Bone Whistle Fragment	1	1	---	---	---	Small fragment from hole area
Mammal Bone Tube Fragment	1	1	28*	10	10	Tapered cylinder, one end broken off
Bone Awls	1	2	96-100	9-10* (medial)	4-6 (medial)	20 tip fragments, 7 medial fragments
Bone Awl Fragments	11	16	50-56* (3) 104*	7-13 (medial) 20	4-6 (medial) 6-8	Distal end broken off, proximal end unmodified.
Polished Ulnae		1	28*	3	2-3	Thin sharply pointed distal end (burnt)
Pin Fragments		2	28*	3	3	Proximal end blunt and rounded off
Pin	1		38	5	3	
"Spurs"		5	27*-41*	6*-14*	5-7	None complete, all have transverse binding grooves
Polished Scapula Fragment		1	---	20	2-7	Medial fragment (burnt)
Polished Antler Fragment	1		---	---	---	Broken split fragment with polish
Polished Bone Fragments	12	7	---	---	---	All small, badly broken, split fragments
Total	27	37				
						64

* 13-15 (base)

TABLE 22: Depth Distribution of Bone Artifacts 4-Fre-129

Artifact Type	(Midden)					Midden Total
	(cm) 0-10	0-15	10-20	15-30	30-60	
Incised Bird Bone Fragment						
Incised Bone Spatula Fragment						
Bird Bone Whistle Fragment						
Mammal Bone Tube Fragment			1			1
Bone Awl			1			1
Bone Awl Fragments	1		3	6	1	11
Polished Ulnae						
Bone "Needle" Fragments						
Bone "Pin"				1		1
Bone "Spurs"						
Polished Scapula Fragment						
Polished Antler Fragment			1			1
Polished Bone Fragments	4		1	3	4	12
Total	5		7	10	5	27

TABLE 22 (continued): Depth Distribution of Bone Artifacts 4-Fre-129

Artifact Type	Burial Area 14E-28S				Burial Area 2W-8&10S				Burial Area 12&14E-2&4N						
	(cm) 0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+
Incid Bird Bone Frag.											1				
Incid Bone Spatula Frag.										1					
Bird Bone Whistle Frag.											1				
Mammal Bone Tube Fragment											1				
Bone Awls											1				
Bone Awl Fragments	1		1			1	1	2		1	1	3	3	1	
Polished Ulnae											1				
Bone "Needle" Fragments															
Bone "Pin"															
Bone "Spurs"										1			1	1	2
Polished Scapula Frag.															
Polished Antler Fragment											1		1	1	
Polished Bone Fragments	1							1							
Total	1	1	1	1	1	1	1	3	5	6	6	6	6	2	3

TABLE 22 (continued): Depth Distribution of Bone Artifacts 4-Fre-129

Artifact Type	Burial Area 12E-12&14N				Burial Area 26E-22N				Total						
	(cm) 0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60		60-80	80+				
Incid Bird Bone Frag.											1				
Incid Bone Spatula Frag.															1
Bird Bone Whistle Frag.															1
Mammal Bone Tube Fragment															2
Bone Awls													1		16
Bone Awl Fragments															1
Polished Ulnae													1		2
Bone "Needle" Fragments															5
Bone "Pin"															1
Bone "Spurs"															1
Polished Scapula Frag.															7
Polished Antler Fragment													1		1
Polished Bone Fragments														3	37
Total															

TABLE 23: Projectile Point Data 4-Fre-129

Point Type	Number of Specimens		Length (mm.)	Width (mm.)	Thickness (mm.)	Weight (grams)	Material
	Midden	Burials					
Small Triangular	7	0	ca. 15-27	9-21	3-5	.4-1.95	Obsidian 2, Sillicate 5
Small Side-notched	10	6	23-32	12-19	2-5	.6-1.3	Obsidian 2, Sillicate 14
Small Side-notched Misc.	1	5	17-22	11-14	3-5	.4-1.15	Obsidian 2, Sillicate 4
Small Serrated	1	1	19*	13	4	1.5*	Obsidian
Small Stemmed	1	1	28*	11	5	1.3(est.)	Sillicate
Large Side-notched	1	1	22*	18	9	5-6(est.)	Sillicate
Large Tapered Stem	1	1	33	28	8	5.6	Mineralized Wood
Large Wide Stem	1	1	18*	19*	9	7.0(est.)	Red Jasper
Large Point Fragments	6	6	--	13-29	6-11	4.0*(est.)	Obsidian 6, Sillicate 6
Small Point Fragments	18	24	--	--	--	--	Obsidian 21, Sillicate 21
Total	43	45					

97-

TABLE 24: Depth Distribution of Projectile Points 4-Fre-129

Artifact Type	Depth Distribution of Projectile Points (Midden)						Midden Total
	0-10	0-15	10-20	15-30	30-60 (cm)	Total	
Small Triangular	2	3	1	1			7
Small Side-notched	2	3	3	2			10
Small Side-notched Misc.			1				1
Small Serrated							
Small Stemmed	1		1	1	1		4
Large Point Fragments	3	3	2	5	1		14
Small Point Fragments	7	3	2	5	1		18
Total	15	9	8	9	2		43

TABLE 24 (continued): Depth Distribution of Projectile Points 4-Fre-129

Artifact Type	Burial Area 14E-28S (cm)				Burial Area 2W-8&10S (cm)				Burial Area 12&14E-2&4N (cm)						
	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+
Small Triangular							2				1			1	1
Small Sidenotched											1			1	1
Small Sidenotched Misc.															
Small Serrated															
Small Stemmed															
Large Sidenotched															
Large Tapered Stem															
Large Wide Stem															
Large Point Fragments						1	1		2		5	7	3	1	
Small Point Fragments						1	1	2	2		6	11	3	4	2
Total						1	1	2	2		6	11	3	4	2

TABLE 24 (continued): Depth Distribution of Projectile Points 4-Fre-129

Artifact Type	Burial Area 12E-12&14N (cm)				Burial Area 26E-22W (cm)				Total		
	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60		60-80	80+
Small Triangular											6
Small Sidenotched											5
Small Sidenotched Misc.	1										1
Small Serrated											1
Small Stemmed											1
Large Sidenotched											1
Large Tapered Stem											1
Large Wide Stem											1
Large Point Fragments						4					6
Small Point Fragments						3	1				24
Total	1	8	1	2	1	1	2	1			45

TABLE 25: Data on Scrapers and Heavy Chipped Stone Artifacts 4-Fre-129

Scraper Type	Number of Specimens		Length (mm.)	Width (mm.)	Thickness (mm.)	Weight (grams)	Material
	Midden	Burials					
Simple Flake	23	24	17-53	9-37	3-14		Silicate 4, Glass 4, Obsidian 1
Multiedged Flake	7	14	20-62	14-44	5-11		Silicate 18, Class 2, Obsidian 1
Serrated Flake	2	2	25-33	22-33	8-15		Jasper 3, Mineralized Wood 1
Bifacial Scraper	3	2	20-33	18-30	6-12		Silicate 5
Beaked Scraper		3	27-53	20-41	5-10		Jasper 1, Silicate 2
Reamer-Scraper	3		21-26	11-16	3-5		Silicate 1, Obsidian 1, Mineralized Wood 1
Unclass. Fragments	7	4	---	---	---		Silicate 9, Mineralized Wood 2
Heavy Flake Scrapers	3	1	46-83	40-44	16-19	32-106	Silicate 2, Basalt 2
Small Core Scrapers	8	12	28-55	20-56	18-29		Silicate 15-18, Basalt 2
Cobble & Core Choppers	5	3	56-161	42-117	20-62	62-ca.450	Silicate 3, Quartzite 3, Sandstone 1, Jasper 1
Cores (Unused)	14	5	34-82	25-63	20-48	46-192	Silicate 13, Jasper 3, Quartz 1, Quartzite 2
Hammerstones*	8	13	38-140*	31-93	23-85		Sandstone 9, Silicate 4, Quartz 4
Total	83	83					
							166

*Includes cobble and core hammerstones

Depth Distribution of
 TABLE 26: Scrapers and Heavy Chipped Stone Artifacts 4-Fre-129

Artifact Type	0-10	0-15	10-20	15-30	30-60 (cm)	Midden Total
Simple Flake Scraper	9	1	6	6	1	23
Multiedged Flake Scraper	2	1	3	1		7
Serrated Flake Scraper			2			2
Bifacial Scraper			1	2		3
Beaked Scraper						
Reamer or Drill			1	1	1	3
Flake Scraper Fragments		1	3	1	2	7
Glass Scrapers (all)		1				1
Heavy Flake Scrapers	2				1	3
Small Core Scrapers	3		1	3	1	8
Cobble & Core Choppers	2		2	1		5
Cores (Unused)	10		2	1	1	14
Hammerstones	5		1	2		8
Total	33	4	22	18	7	84

TABLE 26 (continued): Depth Distribution of Scrapers & Heavy Chipped Stone Artifacts 4-Fre-129

Artifact Type	Burial Area 14E-28S				Burial Area 2W-8&10S				Burial Area 12&14E-2&4N						
	(cm) 0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+
Simple Flake Scraper						1		1			4	2	3		
Multiedged Flake Scraper						1					3	3	1		
Serrated Flake Scraper							1				1				
Bifacial Scraper											1	1			
Beaked Scraper											1				
Reamer or Drill															
Flake Scraper Fragments											1		1		
Glass Scrapers (all)											3	1	1		
Heavy Flake Scrapers	1						2				2	2	2	1	
Small Core Scrapers				1							1		1		
Cobble & Core Choppers	1							1			1	1	1	1	
Cores (unused)		3									1	1	1	1	
Hammerstones															
Total	2	3	1	1	1	2	4	2	2	2	17	10	11	3	

TABLE 26 (continued): Depth Distribution of Scrapers & Heavy Chipped Stone Artifacts 4-Fre-129

Artifact Type	Burial Area 12E-12&14N				Burial Area 26E-22N				Total		
	(cm) 0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60		60-80	80+
Simple Flake Scraper	5	6	1								24
Multiedged Flake Scraper	3	3									14
Serrated Flake Scraper		2									2
Bifacial Scraper	1										2
Beaked Scraper											3
Reamer or Drill											4
Flake Scraper Fragments	1					1					5
Glass Scrapers (all)											1
Heavy Flake Scrapers	1										12
Small Core Scrapers											3
Cobble & Core Choppers											5
Cores (unused)		1									13
Hammerstones		1									1
Total	11	13	1	3	3						88

TABLE 27: Data on Heavy Stone Artifacts 4-Pre-129

Artifact Type	Midden	Number of Specimens Burials	Total	Length (mm.)	Width (mm.)	Thickness (mm.)	Diameter (mm.)	Material
Bowl Mortars	2	2	4	285(1) ¹	210(1)	88-210	153-300 ²	Sandstone 2, Andesite 1, Granitic 1
Miniature Mortars		2	2	107(1)	99(1)	47(1)		Granitic 1, Siltstone 1
Mortar Fragments, Unclass.	7	14	21	---	---	40-80(8)	ca.150	Sandstone 12, Andesite 8, Granitic 1
Pestles	3	1	4	135-185	48-81	41-54		Sandstone 3, Metamorphic Silt 1
Pestle Fragments	9	3	12	125*(1)	52-76(6)	40-49(5)	57-64	Sandstone 8, Andesite 3, Basalt 1
Metate Fragments	1	4	5	140+-160*	125+-185	35-115(4)		Sandstone
Manos	5	2	7	98-184	66-102	30-53		Sandstone 4, Andesite 3
Mano Fragments	6	8	14	123(1)	77-96(6)	21-52(12)		Sandstone 10, Andesite 3, Quartz 1
Small Grinding Slab ³	4	2	6	109-165	99-140	20-31		Sandstone 5, Metamorphic Silt 1
Whetstones	4	4	4	68-92(2)	58-87(2)	9-20(4)		Sandstone
Ground Sandstone Frags.	1	2	3	---	---	19(1)		Sandstone
Ground Split Cobble	1	1	1	117	82	45		Amphibole Schist (?)
Stone "Ball"		1	1				39	Andesite (?)
Utilized Cobble		1	1					Andesite (stained red)
Fitted Cobble	1	1	1	94	81	26		Sandstone
Total	44	42	86					

1 Numbers in parentheses refer to number of specimens measured
 2 Interior diameter 119-190, depth 55-120
 3 Two also utilized as chopping tools

TABLE 28: Depth Distribution of Heavy Stone Artifacts 4-Fre-129

Artifact Type	(cm)	0-10	0-15	10-20	15-30	30-60	Midden Total
Bowl Mortars		2					2
Miniature Mortars							
Mortar Fragments		2		2	3		7
Pestles		2			1		3
Pestle Fragments		3	1	3	2		9
Metate Fragments					1		1
Manos		1		3	1		5
Mano Fragments				2	1	3	6
Small Grinding Slab		3				1	4
Whetstone		1		3			4
Ground Sandstone Fragments						1	1
Ground Split Cobble		1					1
Stone "Ball"							
Utilized Cobble (pig.)							
Pitted Cobble				1			1
Total		15	1	14	9	5	44

TABLE 28 (continued): Depth Distribution of Heavy Stone Artifacts 4-Fre-129

Artifact Type	Burial Area 14E-288				Burial Area 2W-8&10S				Burial Area 12&14E-2&4N						
	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+
Bowl Mortars											1				1
Miniature Mortars	1														
Mortar Fragments	1										1				1
Pestles															
Pestle Fragments													1		1
Metate Fragments							1						1		1
Manos															
Mano Fragments						1					1				1
Small Grinding Slab															
Whetstone															1
Ground Sandstone Frags.								1							
Ground Split Cobble															1
Stone "Ball"															
Utilized Cobble (pig.)															
Pitted Cobble															
Total	2	1				1	1	2		1	2	11	6	2	2

TABLE 28 (continued): Depth Distribution of Heavy Stone Artifacts 4-Fre-129

Artifact Type	12E-12&14N		26E-22N		80+		Total
	0-20	20-40	0-20	20-40	0-20	20-40	
Bowl Mortars				1			2
Miniature Mortars							2
Mortar Fragments	1	1					14
Pestles							1
Pestle Fragments	1						3
Metate Fragments		1					4
Manos					1		2
Mano Fragments		1					8
Small Grinding Slab					1		2
Whetstone							2
Ground Sandstone Frags.							
Ground Split Cobble							1
Stone "Ball"						1	1
Utilized Cobble (pig.)							
Pitted Cobble							
Total	2	1	3	2	1	1	42

TABLE 29: Data on Small Ground Stone Artifacts 4-Fre-129

Artifact Type	Number of Specimens		Length (mm.)	Width (mm.)	Thickness (mm.)	Diameter (mm.)	Notes
	Midden	Burials					
Slate & Serpentine Pins	2	2	26-44	5-6(2)	3(2)	3-6(2)	2 with rectangular crosssections, 2 with circular crosssections
Steatite Labret	1	2			11-17	15-20.	2 have incised "X" on one face
Steatite Pipe Fragment	1				5		Concave-convex sidewall fragment
Steatite Arrow Strait.		1	100	70	20		2 grooves across one face; 4-6 inches wide and 3-4 inches deep
Actinolite Splinters	2		29	3	2		Possibly ground
Actinolite Lump	1						Thumb-sized, unshaped
Steatite Lump		1					Thumb-sized, burnt
Painted Pebble	1		59	31	22		Sandstone
Total	6	8	14				

-106-

TABLE 30: Depth Distribution of Small Ground Stone Artifacts 4-Fre-129

Artifact Type	Midden					
	0-10	10-20	15-30	30-60	(cm)	Total
Slate & Serpentine Pins				1		2
Steatite Labret						1
Steatite Pipe Fragment						1
Steatite Arrow Strait.						2
Actinolite Splinters						2
Steatite Lump						2
Actinolite Lump						1
Total	2	2	1	1	1	6

TABLE 30 (continued): Depth Distribution of Small Ground Stone Artifacts 4-Fre-129

Artifact Type	Burial Area 14E-28S				Burial Area 2W-8&10S				Burial Area 12&14E-28&4N						
	(cm) 0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+
Slate & Serpentine "Pins"		1							1						
Steatite Labret															1
Steatite Pipe Fragment															1
Steatite Arrow Strait.															1
Actinolite Splinters															1
Steatite Lump															
Actinolite Lump															
Total							1					1			3

TABLE 30 (continued): Depth Distribution of Small Ground Stone Artifacts 4-Fre-129

Artifact Type	Burial Area 12E-12&14N				Burial Area 26E-22N						
	(cm) 0-20	20-40	40-60	60-80	80+	0-20	20-40	40-60	60-80	80+	Total
Slate & Serpentine "Pins"											2
Steatite Labret											2
Steatite Pipe Fragment											1
Steatite Arrow Straightener											1
Actinolite Splinters											1
Steatite Lump										1	1
Actinolite Lump											1
Total											7

TABLE 31: Baked Clay Objects Data 4-Fre-129

Object Type	Midden	Burial	Total	Measure (mm.)	Outer Color	Interior Color
Pot Sherds	69	35	104	*	Dull red-brown	Brown-red
Cylindrical Clay Objects	1	3	4	6-8 (dia.) 13+ (length)	Red-orange	Brown orange-red
Total	70	38	108			

* See Table 32

TABLE 32: Pottery Thickness 4-Fre-129

Number of Specimens



TABLE 33: Depth Distribution of Baked Clay Objects 4-Fre-129

Object Type	4-Fre-129					Total
	0-10	0-15	10-20	15-30	30-60 (cm.)	
Pot Sherds	4	15	11	17	22	69
Red Pigment	5	3	7	5	2	22
Cylindrical Baked Clay Objects	1					1
Total	10	18	18	22	24	92

TABLE 33 (continued): Depth Distribution of Baked Clay Objects 4-Fre-129

Artifact Type	Burial Area						Total
	0-20	20-40	40-60	60-80	80+	Burial Area	
Pot Sherds	6			2	2	7	4
Red Pigment			4	1		1	
Cylindrical Baked Clay Objects			1	1		1	
Total	6		4	4	2	8	4

TABLE 33 (continued): Depth Distribution of Baked Clay Objects 4-Fre-129

Artifact Type	Burial Area						Total
	0-20	20-40	40-60	60-80	80+	Burial Area	
Pot Sherds	1	1	1	1	3	1	35
Red Pigment	1						7
Cylindrical Baked Clay Objects							3
Total	1	2	1	1	3	1	45

TABLE 34: Red Pigment, Quartz Crystals and Miscellaneous Remains 4-Fre-129

Area	0-10	0-15	10-20	15-30	30-45	45-60	60-80 (cm)	Total
Baked Clay Fragments	4	2	6	7	9	2	4	34
	6	4	4	4	3	3		24
Red & Yellow Pigments	1	2	1	1	2			7
	5	3	7	5	2			22
Quartz Crystals	20	1	24	4	3	6	7	21
				2		2		48
Concretions and Fossils	3		1	1			1	6
	3	2	4	1				10
Total	42	14	47	25	19	13	12	172

Distribution & Weight of
TABLE 35: Freshwater Shell by Unit and Depth 4-Fre-129

(cm)	0-10	0-15	10-20	15-30	30-45	45-60	60-80	80+	Total
Burial Area									
14E-28S	1(T)*		3(T)	3(T)		1(T)			8(T)
2W-8&10S	1(T)	1(T)	4(T)	1(T)	4(2)	2(T)	3(3.7)	5(T)	21(5.7)
12&14E-2&4N		5(T)		10(2)	12(7.5)	11(1)	5(T)	9(2)	52(12.5)
12E-12&14N		2(T)	2(T)	1(T)	1(1)	5(T)	1(2)		12(3)
26E-22N		2(T)					4(1)		6(1)
Midden									
8E-26S	1(T)		2(T)	4(1)	1(T)	1(T)			9(1)
2W-20S	2(T)		3(1)		2(T)	2(T)	2(1)		11(2)
6E-20S	1(T)			1(T)					2(T)
14E-18S		6(1)			1(T)				7(1)
4E-14S				2(T)					2(T)
10E-14S	1(1)		1(T)	2(T)					4(1)
16E-14S			1(T)						1(T)
2&4E-8S			2(T)	1(T)					3(T)
8E-8S				2(T)	3(T)				5(T)
12E-8S	1(T)		2(T)	5(T)					8(T)
18E-8S			1(T)						1(T)
4&6E-2S	6(2)		7(3)	1(T)					14(5)
12E-2S	2(1)		5(2)	1(T)	1(T)				9(3)
18E-2S	2(T)		2(T)						4(T)
8E-4N		5(5)		4(16)	1(T)				10(21)
18E-8N		1(T)			5(T)				6(T)
4E-10N	1(T)			1(T)					2(T)
10E-10N	2(T)					3(T)			5(T)
18E-22N		1(T)							1(T)
Total	21(4)	23(6)	35(6)	39(19)	31(10.5)	25(1)	15(7.7)	14(2)	203(22)

