

Archeology of the
Grayson Site
Merced County,
California

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and
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ARCHEOLOGICAL

REPORT
12

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PREFACE

Archeological work in California for a number of years has been dominated by what is known as contract, service, or salvage archeology. The work from which the following report was derived cannot be considered salvage, at least in the usual connotation of the term. The project was problem-oriented and was not under strict time and fiscal limitations. The archeological answers being sought revolved around the cultural and temporal relationships for the region with regard to the coastal area to the west; to the Sacramento-San Joaquin Delta area to the north; and to the southern San Joaquin Valley to the south. The region of western Fresno and Merced Counties has been, until this Department's recent explorations, *tierra incognita* as regards prehistory.

Although many questions were answered in the process of the investigations reported herein, many more questions were posed by doing the work. This will necessitate investigations in contiguous regions in the light of what is now known for the subject area.

For those of us so concerned with California's archeological resources, it is with a sense of relief that reports such as the following one have been completed and made available to the interested person before the values have been destroyed through land modification. It is further pleasing to recognize that the work was made possible through the pooling of effort and resources of the U. S. National Park Service, the U. S. Bureau of Reclamation, the State Department of Water Resources, and the State Department of Parks and Recreation. Such a program indicates that "all is *not* lost", and that we must continue such cooperative programs whenever possible to preserve some knowledge of California's fast-disappearing prehistory.

Credit for this archeological work can be divided among a number of people representing a number of agencies, some of which have already been noted. Special credit is due to the interest and support of Mr. Paul J. F. Schumacher, Regional Archeologist, National Park Service, San Francisco office, for whom this report has been prepared in partial fulfillment of contracts 14-10-4: 940-28 and 14-10-0434-3313 between the National Park Service and this Department. Credit for a good job well done must go to William H. Olsen and Louis A. Payen for developing the problem around which the work has been done, for the execution of the field and laboratory work involved, and for the preparation of this present report. The excellent support of the field crew is here gratefully acknowledged, for without their support and interest we could not have completed this part of our Department's program in California archeology.

The site has been named after Charles E. Grayson, M. D., of Sacramento, who has long been a friend of archeology. Further, Dr. Grayson is an avid bow-hunter and a leading historian of archery. It was on one of his hunting trips that he discovered the site with which this report is concerned. It is with pleasure that we mark Dr. Grayson's friendship and interest in California Indians by naming this site after him.

Francis A. Riddell, Editor
State Park Archeologist

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TABLE OF CONTENTS

	Page
Introduction	1
Environment	1
Description of Site	2
Excavation Method	2
Stratigraphy	3
Ornamental Assemblage	5
Shell Beads	5
Type A1a <i>Olivella</i> beads	5
Type A1b <i>Olivella</i> beads	6
Type A1c <i>Olivella</i> beads	6
Type A2a <i>Olivella</i> beads	6
Type B2a, B2b, B2c <i>Olivella</i> beads	6
Type B3a and B3b <i>Olivella</i> beads	6
Type 2a1 <i>Olivella</i> beads	6
Type 2b <i>Olivella</i> beads	6
Type 3b1 <i>Olivella</i> beads	7
Type 3b2 <i>Olivella</i> beads	7
Type 3c (saucer) <i>Olivella</i> beads	7
Type 3d <i>Olivella</i> beads	7
Clam and <i>Haliotis</i> shell beads	7
Stone Beads	7
Bone Beads	7
Shell Ornaments and Miscellaneous Shell Objects	8
Freshwater Mussel Shell Artifacts	8
<i>Mytilus</i> Shell Fishhook	9
Polished Stone Artifacts	9
Stone "Rings"	9
Incised Stone "Ring"	9
Perforated Gorget	9
Perforated Pebble Pendants	10
Perforated Stone "Rod"	10
Grooved Stone "Rods"	10
Flat Slate Pendant Fragments	10
Stone "Pin" or Rod Fragments	10
Flat, Pointed Actinolite Splinter	10
Worked Flat "Slabs"	10
Grooved Flat Slab	10
Charmstone	11
Tubular Pipe	11
Polished Serpentine Fragments	11
Bone Artifacts	11
Drilled Coyote Tibia	11
Drilled Artiodactyl Toe Bone	11
Perforated Canine Tooth	11
Mammal Bone Tube Fragments	11
Bird and Mammal Bone Whistles	11
Worked Bird Bone	12
Polished Bird Bone Fragments	12
Incised Bone Fragments	13
Spatulate Bone Fragments	13

	Page
Miscellaneous Stone Objects	13
Unworked Serpentine and Actinolite Fragments	13
Quartz Crystals	13
Pigments	13
Discussion of Ornamental Shell, Polished Bone, and Stone Artifacts	14
Hunting and War Assemblage	16
Projectile Points	16
Type 1a, 1b, and 1c	17
Type 2	17
Type 3	17
Type 4	17
Type 5	17
Type 6	17
Types 7a and 7b	17
Type 7c	18
Type 8	18
Type 9	18
Type 10	18
Fragmentary Projectile Points	18
Large Bifacial Fragments	19
Knives	19
Atlatl Spur	19
Bone Artifacts	20
Flaking Tools	20
Comparative Analysis of Hunting and War Assemblage	20
Economic Complex	21
Bone and Antler Tools	21
Bone Awls and Fragments	21
Bipoint Bone Pin	22
Bone "Pin" Fragments	22
Small Pointed Tool Fragments	22
Antler Wedge	22
Worked Y-Shaped Antler Fragment	22
Scapular Tools	22
Pointed Antler Fragments	23
Bone Skewer	23
Polished or Cut Bone and Antler Fragments	23
Polished Deer Rib	23
Chipped Stone	23
Drills and Gravers	23
Flake Scrapers	24
Scraper Planes	24
Utilized Cores and Core Choppers	25
Polished Stone	25
Ground Edge Flake	25
Ground and Pecked Stone Artifacts	25
Girdled Cobble	25
Perforated Flat Cobbles	25
Cobble and Pitted Hammerstones	26
Small Grinding Slabs	26
Milling Stones (<i>Metate</i>)	26
Slab Mortars	27
Bowl and Cobble Mortars	28

	Page
Large Cobble Mortars	28
Mullers (<i>Manos</i>)	29
Pestles	30
Discussion of the Economic Assemblage	31
Miscellaneous Stone Objects and Baked Clay Artifacts	34
Serpentine and Actinolite Splinter	34
Quartz Crystals	34
Pigment	34
Clay "Spindle Whorl"	35
Impressed Clay Fragments and Burnt Clay or Ash Fragments	35
Comparative Analysis of Miscellaneous Stone Objects	35
Features	35
Feature 1	35
Features 2 and 7	35
Features 3 and 4	36
Feature 5	36
Feature 6	36
Feature 8	36
Burials	36
Midden Constituents	37
Summary and Conclusions	38
Postulated Temporal Sequence for the San Luis-Little Panoche Locality	39
Dating	41
Bibliography	43

ABSTRACT

The Grayson site (4-Mer-S94) is located just east of Pacheco Pass in the scattered oak parkland so typical of the south coast range. It consists of midden deposit which reaches a depth of 2 m. overlying an older terrace deposit about 1 m. in thickness which also contains artifactual material.

The recovery of some 40 burials and a variety of midden artifacts, as well as three fragmentary house floors, indicates a long period of occupation. Three components have been segregated. The latest (Panoche complex) is contemporaneous with the protohistoric and early historic occupation of the region, the second (Pacheco complex) is coeval with the central California Middle horizon and the early component (Positas complex) is unplaced but is clearly the earliest known occupation in the area. It is suggested that this period has some relationship to the early cultures of the south coast region of California and the central California Early period.

ARCHEOLOGY OF THE GRAYSON SITE, MERCED COUNTY, CALIFORNIA

William H. Olsen
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INTRODUCTION

Site 4-Mer-S94, the Grayson site, was excavated as part of the overall archeological program at San Luis Reservoir under the joint auspices of the State Department of Parks and Recreation, and the Department of Water Resources in conjunction with the Federal Bureau of Reclamation and the National Park Service.

San Luis Dam will impound the water from San Luis and Cottonwood Creeks which originate in the Diablo Range, approximately 16 km. (10 mi.) west of Los Banos, California. The resulting reservoir will ultimately inundate a number of archeological sites, among which is 4-Mer-S94, the site to be described in this report.

Field work on the site was initiated in June of 1966, and was completed during the summer of 1967. The site was mapped, laid out for excavation and a slide screen was constructed in June of 1966. A small stock reservoir a short distance up the creek adjacent to the site was utilized for the washing of the screened midden material with the use of a gasoline-driven water pump. The use of water for washing the midden was essential to the operation (especially in the lower levels) as the material was covered with a calcareous deposit.

In addition to 4-Mer-S94, two other sites were mapped or partially recorded in 1966. A large midden site (4-Mer-S104) with one housepit was mapped while 4-Mer-15, an open and rockshelter site, was surface-investigated in detail and a number of petroglyphs were recorded, including one painted design.

The original plan was to test both 4-Mer-15 and S104, but it soon became clear that due to time limitations and the archeological implications of the sample from 4-Mer-S94, this would not be possible. This report, therefore, will describe only the work performed at the Grayson site, during the 1966 and 1967 seasons.

ENVIRONMENT

The San Luis Reservoir is located in the eastern foothills of the Diablo Range immediately west of the San Joaquin Valley. It is some 29 km. (18 mi.) west of Los Banos and about the same distance southwest of Gustine, the only two sizable communities in the area of the reservoir (Fig. 1).

The Grayson site is situated on the north side of a small unnamed stream which eventually drains into Cottonwood Creek, which in turn drains the northwest portion of San Luis Reservoir. This smaller stream, actually a dry wash, originates south of Pacheco Pass, located immediately west of San Luis Reservoir. In the upper reaches of the streambed the terrain is rather open with a few oak trees. Several springs, near which are sites, are located in the upper end of the flat. One of these, now dammed up for use as a stock reservoir, is only about 100 meters upstream from 4-Mer-S94. At present this spring is the primary water source in the immediate area.

Vegetation around the site consists of grass and small shrubs, while scattered oaks and buckeyes are the dominant trees of the upland area to the west (Cole and others 1952: 7-9). The site area proper is marked by a profuse growth of horehound. This site is the first site excavated in the San Luis-Los

Banos-Little Panoche area which is located at the edge of the oak-dominated uplands, a factor which must have contributed greatly to the differences in the deposit between S94 and other excavated sites in the vicinity.

Game in the area is plentiful at the present time. Especially common are rabbits, ground squirrels and deer. Dove and quail are not infrequent. In aboriginal times elk and antelope, as well as numerous small mammals and birds, must have been of significance to the native people.

The climate is typified by "hot cloudless summers having low humidity and mild cool winters, in which most of the rainfall occurs" (Cole and others 1952: 6). The mean annual temperature at Los Banos is 17.3° C. (63.2° F.) with a maximum of 48.8° C. (110° F.) and a minimum of -6.6° C. (20° F.). The annual rainfall at Los Banos is 21.7 cm. (8.47 in.) with the bulk of this coming from December to March (Cole and others 1952: 6-7).

The site location, in a narrow valley or canyon at the foot of Pacheco Pass, creates a curious climatic situation. Our experience indicated this canyon generally has a breeze from the west and is noticeably cooler than the valley to the east. Only on the rare calm days was the heat oppressive. Presumably the situation would have created undesirable conditions for winter habitation, since even in the summer on cool days the site area is cold enough to produce some discomfort.

Geologically the site is situated at the east edge of the Franciscan formation which characterizes the Diablo Range. The material comprising this formation consists of "hard sandstone and shale and in many places are altered through metamorphism" (Cole and others 1952: 4). The area is characteristically steep and rugged with frequent rock outcrops.

The soil immediately surrounding the site apparently is a small unmapped body of Positas gravelly loam or possibly Sorrento gravelly loam, which is confined to the area along the streambed. The steeper slopes above the site consist of Vallecitos stoney clay loam. The Positas and Sorrento soils are apparently derived from the Vallecitos soils and occur as redeposited terrace or alluvial fan formations along the small streams in the area, mainly along Los Banos and San Luis Creeks (Cole and others 1952: 65-67, 75-76). The Vallecitos soil type is a local soil which "developed in place on shale and sandstone

rocks . . . It occupies the more elevated ridges of the Coast Range having steep slopes and sharp ridges" (Coie and others 1952: 81-82).

DESCRIPTION OF SITE

4-Mer-S94 is situated on a low terrace remnant just above a small streambed at an elevation of about 121 m. (400 ft.). The stream at this point makes a sharp turn where it cuts through the terrace to expose bedrock just below the site. The terrace just across the creek (east) at this point is somewhat higher than the site area, but has steeper banks. Little evidence of occupation is present on this higher terrace. Although it would appear to have been as favorable for occupation as the site itself, it would be more exposed to the prevailing westerly wind.

The midden deposit is bordered on the north and east by the creek bed and on the west by a steep slope. To the south the terrace increases in gradient and becomes narrower until it pinches out against higher ground. The midden area occupies an area 240 m. north-south by 180 m. east-west with the long axis parallel to the creek bed (Fig. 2).

EXCAVATION METHOD

As in several other instances where the deposit tended to mask or cling to the smaller artifactual material, we utilized a pump and washed the processed midden material. All of the material was excavated by trowel or shovel, loaded in wheelbarrows and passed through a slide screen of 1/8 in. (3 mm.) mesh. It was then caught in 1/8 in. (3 mm.) or 1/4 in. (6 mm.) holding screens where the residue that remained was cleaned by the use of water from garden-size hoses. This method, though time-consuming, allowed almost complete recovery in the upper 100 cm. of the deposit. Below this depth, the presence of heavy calcareous deposit on the artifacts and waste material precluded complete recovery even with the use of the washing technique.

The site was mapped using the metric system throughout. The contour intervals are 15 cm. (ca. 6 in.). The horizontal grid is based on 2-m.-squares (ca. 6 ft.). These are somewhat larger than the usual 5 by 5 ft. units used in California, but the ease in working these larger units, plus only slight loss in horizontal control, more than compensates for the increased time in excavation.

The midden was first excavated in 10 cm. levels, but it became clear that with a small crew and

the time limitations, it was necessary to change to 20 cm. levels. Thus, the artifact tabulations are based on 20 cm. levels but the lithic and faunal tabulations are based on those units excavated in 10 cm. levels. One control unit was excavated in 1967 to gain some idea as to the rock content of the midden; the results are presented in a later section.

During the last three weeks of the 1967 season we utilized a bulldozer to clear off the upper midden in several areas not tested by hand excavation techniques. This resulted in the recovery of a number of burials and certain data which we otherwise would not have been able to obtain.

STRATIGRAPHY

As can be seen in Fig. 2 the deposit slopes toward the creek bed with the highest point at about the center of the site. Along the western edge of the site, recent alluvial material from the steep hill slope is beginning to encroach upon the midden. The one unit in this area has a distinct brownish hue rather than the gray or dark-gray coloration of the down slope units.

The deposit exhibits extensive disturbance. Originally several sycamore trees were growing on or near the site. These were cut during reservoir clearing operations, then bulldozed onto the site area and burned. The bulldozing operations modified the east (creek) side of the deposit considerably. In addition, the site was the favored abode of a large ground squirrel colony. Evidence of rodent burrows was noted from top to bottom of the midden deposit and well into the basal yellow soil. This was especially damaging since the upper midden levels have a concentration of rock which was extensively displaced by rodent activity. The burials were equally disturbed by this same activity.

The midden deposit varied in depth from about 110 cm. near the west edge of the site to about 180 cm. in the central portion of the site. The single unit closest (down slope) to the creek bed had about 100 to 110 cm. of deposit. At the north end of the site the midden was ca. 170 to 180 cm. deep and the southernmost unit had some 150 cm. of deposit. Artifactual material and burials were recovered below the midden deposit but the latter were obvious intrusions. There was, however, a consolidated grayish-brown midden zone at the base of the deposit which was distinct from the yellow terrace soil. Whether this transitional zone is a true earlier midden deposit is not clear at present, but there are

suggestions that it indeed may be just that.

The profiles presented in this report (Fig. 38) indicate the physical stratigraphy for the central portion of the site is as follows:

The upper level (ca. 0 to 30 cm.) is extremely dusty and contains a very high percentage of fire-fractured rock. In color it is dark-gray and the texture is rather loose and flour-like. This level contains extensive roots from horehound plants which dominate the surface of the site. Below this zone (ca. 30 to 80 cm.) is a slightly lighter-colored gray midden which still is extremely rocky. This zone is badly rodent-disturbed but has few roots other than from larger shrubs or trees. We feel that these two zones, though differing in color somewhat, actually comprise the upper unit (Zone A) of the deposit.

The second (Zone B, ca. 80 to 175 cm.) is somewhat darker in color and contains less rock than the upper zone. The change is not especially distinct over the site as a whole, however. A few roots were present, apparently from large trees, possibly sycamore. This zone contains the bulk of the cultural material and the majority of the burials. It, like the overlying material, was not especially compacted and was easily excavated by conventional methods.

The basal midden deposit (Zone C, ca. 175 to 195 cm.) was light gray to yellow in color and was extremely compacted or cemented. The transition from the midden zone above to this zone is distinct especially on the basis of consolidation. In contrast to the rock in the uncompacted midden, primarily fire-fractured sandstone, basalt or andesite, this zone contained numerous small, natural water-worn pebbles and sometimes natural (?) slabs of greenish sandstone. Several burials were recovered from this compacted material along with chipping and bone waste which occurred in some quantity.

The basal material (Zone D) was a cemented yellowish-colored sand with a high clay content. It had some rolled gravel like the compacted midden and also had some natural slabs of sandstone. It seems probable that the lower midden zone is essentially this same material which has been reworked due to occupation. One cannot help but feel that this compacted midden represents an occupation with some antiquity.

Two units were partially excavated to bedrock

in 1967. These show that in the central portion of the site the yellow indurated material overlies a thin layer of coarse yellow sand (Zone E) below which is a stratum (Zone F) of rounded stream cobbles. The stream cobbles rest upon bedrock which is a poorly-consolidated shale or sandstone (Zone H). It seems clear that the yellow clay, sand and cobbles represent a sorted terrace deposit laid down by the creek prior to the deposition of the midden deposit.

The profiles indicate that the yellow Zone D deposit terminates against, and in part, overlies an older terrace along the western margin of the site. This material consists of unsorted large cobbles and reddish-colored soil typical of the surrounding area (Zone G). It occurred as the basal soil type only on the upslope portion of the site as can be seen in the profile of the east-west trench (Fig. 38). The unit furthest west (2S-16W) had no distinct physical stratigraphy, but the midden had a distinct brown coloration suggesting mixture with the reddish soil from the slope to the west of the site.

The stratigraphy of the unit closest to the creek bed (2S-10E) was also different in that the rocky midden (A) rested upon a deposit of large unsorted stream gravel. The distinctive yellow compact soil noted further west in the main trench was absent in this area. Presumably it had been removed by stream channel movement prior to the deposition of the midden.

As reconstructed it would appear that the depositional sequence is as follows:

First, the stream established a channel through the reddish unsorted gravel material. Next the yellow clay soil was deposited as a secondary terrace along the west side of the creek bed. In some areas this soil was over the remnants of the older fill. Lastly, the stream cut out the eastern edge of this later terrace and deposited a layer of unsorted large cobbles and gravel along the eastern edge of the secondary terrace. Sometime later the deposition of the midden deposit covered over the remnants of the yellow clay terrace and extended upslope over the older reddish terrace material and downslope over the more recent cobble fill in the creek bed. Only minor erosion of the midden has taken place, possibly since the current channel of the creek has now cut down to bedrock along the east and north margins of the site and has not shifted appreciably in recent times.

Our feelings were originally, and still are to

some extent, that the cultural material from the yellow clay zone under the midden clearly represents the earliest known occupation period in the area. The bulk of the midden, on the basis of certain artifact forms, can fairly easily be correlated to the Middle period as known from the Sacramento-San Joaquin Delta region. In light of the radiocarbon dates of slightly greater than 600 years and 2400 years for the yellow clay zone, this hypothesis is clearly untenable. Presumably, if we are correct, these dates would be at least 2000 years younger than those originally postulated (ca. 4000-5000 B.P.). The dating of the cultural material will be discussed in more detail in a later section of the report. It is clear, however, that if the basal soil component dates to within the last 2000 years or so, our cross dates with the central California sequence are not in order.

It soon became clear in our initial surveys of the area that the sites along the western edge of the reservoir differed from those in the lower treeless valley area. The latter sites had far less rock, and the soil color was grayish in contrast to the dark, ashy-appearing midden at 4-Mer-S94. Few of these rocky, dark-colored midden sites produced surface artifacts, thus we were unable to determine the relationships of the valley sites and the foothill sites. Our original supposition was that these sites represented seasonal acorn processing stations associated with tracts of oak forest. This would be an explanation of the abundant fire-fractured rock and dark midden which characterizes these habitation areas. It was obvious, at least at 4-Mer-S94, that this was not altogether the situation, since the artifact assemblage, though oriented toward acorn processing, did not correlate with any of the excavated valley sites. The depth of the deposit and artifact assemblage also argued for long occupation by a group basically oriented to a foothill (upland) oak belt environment. It is also significant that projectile points were numerous at this site as opposed to the valley sites in the immediate area, suggesting that either hunting played a more important role in the foothills than in the valley, or that temporal differences are indicated.

The absence of the extended burial posture in the mortuary complex at the site is an important additional difference, since this was a dominant cultural element in the lower San Joaquin Valley (Bennyhoff 1961: 79; Fredrickson 1964: 146-147) in the prehistoric period. This area presumably is within the historic limits of the northern valley (west side) Yokuts (Kroeber 1925: 485), an attribution also

indicated by Latta (1949: 14) and supported by the archeological record (Olsen and Payen 1968). Thus the difference in burial position could indicate that this attribution is in error.

ORNAMENTAL ASSEMBLAGE

The bulk of the artifactual material from the site is of stone, either ground or chipped. Less frequent are objects of bone and shell, although the latter, in California, are of extreme importance in relative dating and in the establishment of relationships with other areas including both central and southern California.

SHELL BEADS

The *Olivella* bead typology utilized in this report is that originally established by Lillard, Heizer

and Fenenga (1939) and subsequently modified by Bennyhoff and Heizer (1958). Continued research, primarily by Bennyhoff (1967), but also by others currently working in central California, has clearly revealed the need for a more detailed shell bead classification. This recently has been undertaken on an informal basis. The newly proposed typology is essentially that compiled by J. A. Bennyhoff with the assistance of D. A. Fredrickson, W. H. Olsen, W. E. Pritchard, L. A. Payen and F. A. Riddell.

The classification of the spire-lopped *Olivella* beads follows the new typology (Type A1a through B2c) while the remaining bead types are after Bennyhoff and Heizer (1958).

The following data are presented on the bead types utilized in this report:

TABLE 1

Olivella Shell Bead Types

Type	Name	Size Range	Type (After Bennyhoff & Heizer 1958)
A1a	Small spire-lopped	3-6.5 mm. dia.	1a
A1b	Medium spire-lopped	7-9 mm. dia.	1a
a1c	Large spire-lopped	10-14 mm. dia.	1b
A2a	Small oblique-ground	3-6 mm. dia.	1c
B2a	Small end-ground	3-6 mm. dia.	1a
B2b	Medium end-ground	7-9 mm. dia.	1a
B2c	Large end-ground	10-14 mm. dia.	1b
B3a	Small barrel	3-6 mm. dia.	G1b
B3b	Medium barrel	7-9 mm. dia.	-
2a1	Thin rectangular	-	2a1
2b	Thick rectangular	-	2b
3b1	Split, drilled	-	3b1
3b2	Modified "saddle"	-	3b2
3c	Saucer	-	3c
3d	Small, thin disc	-	3d

The depth and burial distribution of all the bead types are presented in Table 2.

Type A1a *Olivella* beads (Fig. 8a, b). Small spire-lopped *Olivella* beads, 3 to 6.5 mm. diameter at 4-Mer-S94, occurred frequently in the midden and with five burials. The midden specimens range from 3 to 6.5 mm. in diameter but of the 42 beads from the midden, 27 are 6 to 6.5 mm. in diameter and 15 are 5

to 5.5 mm. in diameter. Of the 16 beads of this type from the upper rocky zone (surface to 80 cm.), nine are 6 to 6.5 mm. in diameter and the remainder are 4.5 to 5.5 mm. in diameter. The beads from the deeper levels of the midden (100 to 200 cm.) include one 3 mm. in diameter, ten 5 to 5.5 mm. in diameter and 15 from 6 to 6.5 mm. in diameter.

The beads of this type in burial association

average smaller than those from the midden, but this is clearly demonstrated only in the lot from Burial 6. Of the 63 beads in association with this burial, five are 3 mm. in diameter, 45 are 4 mm. in diameter and 13 are 5 mm. in diameter.

A number of these beads have the spire ground off at a slight angle to the long axis of the shell. In all but one instance this is not especially prominent; thus, these have not been classed as diagonally-ground beads.

The upper level examples, from the upper 40 cm. of the deposit, in many instances exhibit considerable weathering. This suggests that they have been rodent-disturbed, since the bulk of the beads of all types occur well below the surface.

Type A1b *Olivella* beads. These beads, formerly classed as Type 1a (Bennyhoff and Heizer 1958) measure from 7 to 9 mm. in diameter. The bulk of the medium-sized beads are from the midden, primarily between the 100 to 200 cm. level. One occurred with Burial 7 at a depth of 100 cm. and 56 occurred with Burial 27. Those with Burial 27 differ from the midden beads in that the spires are broken rather than ground off.

The medium-sized beads are less frequent than the small spire-lopped beads in the midden and are infrequent in burial association. Both types occur throughout the midden, however.

Type A1c *Olivella* beads (Fig. 8c). The large spire-lopped *Olivella* beads, formerly Type 1b (Bennyhoff and Heizer 1958) occurred infrequently in the midden. The three from the upper midden level are all badly weathered, suggesting that they were displaced vertically due to rodent disturbances. The other four midden beads were below the upper rocky midden like the bulk of smaller spire-lopped beads. They occurred with three burials, but only in quantity with Burial 27. As with the other spire-lopped beads with this burial the large specimens had broken spires.

Type A2a *Olivella* beads (Fig. 8d). Seven beads are classed as Type A2a. This type is spire-ground but the plane of the grinding is at a 45° angle to the long axis of the shell. These specimens are the only definite example of this type, but as noted under the Type A1c beads, slightly oblique ground-spires are not uncommon. These beads all occurred in the midden from 60 to 140 cm.

Type B2a, B2b, B2c *Olivella* beads (Fig. 8g). These three bead types include those with both spire and end-grinding and are differentiated only on the basis of diameter (Table 1). A single example of Types B2a and B2c occurred in the midden and two Type B2b beads occurred. None were in burial association. The small bead and one medium bead occurred at 80 to 100 cm., and the second medium bead occurred in the 40 to 60 cm. level. The large bead was from the upper 20 cm. of the deposit. Traces of calcareous material adhering to this large bead suggest that it was originally deeper than this in the deposit.

Type B3a and B3b *Olivella* beads (Fig. 8e, f). A single example of each of these bead types occurred in the upper portion of the midden. Both are comparable to the Type G1a *Olivella* bead reported by Bennyhoff and Heizer (1958) and referred to as the "barrel-shaped" *Olivella* bead due to extreme end-grinding. This bead form is rare in central California and probably represents a Southern California bead form (Bennyhoff and Heizer 1958: 83, endnote 29). Both are from the upper 40 cm. of the deposit.

Type 2a1 *Olivella* bead (Fig. 8h). The second most frequent bead type was the thin, centrally perforated rectangular *Olivella* bead (Type 2a1). All of these occurred in a single grave lot (Burial 6 at 183 cm.). These beads range in size from 5 by 4 mm. to 8 by 6 mm. but 27 of the 38 specimens measure 7 by 5 mm. The perforation, conically drilled from the concave side, averages 1.5 mm. in diameter. In contrast to the beads of the type from other sites in the Los Banos area these beads are less uniformly shaped, have a slightly larger, though not measurable, perforation and sometimes have a shelf remnant at one end. In this respect they resemble the larger thick rectangular beads from the site.

Type 2b *Olivella* beads (Fig. 8i-n). The thick rectangular beads (Type 2b) occurred infrequently. Three (one fragmentary) were in the upper 40 cm. of the deposit, three below 40 cm. in the deposit, and two were with Burials 7 and 16 (100 and 120 cm., respectively). The deepest midden example came from on or just above the compacted midden zone. One still has traces of red pigment on the concave surface.

Both of the burial associations are rather dubious due to disturbance, but it is clear that they are derived from the lower portion of the midden and

not from the consolidated yellow zone below the midden. These beads measure from 9 to 11 mm. long by 5 to 7 mm. wide and the perforation averages slightly over 2 mm. in diameter. Most of them are ground on the concave side but still exhibit remnants of a shelf at one end. Several appear to have been biconically drilled, but this may be due to string wear.

Type 3b1 *Olivella* beads (Fig. 8o, p). The split-drilled *Olivella* bead had but one occurrence from the 170 to 180 cm. level in Unit 4N-2W. This is just above the compacted grey midden in this unit. It measures 12 by 11 mm. and the perforation is 3 mm. in diameter. A variant bead (8.5 mm. long by 8 mm. wide), dubiously classed as Type 3b1, was higher in the midden. It may actually be a large modified "saddle" bead (Type 3b2).

Type 3b2 *Olivella* beads (Fig. 8q). The modified "saddle" *Olivella* had four occurrences, all midden, from 60 to 100 cm. They appear to be essentially confined to the midden below the upper rocky zone. They average 6 by 7 mm. with a perforation 1 mm. in diameter.

Type 3c *Olivella* beads (Fig. 8r). Forty-one slightly-cupped disc beads of *Olivella* occurred in the site. Though many have a slight shelf, they appear to be related to the "saucer" beads (Type 3c). Only two graves produced specimens, one with Burial 6 and 28 with Burial 39. The midden beads measure from 6 to 8 mm. in diameter with a perforation averaging 2 mm. in diameter. The Burial 6 specimen measures 6 mm. in diameter and the perforation is 2 mm. in diameter. The Burial 39 lot includes three beads from 5 to 6.5 mm. in diameter, seven from 7 to 7.5 mm. in diameter and 16 from 8 to 10 mm. in diameter. The perforations range from 2 to 2.5 mm. in diameter. All of the midden beads are above 120 cm., and only four were below 80 cm. in depth. Some of these beads have an exceptionally shiny, "new" appearance while others are highly weathered. Possibly two periods of use are represented in this type, as a few of the "saucer"-shaped beads occurred at 4-Fre-128 and 129 in a protohistoric context. Those with Burial 39 indicate some antiquity, as the burial was intruded into the yellow clay stratum below the midden, though the grave pit originated in the lower midden zone.

The rough-edged "saucer" (Fig. 8t) is an amorphous-shaped bead with a large central perforation. It measures 12 by 9 mm. with a perforation 2.3 mm. in diameter.

Type 3d *Olivella* beads (Fig. 8s) and *Haliotis* epidermis disc beads (Fig. 8x). The small thin disc *Olivella* beads had five midden occurrences and were associated with Burial 27. Of the midden beads, four are from 80 to 120 cm. and the last from the 0 to 20 cm. level. Burial 27 had 95 beads of this type. They were associated with small steatite and *Haliotis* epidermis disc beads. The association is clearly protohistoric. All of these beads are less than 5 mm. in diameter and have a perforation about 1 mm. in diameter.

Clam and *Haliotis* beads. The other shell beads, those of clam and *Haliotis* shell, all occurred between 80 and 140 cm. Both clam (*Macoma*) disc beads (Fig. 8u) were between 100 and 140 cm. deep in the midden. They measure 9 and 11 mm. long by 8 and 11 mm. wide. Both have a conical perforation 2 mm. in diameter. The two square *Haliotis* beads (Type 1) (Fig. 8v) are from below the rocky zone also. One was with Burial 7 at 100 cm., the other from the midden in the 80 to 100 cm. level. A single *Haliotis rufescens* disc bead (Fig. 8w) occurred at a depth of 140 to 160 cm. in the midden and a subrectangular freshwater clamshell bead (Fig. 8y) occurred in the 180 to 200 cm. level. This bead was clearly in the mixed midden - sterile clay zone. It measures 13.5 by 15.5 mm. and has a central perforation 2 mm. in diameter.

STONE BEADS

Three types of stone beads occurred in the site. Two types are from the midden and the other type occurred only with Burial 27. The Burial 27 beads, noted previously, are small, thin steatite discs measuring from 3.5 to 4.5 mm. in diameter by 1 to 2 mm. thick (Fig. 8aa). The perforation averages 1.5 mm. in diameter. All are made of gray-green or black steatite.

One gray-pink-colored stone disc bead (Fig. 8bb) occurred in the 140 to 160 cm. level. It measures 6 mm. in diameter and 4 mm. thick. The material is dubiously identified as calcite.

The last stone bead is a tubular steatite bead (Fig. 8cc) from the 120 to 140 cm. level. Though fragmentary, it measures 13 mm. long and was ca. 10 to 11 mm. in diameter. It is biconically drilled.

BONE BEADS

Eleven short tubular bone beads occurred in the site. These include two of bird bone, both of which have cut ends and overall polish (Fig. 8ee).

Both are less than 25 mm. in length. The largest may be a reworked whistle fragment. None were grave-associated.

Nine rabbit bone beads were found, eight from the midden and one with Burial 10 at 103 cm. (Fig. 8dd, ff). All are slender sections of bone with the ends broken off and polished. The shaft also exhibits some polish. Apparently they were not purposefully polished like the bird bone specimens. Polished ends (string wear?) produce the most reliable identification of these as beads.

The midden distribution is from 40 to 220 cm. with six occurring below 120 cm. The single grave-associated example has already been noted.

SHELL ORNAMENTS AND MISCELLANEOUS SHELL OBJECTS

The total shell artifact sample (38) includes only five associated with burials (Tables 3 and 4). This is in contrast to the frequency of grave-associated shell artifacts at site 4-Mer-14 in the Los Banos area (Riddell and Olsen 1965) and for the Delta and San Francisco Bay areas (Beardsley 1954: 72, 83).

The shell ornament typology follows Lillard, Heizer and Fenenga (1939) with exception of Type RC(1), which designates the "ring"-shaped *Haliotis* ornament, and is an extension of the Lillard, Heizer and Fenenga typology established by Beardsley (1954: Fig. 7b, endnote 177). Type M2d II is after Gifford (1947).

Thirty-four of the shell objects are made of *Haliotis* shell, three of freshwater mussel (*Margaritifera*), and one of *Mytilus*. The 34 *Haliotis* specimens include 12 totally unclassifiable fragments (one with a burial) and eight partly-worked rim section fragments. The latter apparently are the results of local manufacture or reworking of broken ornaments.

Of the 20 fragmentary pieces, ten are of *Haliotis rufescens* and the remainder have the identifying callus ground or split off. The depth distribution (Table 4) of the fragments suggests they occur more frequently in the rocky zone (ca. surface to 80 cm.) than in the lower levels, but this is of dubious value in view of the nature of the specimens.

The typable ornaments include two basic forms, rectangular (Type B) and circular (Type C).

The Type B forms include three imperforate rectangular specimens (B) (Fig. 8hh) fashioned from a rim section, a tapered rectangular specimen perforated at the wide end and in the center (B.(1)1) (Fig. 8ii) and a broken elongated square fragment with serrated edges (B.?b.) (See Tables 3 and 4). All of these occurred in the midden below the rocky zone. Types B.- and B(1)1 are of *Haliotis rufescens*, the B.?b. example has the epidermis ground off.

The circular midden ornaments include a small edge-perforated irregular disc with simple radial incising (C.1.a) (Fig. 8jj) in the 20 to 40 cm. level and two fragmentary Type RC(1) ("ring") ornaments (Fig. 8kk) from the 40 to 60 and 120 to 140 cm. levels. The latter has a reconstructed outer diameter of ca. 33 mm. and an inner (hole) diameter of ca. 20 mm. Both of these have the epidermis layer removed by grinding.