* First number cited is number of pieces recovered
() Weight in grams
T (Trace) means under 1 gram

TABLE 36: Chipping Waste Analysis 4-Pre-129

Depth (cm.)	Midden 12E-2S		Midden 20S-2W		Burial 12E-12N		Midden 22N-18E		Total No.	Total Weight	
	No.	Weight	No.	Weight	No.	Weight	No.	Weight			
0-10	Silicate	99	186.5	17	30.4	12	16.0	37	80.6	165	313.5
	Basalt & Andesite	6	3.3	--	--	--	--	1	Tr	7	3.3
	Quartz	7	2.0	2	4.5	1	3.5	--	--	10	10.0
	Obsidian	--	--	2	Tr	--	--	2	4.9	4	4.9
10-20	Silicate	57	85.5	35	47.8	28	79.0	42	70.0	162	282.3
	Basalt & Andesite	3	31.5	2	3.8	--	--	4	13.9	9	49.2
	Quartz	2	1.2	2	2.2	1	2.9	6	3.0	11	9.3
	Obsidian	1	Tr	5	1.5	--	--	2	Tr	8	1.5
20-30	Silicate	32	88.8	32	82.8	69	129.5	41	135.9	174	437.0
	Basalt & Andesite	2	1.8	1	3.0	--	--	4	37.5	7	42.3
	Quartz	--	--	2	1.2	11	27.0	2	Tr	15	28.2
	Obsidian	--	--	2	Tr	2	Tr	2	Tr	6	Tr
30-40	Silicate	--	--	22	62.9	58	154.7	27	31.5	107	249.1
	Basalt & Andesite	--	--	1	2.0	4	33.0	--	--	5	35.0
	Quartz	--	--	4	5.5	4	3.7	2	1.8	10	11.0
	Obsidian	--	--	1	Tr	--	--	2	Tr	3	Tr
40-50	Silicate	--	--	24	13.7	43	70.8	27	48.5	94	133.0
	Basalt & Andesite	--	--	--	--	6	20.2	--	--	0	0
	Quartz	--	--	6	21.4	3	Tr	1	Tr	13	41.6
	Obsidian	--	--	--	--	3	Tr	--	--	3	Tr
50-60	Silicate	--	--	27	44.8	36	47.0	24	33.0	87	124.8
	Basalt & Andesite	--	--	4	16.3	5	26.0	--	--	9	42.3
	Quartz	--	--	4	21.7	3	1.4	4	5.0	11	28.1
	Obsidian	--	--	2	Tr	--	--	--	--	2	Tr
60-70	Silicate	--	--	7	6.3	11	22.2	--	--	18	28.5
	Basalt & Andesite	--	--	--	--	--	--	--	--	0	0
	Quartz	--	--	2	29.6	1	1.5	--	--	3	31.1
	Obsidian	--	--	--	--	1	Tr	--	--	1	Tr
70-80	Silicate	--	--	5	20.3	15	32.4	--	--	20	52.7
	Basalt & Andesite	--	--	--	--	--	--	--	--	--	--
	Quartz	--	--	2	1.8	--	--	--	--	2	1.8
	Obsidian	--	--	--	--	--	--	--	--	0	0
Total	209	400.6	213	423.5	314	670.8	230	465.6	966	1960.5	

TABLE 37: Burial Data 4-Pre-129

Burial Number	Unit	Depth* (cm.)	Position	Orientation	Age (approx.)	Grave Pit (cm.)	Associated Artifacts & Notes
1	12&14E-6N	28	Flexed, Right Side	South East	Adult	---	Steatite arrow straightener
2	14E-2&4N	52	Flexed, Left Side	North West	Child	40x50	Possibly ulnae awl
3	14E-4N	83	Flexed, Left Side	South East	Adult	70-90	One bowl mortar on rib cage, and one on edge of pit
4	14E-4N	72-84	Semi-flexed, Right Side	North East	Adult	110x120x62	None
5	14E-4N	72-84	Flexed, Right Side	Easterly	Adult	Into sterile Same pit as #4	None
6	12&14E-4N	84-112	Flexed, Back & Left Side	North East	Adult	102-145	None
7	14E-2N	30	-----	-----	Infant	---	On sterile, skull only. No artifacts
8	12E-2N	40-50	-----	-----	Infant	---	Pile of bones under cobble cairn
9	14E-2N	10-20	-----	-----	Adolescent	---	Skull only
10	12E-2N	40-50	-----	-----	Infant	---	Pile of bones under cobble cairn
11	12&14E-4N	84-112	Semi-flexed	South West	Adult	Same as #6	None
12	2W-10S	100-115	Semi-flexed Back	East	Adolescent	Large, undefined	None
13	2W-8&10S	96-120	Flexed, Right Side	West	Child	Same as #12	None
14	14E-28S	81-96	Flexed (?)	East (?)	Adult	88x75x68	None
15	26E-22N	70-88	Flexed, Right Side	South East	Adult	ca. 87 (dia.)	Possibly Feature #38
16	12E-12N	53-89	Flexed, Left Side	North West	Adult	100x80x36	Covered with cobble cairn Steatite bead & small ground slab associated

* Depth is measured to highest portion of skeleton, and lowest point of skeleton

EXPLANATION OF FIGURES

- Figure 1. a. Aerial view of Little Panoche Valley showing site 4-Fre-128 (just to right of barn); b. aerial view of Little Panoche Valley and dam site looking east (4-Fre-129 is near center just to left of road); c. Salt Canyon looking south (site is located ca. 1/4 mile downstream from this point); d. site area in Salt Canyon.
- Figure 2. a. Aerial view of bulldozer test trenches at Salt Canyon site; b. cleaned profile on east side of Salt Canyon site (dark zones are occupation deposit); c. profile of side cut, lower occupation zone is just above floor of bulldozer cut; d. west side of Salt Canyon showing lateral test trench.
- Figure 3. a. Aerial view of excavations at 4-Fre-129, looking north; b. view of excavations at 4-Fre-129, Easter Week, 1966; c. Feature 2, 4-Fre-129; d. Features 6 and 7, 4-Fre-129.
- Figure 4. a. Feature 15, 4-Fre-129; b. Feature 5, 4-Fre-129; c. Feature 13, prior to exposure, 4-Fre-129; d. Feature 13, exposed, 4-Fre-129.
- Figure 5. a. Feature 38, 4-Fre-129; b. Burial 1, 4-Fre-129; c. Burials 12 and 13, 4-Fre-129 (Burial 13 in sidewall); d. Burial 15 and original grave pit, 4-Fre-129.
- Figure 6. a. Burials 4, 5, 6 and 11 in original grave pits, 4-Fre-129; b. Burial 17 with cairn in place, 4-Fre-129.
- Figure 7. a. Aerial view of 4-Fre-128, looking north prior to excavation; b. vertical aerial view of 4-Fre-128, Summer 1966; c. aerial view of excavations at 4-Fre-128, Summer 1966; d. aerial view of Structure 2 after exposure, 4-Fre-128.
- Figure 8. a. Aerial view of Structure 3 after exposure, 4-Fre-128; b. Feature 5a and b, Structure 2, 4-Fre-128; c. Feature 16, Structure 2, 4-Fre-128; d. Feature 17 just outside Structure 2, 4-Fre-128.
- Figure 9. a. Feature 2 and north wall of Structure 1, Easter Week, 1966, 4-Fre-128; b. firepit and vent of Structure 1, 4-Fre-128; c. vent and floor of Structure 1, 4-Fre-128; d. overall view of Structure 1, 4-Fre-128.

- Figure 10. a. View of north half of Structure 2 looking east, 4-Fre-128; b. view of Structure 2 looking northeast, 4-Fre-128; c. view of Structure 2 looking southeast, 4-Fre-128; d. view of south half of Structure 2 looking east, 4-Fre-128.
- Figure 11. West wall profile of Units 14N, 16N and 18N-22W through Structure 2 showing floor contour and differentiated fill, 4-Fre-128.
- Figure 12. a. Burial 2 covered with small grinding slab, Structure 2, 4-Fre-128; b. test units in Structure 4 looking northeast across lower bench, 4-Fre-128; c. view of final cleaning operations of Structure 3, 4-Fre-128.
- Figure 13. Shell and stone beads and shell ornaments:
 a. and b. Type 1a Olivella, Type 1b Olivella; c. Type 2a1 Olivella; d. and e. Type 3a1 Olivella; f. Type 3a2 Olivella; g. Type 3d Olivella; h. Type 3e Olivella; i. Type 3b Olivella; j. small rough disc Olivella; k. large disc Olivella; l. whole sideground Olivella; m. large rectangular Olivella; n. rough drilled Olivella; o. incised patterns on Type 3e Olivella; p. clam shell disc bead; q. Haliotis disc bead; r. Haliotis epidermis disc bead; s. steatite disc beads; t. Tivella (clam) tubular beads; u. imperforate clam disc ornament; v. Type B2a Haliotis ornament; w. Type B1 Haliotis ornament; x. fragment of circular Haliotis ornament; y. fragment of Haliotis ornament; z. fragment of mussel shell "saw"; aa. mussel shell ornament; bb. baked clay discoidal, 4-Fre-128; cc. baked clay fragment with impressions, 4-Fre-128.
- Figure 14. Bone artifacts:
 a. Split metapodial awl, 4-Fre-129, midden, (W-77-1580);
 b. metapodial awl, 4-Fre-129, burial area, (W-77-1748);
 c. metapodial awl, 4-Fre-129, burial area, (W-77-1682);
 d. splinter awl, 4-Fre-128, Structure 1, (W-89-1142);
 e. metapodial awl, 4-Fre-128, Structure 2, (W-89-636);
 f. ulna awl, 4-Fre-129, area of Burial 2, (W-77-1849);
 g. awl fragment, 4-Fre-129, midden, (W-77-1982); h. bone "pin" fragment, 4-Fre-129, area of Burial 15, (W-77-1901);
 i. bone "pin" fragment, 4-Fre-128, Structure 2, (W-89-689).
- Figure 15. Bone artifacts:
 a. Bone "spur", 4-Fre-129, burial area, (W-77-1851);
 b. bone "spur", 4-Fre-129, burial area, (W-77-1855);
 c. bone "spur", 4-Fre-129, burial area, (W-77-1710);
 d. bone skewer, 4-Fre-128, Burial 2, (W-89-1193); e. blunt-pointed bone object, 4-Fre-128, Structure 2, (W-89-1103);
 f. bone "pin", 4-Fre-129, midden, (W-77-1535); g. bird bone bead, 4-Fre-128, Structure 2, (W-89-758); h. bird bone

bead, 4-Fre-129, midden, (W-77-1596); i. mammal bone tube fragment, 4-Fre-129, midden, (W-77-1588); j. incised bird bone fragments, 4-Fre-128, Structure 2, (W-89-1133); k. incised bird bone fragment, 4-Fre-128, Structure 1, (W-89-731); l. incised bird bone fragment, 4-Fre-129, burial area, (W-77-1732); m. incised bird bone fragment, Salt Canyon buried midden; n. incised bone awl (?) fragment, 4-Fre-129, burial area, (W-77-1671); o. worked scapula fragment (saw?), 4-Fre-129, area of Burials 12 and 13, (W-77-2000); p. scapula "saw", 4-Fre-128, Structure 2, (W-89-649).

Figure 16.

Antler and ground stone:

a. Antler tine digging tool, 4-Fre-128; midden, (W-89-668); b. ground slate "rod", 4-Fre-129, midden, (W-77-90); c. ground slate "pin", 4-Fre-129, burial area, (W-77-1634); d. ground actinolite splinter, 4-Fre-128, surface, (W-89-739); e. actinolite splinter, 4-Fre-129, midden, (W-77-1604); f. and g. steatite ear spool, 4-Fre-129, burial area, (f: W-77-1906, and g: W-77-1696); h. stone disc (limestone?), 4-Fre-128, midden, (W-89-1048).

Figure 17.

a. Steatite sherd arrowshaft straightener, 4-Fre-128, Structure 2, (W-89-1115); b. steatite sherd arrowshaft straightener, 4-Fre-129, Burial 1, (W-77-1846).

Figure 18.

Steatite vessel, 4-Fre-128, midden (Feature 8), (W-89-1158).

Figure 19.

Bowl mortar, 4-Fre-129, burial area, (W-77-1856).

Figure 20.

Cobble mortar, 4-Fre-128, Structure 2, (W-89-1151).

Figure 21.

a. Bowl mortar, 4-Fre-129, surface, (W-77-37); b. bowl mortar fragments, 4-Fre-128, floor of Structure 2, (W-89-1148 and 1149).

Figure 22.

a. Miniature cobble mortar, 4-Fre-129, Feature 38, (W-77-1083); b. slab mortar, 4-Fre-128, surface, (W-89-1157).

Figure 23.

a. Conical pestle, 4-Fre-128, Structure 2, (W-89-1152); b. cobble pestle, 4-Fre-128, midden, (W-89-667); c. cobble pestle or hammerstone, 4-Fre-129, surface, (W-77-34); d. cobble pestle, Salt Canyon buried site; e. cobble pestle, 4-Fre-129, burial area, (W-77-279).

Figure 24.

a. Uniface mano, 4-Fre-128, surface, (W-89-1154); b. biface shaped mano fragment, 4-Fre-129, midden, (W-77-728); c. uniface mano, 4-Fre-128, Feature 5, (W-89-1229); d. uniface cobble mano, 4-Fre-129, burial area, (W-77-282).

Figure 25. a. Metate fragment, 4-Fre-129, Feature 40, (W-77-1041);
b. small grinding slab/chopper, 4-Fre-129, midden,
(W-77-1996); c. small grinding slab, 4-Fre-128, Burial 2,
(W-89-1182); d. bifacial cobble mano or small grinding
slab, 4-Fre-129, midden, (W-77-634).

Figure 26. Triangular projectile points (all silicate):
a. (W-77-1827); b. (W-89-858); c. (W-77-1822).
Crude side-notched projectile points (all silicate):
d. (W-89-655); e. (W-89-745).
Side-notched, straight, or concave base (Panoche side-
notch):
f. (W-77-1539); g. (W-89-1017) Small side-notch miscel-
laneous (obsidian); h. (W-77-1843) Panoche side-notch;
i. (W-77-1954); j. (W-77-1926); k. (W-89-982); l. (W-77-
1698); m. (W-89-767); n. (W-77-1516); o. (W-89-932).
Desert side-notch (obsidian):
p. (W-89-1141); q. (W-89-706).
Serrated concave base (obsidian):
r. (W-89-744); s. (W-89-857).
Stockton (Delta) serrated (obsidian):
t. (W-89-1).

Figure 27. Crude side-notched projectile point (silicate):
a. (W-89-910).
Variant small side-notched points (silicate):
b. (W-77-1837); c. (W-77-1775).
Small stemmed (silicate):
d. (W-77-1545).
Large leaf-shaped fragment (silicate):
e. (W-77-1582).
Large concave base fragment (obsidian):
f. (W-89-1034).
Large midsection fragments (silicate):
g. (W-77-1724); h. (W-89-837).
Large side-notched silicate:
i. (W-77-1935).
Large tapered stem (silicate):
j. (W-77-1786).
Large blade fragment (silicate):
k. (W-89-748).
Drills obsidian, others silicate:
l. (W-77-1985); m. (W-89-2); n. (W-89-117); o. (W-77-1973).
Beaked and pointed scrapers (s. is obsidian, others
silicate):
p. (W-77-1699); q. (W-89-777); r. (W-77-1865);
s. (W-77-1549); t. (W-89-752).

- Figure 28. Simple flake scrapers with one unfacially flaked edge (h. is glass, others silicate):
a. (W-77-1529); b. (W-77-1768); c. (W-89-987); d. (W-77-1603);
e. (W-89-1084); f. (W-89-768); g. (W-77-1928); h. (W-89-496).
Multiple-edge scrapers with two or more edges unfacially flaked (m. and n. are glass, others silicate):
i. (W-89-1068); j. (W-77-1688); k. (W-89-1129) (opposite edge also flaked on reverse); l. (W-77-1689) (opposite edge also flaked on reverse); m. (W-77-1713); n. (W-77-1869).
Serrated scraper (silicate):
o. (W-77-598).
Concave scraper (silicate):
p. (W-89-934); q. (W-89-591).
- Figure 29. Bifacial scrapers (all silicate):
a. (W-77-1800); b. (W-77-1534); c. (W-89-716).
Large flake scrapers (all basalt):
d. (W-77-1984); e. (W-89-1136); f. (W-77-1885).
Small heavy scrapers (g. and h. silicate, i. basalt):
g. (W-77-369); h. (W-77-1603); i. (W-77-1642).
- Figure 30. Cobble chopper (green chert):
(W-77-28).
- Figure 31. Chopper and hammerstone:
a. Cobble chopper, 4-Fre-128; b. cobble hammerstone, 4-Fre-128.
- Figure 32. Utilized cores (chopper/hammerstone?) (a. is basalt, others silicate):
a. (W-89-479); b. (W-77-14); c. (W-77-365).
- Figure 33. Small chopper (silicate):
a. (W-77-891).
Cores (all silicate):
b. (W-77-25); c. (W-77-846); d. (W-77-491); e. (W-77-17).
- Figure 34. a. Tested archeological sites in San Luis, Los Banos and Little Panoche Reservoirs; b. archeological sites in the Little Panoche area.
- Figure 35. Contour map for site 4-Fre-128.
- Figure 36. Contour map for site 4-Fre-129.
- Figure 37. Unit plan for site 4-Fre-128.
- Figure 38. Unit plan for site 4-Fre-129.
- Figure 39. Plan and profiles, Structure 1, site 4-Fre-128.

- Figure 40. Plan and profiles, Structure 2, site 4-Fre-128.
- Figure 41. Plan and profiles, Structure 3, site 4-Fre-128.
- Figure 42. Profile of south wall of Unit 14S-10E, site 4-Fre-129.
- Figure 43. Profile of west wall of Units 12N and 14N-12E, site 4-Fre-129.
- Figure 44. Profile section from east side of Salt Canyon showing stratification.