Three circular ornaments, one fragmentary, occurred with Burials 6 and 13. Burial 6 (183 cm.) had a single disc ornament with central perforation, two edge perforations and serrated edge (Type C(1)2b) (Fig. 8nn) in association. Burial 13 (60 to 100 cm.) had one complete disc ornament with one central and edge perforation and serrated edges (C(1)1b) (Fig. 8mm) and fragments of a second disc ornament with central perforation and serrated edges. Unfortunately, the association is poor for both specimens. The complete Burial 13 example is of *Haliotis cracherodii* while the other two specimens have the epidermis removed by grinding. Significantly, all the centrally-perforated and serrate-edged shell ornaments were near the base of the rocky zone or in the lower midden. The single edge-perforated, incised ornament was above all of these and completely within the upper rocky zone.

The last ornament is oval with tabbed ends, twin perforations and fineline, crosshatched-edge incising (Fig. 8oo). It is classed as Gifford's (1947: 20, 78) Type M2d II. The back is ground extensively but not enough to completely remove the distinctive reddish callus characteristic of the red abalone (*Haliotis rufescens*). The single example occurred with Burial 27 in the upper midden of Trench A.

Freshwater Mussel Shell Artifacts. Only three artifacts of freshwater mussel shell occurred in the site. An imperforate disc, possibly of *Margaritifera*, occurred in the 160 to 180 cm. level (Fig. 8z). It has ground edges but is otherwise unmodified.

A small fragment of mussel shell, unidentified as to species, has a ground serrated edge. The depth, 20 to 40 cm., suggests it is of recent derivation. The last specimen is a small fragment of unidentified mussel shell with a ground edge. It is from the 160 to 180 cm. level.

The mussel shell disc is from the compacted basal midden and thus ranks as the earliest of the shell ornaments from the site. One unclassifiable *Haliotis* fragment occurred in the contact zone between the loose dark midden and the compacted basal midden, but may have been in an intrusive midden-filled rodent burrow.

Mytilus Shell Fishhook. A single fragment of a circular (?) *Mytilus* shell fishhook was recovered from the 40 to 60 cm. level in the midden (Fig. 8ll). It is a curved, tapered piece with both terminal portions now missing. There is no doubt as to its identification as a fishhook fragment, however. Though the original form cannot now be determined, it is identical in material, size, curvature and workmanship to the fishhooks and fragments recovered by Pritchard from site 4-Mnt-101 on Monterey Bay (Pritchard 1968), and presumably like those reported by Evans (1967: 25) from 4-Mnt-371 (College Site 1). Apparently the use of these shell fishhooks lasted until historic times on the basis of the work at 4-Mnt-371 since historic objects were recovered from the site, although depth data are not presented in Evans' preliminary report.

Shell fishhooks of a variety of forms are known from southern California (Gifford 1947: 44-45, 110), but the fragment from 4-Mer-S94 is too incomplete to make a type determination. It is obvious, however, that fishhooks of *Haliotis* or *Mytilus* shell are a coastal and not an interior valley trait. Presumably this single example represents a trade item or a specimen actually obtained by interior people visiting the coast.

POLISHED STONE ARTIFACTS

The following artifact forms include the polished stone objects presumably comprising a portion of the ornamental and socio-religious complex. Some of the items included in Tables 5 and 6, therefore, will not be discussed in this section.

Stone "Rings". Seven flat, circular schist or slate "ring" ornaments occurred in the site, none in burial association. As can be seen in Table 6, they tend to occur in or just below the upper rocky zone, but two come from deep in the midden.

The schist specimen and three of the slate examples are relatively thin rings with large perforations (Fig. 12r, s). The two smaller examples are rather thick and have small perforations (Fig. 12t, u). They may actually represent large beads rather than ornaments. The largest specimen is rather thin and has a smaller perforation in relation to its overall diameter (Fig. 12p). It clearly is a ring, however. Presumably these pieces were strung as ornaments, but judging from their nonoccurrence with burials, must not have been highly prized. All appear to be made of local material.

Incised Stone "Ring" (Fig. 12q). This single specimen is unique to the site and apparently to central California as far as is known. It is a fragmentary section of a thick, laterally-flattened ring with an encircling groove, incised into the exterior surface. The outer edges are also incised producing two flattened truncated ridges around the outer edge. Its reconstructed outer diameter is 30 to 32 mm. and the interior diameter is ca. 25 mm. The ring tapers slightly and the interior surface exhibits a series of transverse scorings, perhaps as a result of reaming out the perforation. The material is a fine-grained, hard, translucent green stone, probably serpentine or jade. The latter is entirely possible, since jade occurs along the coast south of Monterey Bay. The specimen occurred near the base of the dark midden deposit.

Perforated Gorget (Fig. 13f). This unique artifact type is represented by a single midden specimen from the upper rocky zone. It is made from a rectangular, flattened sandstone cobble. Both faces are ground and smoothly polished. Near each "corner" is a biconical perforation. These measure about 4 to 5 mm. in diameter. The perforations are rather irregular due to imperfect drilling. Some string wear is also apparent. Presumably this piece functioned as a large ornament or as the centerpiece of a necklace. Its possible use as an atlatl weight (balance) cannot be ruled out as the four holes provide a good way of attaching the stone to the shaft of the atlatl. Its occurrence in the upper rocky midden may be misleading since one edge is slightly flaked, suggesting that it saw limited reuse as a chopping tool.

No comparative specimens are known from the San Luis-Los Banos-Little Panoche area and, so far as is known, none are reported from the Sacramento-San Joaquin Valleys. A variety of stone objects are reported from Southern California, but none are especially comparable.

Perforated Pebble Pendants. Ten flat, irregular slate or shale pebble pendants occurred in the site. Nine of these are from the midden, five in the upper 60 cm., and four from 120 to 240 cm. One was associated with Burial 7 at a depth of 103 cm. The two or three deepest examples apparently were in the compacted basal midden zone, but rodent displacement cannot be ignored in this respect.

The form of these pieces, though all are fragmentary, can be more-or-less accurately ascertained. Six are oval in outline with a biconical perforation near one end, or almost centered (Fig. 12j, m, n, o). Three are rectangular or subrectangular with a hole near one end (Fig. 12i, h, l). The last apparently was triangular with a perforation at the narrow end (Fig. 12h). Three exhibit some slight edge-grinding or shaping, and the remainder are simply perforated natural sections of shale or slate.

Perforated Stone "Rod" (Fig. 12f, g). Two specimens of this type occurred in the upper rocky midden zone; both were made of gray slate. They have a biconical perforation near the flattened proximal end. The opposite end is broken off in both instances, but judging from the taper, it was more-or-less pointed on both examples.

Grooved Stone "Rods". Two specimens, one of slate, the second of dense green serpentine, are included in this class. Both are from the midden, the former in the 80 to 100 cm. level, the latter in the upper 20 cm. of the deposit.

The slate specimen is oval in cross section and tapers to a blunt rounded point (Fig. 12d). It has an encircling groove 7 mm. from the pointed end. The wide end (10 by 6 mm.) is broken off but subsequently was ground smooth.

The serpentine specimen is cylindrical in cross section, broken at one end and bluntly pointed at the complete end (Fig. 12e). An encircling groove is located at the midpoint of the fragment. Its original length is undeterminable.

Flat Slate Pendant Fragments. A medial section of a thin, flat, well-finished slate pendant (?) occurred with Burial 7 (100 cm.) (Fig. 12c). It is the only specimen of this specific type from the site. Two other flat, thin sections of slate, with some evidence of grinding, occurred in the midden. Both are of local brownish-colored material and are rather crudely

fashioned when compared to the Burial 7 example. They presumably are rejects and of local manufacture.

Stone "Pin" or Rod Fragments. Sixteen subrectangular to cylindrical slate or serpentine "pin" or rod fragments occurred, all in the midden. Six of the fragments are cylindrical in cross section; four of these taper to a point at one end (Fig. 12b). The remainder are nondescript blunt-ended (4) or medial (6) fragments, with evidence of grinding and polish on the sides and edges. One of the cylindrical fragments is almost identical in diameter and material to the unperforated grooved serpentine rod. Presumably, this was a preferred material due to its pleasing color in contrast to the slate objects.

The depth distribution of these pin or rod fragments indicate they are most frequent below the rocky midden zone, but well above the yellow clay zone. This is somewhat in contrast to the perforated and grooved forms. Judging from the use of local material, most of these pieces are of local manufacture.

Flat, Pointed Actinolite Splinter. One flattened, ground splinter of greenish crystalline actinolite was recovered. The modification is minimal and is confined to the edges and the pointed end (Fig. 12a). It occurred in, or just below, the rocky midden zone.

Worked Flat "Slabs". Three elongated, flat schist or slate slabs with edge-grinding occurred, all in the midden. The two smaller pieces are natural flat pebbles which exhibit edge-polish or grinding but only a minimum modification of the original shape (Fig. 13d). The largest example, made of tabular schist, was shaped by pecking along the edges which were subsequently ground smooth (Fig. 13c). Presumably, all of these represent unfinished objects akin to those already described. All occurred from 120 to 160 cm., well below the rocky midden zone.

Grooved Flat Slab. This specimen is a thin, flat slate slab with a narrow V-shaped groove across one face (Fig. 13e). A series of deep scorings occur parallel to the groove. The groove measures 4 mm. wide and 1.5 to 2 mm. deep. Presumably the piece represents a sharpening stone for bone or wooden implements. It is also conceivable that the groove was the initial stage of cutting the slab into narrow tabular sections for use in manufacturing slate

pendants.

Charmstone (Fig. 13b). A single conical charmstone made from a mottled granite pebble occurred in the 120 to 140 cm. level of the site. The wide end has a ground transverse notch while the opposite end tapers to a blunt point. The sides exhibit some polish but apparently only slight shaping from the original form of the pebble.

The method of suspension, if such was the case, is not clear. Possibly a cord was affixed to the narrow end with mastic, or the notched end was somehow utilized for cord attachment. It is also conceivable that the piece was not suspended, but was carried in some manner (e.g., kept in a basket).

Tubular Pipe (Fig. 13a). The single pipe from 4-Mer-S94 was apparently associated with Burial 13 at a depth of 60 to 100 cm. The specimen is made of a light-green steatite or fine-grained mica schist. It is essentially tubular in form but a shallow encircling groove has been cut ca. 10 mm. from the mouthpiece (narrow) end of the tube. The bore has been drilled at the narrow end but a series of longitudinal grooves are apparent at the bowl end. Possibly it was first drilled then enlarged by a gouging technique. The exterior exhibits some polish which has all but been eliminated by subsequent longitudinal grinding. Apparently the specimen was in the process of being refinished at the time of interment. No evidence of burning is present in the bowl and no evidence of a bone mouthpiece was present.

Polished Serpentine Fragments. Three fragments of green serpentine exhibit grinding and polishing. The largest is roughly concavo-convex in cross section and the exterior (convex) surface is ground smooth. It was recovered from the general area of Burial 1 (73 cm.). The second fragment is an irregular lump of serpentine with slight grinding on one flat surface. It came from the 80 to 100 cm. midden level. The last fragment, made of gray-black steatite, has two concave polished surfaces, but is too small to clearly indicate the form of the original artifact. It comes from the 20 to 30 cm. level and may be a fragment of an ear-spool.

BONE ARTIFACTS

Relatively few of the recovered bone artifacts (most of which are fragmentary) may be classed as ornamental or ceremonial in nature. The only frequent artifacts in this class are bird bone whistles.

In fact, whistles were the only distinctive bone artifacts associated with burials. The bone artifacts are tabulated in Tables 7 and 8.

Drilled Coyote Tibia (Fig. 9b). A fragmentary proximal portion of a coyote tibia has considerable polish and grinding along the shaft and a drilled perforation through the articulating surface of the proximal end. The perforation measures 10 mm. in diameter. The specimen came from the upper rocky midden zone.

Drilled Artiodactyl Toe Bone (Fig. 9d). This curious specimen is fashioned from a deer (or antelope?) distal phalange. Both the proximal and distal articulating ends have a punched or gouged perforation, which creates a short bone tube. (A second specimen was recovered from the site in early 1968 and is not included in the tables.)

Comparable specimens from central California are unreported archeologically. Possibly this piece functioned as a sucking tube, as a guessing game counter (Kroeber 1925: 515, 539), or as a portion of the "ring and pin" game.

Perforated Canine Tooth (Fig. 9a). Two badly burnt and fragmentary, biconically-drilled canine teeth (coyote?) were recovered from the midden. Both were below the rocky zone, and one is close to the contact between the lower midden zone and the compact basal midden.

Mammal Bone Tube Fragments. Three small broken fragments of heavy mammal bone have one end cut off and ground smooth. Though all are extremely fragmentary, they apparently represent heavy tubes with an estimated diameter of 17 to 18 mm. Of the three, two are from the upper 40 cm. of the deposit, the last from the 80 to 100 cm. level.

Bird and Mammal Bone Whistles. Five complete and one fragmentary bird bone whistles were recovered from 4-Mer-S94. Two were loosely associated with Burial 13, and single examples occurred with Burials 10 and 18. The two remaining specimens from adjoining units (4N-2W, 6N-2W) are from the 80 to 90 and 120 to 130 cm. levels in the area of Burials 9 and 10. Both are similar to the example with Burial 10 and possibly were originally associated with that burial.

Two types of whistles may be segregated on the basis of hole placement in relation to the ends of the shaft. The first type, both with Burial 13, are made of fairly large diameter bird bone, have both ends neatly squared off and have a single hole about midway on the concave surface of the shaft (Fig. 9h, l). The hole is subrectangular to nearly square and has been made by cutting a section from the shaft sidewall and then grinding the cut edges smooth. On one specimen, the hole extends almost halfway through the shaft. The hole position, expressed as a percentage of the distance from the center of the hole to either end, is diagnostic of this type. On the smaller specimen it is 45.5 percent (large end) and 54.5 percent (small end), and on the larger 53.5 percent (large end) and 46.5 percent (small end).

The longer example has faint traces of fine cordage wrapping near one end for a distance of 10 mm. The cordage apparently was ca. 1 mm. in diameter. There are also traces of asphaltum on the interior of the shaft below the hole.

The shorter specimen exhibits no evidence of binding or asphaltum near the hole. The exterior shaft, however, has five encircling bands of crosshatched incising 10 mm. wide. A large panel near the wide end is undecorated (Fig. 9h).

The second whistle type occurred with Burials 10 and 18, plus two from the midden near Burial 10. All four are made of bird ulnae sections. Three (all with or near Burial 10) are from smaller birds, and the last is of a large diameter ulna (Burial 18) (Fig. 9g, i, k).

Of the three small specimens, one has a well-trimmed small end and neatly broken-off wide end. The other two, one a fragment, have broken-off ends. The hole is unfinished on one specimen, but it like the other two, is oval in outline and was fashioned by cutting a section from the shaft sidewall. One specimen also exhibits traces of wrapping near the small end.

The large example of this type also has an oval-cut hole. Both ends are squarely trimmed off, but the end nearest the hole is obviously reworked after being broken (Fig. 9k). This specimen is unique in that the asphaltum plug is still in place. It is saddle-shaped and completely fills the bottom of the shaft below the edges of the hole.

Like the first whistle type, these whistles also

have the hole located on the concave side of the shaft. The hole placement is definitely toward the wide end of the shaft, however. The data for hole placement expressed as a percentage is as follows: large specimen 20 percent from wide end, 80 percent from small end; small specimens (one lacking wide end) from wide end 27.7 percent and 36 percent, and from small end 72.3 percent, 64 percent and 68.8 percent, the latter figure an estimate based on reconstructed length.

It is clear that two forms of whistles are present in the site, on the basis of hole placement. There is also slight internal evidence to suggest that they are not more-or-less contemporary, however, even though those with Burial 13 are the shallowest. This question, with the addition of comparative data, will be discussed in the summary section.

The single whistle of mammal bone is fashioned from a medium-sized mammal tibia (Fig. 9j) (fox or bobcat?). Both articulating ends have been trimmed off by cutting or breaking. The hole is located slightly off-center toward the wide (proximal) end of the shaft. It has been fashioned by cutting or reaming out a section of heat-scorched bone. The only scorched area on the shaft is where the hole is located suggesting that that burning was an intentional step in the perforating process.

No other mammal bone whistles are known from the general area, but even larger specimens are reported from the Delta region in a Middle period context (Beardsley 1954: 74).

Worked Bird Bone. A single small-diameter bird bone was associated with Burial 10. The feather nodes and shaft have been ground and polished and the ends are partly trimmed by breaking away a portion of articulating surface. Presumably, the specimen represents a whistle blank.

Polished Bird Bone Fragments. Five fragments of worked bird bone are included in this section. Of these, two are small with cut, polished ends; two are fragments with broken ends but with grinding and polish showing on the shaft; and the last is a trimmed-off articulating-end section (Fig. 9f). The latter is included as it exhibits some polish on the shaft segment still remaining. It may represent raw material, possibly for a bead, on the basis of its length (41 mm.). The other fragments presumably represent tubes or whistles, but provide no data as to their original form.

Incised Bone Fragments. Two small splinters of mammal or bird bone have traces of simple encircling incising. The larger is an end fragment of a tubular piece. One end is neatly cut off and a single shallow incised line occurs 15 mm. from the cut end. The specimen is from the rocky midden zone.

The second fragment, from the 160 to 180 cm. level, is a small splinter of thin polished bone with one end cut off. It has four shallow incised lines across the long axis of the shaft.

Neither fragment is large enough to suggest the original size of the specimen. The occurrence of these small fragments plus the incised whistle indicate only slight interest in this art during the entire span of the site's occupancy.

Spatulate Bone Fragments. Twenty-five flat, thin spatulate bone fragments are included in this class. The narrow pieces are 6 to 7 mm. wide, and the wider ones are 9 to 17 mm. wide.

The narrow spatula fragments include two pointed-end fragments and four medial sections (Fig. 10e, g). One of the latter appears to be from a deer or antelope outer metatarsal (splint) while the remainder are split sections of mammal bone.

The wide form includes one more-or-less complete example (associated with Burial 24) and 18 fragments from the midden (Fig. 10c, d, l, n). One of the latter is of split antler rather than bone, but is of the same form. The bulk of the specimens (12) are split fragments with a sharp or narrow rounded edge. When complete, most of these would have been at least 15 to 20 mm. wide. Three narrower fragments are 9 to 11 mm. wide but at least two were originally wider judging from their taper.

The remaining four specimens consist of three complete medial fragments and one large proximal-end fragment. All measure from 14 to 17 mm. in width and from 4 to 7 mm. in thickness. Three have a lenticular or plano-convex cross section and the last has a concavo-convex cross section. The latter (from Burial 24) is a split section of large mammal bone with the edges cut and polished. The proximal end was roughly broken off and ground smooth (Fig. 10l). It and the other three larger pieces possibly represent heavy bone tools rather than nonutilitarian objects.

The last specimen differs from those already

described in that it has a notched edge. The original form is unknown, but one broken end has been partially ground smooth after breaking.

Of the 25 spatulate bone specimens, 11 come from the upper rocky midden zone (surface to 80 cm.) and 14 come from below 80 cm. in the deposit. In view of the total distribution of the bone artifacts from the site it is clear that the spatulate bone objects are one of the distinctive deep-level forms.

MISCELLANEOUS STONE OBJECTS

This last descriptive section under the general heading of Ornamental Artifacts includes only three classes. These are unworked serpentine or actinolite fragments, quartz crystals, and red or yellow pigment lumps. Data on these items are included in Tables 15 and 16.

Unworked Serpentine and Actinolite Fragments. Twenty-three splinters of actinolite or lumps of serpentine occurred in the midden, none with burials. Most of these fragments apparently represent either waste or unused raw material.

Quartz Crystals. Twenty-two more-or-less complete crystals were recovered, all but three unassociated in the midden. One each was apparently associated with Burials 1, 24, and 34. All are about the size of the end of one's little finger. A small number of broken fragments also occurred, but only those in the three units where the chipping waste was analyzed were tabulated. Crystals, in general, are more frequent in the upper half of the deposit but occurred sporadically in the lower levels also. It is of interest to note here that two quartz projectile points, one of crystalline quartz, occurred in the site. The latter indicates that crystals larger than those recovered were available to the site inhabitants.

Pigments. Pigment lumps, either red or yellow, occurred frequently in the deposit, especially below 100 cm. Of the 108 pieces, 100 are hematite and eight are limonite. Seven of the eight limonite lumps occurred below 100 cm.

Few of the lumps exhibit evidence of use, that is, grinding. Many were so small that they would have been of little value. Some are of dubious quality and may actually be burnt fragments of fine-grained sandstone. All of the tabulated example could have been utilized as pigment on the basis of color and texture, however.

DISCUSSION OF ORNAMENTAL SHELL, POLISHED BONE, AND STONE ARTIFACTS

Comparative materials for the Grayson site are scanty. It is clear, however, that the site does not relate at all closely to previously excavated sites in the area (4-Mer-3, 14 and 4-Fre-128, 129). Thus the bulk of the comparative material must be drawn from other areas: Sacramento-San Joaquin Delta, San Francisco Bay region, and a few scattered sites (mostly unpublished) in the San Joaquin Valley.

The bead complex at 4-Mer-S94 suggests that three or more occupation periods are represented, although the depth data do not clearly bear this out. Essentially confined to the Central California Middle period in the Delta and Bay regions are *Olivella* bead Types 3b1, 3b2, and 3c along with the *Macoma* and *Haliotis* disc beads with epidermis not removed (Bennyhoff and Heizer 1958). At 4-Mer-S94, Types 3b1 and 3b2 are confined to the lower midden. It may be significant that the single split-drilled bead (3b1) was near the base of the midden while the modified saddles (3b2) were from the upper portion of the lower midden. The disc-shaped *Olivella* beads, classed as Type 3c, occur at the same depth as do the 3b2 beads, but also occur in the rocky midden zone. Possibly their shallow occurrence is due to rodent disturbance. Type 3c *Olivella* beads are reported from an unpublished site (4-Sta-133) (Foote n.d.) to the north of 4-Mer-S94. Here they were clearly in a Middle period context (L. J. Foote, personal communication) and were associated with large and small spire-ground and saddle (Type 3b) *Olivella* beads. The latter type, curiously, did not occur at 4-Mer-S94, but is a diagnostic of the Middle period (Bennyhoff and Heizer 1958). From 4-Mer-7 just east of Los Banos came five burials, one of which had Type 3c *Olivella* beads along with a Type C(1) *Haliotis* ornament and a large obsidian projectile point. The burials are noted as having been removed from "hard soil". (Data obtained from University of California Archaeological Survey - now Facility - site record file for Merced County.)

Disc-shaped clamshell beads occur in historic or protohistoric sites in the San Joaquin Valley and in the Monterey Bay area (W. E. Pritchard, personal communication), but these clearly are not related to the Central California Middle period *Macoma* disc beads (Cook and Elsasser 1956: 36; Bennyhoff and Heizer 1958: 65). Occurrences of *Macoma* clam disc beads in the San Joaquin Valley, previous to the excavation of 4-Mer-S94, are unknown, but a specimen from the Tranquillity site described as a

"disc bead of clamshell 10 mm. in diameter" (Hewes 1946: 213) suggests that a *Macoma* bead is represented. This site is located about 60 mi. southeast of 4-Mer-S94 in the San Joaquin Valley proper. The single *Haliotis* disc bead from 4-Mer-S94 apparently is a Middle period form since the epidermis is intact. So far, none of the late *Haliotis* disc beads from the area are identical to this example. The single specimen occurred deep in the midden arguing that it is part of the earlier complex at the site.

The small spire-lopped beads (Types A1a, A1b and A1c) and the end-ground variants (Types A2 and A3) are of little diagnostic value at 4-Mer-S94. Bennyhoff and Heizer (1958: 81, endnote 14) indicate that the "small" beads (Types A1a and A1b) are most frequently in the Early period and Phase I of the Late period. They are, however, known from all periods, as are the larger spire-ground beads. Both forms occurred at 4-Mer-3 and 4-Mer-14 in a Late period context (Pritchard 1966: Appendix 2 and 3; Riddell and Olsen 1965).

The one grave lot (Burial 6) of thin rectangular beads (Type 2a1) near the base of the deposit are an anomaly. This bead type is the diagnostic form for the Late Phase I period in Central California (Bennyhoff and Heizer 1958: 67). The association of this bead form with a *Haliotis* ornament of specific Middle period form (Type C(1)2b) and well below other definite Middle period beads, strongly suggests that the burial marks a transitional Middle Late Phase I occupation in western Merced County.

Since the burial is intrusive, it is clear that the deep midden bead complex predates this burial. This form is a basic part of the bead complex at 4-Mer-14 and in the early occupation at 4-Mer-3 (Pritchard 1966: 94), though the context at 4-Mer-S94 is quite different.

The last *Olivella* bead type is the large, thick, rectangular bead (Type 2b). The depth occurrence of this form is peculiar in several respects. Three of the midden beads are deep and below the Type 3b1, 3c and *Macoma* beads. However, two occurred in the upper levels and two occurred with burials in the midden. Thus, all but the deep midden beads appear to date from the same period, or later than the "Middle" period bead complex. It is possible that they represent a variant rectangular Late Phase I bead. Such variants, though not identical to the 4-Mer-S94 beads, have been recovered from 4-Mer-14.

Typically the form is representative of the Central California Early period in the Delta (Heizer 1949: 17, Table I; Bennyhoff and Heizer 1958: 63), but no definite evidence of the complex, as it is now known, is present in the Los Banos region. We feel that the few "early" traits noted, clearly indicate some antiquity, however.

The last bead form is the rectangular *Haliotis* bead. These beads occur most frequently in the Early period in central California, but later occurrences are known from the transitional Early-Middle period, Berkeley facies in the San Francisco Bay area (Bennyhoff and Heizer 1958: 64-65, Table 2), as are the thick rectangular *Olivella* beads.

The shell ornaments include only a few diagnostic forms. Types C(1)2b and C(1)b are clearly related to the Central California Middle period, a thesis strengthened by one being made of *Haliotis cracherodii* (Beardsley 1954: 72). The Type B(1)1 *Haliotis* ornament and the fragmentary example with a serrate edge (B?.b) are clearly related to this same tradition. The fragmentary *Haliotis* ring ornaments RC(1) are also diagnostic of the Middle period (Cook and Elsasser 1956: 40-41, Table 3), but also occur in the southern San Joaquin Valley in a different context (Wedel 1941: 51, 95). The association of these latter specimens indicates a protohistoric or "Late period" date. They certainly are not temporally comparable to the Sacramento Valley-Bay region "ring" ornaments. Ring ornament fragments of *Haliotis cracherodii* are reported by Pritchard (1966: 98) from 4-Mer-3, all from disturbed midden.

The partially-worked rim fragments, unclassifiable fragments and a single imperforate rectangular ornament would appear to indicate local manufacture of shell ornaments. The occurrence of such refuse throughout the deposit indicates some time depth for the practice. Worked rim fragments occurred at 4-Mer-3 (Pritchard 1966: 97-99) in addition to several complete rectangular specimens. The bulk of the waste apparently is attributable to the protohistoric occupation at 4-Mer-3. No waste material of this sort occurred at 4-Mer-14 and rectangular rim ornaments are lacking here, also.

The late occupation at the Grayson site is best represented by a single small disc ornament (C.1.a) and one grave lot recorded in 1967 from the upper 50 to 60 cm. of the deposit in the northeast quadrant of the site. This lot included a single "tabbed" ornament (Gifford's Type M2dII) along with small *Haliotis*

epidermis disc beads, steatite disc beads, and small *Olivella* disc beads. This lot is clearly attributable to the late period as known from Panoche complex sites 4-Mer-3A and 4-Fre-128 and 129 (Pritchard 1966; Olsen and Payen 1968).

The worked mussel shell fragments are worthy of little comment. Serrated mussel shells occurred in all of the excavated sites (4-Mer-3, 4-Mer-14, 4-Fre-128, and 4-Fre-129) in the area. The single fragment at 4-Mer-S94 was shallow, but this seemingly has little meaning.

The ground disc and fragment probably have little diagnostic value. Ground mussel shells are not infrequent, and are known from most parts of California.

The remaining bead types include a subrectangular freshwater mussel shell bead, two stone beads and the short bone beads. The mussel shell bead, on the basis of form, may be related to the Type 1 (square) *Haliotis* beads. It occurred in the transitional midden-yellow clay zone well below all but the thick rectangular and small or medium spire-ground *Olivella* beads. The stone beads include a steatite tube and a calcite (?) disc bead. Both were below, but in the same depth range, as the Type 3b2 and 3c *Olivella* beads and presumably belong to the same period. One tubular steatite bead is noted from the Middle period by Beardsley (1954: 72) but stone disc beads of material other than steatite or magnesite are uncommon, or not noted in the literature. Short tubular steatite or serpentine beads are reported from Buena Vista Site 1 by Wedel (1941: 54-55). All but one of these came from the upper (late) levels of the site.

The short bird or small mammal bone beads occur in most sites in the San Luis-Los Banos-Little Panoche area. They presumably lack temporal value.

The polished stone objects include a number of forms which are most frequent in the earlier portion of the central California sequence. The slate "rings", perforated flat pebbles and perforated or grooved slate "rods" are more or less definite Middle period forms (Beardsley 1954: 72). Slate "pins" or "rods" are known from protohistoric sites in the Los Banos region, but these do not appear to be part of a distinct polished stone assemblage such as that recovered from 4-Mer-S94.

The charmstone from 4-Mer-S94 apparently is

a unique form. No examples occurred at 4-Mer-14 or from the Little Panoche Reservoir area to the south. The most frequent forms in the San Joaquin Valley include various plummet, spindle or capsule-shaped types (Hewes 1941: 127-128; Gifford and Schenck 1926: Pl. 20, 22, 23, 32, 33 and 34), but none of these are end-grooved such as the 4-Mer-S94 example, though pieces with notched ends do occur.

The stone pipe is similar to one recovered at 4-Mer-3 by Pritchard (1966: 64), though the specimen lacks the encircling groove near the mouthpiece and is shorter than the Grayson example. The 4-Mer-3 pipe is attributed to the Late Protohistoric period, while the present example presumably is earlier. This attribution is not wholly supported by the data, as the burial with which the pipe occurred was clearly disturbed. Small cup-shaped pipe bowls occur in Delta and Sierran Foothill Middle period sites (Beardsley 1954: 75; Payen 1964), but no examples of this form are known from the Los Banos region. Pipes are unreported by Hewes (Hewes 1941) from the San Joaquin Valley, but Gifford and Schenck report a pipe, or tube, from the upper San Joaquin Valley (Gifford and Schenck 1926: 93).

The bone artifacts include only a few which are of diagnostic or temporal value. The drilled coyote tibia, drilled deer toe bone, mammal bone tube fragments, worked bird bone and polished bird bone fragments are either unique or too generalized in nature to suggest temporal affinities.

Perforated canine teeth are known from both the Early and Middle period in central California (Heizer 1949; Beardsley 1954: 73). They are most frequent in the Middle period, however.

Bird bone whistles with off-center holes are noted for the Middle period (Beardsley 1954: 74), but the type is retained into Late Period Phase I times on the coast (Beardsley 1954: 85), and Phase I examples are known from sites in the Colusa Province (Riddell and Olsen n.d.; Olsen n.d.). A series of whistles with off-centered holes are also known from 4-Mer-14 in a definite Phase I context. The whistles reported by Pritchard (1966: 79) from 4-Mer-3 on Los Banos Creek, so far as can be determined, all had centered holes. It is of interest to note that incised whistles were also recovered from the same site. The grave associations of one 4-Mer-3 whistle include bone awls, a bone tube, large and small spire-topped and small, thick disc *Olivella* beads and a steatite disc bead. A second burial was accompanied only with a

whistle. The other 4-Mer-3 whistles are from house pit fill, suggesting that they and the burial associated specimens all belong to the latest occupation at the site.

It is clear the deeper 4-Mer-S94 whistles date prior to those from 4-Mer-3 and typologically relate to those from the Middle period or early portion of the Late period. The two whistles from Burial 13 are similar to Late period central California Delta examples. The holes are more-or-less centered on the shaft and one is modified by the presence of decorative incising. It is clear, however, that temporal distinctions on the basis of hole position are not valid in central California (Hammel 1956; Davis 1960: 24). The grave goods with Burial 13 suggest that some of the objects are out of context, but do not entirely rule out affiliation with the earlier portion of the site.

The incised bone fragments suggest a late date, but one occurred at a considerable depth in the deposit. Incised bone objects are known from the Central California Middle period (Beardsley 1954: 73; Olsen 1963) and are most frequent in the protohistoric period both in the Delta (Beardsley 1954: 77) and in the western Merced-Fresno County area (Pritchard 1966: 82-84). One definite Late Period Phase I occurrence is known from 4-Mer-14 in the Los Banos region (Riddell and Olsen 1965).

The few miscellaneous stone objects included in this section are of little diagnostic value. Actinolite or serpentine splinters occur at all sites in the area, as do quartz crystals. The abundance of hematite at 4-Mer-S94 may be slight evidence of a minor Middle period trait (Beardsley 1954: 73), but pigment is used throughout the central California sequence. No beds of pigment associated with burials occurred at the Grayson site.

HUNTING AND WAR ASSEMBLAGE

This section includes only those items associated with the taking of game or objects associated with the preparation of game for consumption. It includes, therefore, certain of the chipped stone artifacts, some of the pecked or polished stone artifacts and a few bone artifacts.

PROJECTILE POINTS

Fourteen types or subtypes have been distinguished in the projectile point series from 4-Mer-S94. The total sample consists of 191 fragmentary projectile points or large bifaces and 71

classifiable complete or reconstructable specimens. Nonobsidian points, including chert, jasper, chalcedony and quartz made up about 64 percent of the total sample and ca. 80 percent of the typable points. In contrast to the other excavated sites in the Los Banos region (4-Mer-3 and 4-Mer-14) projectile points were relatively frequent. This could suggest that the use of stone points became less frequent in the Late period, but the data from the sites in the Little Panoche area (Fresno County) to the south hardly bear this out. The projectile points are tabulated in Tables 9 and 10.

Type 1a, 1b, and 1c (Fig. 14a to i). Leaf-shaped, rounded or pointed base, the greatest width of blade is medial. Seventeen specimens. These points occur from top to bottom of the deposit but appear to increase in frequency in the upper levels. Obsidian was used more commonly for this type than other types. The deepest point of this type, definitely from the compacted lower midden, indicates that obsidian was used in the earliest occupation at the site.

Type 2 (Fig. 14j). Leaf-shaped, slightly rounded flat base, wide point at base. The one specimen which occurred is made of obsidian. It is unique in that it appears to have been subjected to streamrolling which almost obliterated the flake scars. Presumably the point was collected as a curio by the site inhabitants. This specimen is of interest in that it could be evidence of sites older than 4-Mer-S94 in the area.

Type 3 (Fig. 15a to e). Slightly shouldered, triangular blade, pointed stem. Five specimens. Of the five specimens of this type, two occurred below 100 cm., and the other three were between 20 and 60 cm. Only the two obsidian points of this type are well-chipped and one of these apparently is a reworked fragment from a larger point. The depth distribution of this type suggests it was in vogue primarily during the terminal midden deposition period, but prior to the protohistoric occupation.

Type 4 (Fig. 15f, g). Slightly shouldered, tapered, squared stem, triangular blade. Two specimens. These two points are closely similar to Type 3, but the stem form is distinct enough to allow segregation into a separate type. The deepest example of this type is made of a dense greenish chert or quartzite, and exhibits considerable surface alteration or patination. The smaller chalcedony specimen, like the bulk of the chalcedony points, occurred in the

upper rocky midden. Both points are shaped entirely by percussion flaking.

Type 5 (Fig. 15h, i). Slightly shouldered, wide-pointed stem, triangular blade. Two examples of this type occurred, one made of red Franciscan chert or jasper; the other was of dense green chert. These two points are both well-chipped, with the flake scars extending well across the blade. The edges exhibit well-controlled retouch flaking unlike some of the other points made of nonobsidian material. The largest point (120 to 140 cm.) still has traces of asphaltum on the stem, and has a considerable calcareous deposit. The smaller example (40 to 60 cm.) is partly shattered near the tip and one edge is abraded suggesting it has seen use as a knife. Presumably, these large points represent dart or spear points.