FIGURE 1

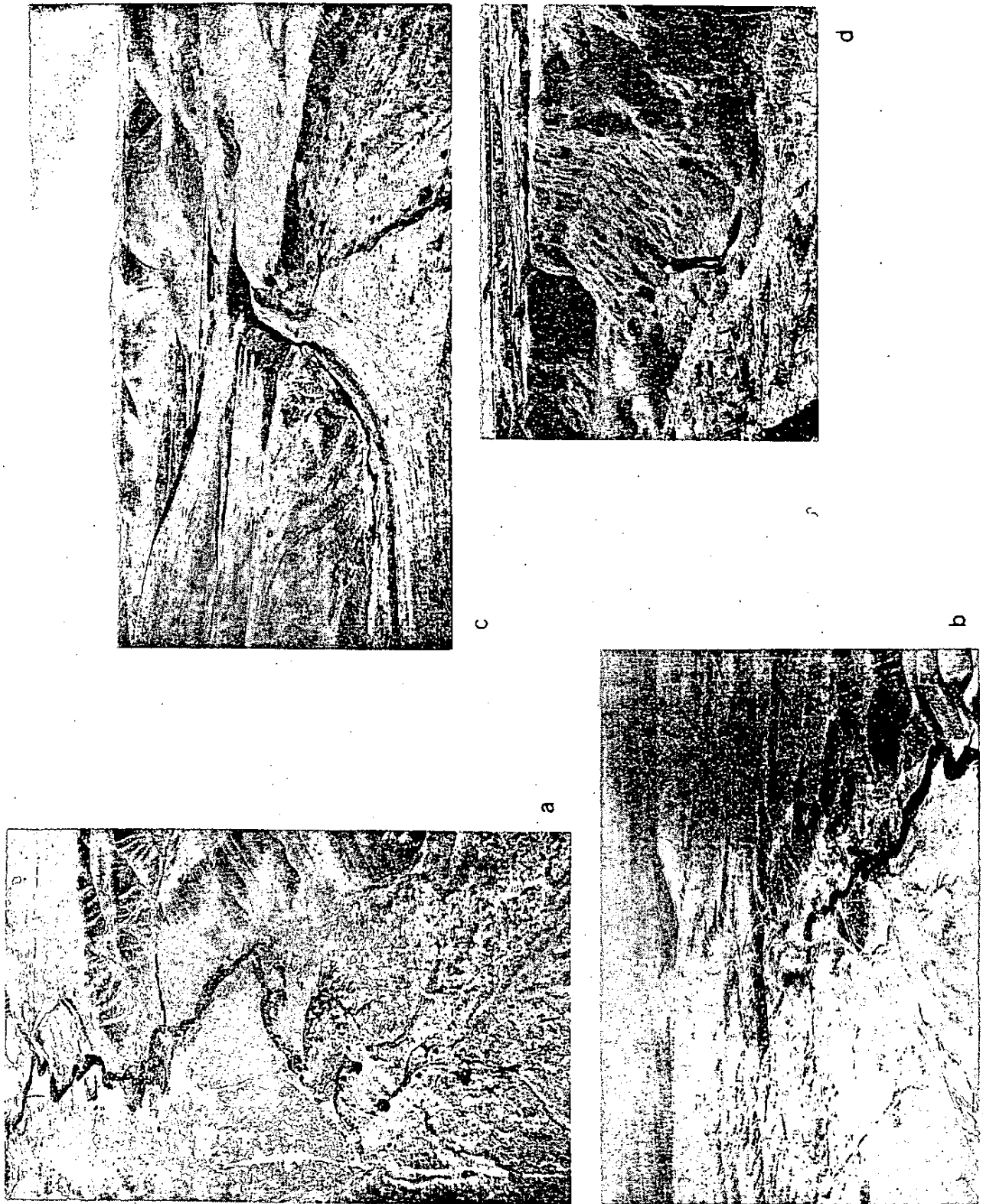


FIGURE 2



b



b



a



c

FIGURE 3



a



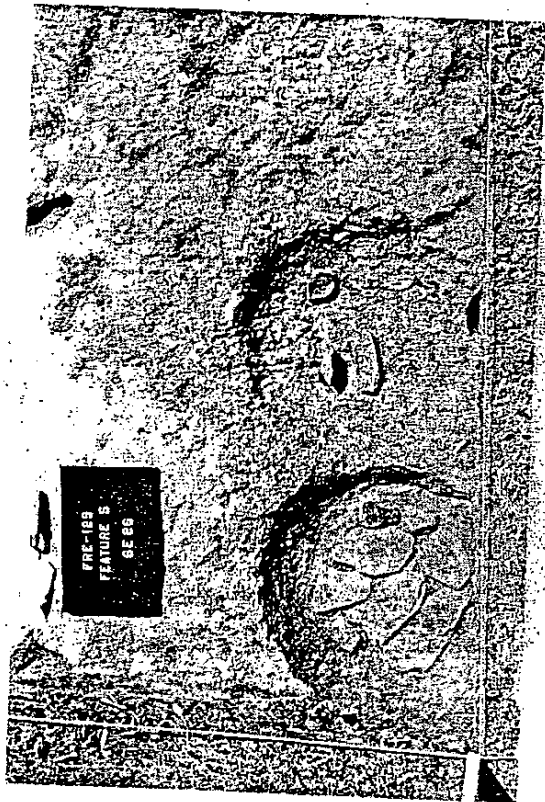
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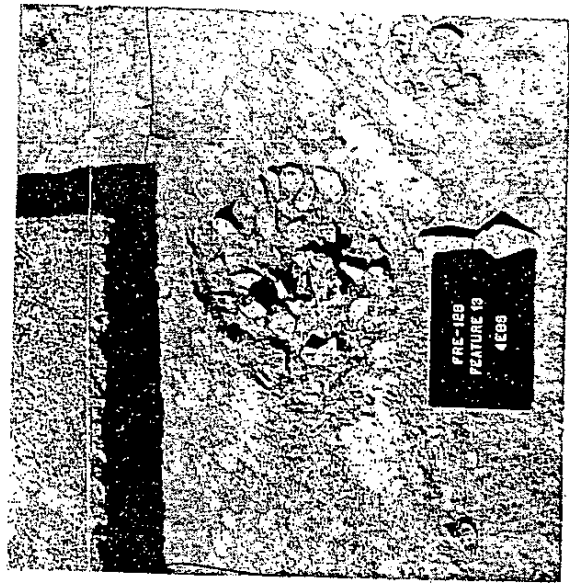
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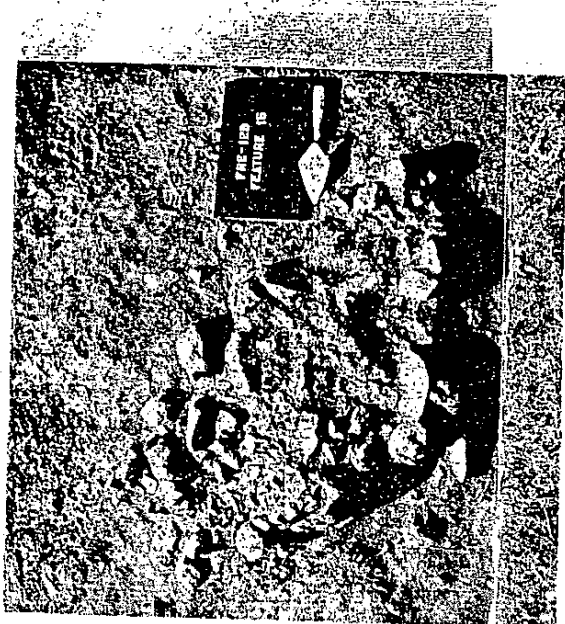
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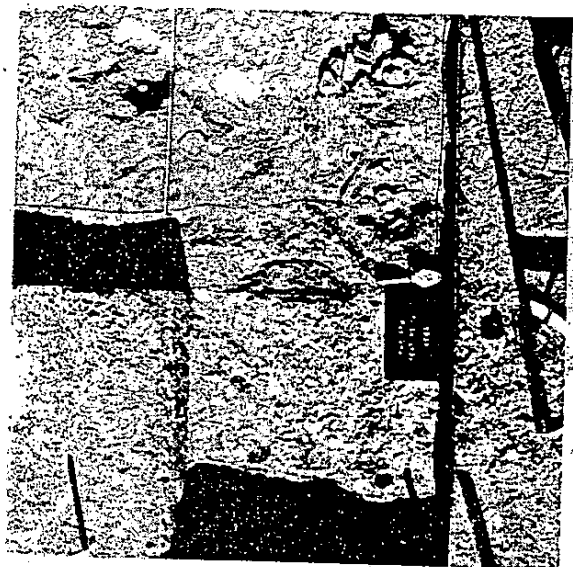
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d

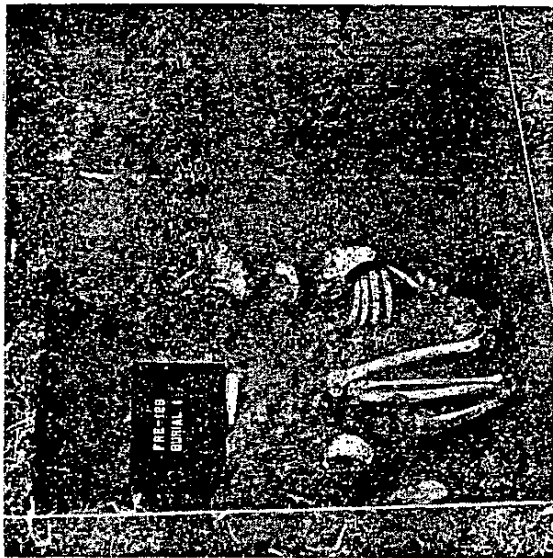


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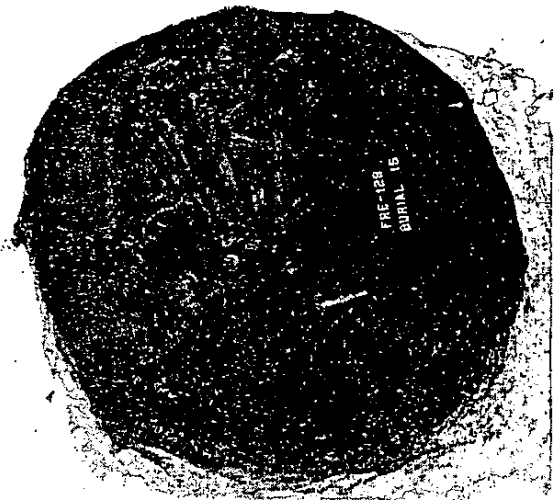


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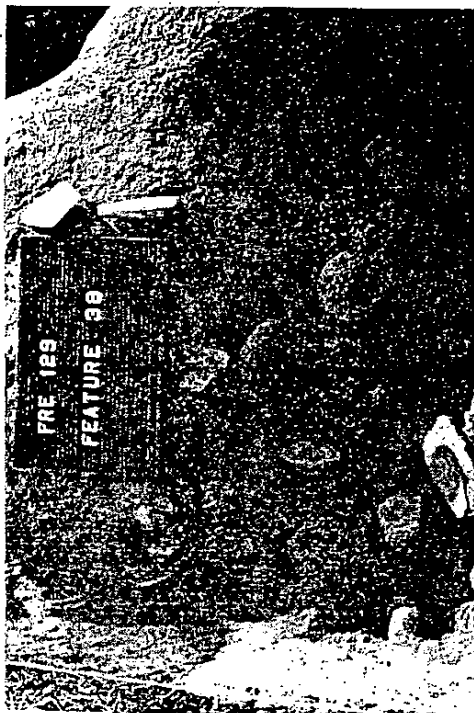
FIGURE 5



b



d



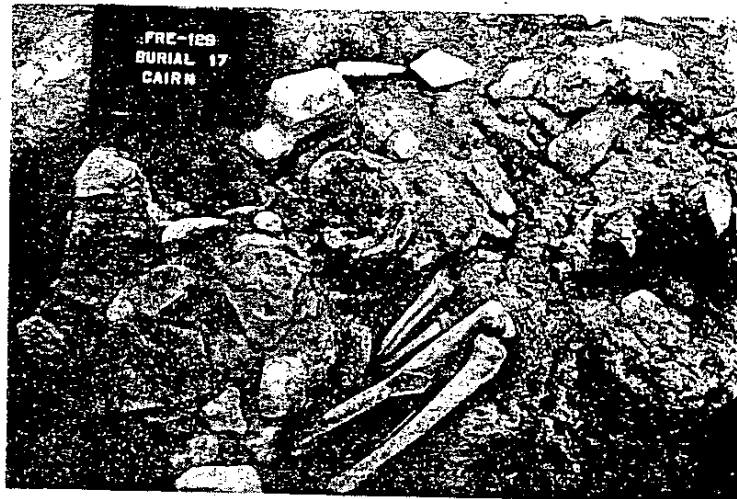
a



c



a



b



b



p



a



c



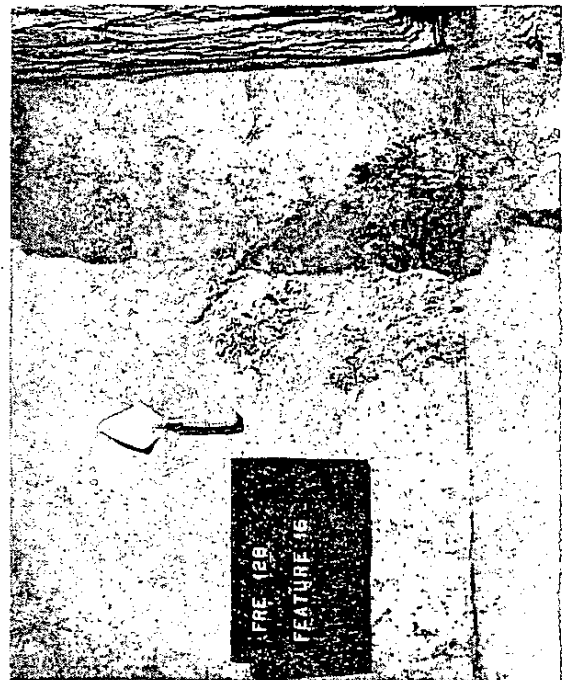
b



d



a



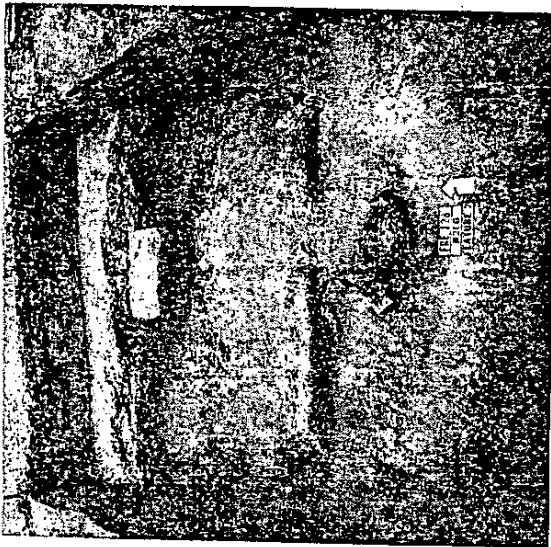
c



b



d



a



c

FIGURE 10



b



d



a



c

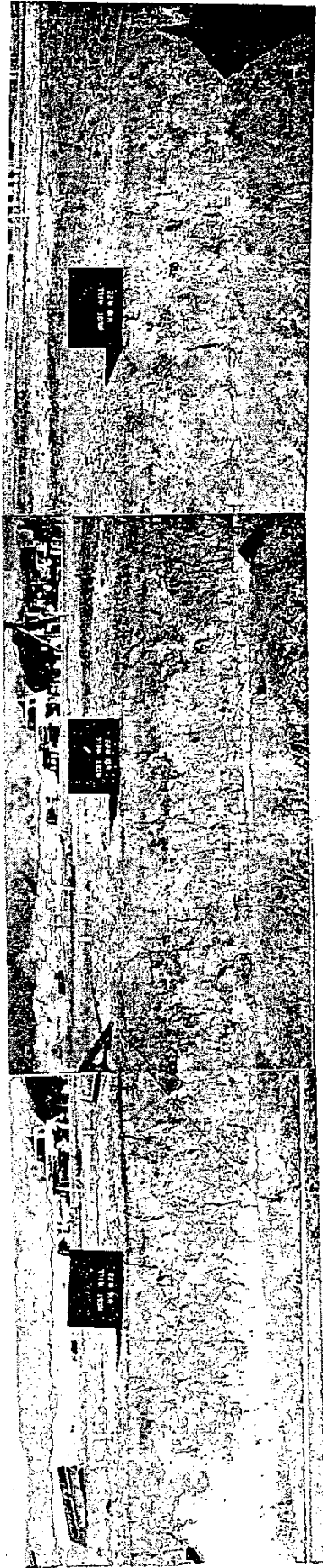
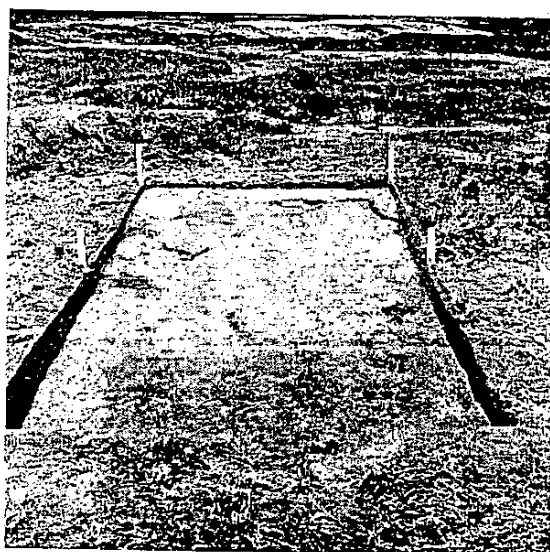


FIGURE 11



a



b



c

FIGURE 13

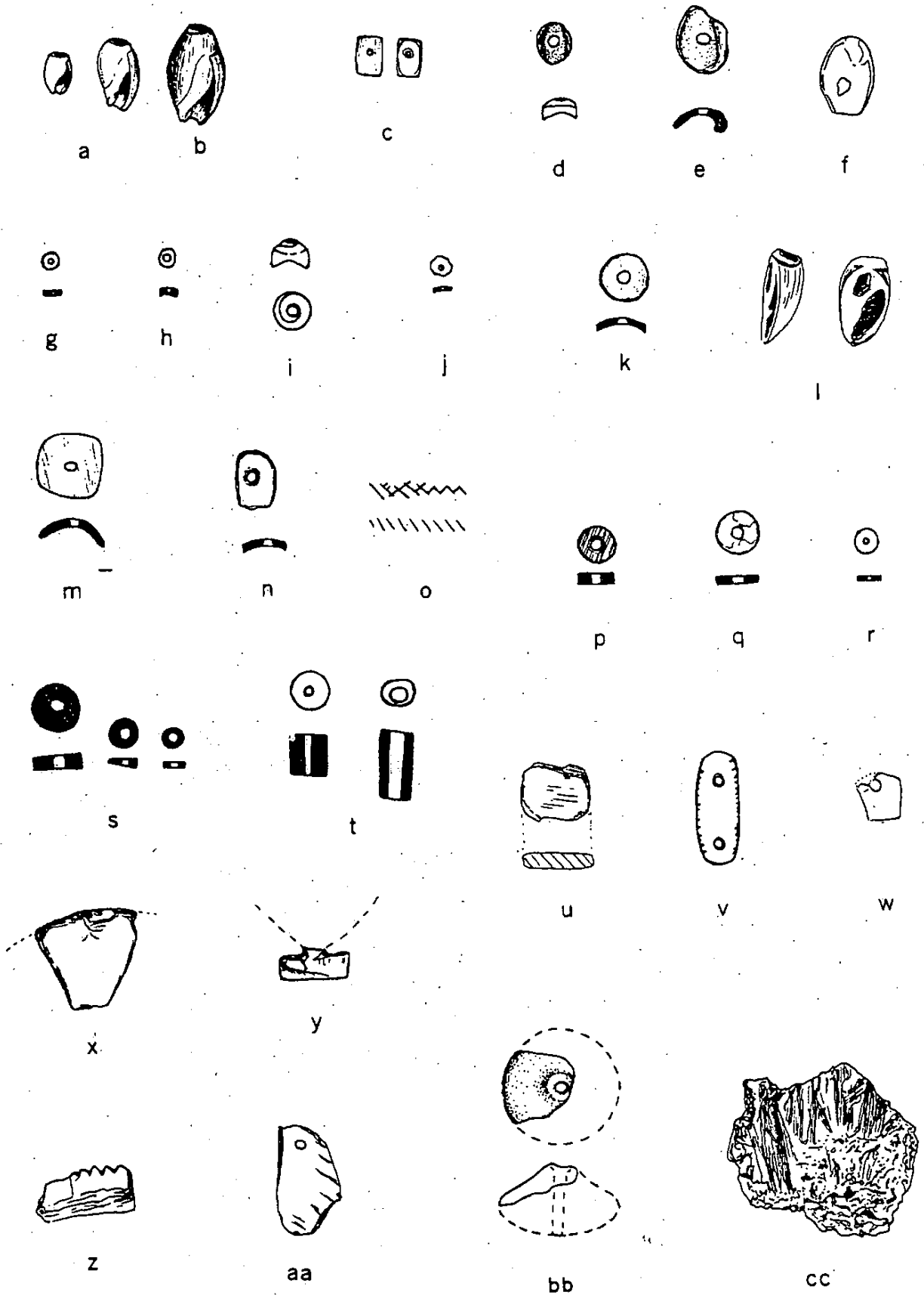
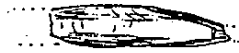