Type 6 (Fig. 15j to m and Fig. 16a to f). Pronounced straight or slightly sloping shoulder, straight wide flat or slightly expanded stem. These are large, heavy points, all definitely percussion flaked with but slight pressure retouching along the blade. This point type is clearly most frequent in the rocky midden, eight of 12 above 80 cm., but two specimens occurred in the 140 to 160 cm. level and one is from the 220 to 240 cm. level in the yellow terrace deposit. One example was associated with Burial 40 (Trench B). It was deeply embedded in the sacrum, apparently causing death. The projectile struck the individual from behind with considerable force. This burial was just into the yellow clay, and presumably the pit originated in the lower midden zone. This is the only direct evidence found at the site for warfare or violent intravillage behavior. Several other fragments suggest that these heavy shouldered points were more frequent than our data would indicate, but clearly they are one of the distinctive point forms from the site.

Types 7a and 7b. Type 7a is represented by two fragmentary examples of obsidian. Both apparently had a flat base with large U-shaped sidenotches a short distance above the base (Fig. 16g, h). The width and thickness of the fragments indicate the original width must have been at least 25 to 30 mm. The specimens are well flaked but lack extensive pressure retouch. Grinding on the complete corner of the shallower specimen indicates use after the original point was broken. Both specimens must have weighed well in excess of 5.0 gm. on the basis of size.

The four Type 7b specimens are also side-notched with flat bases but are short, broad

points with less pronounced notches (Fig. 16i to l). In contrast to the Type 7a pieces, these specimens are all made of chert or quartzite and tend to lack pressure retouch along the margins. One example, of green chert, has had the base ground smooth. They cluster at the lower margin of the rocky midden, but one deep example came from the 140 to 160 cm. level.

Type 7c (Fig. 16m, n). Small, side-notched, concave base. This subtype is represented by only two chalcedony specimens, one of which is a basal fragment. These points are comparable to the small side-notched, concave-based points from the Little Panoche area, though neither is definitely of the distinctive deep-notched form classed as "Panoche Side-notched" from that area (Olsen and Payen 1968). The depth of both points, 0 to 10 and 40 to 60 cm., indicates they are representative of the brief late occupation of the site noted previously.

Type 8 (Fig. 16o, p and Fig. 17a to k). Side-notched point with rounded base. These points (22) typically are short and thick, somewhat variable in size and have wide U-shaped notches just above the base. There are two that are definitely reworked fragments of larger points and several other of the smaller specimens suggest that reworking of points was a common practice. On the basis of estimated weight, the type includes two points weighing 1.7 gm. to ca. 2 gm., seven weighing from ca. 3.0 gm. to 4.3 gm. and eight which definitely weigh over 5.0 gm. to the heaviest at 7.6 gm. plus. Five basal fragments are not usable in this respect.

The depth distribution of this point type, in view of its frequency, is of some interest. Ten specimens occurred in the upper 80 cm. of the deposit, ten between 120 to 160 cm., and two were below 160 cm. The deepest example is of obsidian.

The two quartz points from the site are both of this type (Fig. 16o, p). The chipping on both of these, as well as on the others, is poorly controlled and little retouch is apparent.

Type 9 (Fig. 14k). Large pointed base with small sidenotches well above the proximal end. The single example of this type was recovered from bulldozer Trench A in the midden. The tip is now snapped off, but apparently the specimen is at least two-thirds complete. The basal portion of the piece is stained with asphaltum up to the notches, indicating that it was hafted. On the basis of its size and shape, it probably served as a knife or spear point. It is not,

however, greatly larger than the lethal Type 6 stemmed point. The material of this specimen is somewhat unusual in that it is made from a milky white chalcedony. The bulk of the chalcedony points range in color from dark brown-black to tan or orange in color.

Type 10 (Fig. 17l). A single point of this type occurred. It has slight shoulders and a concave base which produces a distinctive "eared" appearance. The single specimen is made of poor-quality, gray-white chalcedony with crystal inclusions. It is almost completely percussion flaked with pressure retouch along portions of the blade. It occurred in the upper rocky midden.

FRAGMENTARY PROJECTILE POINTS

As is frequently the case, the majority of the projectile points consist of fragmentary specimens. At 4-Mer-S94, 60 percent of the sample consists of fragmentary specimens.

The projectile points fragments are about evenly divided between obsidian and various cherts or jaspers and other silicates. The bulk of the obsidian fragments are tip or medial sections of large, heavy points. Most of them are from 6 to 8 mm. thick, certainly far thicker than the small obsidian points from the general area. For the most part, the fragments are well-flaked. The flake scars tend to be rather broad and shallow and with little pressure retouch noticeable along the margins. Presumably these fragments, plus the few complete obsidian points, can be utilized to obtain a series of obsidian hydration dates for the site.

All of the chert, jasper and other silicate fragments also appear to be from large heavy points. They clearly conform to the typable projectile points in this respect.

The depth distribution of the fragments essentially conforms to that of the typable specimens. They were frequent throughout the midden, with a peak between 40 and 140 cm. The distribution of the obsidian fragments suggests a greater popularity below 80 cm. The significance of this is not clear, but extensive trade is certainly indicated for this period.

Four point fragments were noted as burial associations, but all are small sections. Their association is dubious in light of the frequency of point fragments in the midden, and thus they have not been tabulated as burial associated.

LARGE BIFACE FRAGMENTS

These fragments include 33 sections of wide (over 25 mm.), fairly thin specimens. All are bifacially flaked, like the projectile point fragments, but their width suggest that they may represent a discrete chipped stone type. As may be noted in Table 9, the typable projectile points rarely are wider than 25 mm. and all the types average less than this in width. Only point Type 6 (large stemmed) is consistently over 25 mm. in width, but these fragments certainly represent leaf-shaped rather than stemmed points. They are wider than all but three of the Type 1 points, thus, they presumably are not fragmentary examples of this type. Most likely they represent large leaf-shaped knives, but none exhibit use-wear which would substantiate this hypothesis.

They clearly are more frequent in the lower midden, below 80 cm. (11 above 80 cm., 22 below), and thus are a distinctive part of the earlier midden complex.

KNIVES

Five knife forms may be distinguished in the collection. These include: 1) a wide form with rounded base and triangular blade; 2) oval, either biface or plano-convex in cross section; 3) crude elongate bifacial fragments; 4) small prismatic-struck blades (knives?); and 5) large cobble flake knives. Data on the knives are included in Tables 11 and 12.

The Type 1 knives (3), all of jasper or chert, are fragmentary (Fig. 18j, k). The two larger ones are percussion flaked with some evidence of retouch or use-wear along the margins. The smaller one is a basal section, again percussion flaked. The depth, all in the 0 to 20 cm. level, or surface, indicates they are a late form, but no comparable specimens are known from the other definite late sites (Panoche complex) in the area.

The complete Type 2 knives are all ovate in outline with a biconvex or plano-convex section (Fig. 17t, u; 18l-o). The fragments, though not distinctive, are all bifacially flaked and appear to have been similar to the complete specimens. Of the five complete examples, four are chipped completely around the margins and one is chipped only along one side. All appear to have been struck from a prepared core. The flaking is rather gross, with a minimum of fine pressure retouch confined to the extreme edge. Wear along the margin occurs in the form of blunted or slightly crushed areas.

Type 3 knives (1) are very sparsely flaked bifacial pieces with rounded ends (Fig. 17s; 18p, q). All are completely percussion flaked and only minimal wear is exhibited along the edges. Conceivably, these pieces are rejects or broken unfinished Type 2 knives. All apparently were struck from a core specifically for use as knives.

The Type 4 knives are rather small prismatic flakes or blades struck from a prepared (?) core (Fig. 17r; 19a-d). All have parallel or slightly tapered sides, and squared or rounded ends. The three larger specimens are all from the 160 to 180 cm. level. Two have triangular cross sections and one is almost biconvex. The edges exhibit a slight amount of use flaking. The four smaller specimens include two from the 160 to 180 cm. level, one from the 140 to 160 cm. level and one from the 20 to 40 cm. level. One, from 160 to 180 cm., is leaf-shaped due to edge retouch, and all four are triangular or subrectangular in cross section. These pieces appear to represent a distinctive lower level trait. Their use as knives is not definite, but the used edge is definitely thinner than on the flake scrapers from the site.

The last knife form (Type 5) is fashioned from large ovoid basalt flakes (Fig. 19e). Remnants of weathered cortex still show on the specimens. The edges are abraded and polished but were never purposefully flaked. This type would have served admirably as a skinning or hide-dressing tool, as well as for heavier uses. A number of other large flat basalt or andesite percussion flakes were recovered from the site, but none exhibit clear evidence of use. Undoubtedly they, along with some of the larger silicate flakes, served as knives even though no evidence of such use is apparent.

The overall depth distribution of the knives clearly indicates the temporal precedence of the oval bifaced and prismatic "blade" forms over the other knives. The bulk of these occur below 120 cm. in the deposit, while two of the other three types all occur above 60 cm. The Type 3 knives have two shallow and three deep occurrences. It is clear that the bulk of the early knives tend to be small oval or parallel-sided forms, and that the late forms are triangular bifaces or struck cobble flakes.

ATLATL SPUR

This is the lone item in the polished stone class considered in this section. The pertinent data is presented in Tables 5 and 6.

The single spur is made from a small section of serpentine (Fig. 12v). It has a polished conical engaging end, while the opposite end is roughly worked down. A shallow transverse groove encircles the piece approximately at the midpoint. On the basis of depth, it clearly relates to the lower midden deposit.

BONE ARTIFACTS

Flaking Tools. The flaking tools (see Tables 7 and 8) include ten of antler and two heavy split-bone sections. All but two, both of antler, are small fragments which have snapped off near the utilized end. Of the 12 specimens, nine are tip fragments of antlers which have been ground to a blunt, or slightly pointed tip (Fig. 10j, k). Several show use-wear in the form of striations, while the others lack such wear. Only one of these is still large enough to use. It measures 58 mm. long, while the others are all under 30 mm. long. The other antler specimen is a split, worked-down section (Fig. 10i). The narrow end exhibits considerable wear and abrasion. It measures 25 mm. long and 8 mm. wide by 5 mm. thick. The bone examples are both split sections of large mammal bone ground along the sides. Both show a series of striations near the blunt tip.

Presumably, some of the other blunt-pointed bone fragments could have served as flaking tools. The antler fragments classed as "pointed antler fragments" also could have served as flakers, but have polished rather than striated ends. The flakers, and pointed antler tip fragments, have a continuous distribution to 180 cm. in the deposit.

COMPARATIVE ANALYSIS OF HUNTING AND WAR ASSEMBLAGE

The projectile point series from 4-Mer-S94 includes at least two complexes. The first is that marked by the two small side-notched Type 7c points made of silicate. Points of this type, referred to as "Desert Side-notched" after Baumhoff and Byrne (1959), were recovered from 4-Mer-3 by Pritchard (1966: 31-32, Fig. 17a-d). Here, three of the five points of this type with depth data occurred in the upper 12 in. of the deposit and are attributed to the Late Protohistoric occupation at the site. Small side-notched concave-based points termed "Panoche Side-notched" were recovered at 4-Fre-128 and 129 on Little Panoche Creek in western Fresno County. Here, too, they are attributable to the Late Protohistoric or Early Historic period (Olsen and Payen 1968). Gifford and Schenck (1926: 80-84)

record two forms which, in general, conform to this type (SCa3, SCb3). It is difficult, however, to determine from their Tables 7 and 8 just how many of the points of these two types are comparable to the Desert Side-notched or Panoche Side-notched forms, since the large and small points have been included as a single type. It is clear, however, that these point types are not frequent in the upper San Joaquin Valley. Baumhoff and Byrne (1959: 59-60, Table 13, suggest that in Central California, this point type was introduced after A.D. 1600. Such a date is entirely compatible with our data from the Los Banos, Little Panoche Creek area. It also bears out our supposition that only slight occupation in late times is present at 4-Mer-S94.

The remaining point types, all large, include a series of leaf-shaped, stemmed and sidenotched forms. It is clear from Table 10 that some of these types are confined to the upper rocky midden zone. Point types wholly confined to the upper levels are lacking, however. Specimens of Types 1a, 1b, 4, 6, 7b, and 8 appear to be the oldest forms. Types 1a, b, c, 3, 6, 7b, 7c, 8, and 10 occur frequently in the rocky midden zone. While a number of types occur, it is clear that only Types 1 (leaf-shaped), 6 (side-stemmed) and 8 (side-notched) are frequent. It is obvious that the points from 4-Mer-S94 are heavier than the projectile point series from protohistoric components in the area. We thus assume that these points represent dart points, and the small side-notched and triangular forms from the Late sites represent arrow points.

The fragments indicate that the large bifaces are most frequent in the lower midden deposit, but the smaller fragments are relatively constant throughout the deposit. The frequency of obsidian fragments in relation to complete points and obsidian chipping waste indicates that the obsidian was traded into the area in finished form.

The projectile point sample from 4-Mer-S94 is similar in some respects to that from Buena Vista Lake Site 2 (Wedel 1941). Here the bulk of the points were heavy and crudely flaked. The stemmed forms are reminiscent of the 4-Mer-S94 points (Wedel 1941: 99). The materials, jasper and chert with a reduced frequency of obsidian, are also reminiscent of 4-Mer-S94. A preference for chert or jasper is also indicated by the data presented by Gifford and Schenck (1926: 82-84) for the Tulare Lake-Alpaugh region. The large stemmed points from the Coalinga

area (Hewes 1941) possibly indicate an affinity to that area in the period or periods represented at 4-Mer-S94. The concave-based blades noted by Hewes (1941: 129) for the Los Banos region have not, as yet, been recovered from any of our sites.

The heavy stemmed points from the Tranquillity site (Hewes 1946: 214, Fig. 28a, g, h, y) are directly comparable to those from 4-Mer-S94. This suggests to us at least a general temporal relationship.

In general the point assemblage is like that from the Early and Middle periods in central California where heavy stemmed points are frequent though not dominant (Beardsley 1954: 68, 74). The preference for obsidian is much greater in the central area, undoubtedly due to better sources of supply. Presumably, the obsidian points at 4-Mer-S94 are derived from the Napa area via the Delta or the Coast Range south of San Francisco Bay. The clear preference for jasper and dark-colored chalcedony or cherts at the Grayson site suggests considerable influence from the west, but little data are available from San Benito or Monterey Counties. The projectile points from several Monterey Bay sites (Evans 1967; Pritchard 1968) indicate considerable similarity of form and material to those reported here. It is clear that this area was the source for at least some of the chipped stone recovered from 4-Mer-S94. A similarity to certain of the southern California assemblages may also be seen (for example see Reinman and Townsend 1960: Plate 6, especially Types 3, 3a and 6, Table 6).

The knives, with few exceptions, appear to be made of local material. The leaf-shaped forms (Type 2) are infrequent during the late period in the area, suggesting that they were replaced by flake knives since these do occur. The triangular knives are also unknown from local late sites, suggesting that they are rare trade pieces from out of the area.

The atlatl spur is similar to those described as "snakeheads" by Gifford and Schenck from the Alpaugh region (1926: 98, Plate 19m-f). In central California, these spurs are almost wholly confined to the Middle period (ca. 2000 B.C. to A.D. 300) and presumably have the same time span in the Los Banos and Alpaugh regions. This indicates that the bulk of the large points at 4-Mer-S94, on the basis of weight, are dart points. Heizer suggests that the Central California Early period dart points weigh from 3 to 12 gm. (1949: 22, Table 9) - a range, it might be

noted, which includes almost all of the points from 4-Mer-S94. Of the points with adequate weight data, only three definitely weigh less than 3 gm., not counting the small side-notched concave points.

The few flaking tools recovered are not of a temporally diagnostic nature. Many of the pieces classed as awls or pins could have been used as flaking tools, but the clear preference for antler flakers with a relatively heavy tip suggests that fine retouch was not considered necessary.

ECONOMIC COMPLEX

This section consists of a description of the food-processing implements of all classes and those items which relate to other daily activities of the site inhabitants. It is unfortunate in this respect that the faunal remains could not, for monetary reasons, be analyzed at this time.

BONE AND ANTLER TOOLS

The bone tools included in this section are all those which are assumed to have had a utilitarian function. The only doubtful class included here are the bone pins. The single burial-associated pin may have served a nonutilitarian function as it differs in degree of finish and apparently was considerably longer than the midden examples. The bone and antler artifacts are tabulated in Tables 7 and 8.

Bone Awls and Fragments. The five complete awls include four heavy split sections of mammal long bone with one end ground to a narrow blunt point and one narrow well-worked splinter or broken reworked specimen (Fig. 10o-s; 11a, b, d). The four split pieces are not ground along the shaft, but on two the proximal end has been somewhat blunted and squared off by chipping. The other two are simple jagged splinters with ground or pointed ends. The only well-made example is long and narrow with a sharp point. The proximal end shows an old break which was ground off and polished. It is from Trench B near the base of the midden.

The awl fragments include five base fragments fashioned from the proximal end of a large mammal cannon bone, one large splinter with the head broken off, and one splinter awl with a ground base. All of these fragments exhibit better finish than the complete examples. The medial fragments include both well-finished and essentially unworked splinters. They tend to have an oval to flattened cross section. The tip fragments for the most part are heavy with

blunt points. Only three have the characteristic extended needle-like point. It is quite clear that the bulk of the items classed as awls consist of rather heavy, pointed tools suitable for a variety of functions. Only two of the tip fragments have the fine needle-like point commonly associated with coiled basketry. However, both of these are from the 120 to 140 cm. level. Three other wide but still sharply pointed tip fragments are also from the deeper levels of the deposit, 120 to 180 cm., which supports a hypothesis that fine basketry was made throughout the occupation of the site.

Bipoint Bone Pin. A single short bone pin was recovered from the midden (Fig. 9e). It is subcylindrical in cross section, sharply pointed at one end, and blunt on the opposite end. It is comparable to the short pointed bone tools commonly regarded as gorge hooks or composite hook parts. The specimen appears to have been hafted in some way, since one end is definitely nonfunctional. It came from the lower midden and is completely coated with a calcareous deposit.

Bone "Pin" Fragments. Ten cylindrical or slightly flattened bone "pin" fragments were recovered (Fig. 10a, b, f, h). Of these, three are pointed end fragments and seven are medial segments. All of the specimens are made from sections of worked down large mammal bone and, where still present, exhibit considerable polish. None of the tip fragments exhibit wear such as might be expected if they were used as awls, but their possible use as perforating implements cannot be ruled out.

The depth distribution of the "pins" indicates a higher frequency in the lower levels, but they also occurred in the rocky zone (above 80 cm.). The best example (Fig. 10a) was associated with Burial 6 at a depth of 183 cm. It had been broken (i.e., "killed") prior to interment as two nonfittable fragments were recovered.

Small Pointed Tool Fragments. This class includes four slender, flattened, pointed fragments; seven narrow flattened medial sections; and, for convenience, three small splinters of mammal bone with a sharp point ground on one end (Fig. 11e, f). All apparently are suitable as perforators or punches on relatively soft material. The four tip fragments could represent sections of longer pin-like pieces or even slender awls. They lack the wear normally associated with the latter, however. The pointed splinters almost certainly functioned as perforators.

Antler Wedge (Fig. 10m). A single fragmentary antler wedge was recovered from the site at a depth of 120 to 140 cm. It is fashioned from a split section of antler, has squared edges and a relatively narrow tapered end. The basal portion is missing. It differs from the normal central California wedges in that it is a split, worked down section. The bulk of the wedges are simple beveled antler sections with trimmed bases. This example lacks the use-polish typical of wedges, but this, in part, is probably due to weathering and the deposit of calcareous material over most of the specimen.

Worked Y-Shaped Antler Fragment. A fragment of antler from the juncture of the tines apparently has been obliquely cut off on one side. The opposite tine is now broken off, but the evidence suggests that the piece may have served as a handled adze-like tool when complete. The specimen is from the 100 to 120 cm. level.

Scapular Tools. Three definite and four possible scapula tools were recovered from the site (Fig. 11g, h). The three definite specimens are both made from right scapulae, probably deer or antelope. The only complete example and one fragmentary piece are made from a right scapula. The spine and corocoid border have been trimmed off, apparently by a chipping process leaving only the axillary border and a narrow slightly polished blade area. The most pronounced polish is on the reverse (outer) edge of the axillary border, but the blade is polished or blunted on the high points. The distal end of the tool was ground or broken off to a rough point.

The third finished specimen, also a right scapula, is now badly fragmented. The axillary border has been cut off and the spine trimmed by cutting and grinding. Polish is apparent along both edges, that is, along the corocoid border and the inner edge of the spine. The distal end of the tool is rounded off.

The four possible scapula tools include one left and three right scapulae. The spine has been broken off on all four but none exhibit grinding along the trimmed spine area. The distal area of all three examples is now broken off, but enough remains on two of them to suggest that the borders had not been removed. The fact that the spine was trimmed suggests that these were intended as tools, but that they are unfinished or are of a different type than those with one border removed.

The depth distribution of these worked

scapulae indicates they are primarily confined to the lower midden. The shallow, badly broken specimen was recovered from the 40 to 60 and 60 to 80 cm. levels, suggesting that it probably was originally at about 60 cm. in the deposit. The remainder all occur below 80 cm., and the deepest piece is from the 160 to 180 cm. level. They apparently are dominantly a lower midden level trait at 4-Mer-S94.

Pointed Antler Fragments. Six small broken tip sections of ground antler tools were recovered, none apparently complete. Four of these are bluntly pointed, polished along the sides, and exhibit some wear on the tip end. They may have served as flaking tools but the wear pattern is one of polish rather than striations or chipping.

The last two specimens are ground to a beveled, flattened, sharp point (Fig. 10j). They resemble a wedge in this respect, but are smaller and are not split sections like the one wedge from the site. When whole, they could have served as flakers, wedges, or even as digging tools.

Bone Skewer. A single fragmentary small mammal rib has been ground off obliquely to a dull point (Fig. 9c). Unfortunately, only the sharpened end is now present, thus its original length is unknown. This piece, plus a second ground bone fragment, was associated with Burial 40.

Possible fragments of skewers occurred with Burial 39 also, but these are too small to determine the original artifact type. Both fragments are of split, ground small mammal rib, however.

Polished or Cut Bone and Antler Fragments. The bulk of these small worked bone fragments are split sections of large mammal long bone with evidence of splitting and grinding or polishing along one or more edges. The bulk of them appear to represent heavy flattened to oval cross-sectioned tools such as awls or spatulate pieces. One appears to be a fragment of an almost complete, that is, unsplit, large mammal metapodial tool. A second may have been a tube fragment from a medium-sized mammal. One slightly polished, split bone fragment occurred with Burial 33, and a split section of antler was associated with Burial 35 (Fig. 11c). Both conceivably represent heavy blunt tools, but the distal ends are now incomplete.

Though none of the fragments are distinctive, they indicate that many of the bone tools must have

been better made than those described. It is possible that some fragments represent tools "killed" (broken) and scattered during burial rites.

Polished Deer Rib. A single deer (?) rib with considerable polish and a series of faint striations along one side was recovered from the midden. It apparently was used as some sort of a scraping tool, though such use must have been of slight duration judging from the wear.

CHIPPED STONE

The chipped stone artifacts included in this section are comprised of the perforating tools; flake, plane and core scrapers; utilized cores; and chopping tools. The data on these artifact types are included in Tables 11 and 12.

Drills and Gravers. Three types of perforating or graving (?) tools are segregated among the small pointed tools. Type 1 includes three heavy projectile tip fragments and four crudely flaked pointed pieces (Fig. 18a-d). They are similar in that they have a rather bluntly pointed to rounded tip. The bulk of the wear shows above the tip, in some cases producing a noticeable shouldered effect. They appear to have been used to ream out holes in stone or heavy bone objects.

The Type 2 specimens (5) are all shank portions or narrow, heavy, bifacially chipped pieces (Fig. 18e-g). All have a triangular to diamond-shaped cross section. Only two have the pointed end remaining. This type, though based only on shaft fragments, seem to represent purposefully manufactured drills. Since no expanded proximal sections are included in the collection, we assume that these pieces must have been of an elongate pointed form. Presumably they, too, were heavy duty drills or reamers like those in Type 1.

The graving (?) tools (Type 3) includes six sharply pointed, slightly worked chalcedony or chert flakes from the upper 40 cm. of the deposit (Fig. 18h), and eight pointed flakes or chipped examples from below 80 cm. in the deposit (Fig. 17m-q; 18i).

The upper level pieces include three pointed flakes which exhibit slight use-wear on the pointed end, but little purposeful flaking and three flakes which have been retouched along the edges to produce a narrow pointed or chisel-shaped end.

The deeper examples include two small flakes with narrow pointed ends. Both show some retouch along the margins. Two others are also flakes, but have been modified extensively along the edges producing a sharp point or points. Additionally, the base has been shaped so they could have been hafted. The four deepest specimens, 140 to 180 cm., (Fig. 17n-q) include a triangular flake with a blunt flaked end and two or three pointed areas worked onto the sides or on one corner. It appears to have originally served as a flake scraper. The second triangular piece is a bifacially worked flake with a sharply pointed end and a chipped convex base. The edges of the pointed end show a series of secondary projections or serrations. Possibly, this example was hafted. The last two deep-level specimens are small oval-shaped pieces with a small, delicate graver point chipped on one side. One is a plano-convex flake, the second is bifacially flaked. Both appear to have been hand held.

The deep-level specimens clearly served as gravers or light-duty perforators, since they are not heavy enough to have served in the drilling of bone or stone. The upper level examples are heavier and could have served as perforators or drills as well as graving tools. There is little doubt that the deep specimens represent a distinct group, not only on the basis of form and suggested use, but since all are of obsidian and exhibit superior skill in chipping.

Flake Scrapers (Fig. 19f-k; 20a-f). One hundred and nine flake scrapers or small broken flakes with some retouching were recovered from the site. The only difference between the small and large examples is size, plus the possibility that the larger pieces could have served as small chopping or cutting tools.

In general the scrapers tend to be rectangular or subrectangular in outline and most have a plano-convex cross section. A good many have remnants of the striking platform still in evidence at one end, indicating that they were struck from prepared cores (Fig. 20c, d, f). The edge retouching in many instances is minimal, but where well defined, the worked area is steeply flaked leaving little doubt that a thick, durable scraping edge was desired. In general, only one straight or slightly convex edge was retouched but on several of the few obsidian scrapers, retouch is apparent on more than one edge. One of the complete obsidian scrapers is fashioned from a large blade fragment, originally over 26 mm. in width (Fig. 19j). The other three are waste flakes. Several have concave chipped areas on one or more edges, but these do not, on the basis of frequency, appear to

represent a distinct form (Fig. 19f, g).

The depth distribution of the flake scrapers indicates they were used essentially throughout the occupation of the site, but seemingly increase in frequency in the upper 60 cm. of the deposit. This, in part, may be due to the lack of calcareous material on the flaked stone in the upper levels; hence, the percentage of recovery of items such as scrapers would be greater. It is clear that no refinement in form or method of production is exhibited from top to bottom.

Scraper Planes. The scraper planes include both large and small forms, arbitrarily divided at ca. 40 mm. in length although some overlap occurred.

The small scraper planes tend to be plano-convex in cross section and oval to squarish in outline (Fig. 20g-k). Some exhibit cortex from the original silicate cobble on the convex surface, while others are heavy thick flakes with the cortex completely flaked off and a very few are small cores with evidence of use along one edge. In most instances, the utilized edge is very steep, nearly vertical in some instances. The wear is confined to the extreme edge and is pronounced enough to suggest that they were used on relatively dense material, such as wood or bone.

The depth distribution suggests that they are frequent throughout the entire span of occupation with a definite peak in the upper rocky midden zone.

The large scraper planes include two more or less distinct subtypes. The first subtype includes those with a distinct turtle-back form (Fig. 21c). All are heavy and block-like with use-wear around the flat surface. Five are percussion-flaked basalt or andesite cobbles and the last is fashioned from a quartzite cobble. Of the six specimens, three occurred below 120 cm., one in the 80 to 100 cm. level, and the last two in the upper 40 cm. of the deposit. The four better shaped examples all occurred below 80 cm.

The second subtype includes those fashioned from heavy, thick flakes (Fig. 21a, b, d). All are, therefore, thinner than the block-like form. In addition, they tend to be more elongate in outline than the block form. A few have definitely flaked edges, blunted from use, but most exhibit only use-wear along one side.

It is clear from the data at hand that the larger scraper planes occur more frequently below the rocky midden level than do the smaller ones on a percentage basis. In view of the size of the sample, this would appear to have some significance, even though both types occurred to a depth of 240 cm.

Utilized Cores and Core Choppers. This section is concerned with all of the utilized cores, either those used as scrapers or cutting implements or those used as chopping tools.

The utilized cores are, for the most part, natural silicate cobbles which exhibit the removal of flakes over most of the surface (Fig. 21e, f; 22a-e). All but two are heavy block-like or slightly elongate specimens. The latter two specimens are small nodules which have been flaked off along the edges and across one side.

The wear on the utilized cores suggests use as scraping chopping tools. In some instances the edges are slightly blunted or crushed from use. They are all rather small to have served primarily as choppers, however, and the wear is indicative of only slight use. They do not greatly differ from the unused cores, and may be remnant cores rather than tools.

The choppers, six in all, are all large cobbles or cobble fragments with bifacial percussion flaking along one or more edges (Fig. 22f, g). The utilized edges are straight or slightly sinuous and exhibits slight to extreme wear. In all instances, the edge is sharp and narrow as contrasted to the utilized edges on the cores.

The depth distribution of the utilized cores and choppers does not suggest they are more frequent at the base of the deposit. Unfortunately, the bulk of the waste material chippings and cores, has not been analyzed for this report. It is therefore not possible to determine where in the deposit the unused cores are the most frequent. The utilized cores clearly are most frequent in the midden, however, and not in the yellow terrace material.

POLISHED STONE

Ground Edge Flake. The single artifact included in this section is an andesite percussion flake with a thin, flattened, polished edge. Since the wear pattern is at a right angle to the long axis of the flake, it presumably served as a smoothing or scraping tool. It may have functioned much like some of the steep edged flake scrapers. Its depth and size are presented

in Tables 5 and 6.

GROUND AND PECKED STONE ARTIFACTS

Numerically, the ground and pecked stone artifacts outnumber any other general artifact class. The most frequent of these are manos and pestles, but hammerstones, perforated flat cobbles and mortars are well represented.

Like the other artifact classes, the ground and pecked stone artifacts are most frequent between 80 and 160 cm. in the deposit. Several types are apparently confined to the midden below 80 cm., however, and the perforated cobbles are most frequent below 120 cm. and occurred frequently to a depth of 240 cm. The basic data on the ground and pecked stone artifacts are presented in Tables 13 and 14. Though not specifically stated, the bulk of the heavy stone material is represented by fragmentary specimens. The measurements are thus not as meaningful as would be desirable.

Girdled Cobble. Two fragmentary flattened ovoid cobbles have a pecked depression encircling their midpoint. One has been partially shaped by pecking on one end while the other is so fragmentary that other worked surfaces are not apparent (Fig. 28f). The pecked depression measures ca. 20 to 23 mm. wide by 7 to 10 mm. deep with a V- or U-shaped cross section.

Both of these specimens occurred below 120 cm. in the midden deposit from adjoining units. The shallower example is from just above the compact basal midden, while the deeper specimen was in the compact midden.

Perforated Flat Cobbles. These specimens are all fashioned from flat, roughly circular to subrectangular natural slabs of sandstone or schist. The edges on some are pecked and slightly ground and on others projecting corners have been removed to round the outline. The central perforation has been pecked in two ways. The first was to simply peck a biconical hole through the center; and then ream it out to the desired size. Several have been perforated by pecking a circular groove on both sides and removing the interior portion. Unfinished examples showing both methods were recovered (Fig. 23a, b, c; 24a, b, c).

The size range of these rough perforated cobbles is difficult to interpret (Fig. 24d-h; 25a-f;

26a-g; 27a-e). The smaller examples, those with an estimated diameter of 100 mm. or less, resemble the discoidals from other areas of central California, but differ in that they are crudely finished and have a large perforation. Judging from the more or less complete pieces, the desired perforation was at least 20 to 35 mm. in diameter. The larger specimens measure from ca. 140 to the largest which is ca. 260 mm. in diameter. The perforations range in diameter from ca. 25 mm. up to the largest with a perforation over 70 mm. in diameter. One specimen had secondary perforation, suggesting that it was to be used after the original had broken (Fig. 26f).

The distribution of the perforated cobbles indicates definite concentrations. Only two were found with burials (13 and 24). The notes suggest that the specimen with Burial 13 is of dubious association, since the burial was badly scattered vertically over 40 cm.

The following multiple occurrences of perforated stones were noted: three from Unit 12N-2W (200 to 220 cm.); 15 from 10N-2W (200 to 240 cm.); 15 from 8N-2W (220 to 260 cm.); four from 6S-2W (180 to 220 cm.); three from 2S-12W (120 to 160 cm.); three from ON-2W (140 to 160 and 160 to 180 cm.); six from 4N-2W (180 to 190, 190 to 200, 220 to 230 and 230 to 240 cm.); and 11 from Unit 6N-2W (160 to 170, 204 to 231 cm.). Most of these multiple occurrences clearly suggest that these objects were deposited together prior to the buildup of the midden deposit. That is, they appear to be coeval with the deposition of the yellow terrace fill. They certainly represent objects deposited prior to the building of at least the greater portion of the mound mass. The overall depth distribution clearly shows these crude stone "rings" to be one of the earliest artifact types in the site. On this basis they are set off from the material in the lower midden deposit, even though some mixing has obviously taken place. The evidence regarding this earliest component will be summarized in the concluding section, but is safe to say that the basal component apparently predates the midden by some time.

Cobble and Pitted Hammerstones. The 18 noncore hammerstones from the site have been divided into two types. These include cobbles with battered edges or ends (14) (Fig. 28a-e) and four specimens with battered edges or ends and pecked pits on both faces (Fig. 30d).

The cobble hammerstones are roughly

first-sized and are evenly divided between dense material such as chert, andesite, or quartzite and sandstone.

The cobble hammerstones occurred in all levels to a depth of 180 cm. with no concentration. The extreme wear on some of these suggests that they were utilized in the shaping of other heavy stone objects, such as pestles, mortars, etc.

The pitted hammerstones are natural flattened or ovoid cobbles with evidence of battering primarily on the ends. All have shallow pits, from 12 to 22 mm. in diameter and 1 to 5 mm. deep pecked on both faces. A number of the manos also have these shallow pits pecked on one face (Fig. 31d). Pitted stones of all types could have served as acorn anvils such as those described by Barrett and Gifford (1933: 143, 210) for the Miwok.

Small Grinding Slabs. These pieces are simply thin squarish or elongate sandstone slabs which have been worn by abrasion on one or both of the flat surfaces. One example exhibits slight pecking on the smoothed face, while the others are worn smooth. We suspect that these small ground slabs served as whetstones for bone or wooden tools since the working surface is more polished than ground. The depth distribution of the four excavated examples suggests they are more frequent below the rocky zone. None occurred in the basal portion of the site even though numerous natural flat sandstone cobbles occurred.

Milling Stones (*Metate*). The milling stones from 4-Mer-S94 include three more or less distinct forms. These include: 1) shaped rectangular; 2) shallow pitted; and 3) flat or shallow basin slab milling stones. The latter two types were frequent, while the first had but a single occurrence.

The lone shaped milling stone is rectangular in outline and essentially flat in cross section with a distinct narrow raised rim (Fig. 36b). Both the top and bottom are well finished in contrast to the other two types. Though it lacks precise depth data, since it was recovered during the bulldozing of Trench A, it surely is from the upper 50 to 75 cm. of the deposit. Presumably, this would place it securely in the upper rocky zone. As can be seen in Table 14, only one other milling slab came from the upper 80 cm. of the deposit. This suggests that the shaped milling stones such as this example are either a rare form or that it belongs to the brief late (Protohistoric) occupation

period at the site. Unfortunately, no other such specimens are known from the general area; thus, such speculation must await further work.

The pitted milling stones are all large fairly thick sandstone slabs with one flat ground surface in the center of which is a shallow circular depression (Fig. 35c; 36a). Unlike the slab mortars, this "pit" is never more than 5 mm. deep and it consistently exhibits a smooth ground surface and poorly defined rim.