FIGURE 15



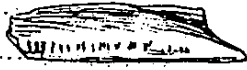
a



b



c



d



e



f



g



h



i



j



k



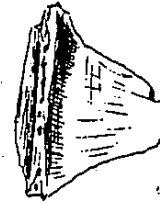
l



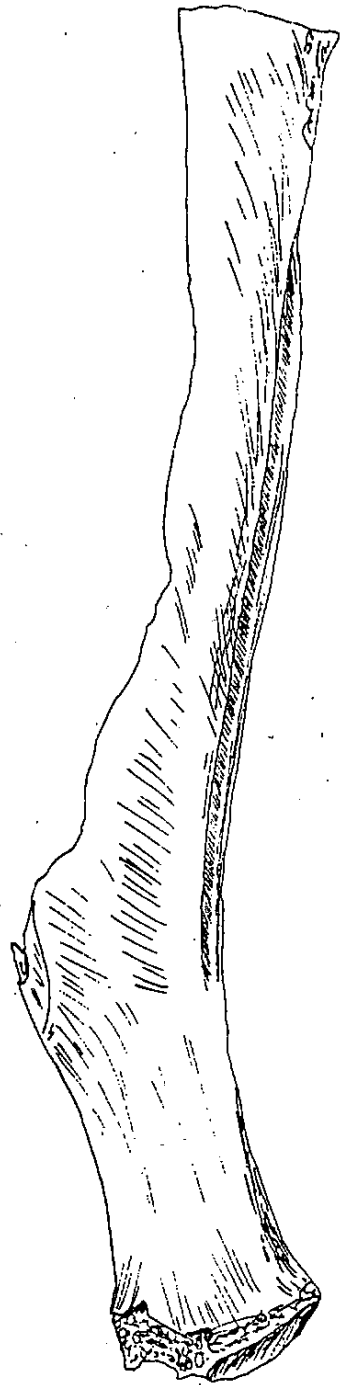
m



n

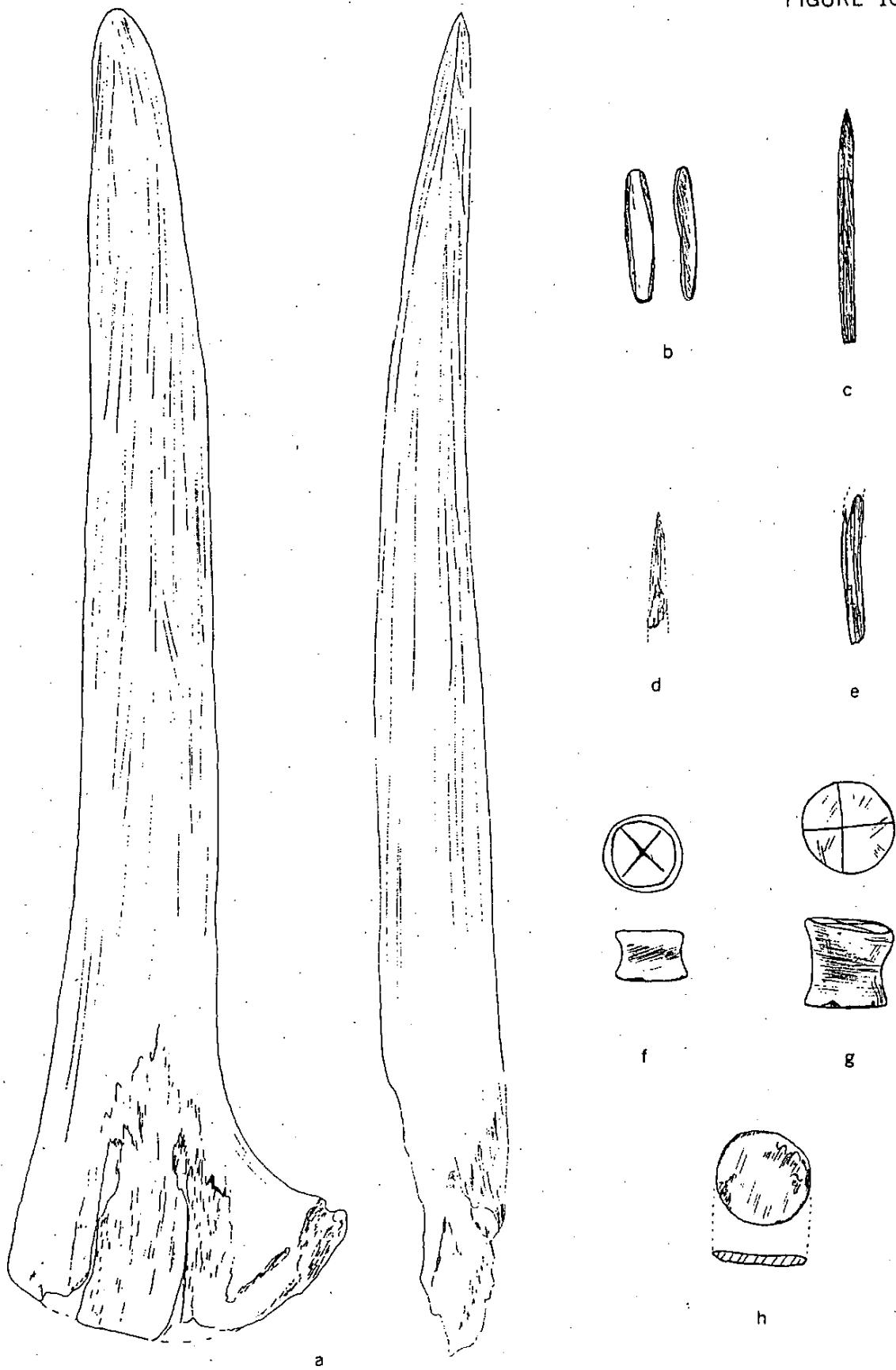


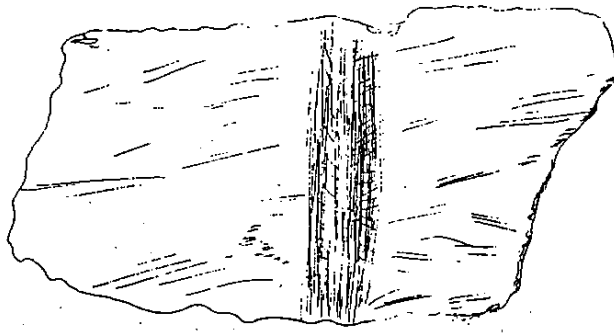
o



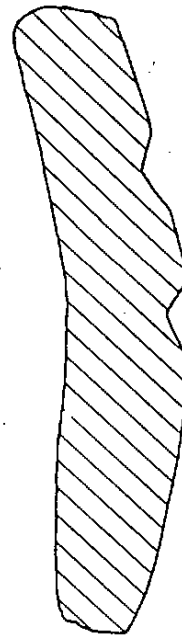
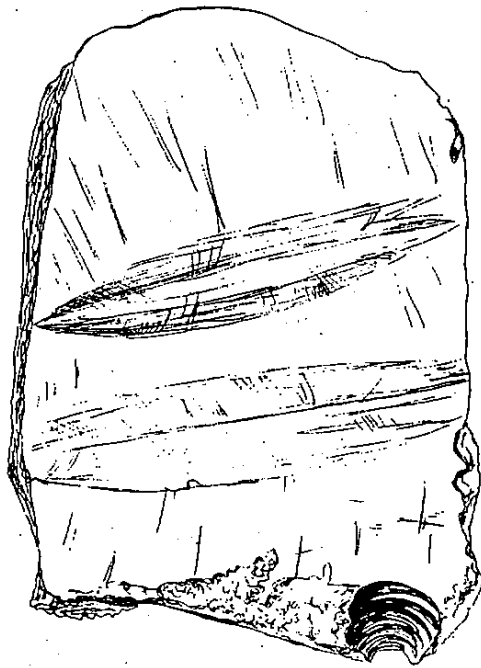
p

FIGURE 16





a



b

FIGURE 18

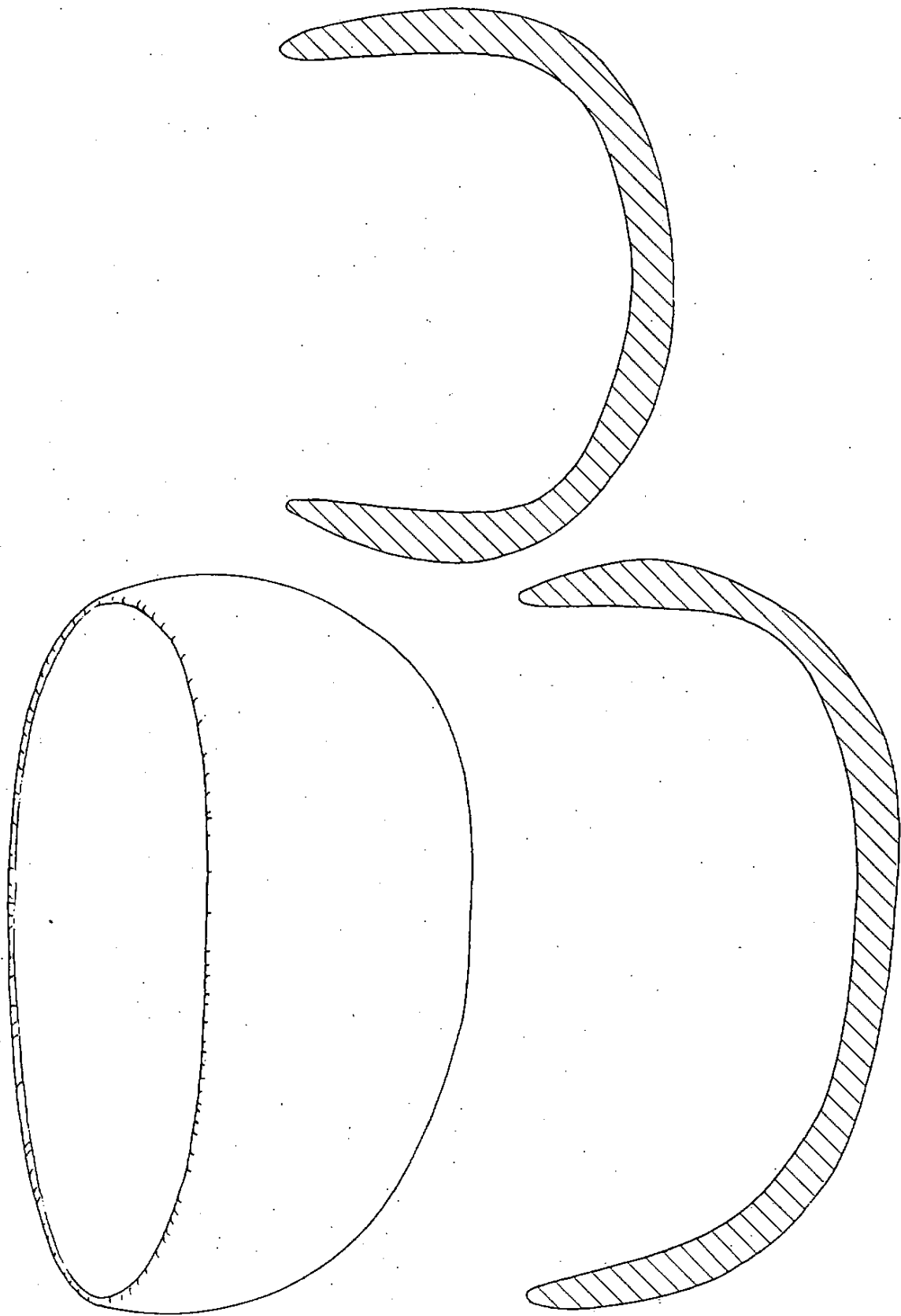


FIGURE 19

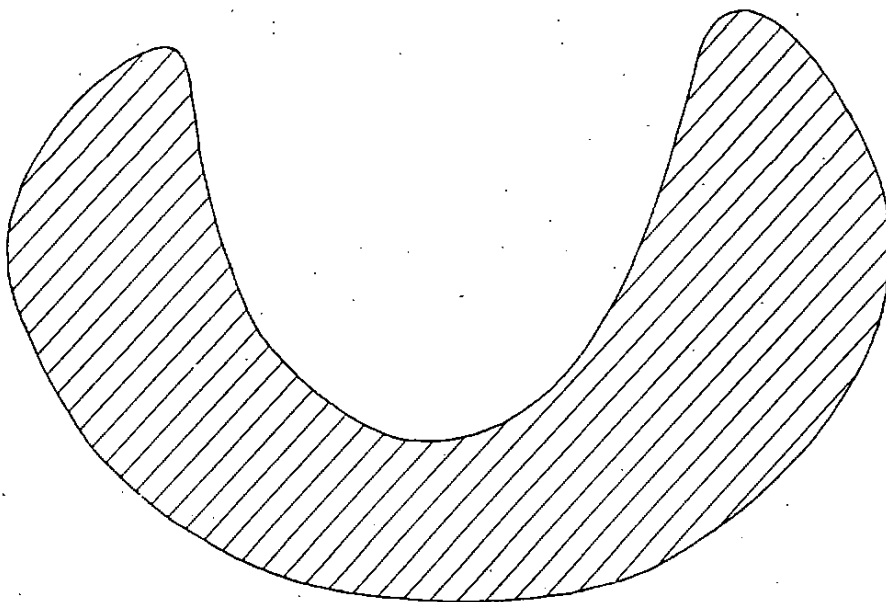
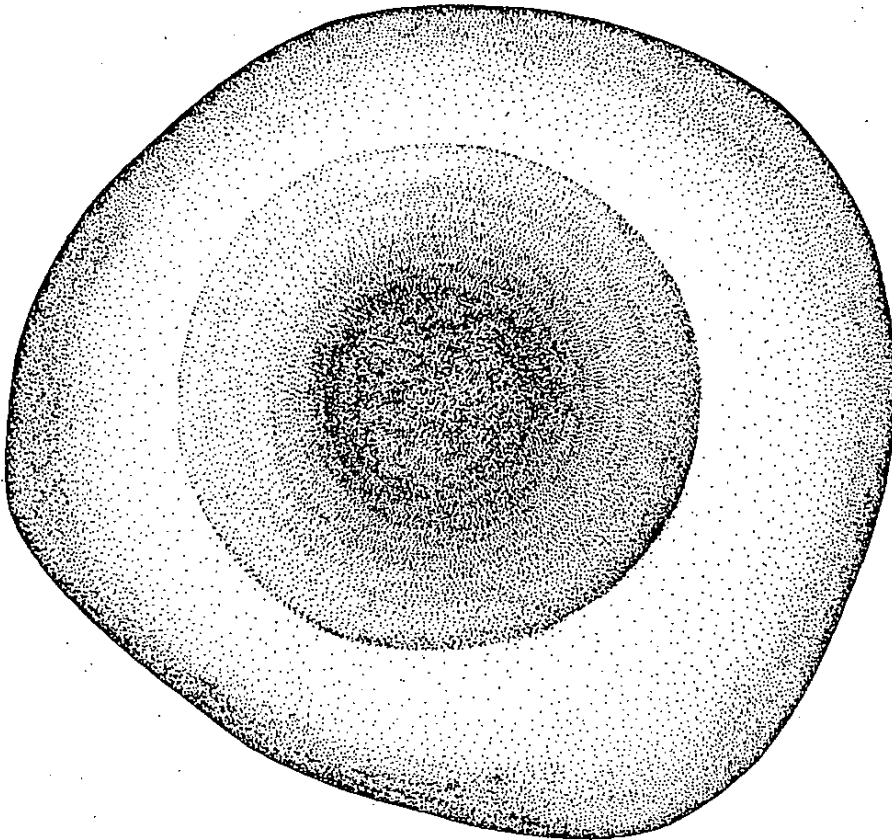


FIGURE 20

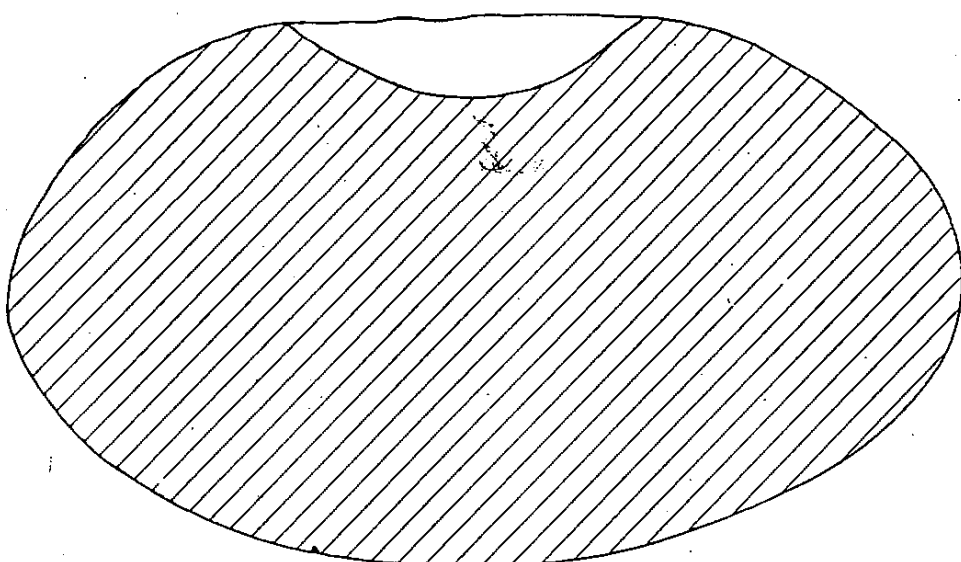
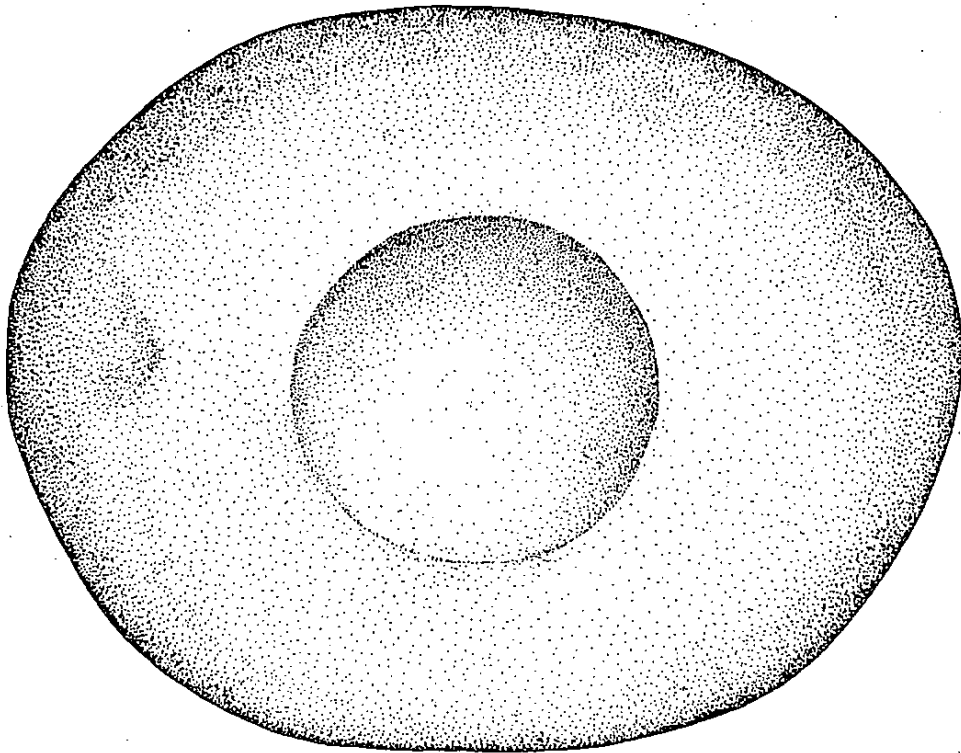
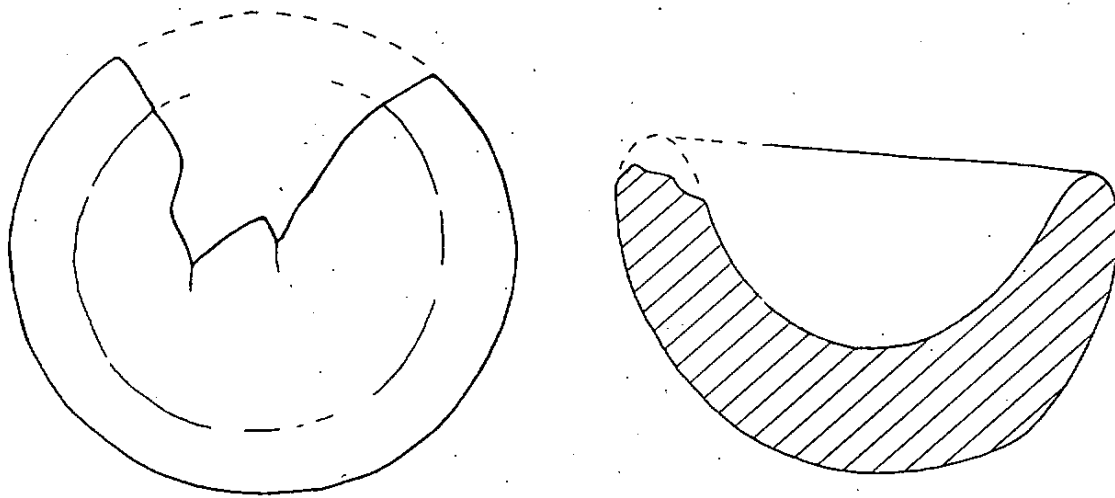
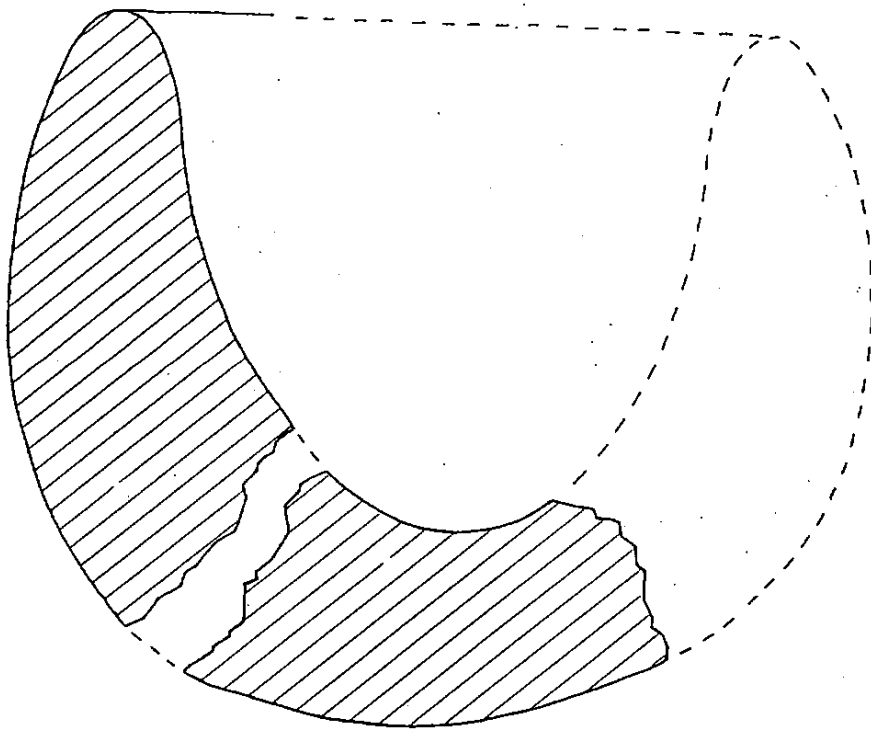


FIGURE 21.

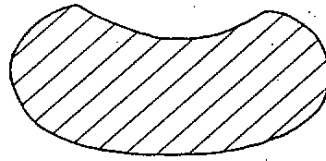
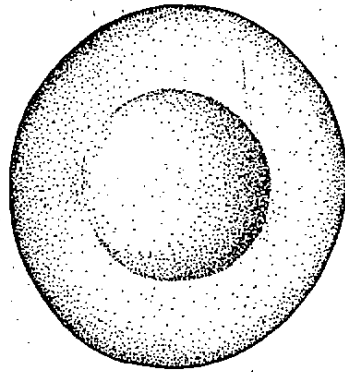


a

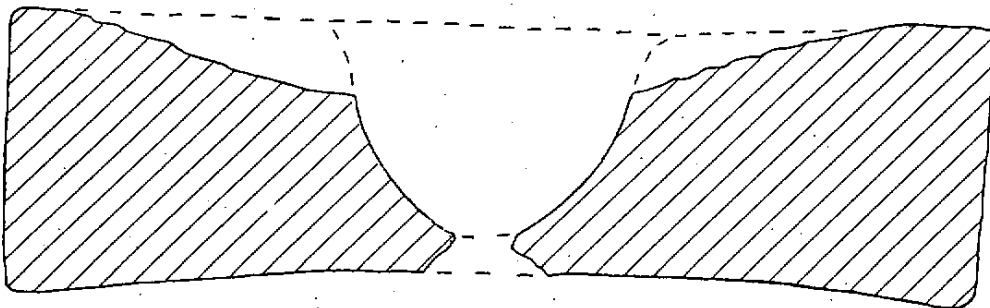
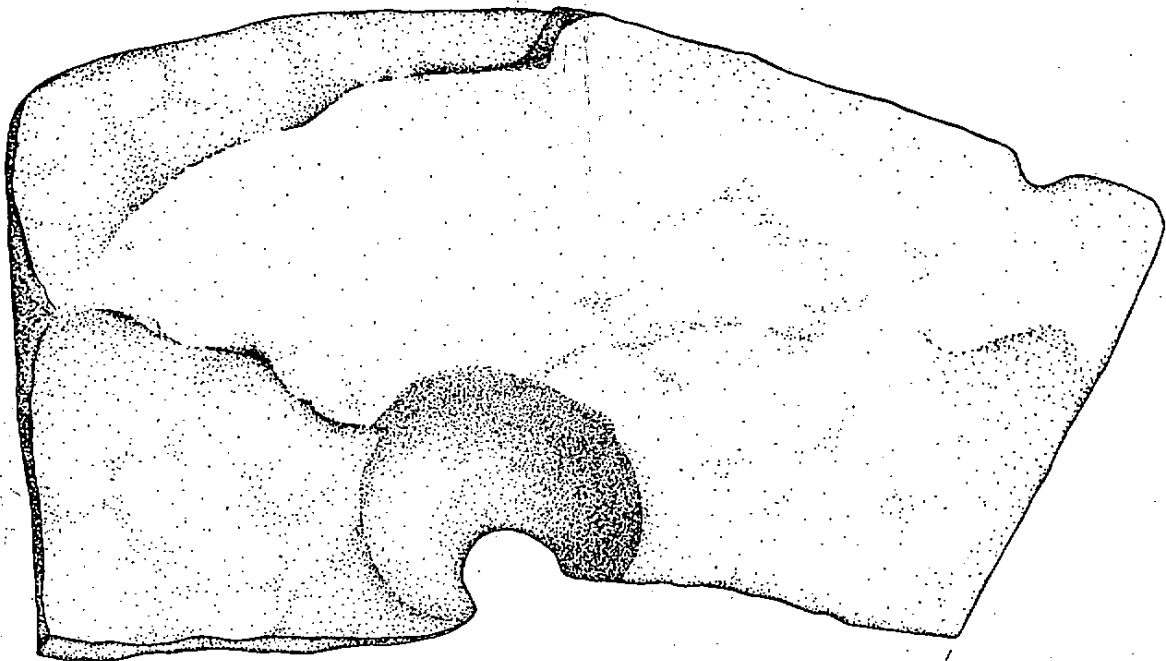


b

FIGURE 22

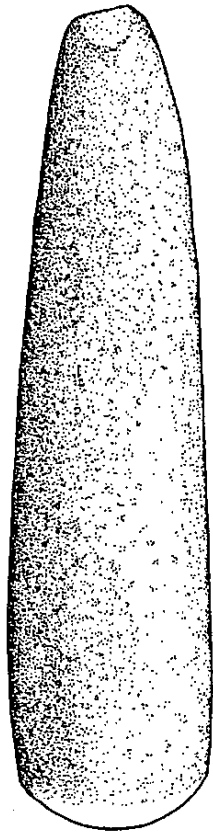


a

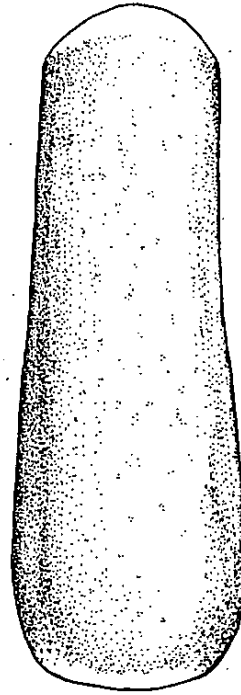
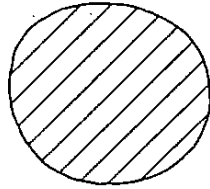


b

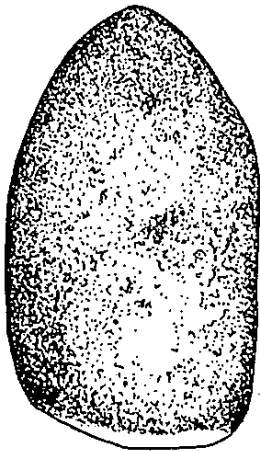
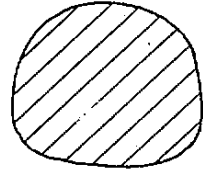
FIGURE 23



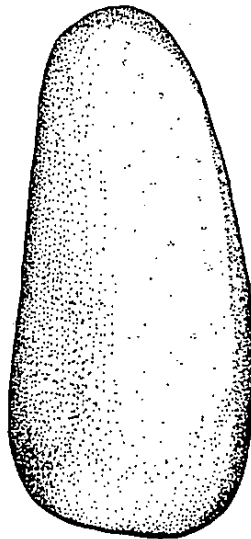
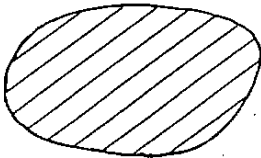
a



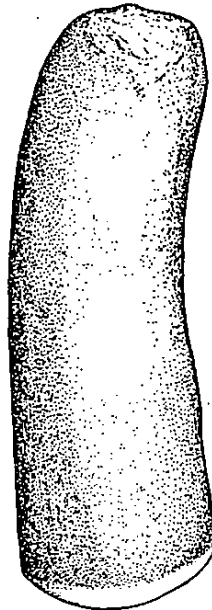
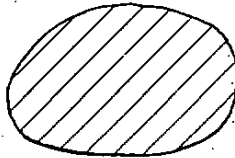
b



c



d



e

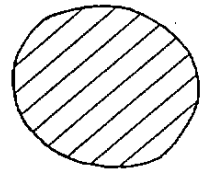
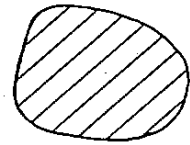
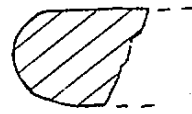
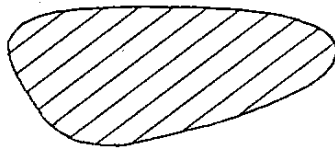
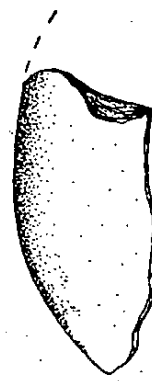
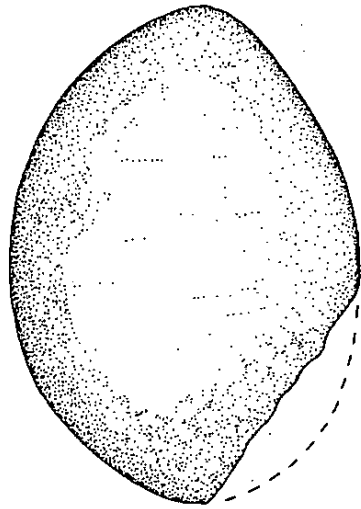
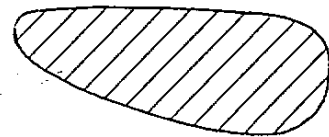
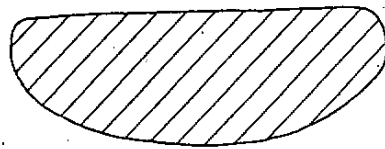
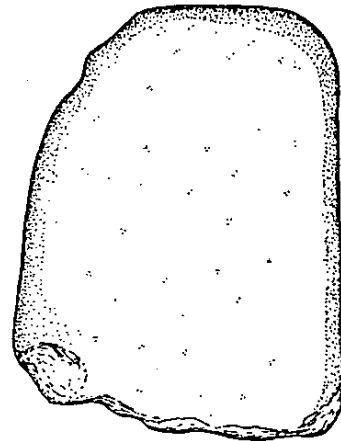
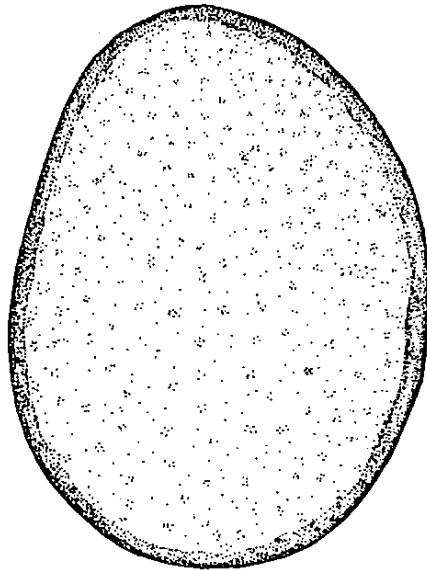


FIGURE 24



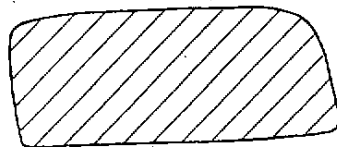
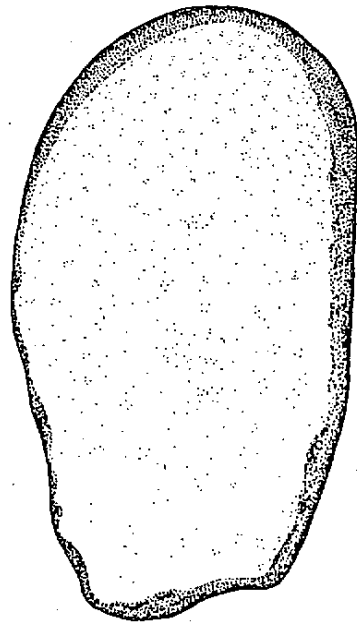
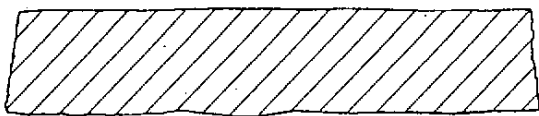
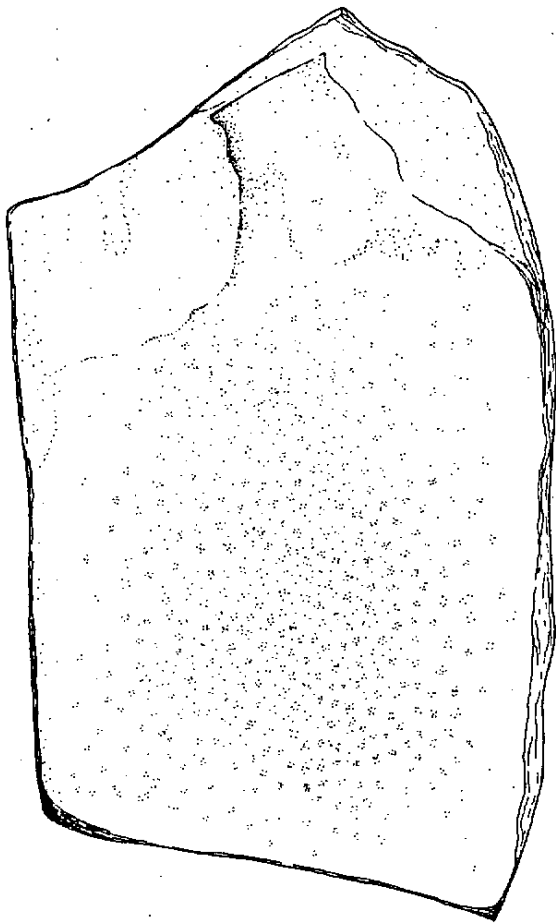
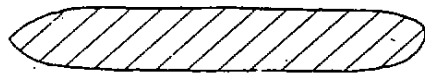
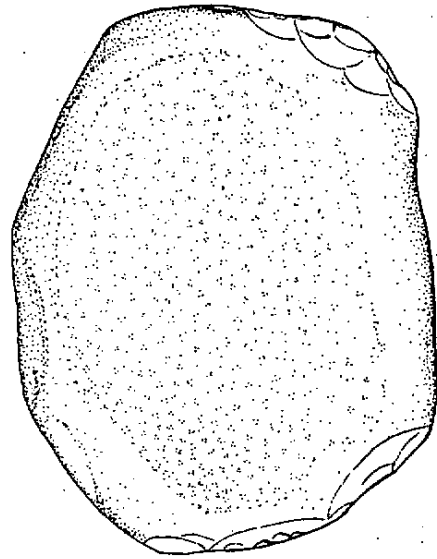
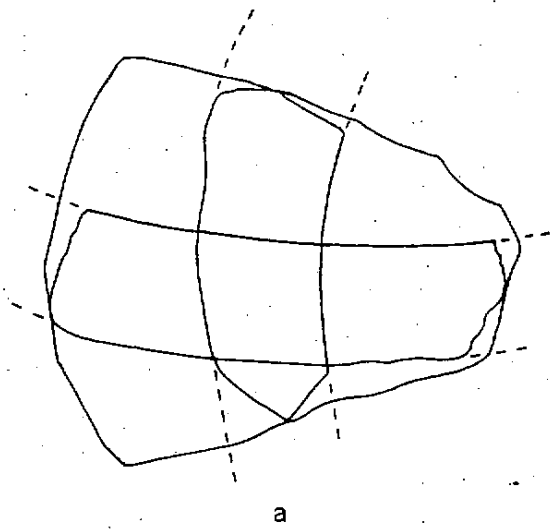
b