We assume these specimens represent slab mortars reused as milling stones or a type used to prepare a specific foodstuff. Initially, the possibility that these were a truly transitional form between the milling slabs and true mortars was considered, but such a hypothesis is untenable since cobble or bowl mortars and slab milling stones clearly occur in a contemporaneous context.

The specimens with depth data all occur between 80 and 160 cm. and clearly belong with the lower midden complex. One (with Burial 29) was associated with a bowl mortar and a pestle. The burial was intrusive into the sterile lower gravel terrace in Trench A at an estimated depth of 90 to 100 cm. The basal portion of the midden in this area is most likely coeval with the deep midden in the excavated trench.

The last type, flat or basin slab milling stone, was the most frequent form, although over half of them were recovered as a result of the exploratory bulldozing operations (Fig. 36c, d; 37a, b). They tend to be about the same size as the pitted milling stones, but somewhat thinner. They may have been used only with mullers and never with a pestle. Almost all are made from selected, natural, flat slabs or blocks of local sandstone. The wear pattern is consistent. All appear to have been roughened by pecking and smoothed from use. The basined examples exhibit only slight concavities. Of the six examples with measurable depressions, one is 3 mm. deep, four are 6 to 11 mm. deep and the last is 16 mm. deep. The remainder are either essentially flat with a pecked surface or have only a ground surface. Only four exhibit shaping. In all cases this consists of flaking off unwanted projections along the edges or ends.

Two specimens were recovered with burials. One was partially over Burial 4 (86 cm.) and the second was in the area of Burials 7 and 8 (130 to 140 cm.). The scarcity of milling stones with burials is surprising, but apparently they were of little value, as

material for them was obtainable at the site. This probably also explains why they lack evidence of extensive use.

Like the other milling stone types, the slab form is most frequent between 80 and 160 cm. Of the nine excavated specimens, six occur within this range. Two deeper examples indicate the sporadic use of this type prior to the deposition of the lower midden. Both of the deep specimens are apparently smaller than the bulk of the midden examples and neither is excessively ground. One is partly shaped and slightly basined, in part due to the natural curvature of the slab.

Slab Mortars. Eleven slab mortars were recovered from the site, including seven from the midden and four associated with burials. Ten of the specimens are flat, subrectangular sandstone slabs and the last was fashioned from a sidewall fragment of a cobble mortar (Fig. 35a, b).

All of the specimens have a ground circular depression on one or both sides. The depressions range in diameter from 65 to 130 mm. (average 100 cm.) and are from 6 to 31 mm. deep, but average between 10 and 15 mm. deep. One specimen has been slightly ground around the depression, three are ground or slightly pecked and ground on the reverse side and one shows evidence of pecking and grinding on both sides around the shallow pites. Apparently, while the primary use was as a mortar, these slabs were also sporadically used for grinding. There is no evidence of a hopper basket ever being used in conjunction with these slab mortars. The wear pattern which is a distinct pit and moderately distinct rim suggests that one could have been used, even though we doubt that such was the case. This is further supported by the evidence of grinding adjacent to the pit and on the reverse side of some of the specimens. The latter, of course, does not rule out the possibility of later or earlier use as milling slab.

The depth distribution of the slab mortars is distinctive, since the excavated specimens are mainly from between 100 and 160 cm. in the deposit. One was associated with Burial 8 at a depth of 140 cm. and three were in the area of disturbed Burials 17 and 20 at a depth of 100 to 120 cm. Two of the midden examples were included in a rock concentration just on and into sterile base in Unit 2S-16W (Feature 3) at a depth of 110 cm. The adjacent units were not excavated, thus the nature of this feature, as well as its extent, is unknown.

Bowl and Cobble Mortars. A total of 80 complete, reconstructable or fragmentary shaped or cobble mortars were recovered from the site. Of these, one is from the surface; 27 are from the bulldozed trenches, or without location data; and the remainder are from the excavations.

Four distinct mortar types can be distinguished among the more or less complete specimens. These include large cobble, large bowl, small globular and small flat cobble mortars. The fragments suggest that small to medium-sized cobble or shaped mortars were most frequent, but the nature of the fragments precludes classification.

Large Cobble Mortars. Large cobble mortars are represented by two examples, both recovered during the bulldozing. Both are large irregular blocks with a well-defined pit (Fig. 34d). The complete example has an oval depression and is worn over one end as though the pestle was held at a distinct angle. The pit measures 135 by 180 mm. and is 107 mm. deep. The exterior is coated with calcareous deposit suggesting that it came from some depth in the midden. The second example, about two-thirds complete, has a pit ca. 120 mm. in diameter and 120 mm. deep. It was definitely smaller than the first example.

Ten large bowl mortars were recovered, six are whole and four are represented by large fragments. The complete examples are fashioned from large globular andesite or rhyolite cobbles (Fig. 33a, b, c, d). All show some, though not pronounced, exterior shaping. None could be classed as intentionally shaped in that the basic cobble outline was not essentially altered. The mortar pit has a flaring U-shaped cross section and a round bottom. The rim is modified (flattened) on one example by pecking while the others have a rounded rim. The pits are circular to oval and average 179 mm. in diameter and 140 mm. in depth.

The four fragments include three essentially like those described. The last one, split in half, measures 230 mm. by 180 mm. and is 205 mm. high. The interior measures 160 mm. by 120 mm. and is 80 mm. deep. The exterior of this specimen is completely pecked, while the interior not yet completely pecked out, is flat and exhibits no use-wear. One of the fragments was included in Feature 3 at a depth of 140 cm. Four of the specimens, three complete and one fragmentary, were associated with Burials 29 and 30 (Trench A), 33 and

36 (Trench B). Two of the burial-associated examples (Burials 30 and 36) had been split in half or had the bottom punched out, while one midden example (100 cm.) was similarly treated. The latter was in the area of several burials but was not directly associated.

The third mortar type, Small Globular Cobble, is essentially the same as those described above, but all measure less than 200 mm. in length or diameter (Fig. 32f; 34a, b, c). The depression on this type is oval to circular and averages 88 mm. in diameter by 50 mm. deep. At least six of them have flat bases (either natural or shaped). Eight are simply utilized globular cobbles and two are definitely shaped and ground on the exterior. This type occurred sporadically to a depth of 160 cm., but no clusterings can be noted. None were associated with burials.

The last definite mortar type is the small flat cobble mortar. These specimens are all fashioned from flat, ovoid stream cobbles modified by pecking a depression on one surface. The single definite complete example, from the surface of the site, is 183 mm. long by 139 mm. wide by 40 mm. thick (Fig. 34e). The depressions on this type average 84 mm. in diameter and 34 mm. in depth. None are externally shaped, nor do they exhibit any great amount of wear. Presumably, they served to pulverize small mammals or soft vegetal material. It is clear that these specimens were just large enough to be usable, judging from the size of the pestles (see Table 13), since few small pestles were recovered. The depth distribution of this type and the small globular cobble mortars is similar, suggesting that they are related forms. Both types are apparently slightly more frequent in the upper rocky zone, and definite specimens of either form are slightly less frequent in the lower midden, although the overall sample is rather small to indicate a trend.

The mortar fragments include a variety of degrees of finish and form. These are definite examples from all levels of well-finished rim fragments. At least one has a squared-off rim. Some of the fragments exhibit exterior shaping and were from externally shaped bowls. The remainder are from globular-shaped cobble mortars with little or no exterior shaping. One fragment represents a very small shaped bowl, possibly not used as a mortar (Fig. 34f).

Two of the fragments were reused after breaking. One is coated with red pigment indicating its use as a pigment-grinding implement. The second

was in the area of Burial 7 at a depth of 140 to 150 cm. though its association with the burial is not clear.

The three deepest fragments at 180 to 200 (1) and 220 to 240 cm. (2), respectively, indicate the use of the mortar was known in the earliest period of the site's occupancy. All three fragments are from symmetrical, medium-sized globular mortars with external shaping. It is clear from the overall distribution of mortars (Table 14) that mortars are rare in the deep levels of the site. The occurrence of pestles with some frequency in the deep levels (below 180 cm.) indicates their use was probably more frequent than is indicated by our present data.

Mullers (*Manos*). A total of 122 mullers, whole and fragmentary, were recovered from the site. These, on the basis of form and wear patterns, may be divided into five more or less discrete types.

The first type is rectangular in outline, has squared sides and ends and exhibits bifacial wear (Fig. 31b, c, d). The bulk of the rectangular mullers are made of dense sandstone but andesite or rhyolite examples occur. These specimens are notable in that they are the only type which is carefully finished and definitely shaped.

This type occurred with frequency in both the rocky and in the upper portion of the lower midden. The five deep examples could suggest an earlier occurrence, but the overall distribution suggests they are intrusive. None occurred in the yellow terrace fill and none occurred with burials.

Four examples, one in the rocky midden, three in the lower midden, have small, shallow pits pecked into one (3) or both faces (1) (Fig. 31d). They, presumably, have served as anvils. One specimen from Trench B was included in a midden cache of four mullers. The three associated examples were well-shaped oval cobble unifaces.

The second bifacial type differs from the first in that it is oval in outline. These exhibit some edge-shaping, but on the whole, are not as well made as the rectangular form (Fig. 31e, f; 32a, b, c). Several appear to have been convenient-sized cobbles which were but slightly pecked around the edges, while others are well-worked and completely shaped. Variant specimens included in this type are three with shallow pits on one or both faces. One of these is almost circular with battered edges suggesting it served as a hammerstone as well as a muller. The last

variant, included here for convenience, has a subrectangular cross section and oval outline. It has wear facets on both sides and on the edges. Unfortunately, this aberrant example lacks depth data. Like the rectangular mullers, the oval form is most frequent between 80 and 160 cm. None occurred in the yellow terrace stratum, but five are from the upper 40 cm. of the deposit.

The fragments of edge-shaped, bifacial mullers, unassigned to type, occurred in all levels to 120 cm. in the deposit. None are complete enough to suggest the original form, but the cross sections indicate that the bulk are of the rectangular form. Their depth distribution is strikingly similar to the other shaped biface forms.

The last bifacial muller type is simply an irregular cobble used on both sides. This type occurred continuously to a depth of 160 cm. in the midden, and one came from the yellow terrace deposit. Though not frequent in any one level, they tend to cluster between 40 and 140 cm. in the midden.

One of the deepest mullers from the site (190 to 240 cm.) is of this type and came from the area of the perforated flat cobbles along with a single partly shaped pestle fragment. It is thus one of the three mullers of all types below 180 cm. in the deposit.

The last two muller types include all of the unifacial examples from the site. Unifacial specimens with shaped edges occurred infrequently with but 11 specimens recovered (Fig. 32d). Eight of these are essentially plano-convex in cross section while the other three are made from flat or block-like cobbles. In all instances, the edges exhibit some shaping and tend to be slightly convex. The three best examples were included in the previously noted cache in Trench B.

The unshaped uniface cobble mullers were frequent as contrasted to the edge-shaped form. All are irregular or oval cobbles with wear on one side (Fig. 32e, g). In many instances this is minimal, suggesting that they are not a well-defined type, but were simply used for a short period, then discarded. Curiously, they occurred frequently above 100 cm. in the deposit and 12 of 19 with data occurred in the upper rocky midden. Only three occurred below 100 cm., but one of these is from the yellow terrace deposit. The wear is not pronounced on this example, but it clearly has seen some use. It may have been an

abrader or was in the process of being shaped into a better defined type.

Pestles. A total of 134 complete or fragmentary pestles were recovered from the site. Of these, 34 were recovered from the bulldozed trenches and the remainder were obtained from the controlled excavations. Of the total sample, 24 percent are completely shaped, 29 percent partly shaped, and 47 percent are utilized cobbles without shaping of the sides.

Three primary pestle types (nine subtypes) occur, based upon the amount of exterior modifications and end configuration. These include shaped, partly shaped, and cobbles with round, flat or pointed ends. Some are used on both ends, in which case the end with most pronounced wear determines the subtype.

The completely-shaped, round-end pestles (27 specimens) include ten complete examples, 14 end fragments and three cylindrical medial or distal end fragments. The latter are included as almost all of the completely-shaped pestles appear to be of the round-end form. The complete or near complete-shaped pestles are straight sided or slightly conical in outline; cylindrical or slightly oval in cross section with blunt rounded ends (Fig. 28g, h, i, j; 29a, b; 31a). The cylindrical examples average 6.0 cm. in diameter and the oval examples average 61 by 69 mm. The ten complete pestles average 177 mm. in length. Three examples are less than 140 mm. long and one is over 300 mm. long. The smallest pestle appears to be a miniature and is atypical. The preferred length seems to be within the 140 to 220 mm. range.

The two deepest specimens are conical in outline with cylindrical cross section. Both are exceptionally well-fashioned. One similar specimen is from the 150 to 160 cm. level. In the main, the upper level examples are untapered cylinders, suggesting that the conical form is the earliest, even though it is not confined to the yellow terrace fill. None of this subtype occurred with burials.

The two other fully-shaped subtypes include those with flat or pointed ends. The flat-ended subtype had four occurrences, including three from the lower midden (ca. 130 to 160 cm.) in Trench B and one from the 120 to 140 cm. level in the excavated trench. The flattened end suggests they were used in conjunction with the slab mortars. One

from Trench B is stained with red pigment. It is a short broken segment which was reused after breakage.

The only pointed-end example comes from the midden in Trench B. It was broken and partially reshaped. Some wear is exhibited on the sides and it is stained with red pigment, indicating use as a pigment-grinding slab subsequent to its use as a pestle.

The last "shaped" pestle is a partly-shaped "blank" which occurred with Burial 36. The edges are fully pecked but exhibit no grinding and the ends lack any evidence of wear.

Twenty-five partly-shaped, round-end pestles were recovered from the site (Fig. 30b). Of these, 19 were excavated and six are from the bulldozer trenches. One was associated with Burial 29. The partly-shaped pestles are made from selected elongate cobbles which range in cross section from near flat to almost cylindrical. All exhibit some pecking along the sides or edges which tends to produce a more or less symmetrical cross section and outline, but lack the careful finish of the fully-shaped types. Of the 25 specimens, 12 are complete, two are broken and reused, and 11 are fragmentary. The complete examples average 204 mm. in length with two below 150 mm. and two 300 mm. or over. They are distinctly oval in cross section averaging 55 x 64 mm. They occur frequently above 160 cm. in the midden and are equally divided between the rocky zone and lower midden. The five no-location examples include three from Trench B, two from Trench A and one with Burial 29. The latter was in an intrusive pit into the sterile stream cobble terrace fill. They appear to be coeval with the shaped pestles suggesting that at least some of them are unfinished examples of that type.

The flat-ended, partly-shaped pestles had eight occurrences, all but one from the midden excavations (Figure 30c). One without depth data is from Trench B. The three complete examples have a considerable size range (Table 13). All are oval in cross section, typically from 60 to 70 mm. wide by 45 to 60 mm. thick. Like the other flat-ended pestles, they may have been used in conjunction with the slab mortars. Six of the eight are from the rocky or lower midden, with five above 120 cm. Two are below 160 cm., both on or just into the basal soil zone. They span the bulk of the occupation at the site, but clearly are a minor type.

The only pointed-end, partly-shaped example is from the 60 to 80 cm. level in the midden. It possibly is a slightly-used, round-end example, but is distinctive enough to segregate. Pointed-end pestles are rare and on this basis probably represent a stage in manufacture of the rounded-end forms.

The partly-shaped fragments, all medial segments, include two from the midden and two deep level occurrences. One of the latter, associated with a number of perforated flat cobbles (Feature 5), was definitely in the yellow terrace fill. The second, from the 190 to 200 cm. level of unit 4N-2W, was in a rodent-disturbed area, thus its exact provenience is not clear.

The cobble pestles (67) are segregated into flat, rounded and pointed end types. All are elongate cobbles which exhibit wear on one or both ends. As can be seen in Table 14, all three subtypes occur in the lower midden and the pointed and round-end forms occur in the rocky midden in quantity. Both also have rare deep-level occurrences.

The pointed examples are all complete (Fig. 30a). Three are over 200 mm. long and one is 168 mm. long. One is squarish in cross section, the others oval. The deepest example is the short, squarish specimen.

Three of the flat-ended cobble pestles are complete (Fig. 29f). All are under 200 mm. in length, and all have a square to oval cross section. One was included in Feature 4 (Units 2S-16W) in the midden just above the upper gravel terrace.

The round end subtype is the most frequent pestle form from the site (Fig. 29c, d, e). Of the 55 specimens, 21 are complete and the remainder are fragmentary. The complete specimens average 194 mm. in length and 64 mm. wide by 49 mm. thick. The single associated specimen was included with Burial 30 in Trench A. The interment was in a pit which extended into the basal cobble deposit in this area.

Pestles of this type have been recovered from the surface of at least one other site in the San Luis area. This site, 4-Mer-15, appears to fall within the late protohistoric period. Presumably, however, the type is not restricted to any given period.

DISCUSSION OF THE ECONOMIC ASSEMBLAGE

Few of the bone artifacts from 4-Mer-S94 are specialized enough to allow detailed comparisons with other sites or regions. The rather scanty bone artifact assemblage from the site is typical of the western San Joaquin Valley as we now know it.

The bone awls from 4-Mer-S94 consist almost completely of large, crudely-fashioned mammal bone splinters with only the extreme tip evidencing signs of use. This type occurred at 4-Mer-3 (Pritchard 1966: 75) and at 4-Mer-14 (Riddell and Olsen 1965). The awls from the Little Panoche sites (4-Fre-128 and 129) typically are completely worked and are fashioned from split sections of a deer (?) metapodial with the proximal end serving as the base (Olsen and Payen 1968). Several well-made specimens akin to these occurred at 4-Mer-3 associated with protohistoric cremations (Pritchard 1966: 75-76). Few of the 4-Mer-S94 specimens seem suited to the manufacture of fine basketry, though some of the tapered fragments indicate that small slender examples were probably more frequent than our data would indicate.

The lack of well-made awls from 4-Mer-S94 contrasts sharply with the Sacramento-San Joaquin Delta region to the north. Though few definite awls are present in the Early period (Heizer 1949: 26-27), they do occur. In the succeeding Middle and Late periods, they become much more frequent. These typically consist of a well fashioned, quarter or half split section of deer metapodials (cf. Gifford 1940: Types A1a, A1b and A1c) in contrast to the splinter awls from 4-Mer-S94 (Beardsley 1954: 74, 77).