c

d

FIGURE 25



c

d

FIGURE 26

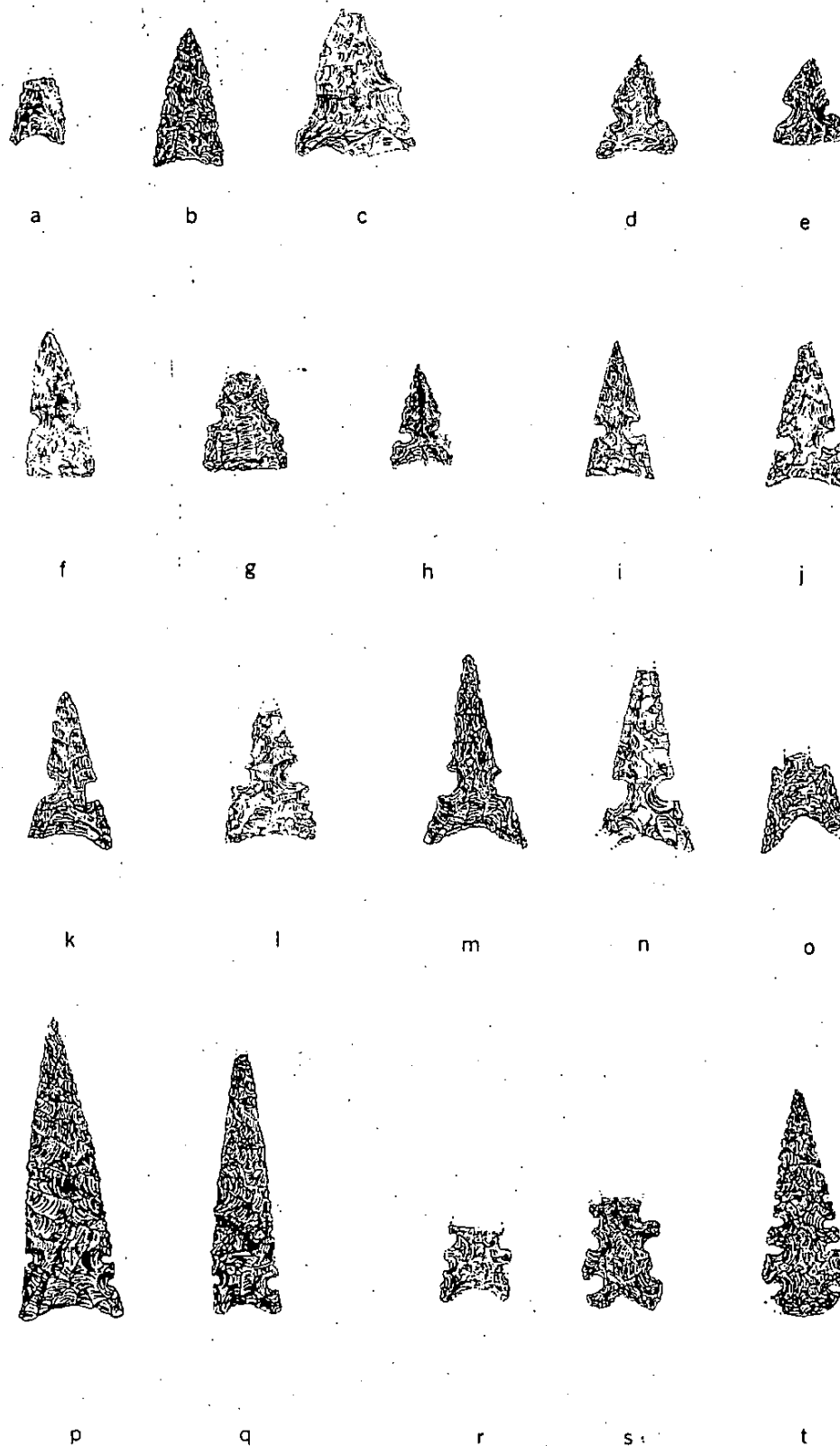


FIGURE 27

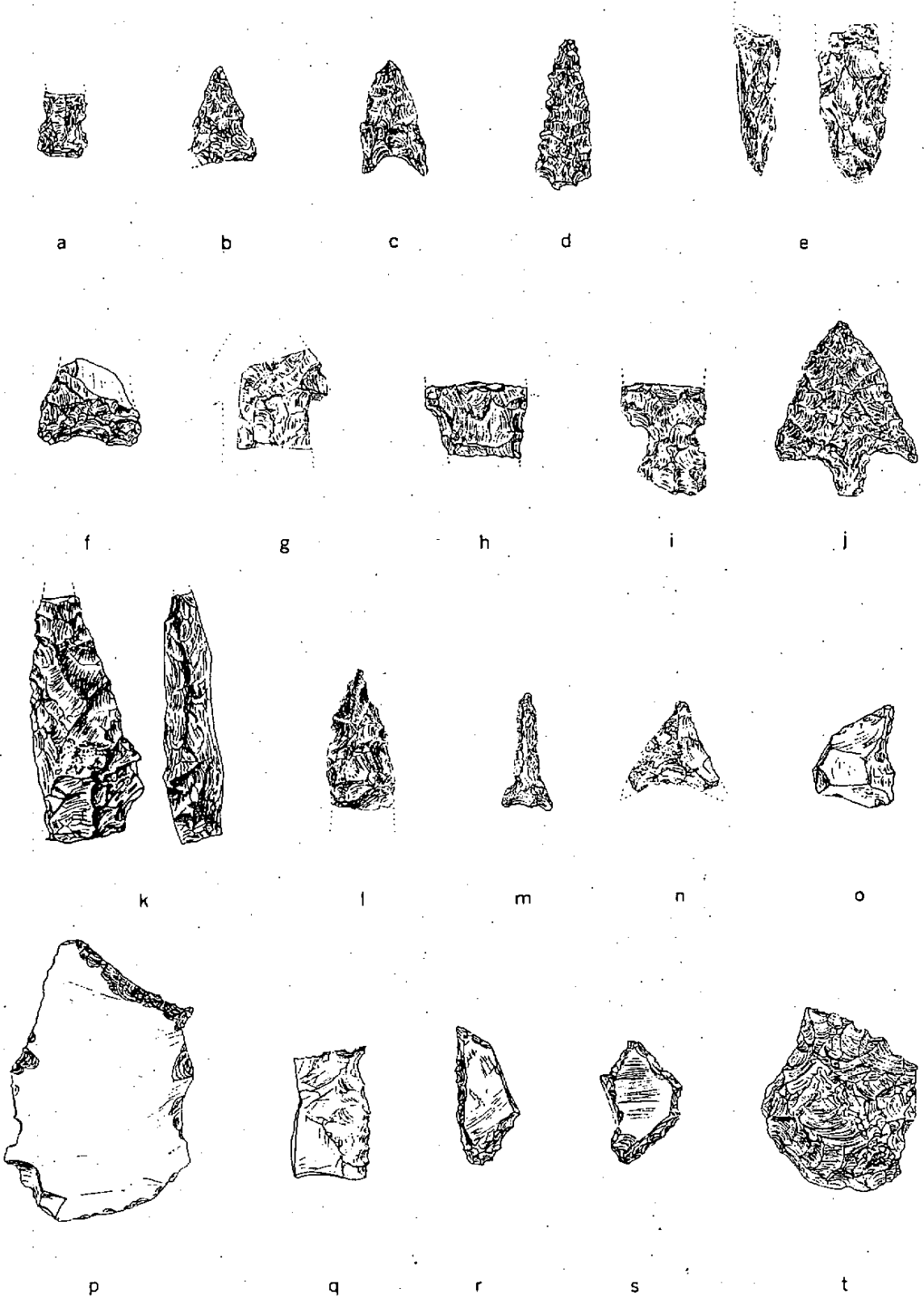


FIGURE 28



a



b



c



d



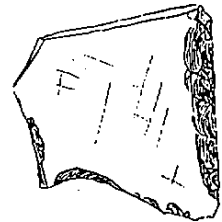
e



f



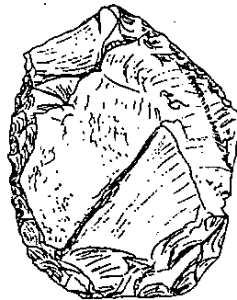
g



h



i



j



k



l



m



n



o



p



q

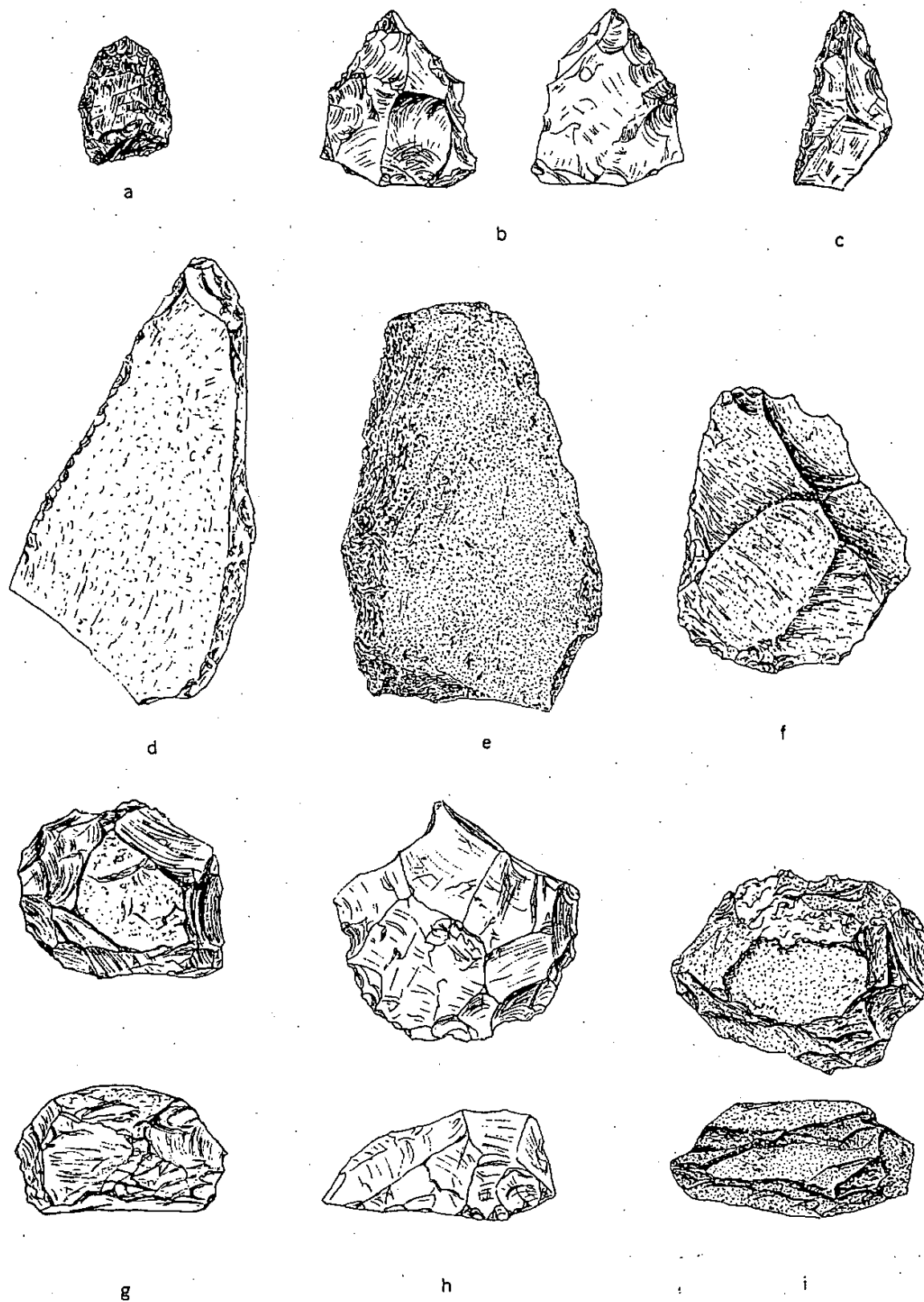
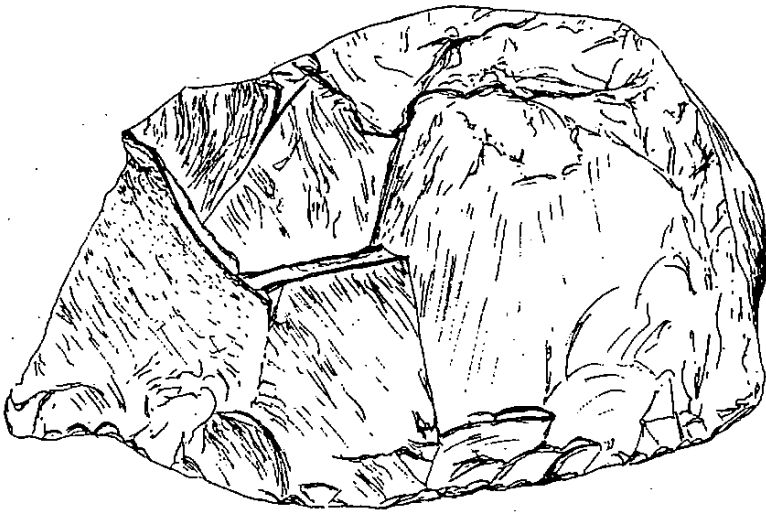
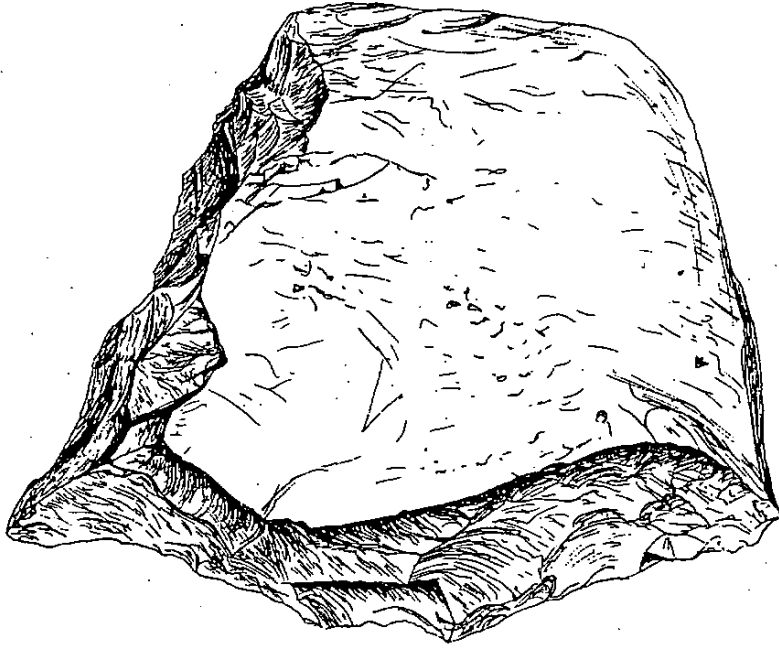
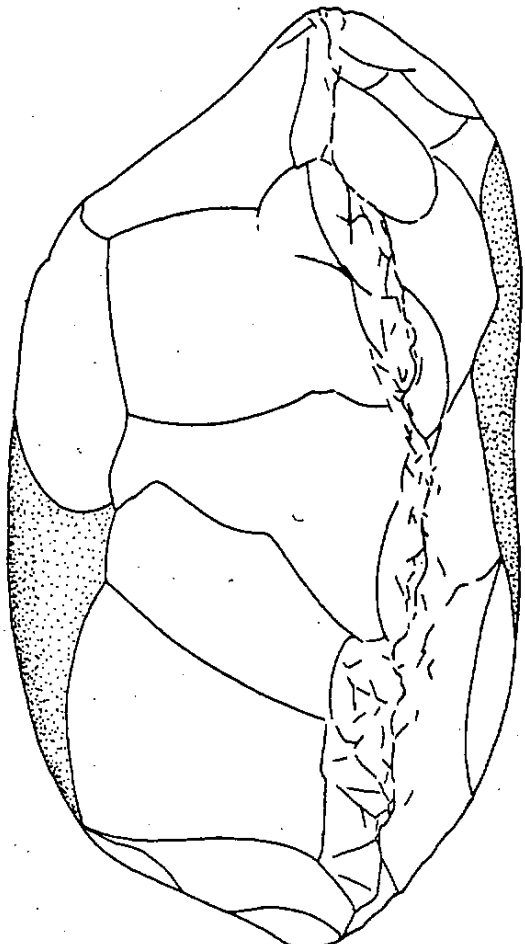
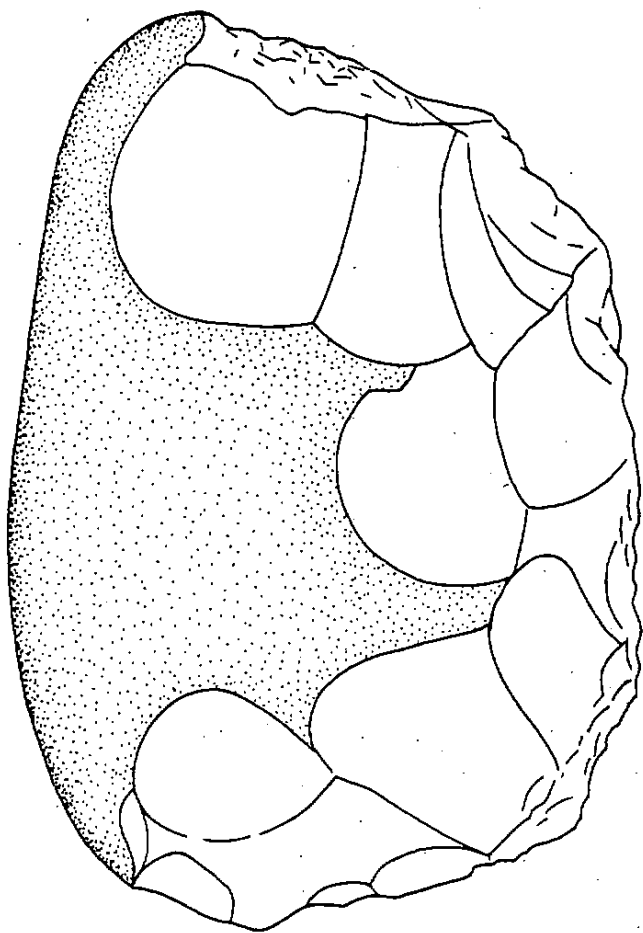
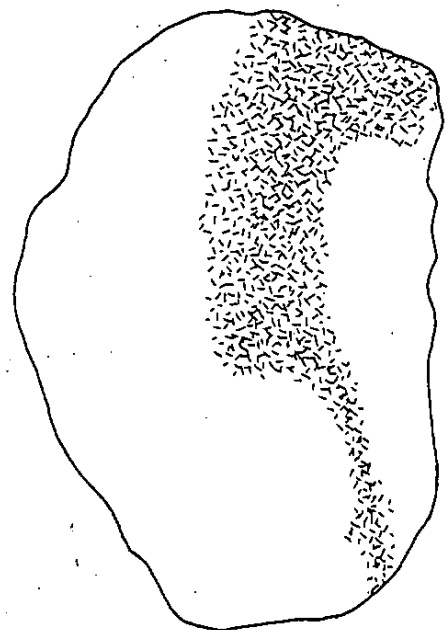
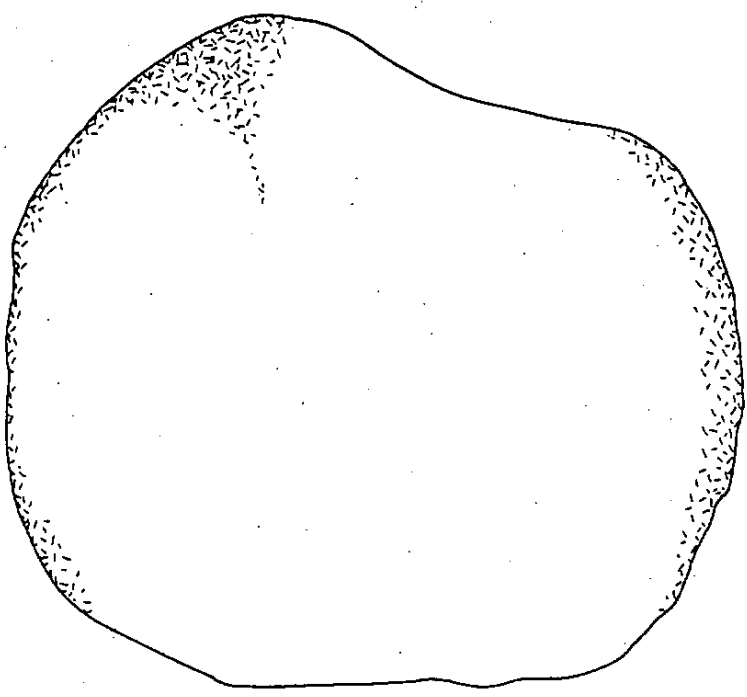


FIGURE 30

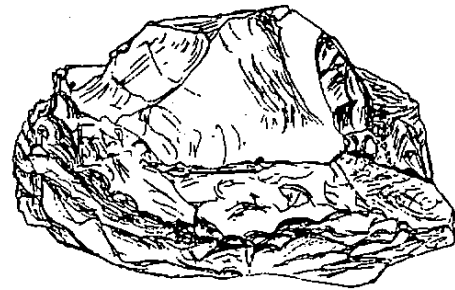
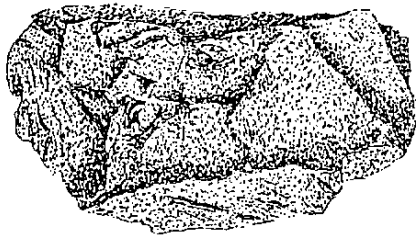
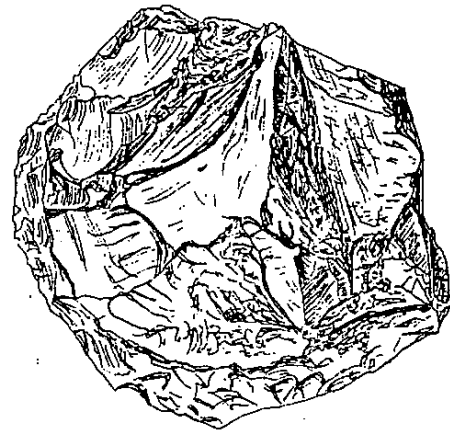
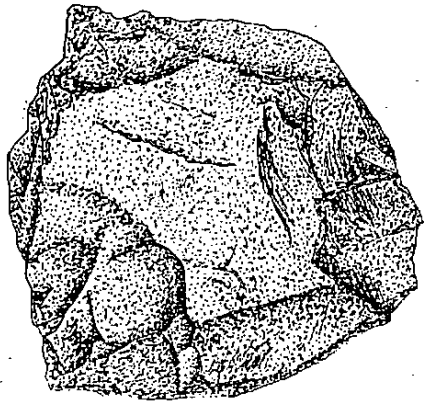




a

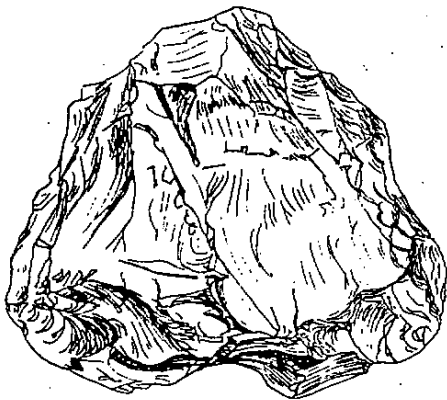


b

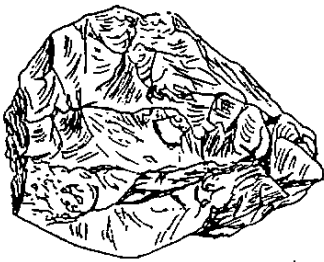
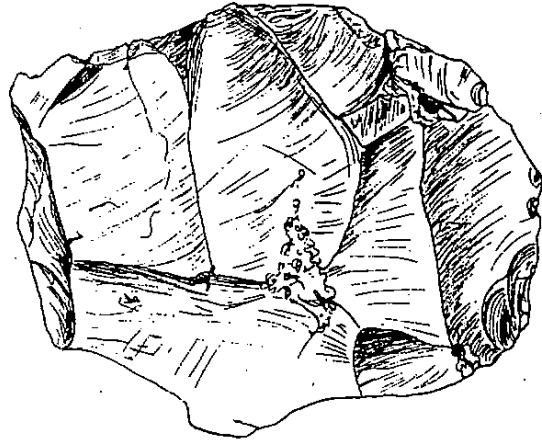


a

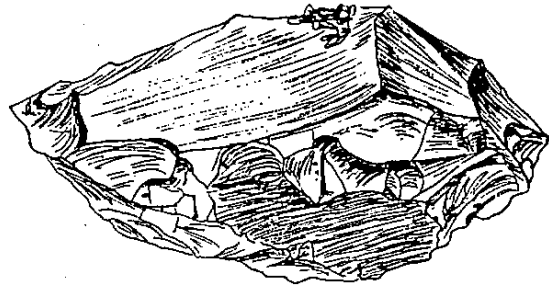
b



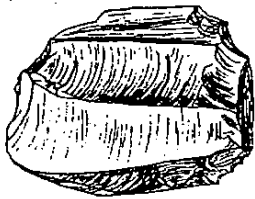
c



a



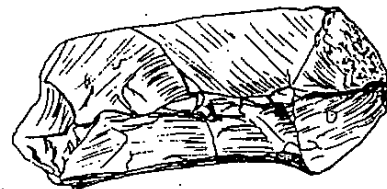
b



c

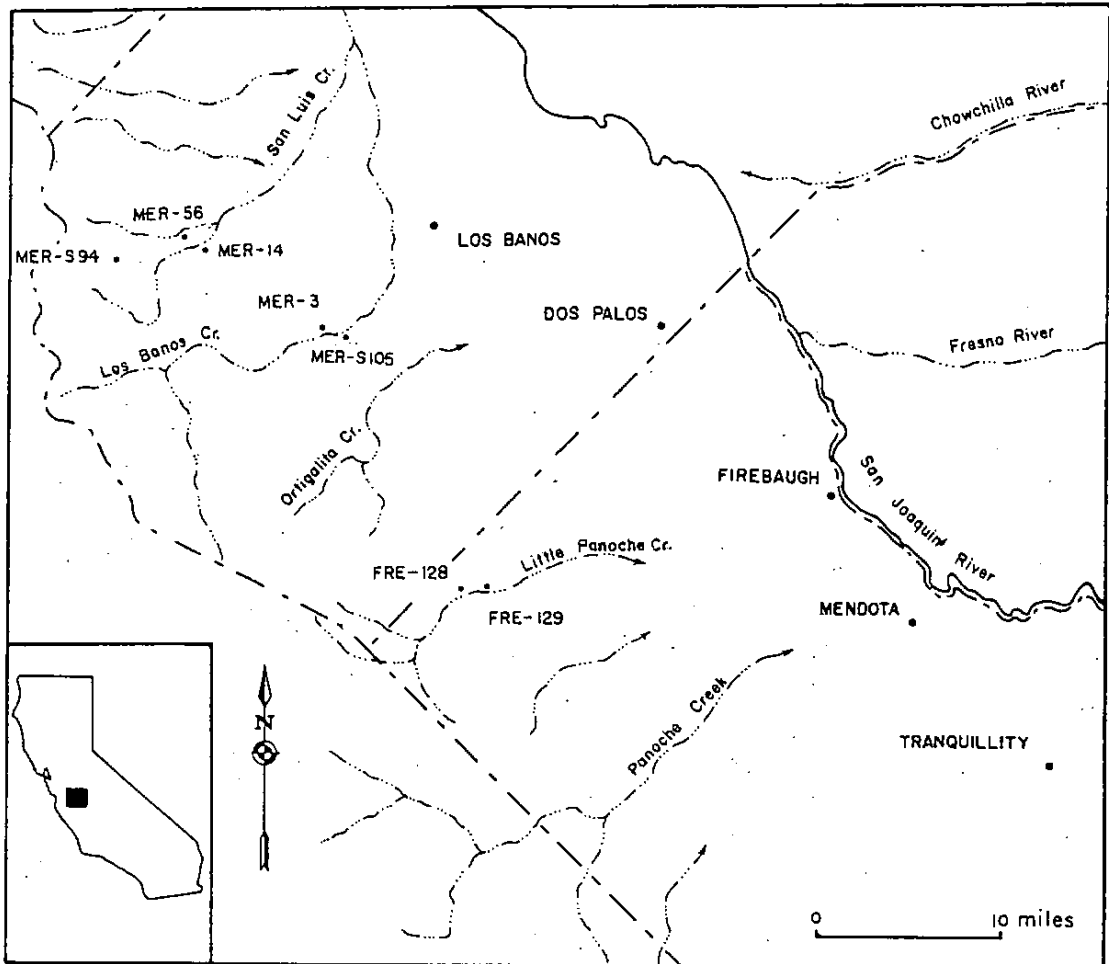


d

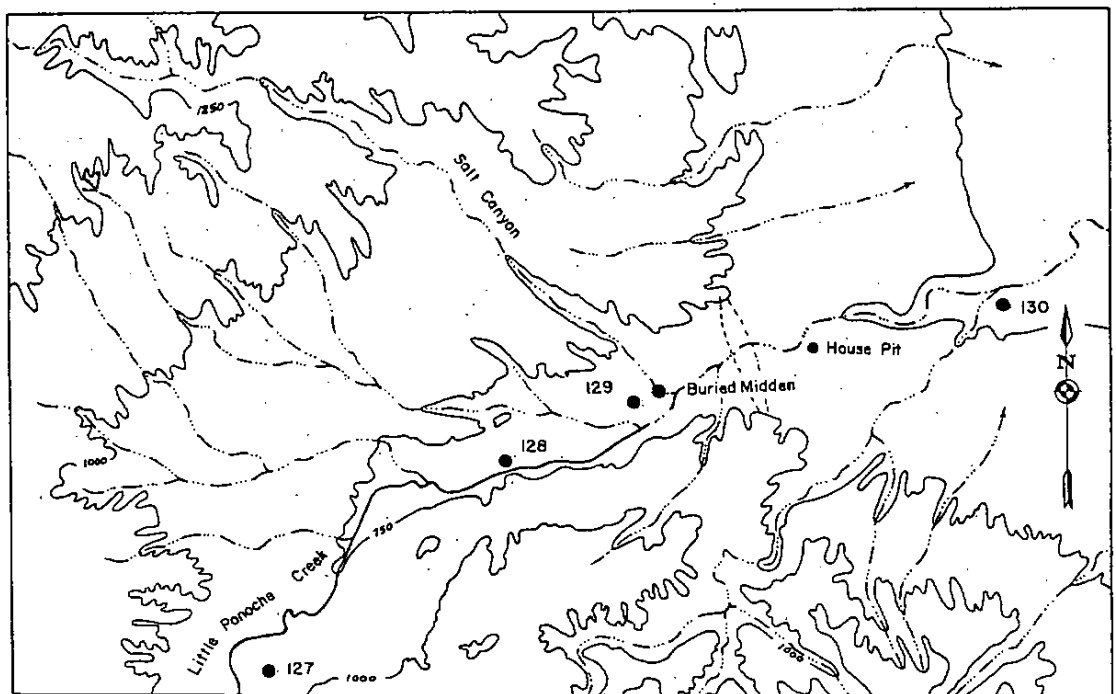


e

FIGURE 34



a



b

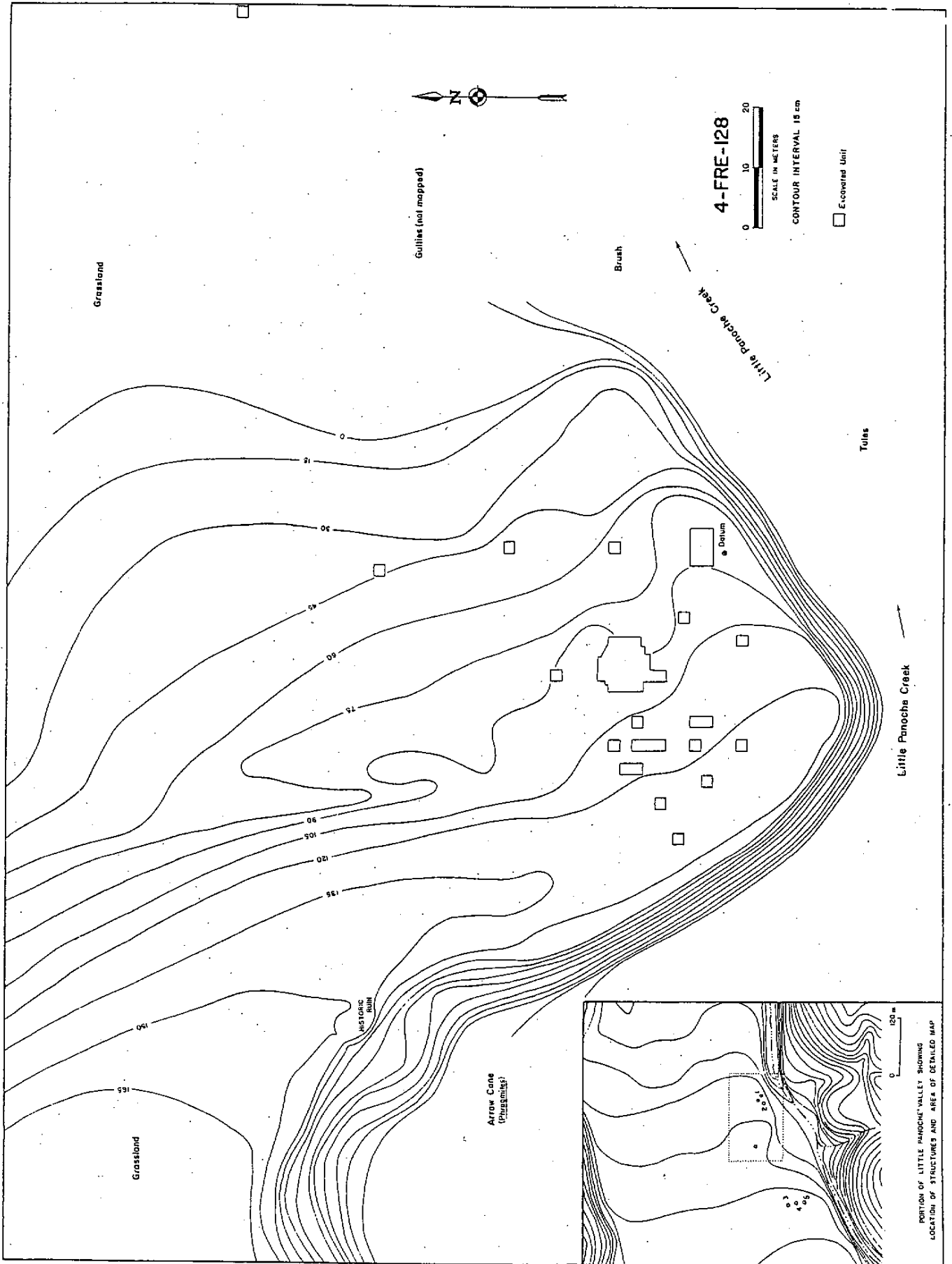
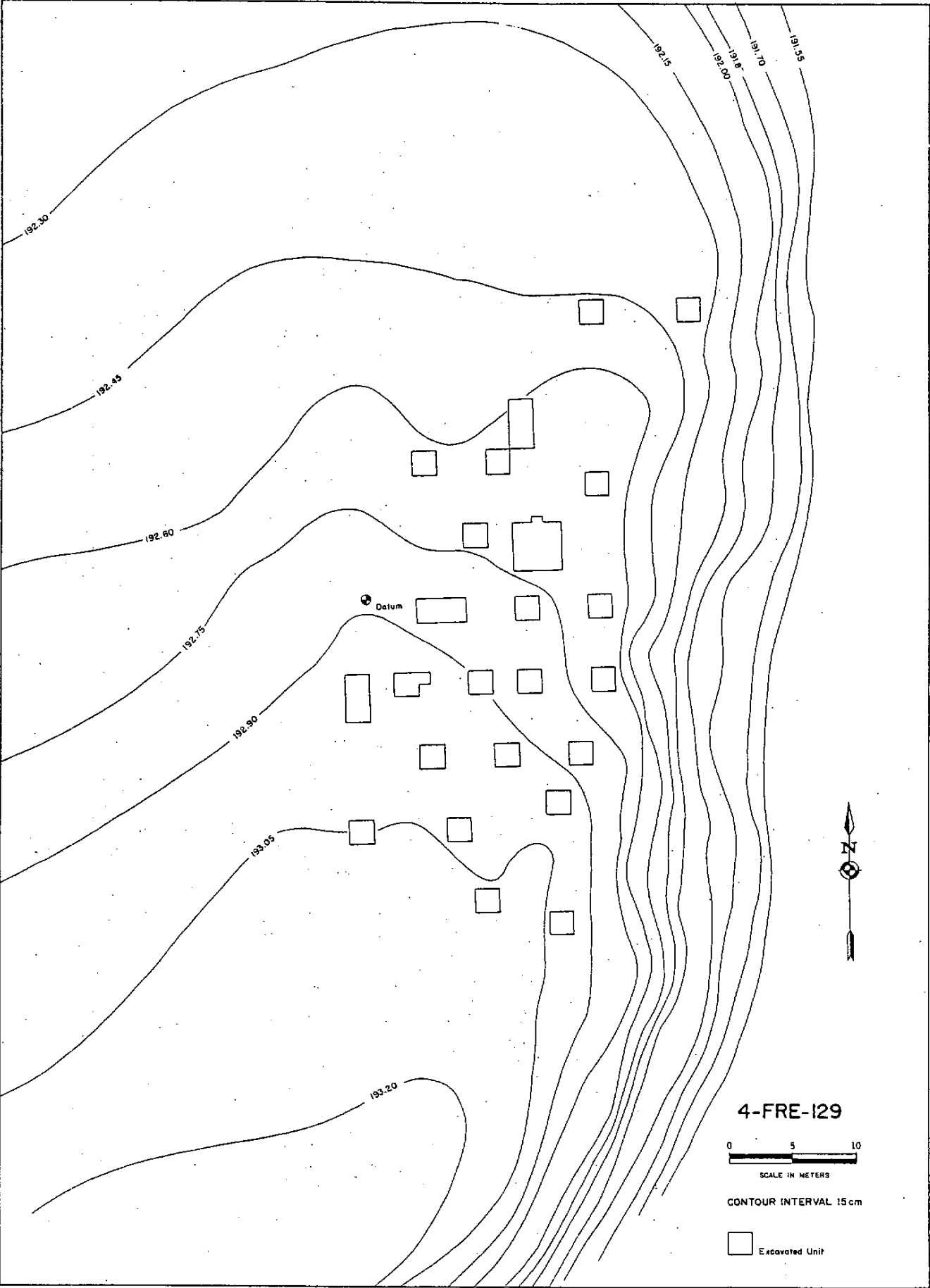
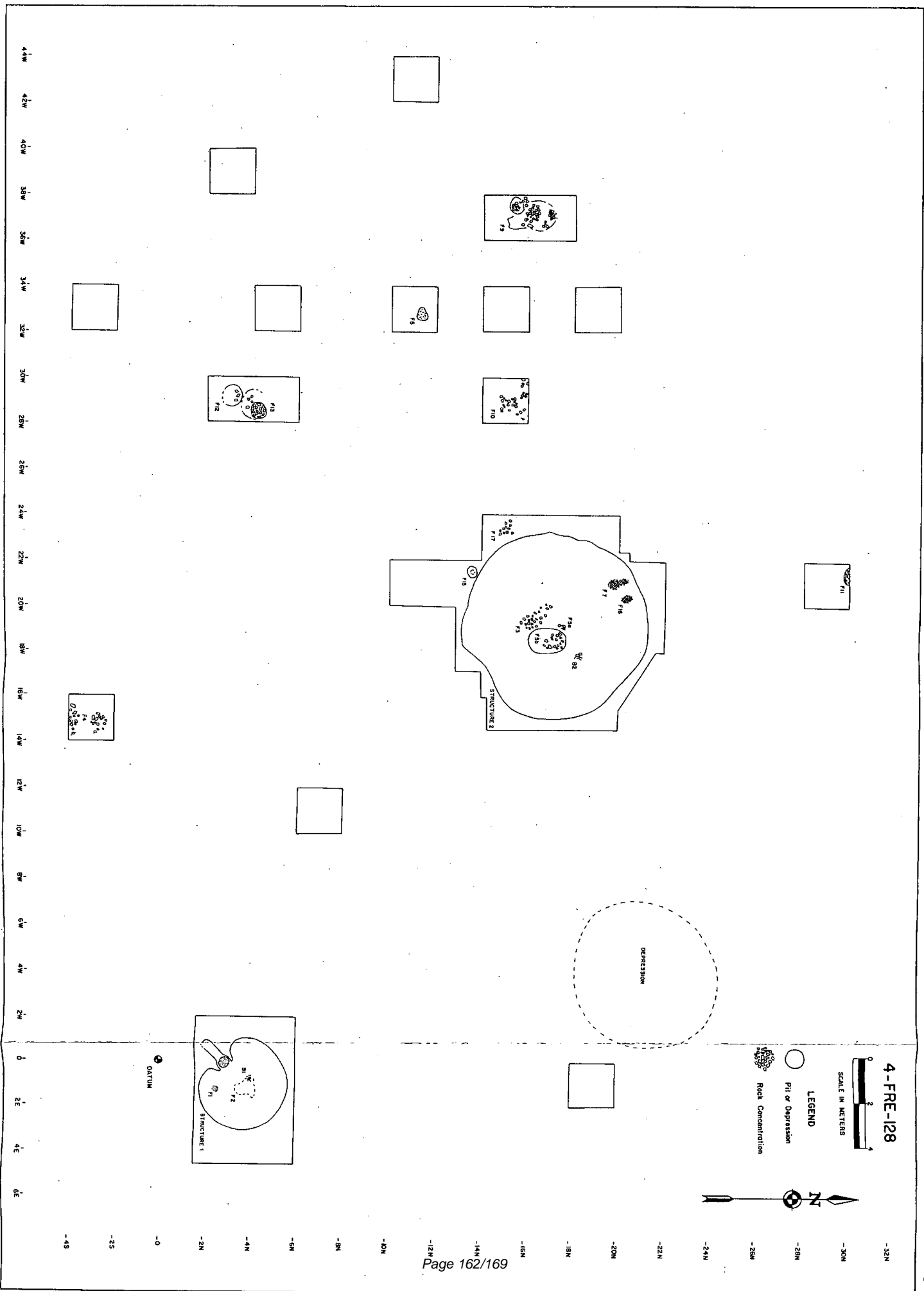


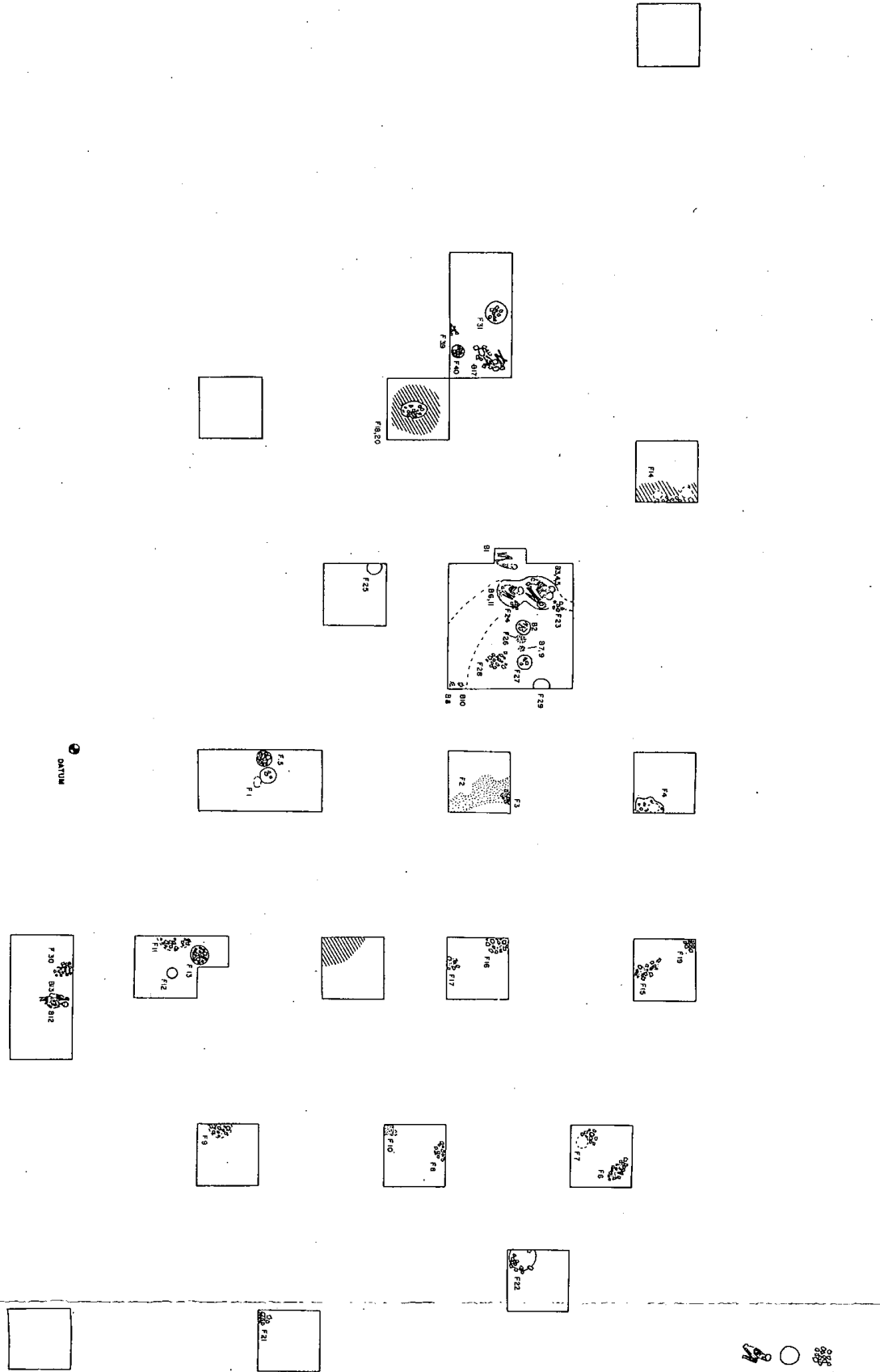
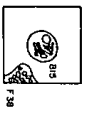
FIGURE 36





30E 28E 26E 24E 22E 20E 18E 16E 14E 12E 10E 8E 6E 4E 2E 0 2W

24N 22N 20N 18N 16N 14N 12N 10N 8N 6N 4N 2N 0



4-FRE-129
SCALE IN METERS
0 2 4

LEGEND

- Rock Concentration
- Historic Post Hole
- Pit or Depression
- Ash
- Burial
- Hard Surface

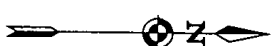
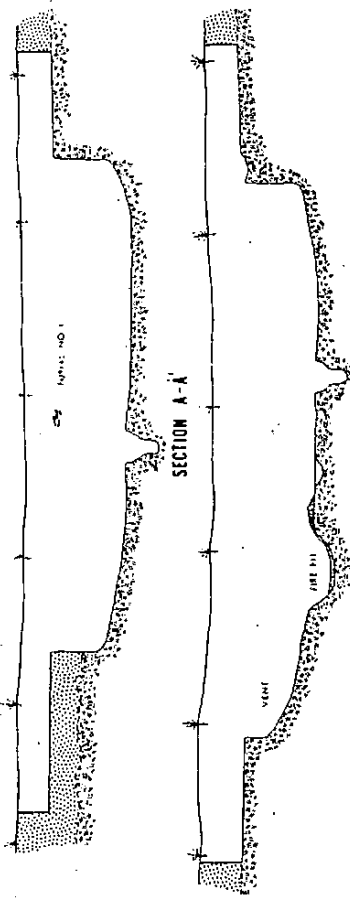
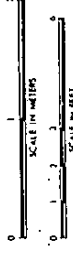
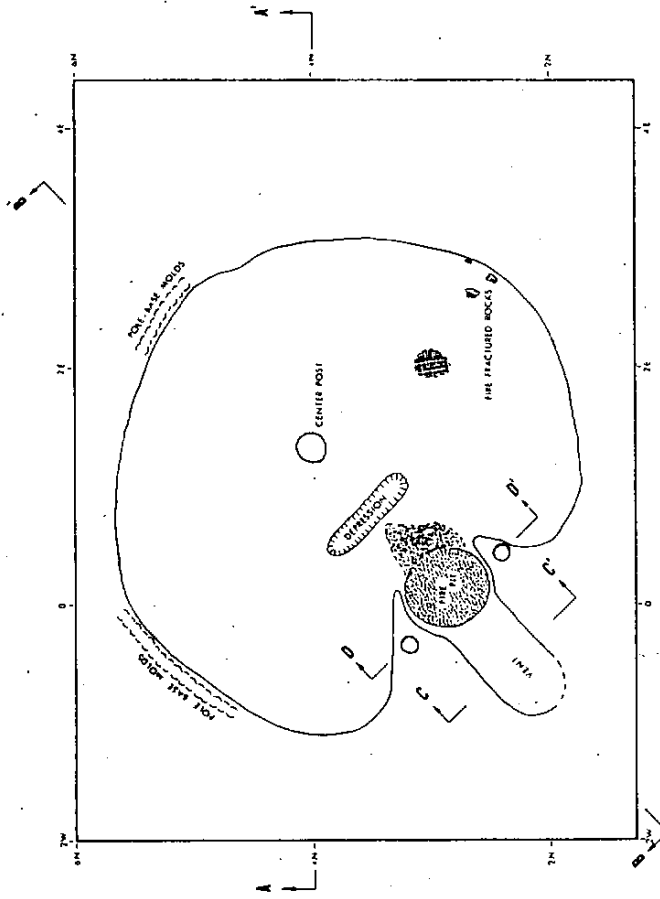


FIGURE 39

4-Fra-128
Structure-1

- LEGEND:
- Ash
 - Burned Area
 - Fire Pit
 - Midden
 - Sterile
 - Limit of Excavation
 - Limit of House Floor
 - Post Hole



SECTION B-B

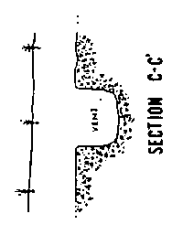
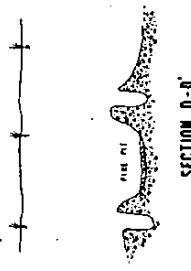


FIGURE 40

4-Fre-129 Structure -2

- LEGEND:
- Burned Area
 - Fire Pit
 - Midden
 - Sterile
 - Limit of Excavation
 - Limit of House Floor
 - Post Hole

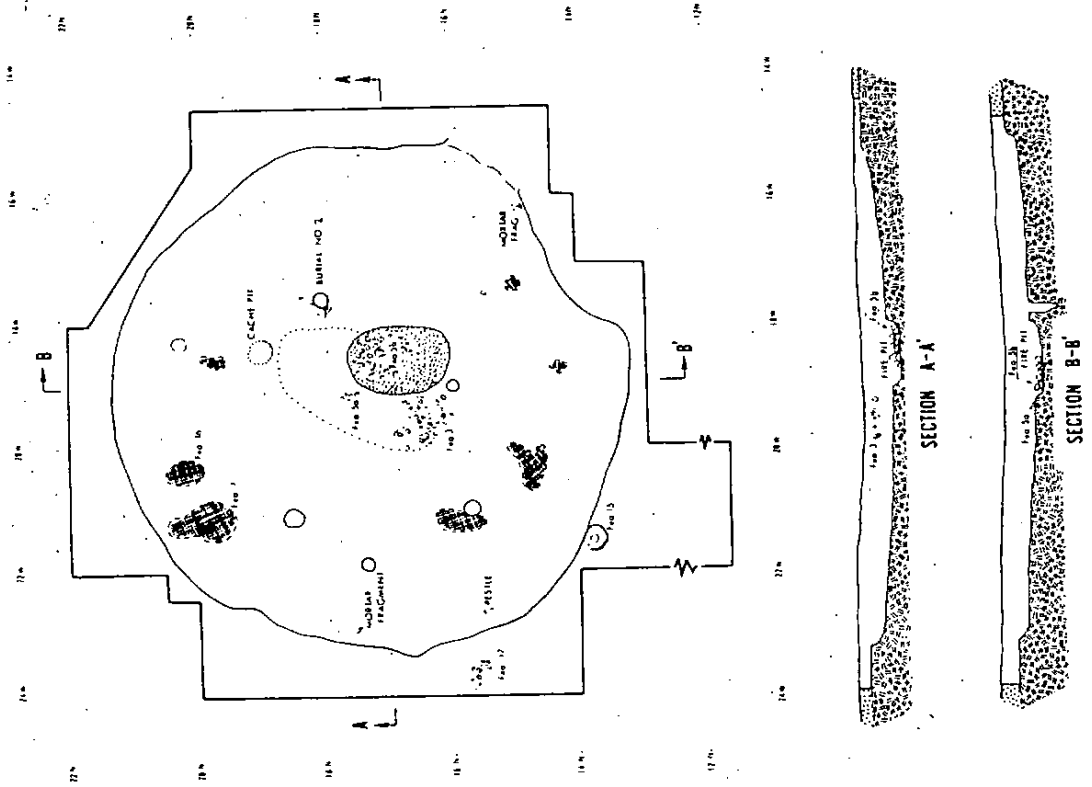
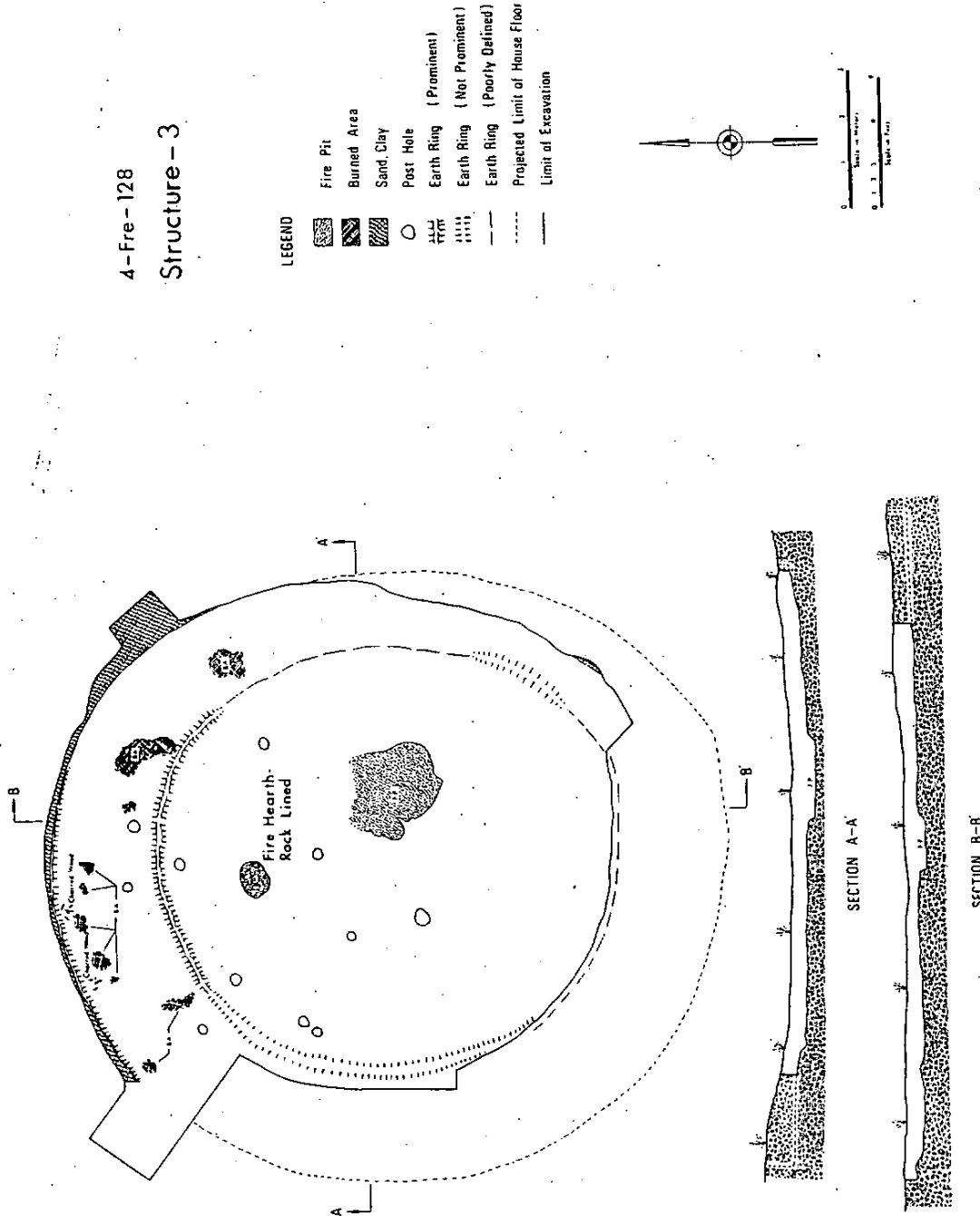


FIGURE 41

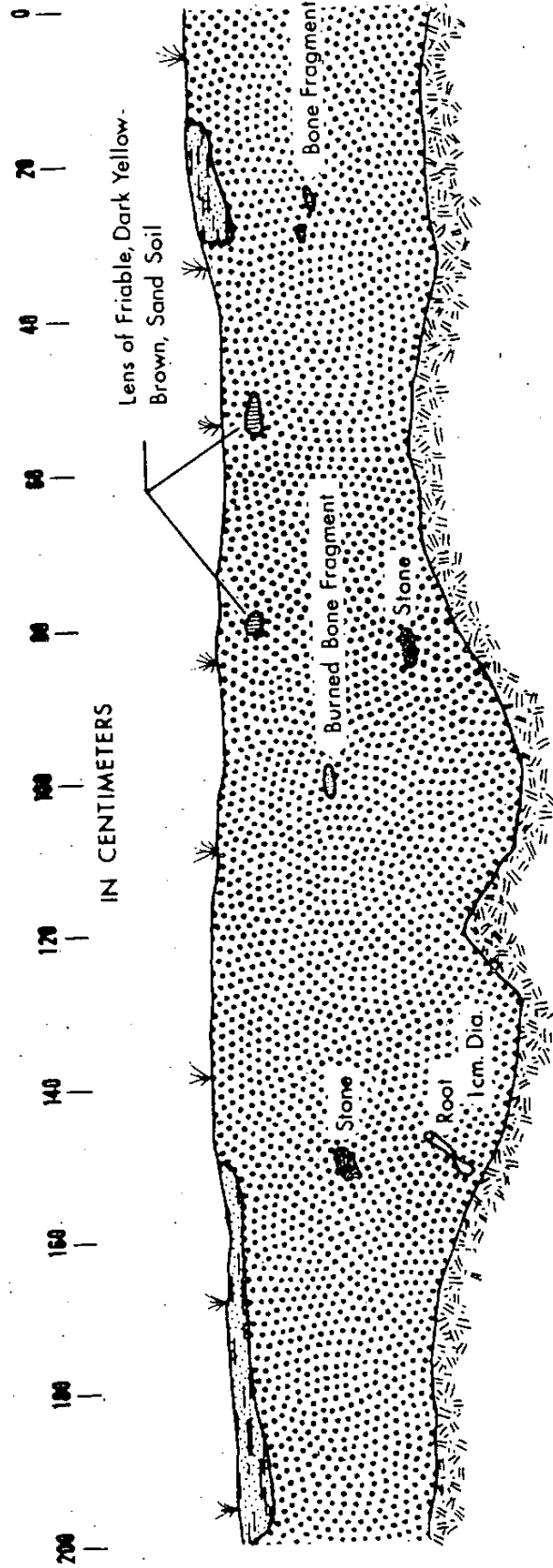
4-Fre-128

Structure - 3






4-FRE-129
UNIT 14S/10E

Profile: South Wall



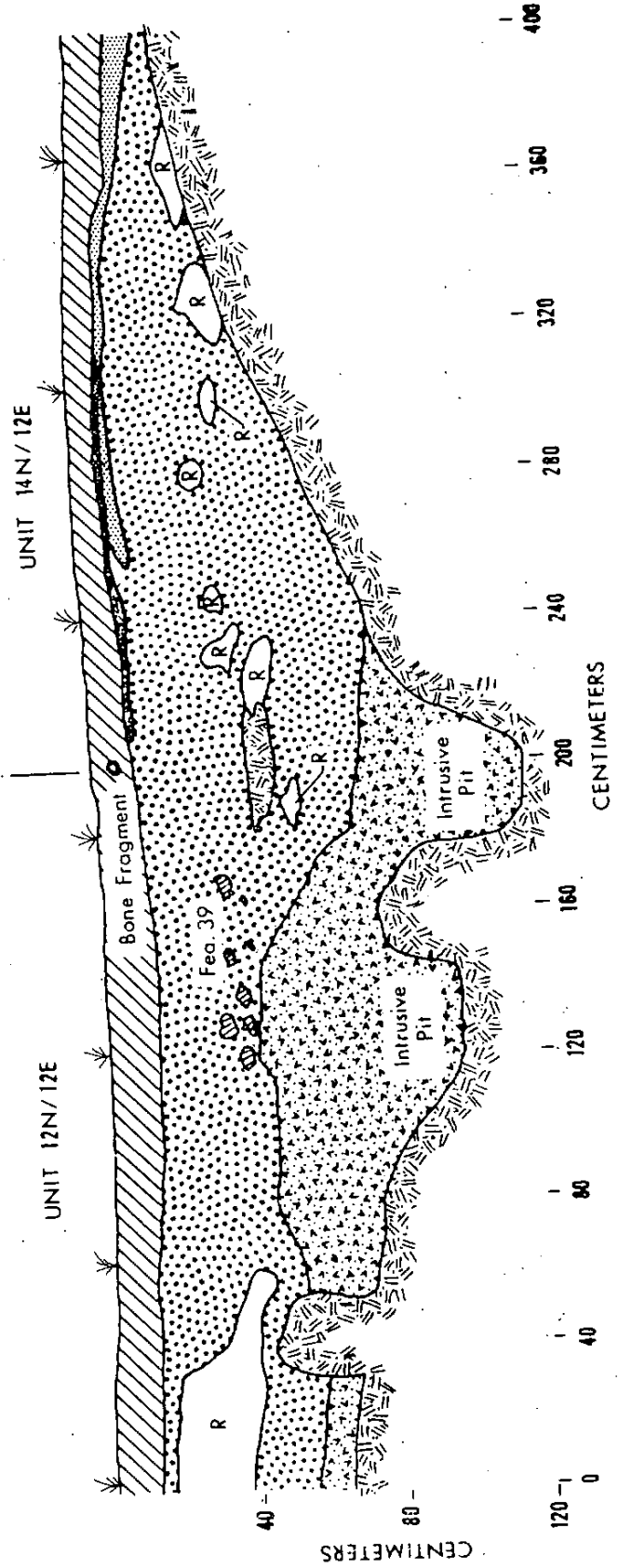
LEGEND:

-  MIDDEN
-  STERILE
-  LENS OF HARD COMPACT, YELLOW SOIL





Midden in this unit is very gray, with relatively large numbers of charcoal flecks appearing thruout.



4-FRE-129

Profile West Wall



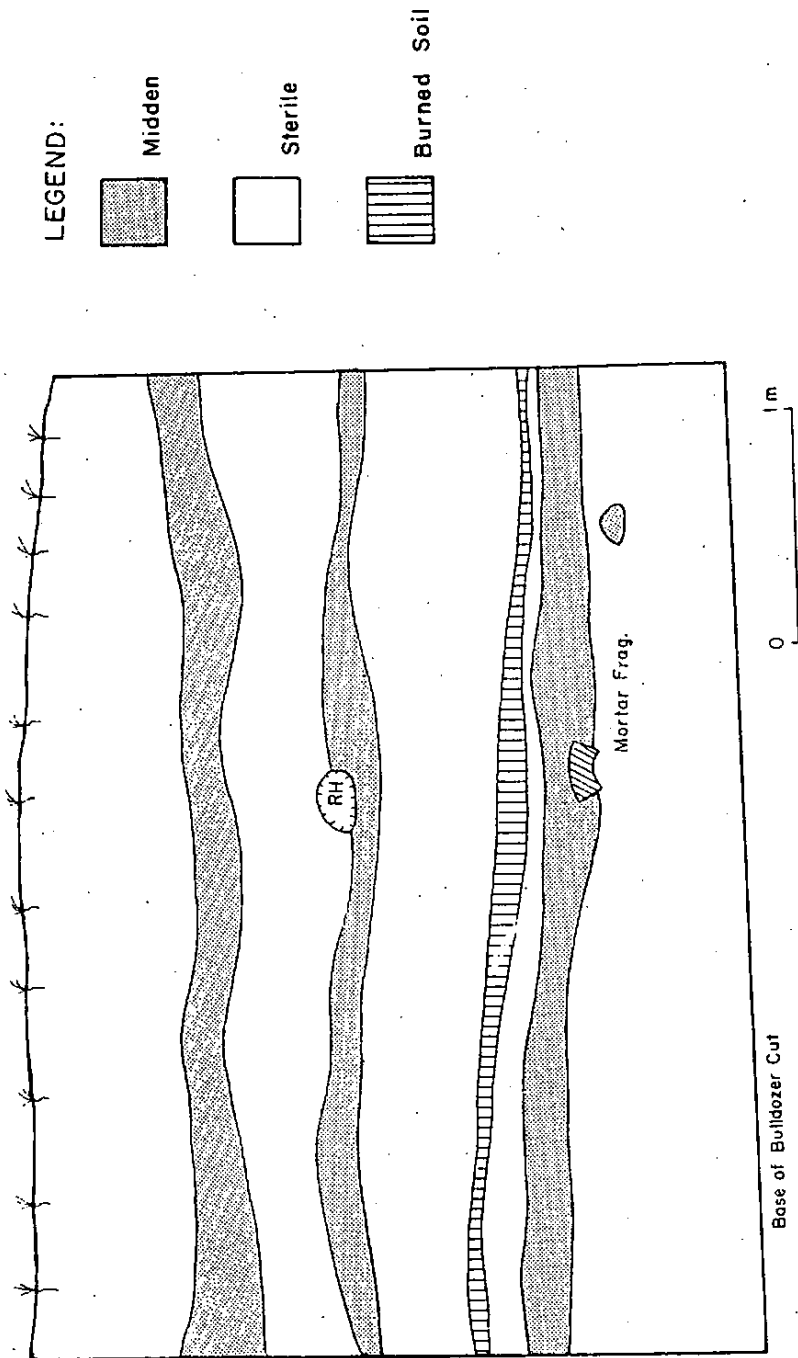
LEGEND

-  Ash & Charcoal Level
-  Compacted Midden
-  Midden
-  Mixed Midden & Sterile

-  Sod, Dung & Historic Debris
-  Sterile

R -- Rodent Holes (Some with sterile soil fill)

FIGURE 44



PROFILE SECTION FROM EAST SIDE OF SALT CANYON SHOWING STRATIFICATION