In the Buena Vista Lake region, the bulk of the awls are well made. (Wedel 1941: 40-41, 89-90). The splinter awls shown by Wedel (1941: Plates 23b-h) are similar to those from 4-Mer-S94, but are clearly in the minority from the Buena Vista region.

The slender bone pins and bipoint from 4-Mer-S94 are not especially distinctive. They are most frequent in the Early or Middle periods in Central California (Heizer 1949: 27-28; Beardsley 1954: 73-74). They are relatively rare in the Buena Vista region, although the more familiar bipointed pieces (gorge hooks?) occurred somewhat more frequently (Wedel 1941: 42-43, 90-91). Only one bipoint was recovered from 4-Mer-S94 suggesting that fishing was of little importance at this site,

presumably due to its location well removed from any large body of water. Bipoint pins occur throughout the central California sequence, but are most frequent in the Middle period (Beardsley 1954: 68, 74).

Spatulate bone fragments from 4-Mer-S94 are suggestive of the Middle period bodkins from the Delta region (Beardsley 1954: 73). None of the large, wide spatulae occurred at 4-Mer-S94 nor did any narrow, perforated bone spatulae or "pins". Both are distinctive of the Early or Middle periods in Central California (Beardsley 1954).

The scapula saws or grass cutters from the Grayson site indicate a considerable span in time for use of this tool form. They are known from the protohistoric period (4-Fre-128 and 129) and the prehistoric period 4-Mer-14 in the western Merced-Fresno County area (Olsen and Payen 1968; Riddell and Olsen 1965). The data at hand infer that they are to be linked with the use of grass or tule-covered houses. Curiously, none occurred at Buena Vista Lake, and they are rare in central California other than in the Napa and San Francisco Bay regions (Heizer 1953; Davis 1959: 49-50). Their occurrence in western Merced and Fresno Counties suggests a relationship with the south Bay region.

The remaining artifacts include only those items of dubious value in a comparative study. Antler flakers occur throughout California. The one fragmentary antler wedge (?) from 4-Mer-S94 indicates little interest in heavy splitting tools. Antler wedges are known from 4-Mer-3 in a late context (Pritchard 1966: 86-87). Their distribution in California suggests they are more frequent in central or northern California than in the San Joaquin Valley.

The small, pointed bone tools are not a distinctive artifact type. They normally are not specifically noted from other areas as they may represent reworked awl tips or pin fragments.

Bone skewers are known from Buena Vista (classed as awls by Wedel) (cf. Wedel 1941) and are not infrequent in central California. Presumably, they are not temporally significant.

The split rib "sweat scrapers", known from both central California and the Buena Vista region (Wedel 1941: 43, 91-92), did not occur at 4-Mer-S94. They also are lacking from other sites in the San

Luis-Little Panoche area. The single, slightly worn (but not split) deer (?) rib from 4-Mer-S94 may be representative of this implement, however.

The following chipped stone items are not those which easily lend themselves to a comparative analysis. The flake scrapers from 4-Mer-S94 are not as well made as the scrapers from the protohistoric sites in the area (Olsen and Payen 1968: 18-20, 49-50) and, in addition, are not as frequent. Large, heavy scraping or core tools are much more frequent at 4-Mer-S94 than at other sites in the area. There appears to be a frequency change with a greater emphasis on heavy stone tools in the earlier sites in this area. This characteristic is suggestive of some assemblages from southern California in this respect (cf. Wallace 1955; Warren and True 1961), since heavy scraping tools are not especially frequent in San Joaquin Valley or central California.

Drills and gravers are infrequent in the western Merced-Fresno County area. They are known from the Little Panoche area (Olsen and Payen 1968: 19, 50), but even here distinct drill types are rare. The gravers from the deep levels at 4-Mer-S94 are not duplicated from other sites in the area, since the pointed tools from other sites probably served as drills rather than gravers. Detailed comparisons with sites in other regions do not seem profitable at this time, as the data are scanty and of uneven quality.

The girdled cobbles from 4-Mer-S94 are unique for the immediate area. None were recovered from 4-Mer-14, 4-Mer-3, or from the two sites tested in the Little Panoche area. They are unreported from the central San Joaquin Valley by Gifford and Schenck (1926) or by Hewes (1941), but Hewes does note the occurrence of flat stones "with roughly chipped side-notches" and interprets them as net sinkers (Hewes 1946: 214). They are also unreported from Buena Vista Lake by Wedel (1941).

From central California, girdled stones are reported from the Middle period and notched sinkers are known from the Late period (Beardsley 1954: 74, 79), but are rare. Around San Francisco Bay and along the Marin coast, girdled cobble "sinkers" are frequent in a Middle period context (Beardsley 1954: 38-39, 87; Table 8). They are also known from the Late period in this area, however they appear to be less frequent (Davis and Treganza 1959: 47, Table 2).

The perforated cobbles from 4-Mer-S94 apparently have no clear counterpart in the San

Joaquin Valley. No examples are known from Buena Vista Lake (Wedel 1941), but Gifford and Schenck (1926: 90) record doughnut-shaped stones from the Alpaugh region. However, none are made of sandstone. Apparently, the specimen they note for Tulare Lake, described as of sandstone with a large perforation, is similar. They interpret it as a charmstone smoother. Hewes (1941: 128) notes the occurrence of "a few center perforated stone discs" from the west side of the San Joaquin Valley. In central California, small perforated discs ("discoidals") are known but all are smaller and better finished than the specimens from 4-Mer-S94. It is clear that the size, material and lack of finish of the 4-Mer-S94 specimen sets them off as a distinct, unreported artifact type. Since they underlie a midden which clearly has central California Middle period affiliations, they must predate the bulk of the discoidal shaped stones. The size of the perforation also clearly indicates a use other than those normally suggested for these pieces.

The hammerstones, all types, deserve little comment. They occur throughout California and have little, if any, temporal sensitivity. It is clear, however, that they are more frequent in foothill sites, but this presumably is due to the greater availability of raw material. The scarcity of pitted hammerstones, presumably acorn anvils, is curious, but apparently the pitted manos could have been used for the same purpose, that is, as anvils.

The small sandstone grinding slabs have been noted from all sites in the area and are frequent in other areas of the central valley and foothills. None of them exhibit any specialization, such as that which would be expected if they were used as bow smoothers or for finishing shell beads.

The milling stone complex from 4-Mer-S94 differs from other sites in the area primarily in frequency of occurrence. The pitted milling slabs are, however, unique and have no known counterparts. Flat slab milling stones are known from 4-Mer-14 in a Late Period Phase I context (Riddell and Olsen 1965), while at 4-Mer-3 slightly basined or flat slabs occur both in the upper and lower components. The latter is equivalent to the Phase I occupation at 4-Mer-14 while the former is representative of the protohistoric period in western Merced County. In the Little Panoche area several burnt fragments from slab milling stones were recovered in a protohistoric context, but they appear to be rare in this area (Olsen and Payen 1968). At Buena Vista Lake, milling stones

(mealing slabs) are noted only in the basal segments of the sequence, a fact which indicates that they clearly predate the mortar and pestle in this area (Wedel 1941: 136). Hewes (1941: 127) notes the occurrence of milling stones in the lower San Joaquin Valley, but they have a spotty distribution. He also indicates that both the milling slab and mortar were used ethnographically. The Tranquillity site produced both milling slabs and boulder mortars in a context indicating considerable antiquity (Hewes 1946: 214). It is of interest to note that on the whole, the Tranquillity assemblage closely resembles that from 4-Mer-S94.

Milling stones are known from both the Early and Middle periods in central California (Heizer 1949: 20; Beardsley 1954: 74), and examples are known from the protohistoric period in the Sierra Nevada foothill regions, east of our area (Bennyhoff 1956: 49).

Mullers have much the same distribution as that noted previously for the milling stone. Locally, well shaped rectanguloid or oval mullers are rare except at 4-Mer-S94. This, plus the extremely high incidence of unshaped cobble uniface and biface forms at 4-Mer-14 and Little Panoche, suggests that the shaped examples precede the cobble form in time. At 4-Mer-3, Pritchard (1966: 55) recovered 25 bifacial manos and 37 unifacial manos. Of the bifacial type, only 13 have shaped edges (ca. 21 percent) while at 4-Mer-S94 shaped bifacial mullers make up 57 percent of the sample. Again, the unshaped unifacial manos at 4-Mer-3 make up almost 60 percent of the total while at 4-Mer-S94, this type comprises ca. 19 percent of the total. It is of interest to here again note that this type at 4-Mer-S94 occurs dominantly in the upper portion of the deposit. Presumably, while this is the dominant late type in the area, it has some time depth. The few definite protohistoric elements at 4-Mer-S94 indicate a sporadic occupation which certainly could not account for the bulk of the uniface mullers.

The temporal aspects of the mortar and pestle in the San Joaquin Valley are somewhat confusing. At Buena Vista Lake, Wedel (1941: 133-140, Fig. 18) found mortars and pestles only in the upper (late) portion of the sites investigated. Hewes (1941: 127) reports cobble mortars and pestles from the central San Joaquin Valley and their occurrence at the Tranquillity site (Hewes 1946: 214) indicates considerable time depth. In central California, shaped bowl mortars and cobble mortars occur in the Early

period (Heizer 1949: 29) along with rounded end cobble pestles. Miniature mortars and pestles along with large cobble mortars and cone-tipped pestles also occur in at least one Middle period site (Beardsley 1954: 74), but the typical pestle form is the chisel-pointed cobble used in a wooden mortar. In the San Francisco Bay area, cobble mortars and shaped, rounded bowls occur in the Middle period and fully-shaped, flat-bottomed examples are known from the Late period (Beardsley 1954: 83, 85).

The pestles from Buena Vista Lake described by Wedel (1941: 71, 104, Plate 47) resemble those from 4-Mer-S94, but they would appear to be less frequent in that area. The dressed and nondressed cobble mortars from Buena Vista Site 2 (Wedel 1941: Plates 46a and 46b) are also similar to those from 4-Mer-S94. All of the mortars and pestles appear late in the Buena Vista sequence, however, as opposed to their occurrence essentially throughout the occupation at 4-Mer-S94. The evidence suggests that little change in the basic bowl mortar and pestle types occurred in the area with the exception of greater attention to exterior shaping in the late occupation. The large, well-shaped bowls from 4-Mer-3, 4-Mer-14 and 4-Fre-129, for example, do not occur at 4-Mer-S94 and appear with frequency only in association with burials (Pritchard 1966; Riddell and Olsen 1965; Olsen and Payen 1968).

The slab mortars present certain problems. At 4-Mer-S94 they appear to date well prior to any hint of late occupation. In the Los Banos area, they have been recovered only from 4-Mer-3 associated with Late Period Phase I extended burials (Pritchard 1966: 41). It is interesting to note that at 4-Mer-3 no evidence of a hopper basket was recorded, though Pritchard assumes them to have functioned in this manner. In view of the frequent and widespread use of asphaltum as a mastic for hopper baskets, it is curious that evidence for their use would be absent. Definite evidence of hopped mortars is present in the upper levels of Buena Vista Sites 1 and 2 (Wedel 1941: 69, 102) from the upper San Joaquin Valley, and Hewes (1941: 127) notes their occurrence in the Avenal region, with the suggestion that they are intrusions from Santa Barbara. Two fragmentary flat slab mortars were recovered from the Little Panoche area (Site 4-Fre-128) and a shallow boulder mortar was associated with a house pit at the same site. Both flat slabs were surface finds, thus their exact relationship to the site is unknown. Apparently, they relate to the late occupation, but conceivably they represent finds from older sites returned to the village

(Olsen and Payen 1968).

In the San Francisco Bay region, slab mortars are recorded from several sites, but they are noted as more frequent from the south end of the bay than elsewhere (Beardsley 1954: 89). One example, unplaced, is known from the Alamo site (CCo-308) in Contra Costa County, but lacks depth data. The site, however, contains a Late Period Phase I component and two Middle period components, thus the specimen is definitely not from the protohistoric period (Fredrickson 1964: 79). The slab mortar was probably known in Phase I times (ca. A.D. 300-1500), and we suggest that its use could predate this period by some time, indicating that it was known in what is equivalent to the Middle period in central California.

MISCELLANEOUS STONE OBJECTS AND BAKED CLAY ARTIFACTS

The miscellaneous stone objects include those pieces which may be classed as artifacts only on the basis of their occurrence in the site deposit, not because they have been modified by man. The baked clay artifacts include only one true artifact; the remaining pieces are those which present evidence of structures or daily activities. These specimens are tabulated in Tables 15 and 16.

Serpentine and Actinolite Splinter. A number of small chunks or splinters of unworked serpentine or actinolite occurred in the site, none with burials. The serpentine is in the form of small chunks, all of a light green color. The actinolite occurs in thin, narrow tabular fragments of a deep green color. These pieces may have been raw material since worked pieces occurred in the site (see Tables 5 and 6).

Quartz Crystals. Crystalline quartz specimens were not overly frequent, but three occurred with burials and a handful more occurred in the midden. The three specimens associated with Burials 1, 24 and 34 appear to be slightly ground. The Burial 24 example is, along with some midden specimens, also flaked or battered, suggesting that they may have been utilized in some other fashion, possibly for producing sparks.

Pigment. Pigment lumps, all less than thumb-size, were frequent in the midden, especially in the lower levels. The bulk of these are red in color (hematite?), but yellow pigment (limonite?) also occurred. A few pieces were ground or scratched, but

the bulk of them are small unmodified chunks. One example now resembles a tiny mortar in that it has a conical pit gouged into one surface and the sides are ground flat (Fig. 34g).

Clay "Spindle Whorl". A single, small, fragmentary baked clay "spindle whorl" was recovered from the 100 to 120 cm. level in the midden (Fig. 12w). It is a roughly shaped teardrop with a rounded base and cone-like upper portion. The perforation was apparently produced by pushing a small twig through the center or molding it around a twig which burnt out during the firing process.

Specimens identical to this have been recovered from the Little Panoche area (Olsen and Payen 1968), 4-Mer-3 (Pritchard 1966: 70), and Buena Vista Lake (Wedel 1941: 45). All appear to date in a Late context, suggesting that the present example is either considerably older than the others or is an intrusive late artifact type. Unfortunately, this must remain in the realm of speculation until further data are available.

Impressed Clay Fragments and Burnt Clay or Ash Fragments. The impressed clay fragments include those with tule or grass impressions and smoothed fragments. Most frequent were fragments with tule impressions. The best of these exhibits a series of parallel impressions on one side of a burnt fragment measuring 52 mm. thick, 150 mm. long by 100 mm. wide. The individual impressions measure from 7 to 11 mm. in diameter and clearly indicate that the mud was plastered over a tule foundation, possibly a mat, although no evidence of weft elements are present. The reverse side of the specimen bears the imprint of grass or small twigs. Apparently, the mud was placed on a floor (or wall?) over the tules and under a bed of grass and twigs, and was accidentally fired.

The few fragments with smoothing on one surface do not indicate molding of clay. Rather, they appear to have come in contact with a flat object or large peeled pole and were, thus, accidentally smoothed.

The clay and ash chunks presumably are related to the impressed fragments since their depth distribution is identical. Curiously, the baked clay fragments were not more frequent near floor surfaces, as might be expected. It should also be noted that baked clay fragments occurred well below the floors. This suggests that these pieces may not have been associated with house remains and resulted from

some other activity of the site inhabitants.

COMPARATIVE ANALYSIS OF MISCELLANEOUS STONE OBJECTS

It is clear that such items as actinolite, serpentine, quartz crystals and red pigment were valued by the inhabitants of 4-Mer-S94. The depth distribution indicates that the use of these materials encompassed the entire span of time represented by the midden deposit. Pigment lumps are more frequent in the lower midden, below 100 cm., and may thus be a minor trait for this period. The use of crystals and actinolite is known from other sites in this area and elsewhere (Pritchard 1966: 66, 73). Curiously, while the bulk of the actinolite splinters from 4-Mer-3 are worked, only one ground example is known from 4-Mer-S94.

The impressed baked clay and ash or clay fragments are primarily confined to the midden. The two deep impressed fragments apparently are intrusive due to disturbance, as the bulk of these fragments occur above 140 cm. in the deposit. The clay "spindle whorl" has been discussed previously in the text.

FEATURES

Six features were recorded from the Grayson site. These include three hard-packed surfaces, two cairns and a concentration of perforated flat cobbles in the sterile basal deposit. All are shown in Figure 3.

Feature 1. This feature consisted of a hard-packed surface measuring 46 by 110 cm. along the east side of Unit 4N-2W at a depth of 80 to 90 cm. It was almost black in color, well smoothed, but was devoid of post holes, hearths, or other evidence of function. Presumably, it represents a floor surface. No evidence as to its point of origin was noted.

Features 2 and 7. This hard-packed floor surface, dark in color, was located in Unit 2S-10W at a depth of 50 cm. It covered much of the unit (141 by 150 cm.) at this depth (Fig. 5a). A gray ashy deposit was noted just above the floor along one edge. Further work in this area in 1967 revealed that the surface extended considerably beyond what was exposed in the 1966 season. When completely cleared, the floor segment was revealed to be 2.4 m. in east-west extent by 2.2 m. in north-south extent. It occupied the western three-fourths of Unit 2S-10W, northwest quadrant of Unit 2S-12W and extended somewhat north into Units ON-12W and ON-10W. In

profile, the floor near the edges of the hard-packed surface is at a depth of about 40 cm. from the surface. At the center, it dipped to a depth of almost 60 cm. Though badly rodent-disturbed, it clearly is the remnants of a basin-shaped house floor. No post holes were noted in the floor area, but they could have been along the edges where the floor was destroyed by rodent activity. When complete, it was probably less than 3 m. in diameter.

Feature 7 comprised the remnants of a second floor, located some 40 cm. to the north of Feature 2 in the north half of Unit ON-10W. This segment, not completely exposed, was somewhat deeper than Feature 7 (ca. 60 to 70 cm.), but was badly disturbed by rodent activity. A heavy slab mortar was embedded in the floor on the western edge (Table 14; 60 to 80 cm. level). The mortar pit was stained with red pigment indicating the last use of the specimen was to pulverize pigment lumps into powder form.

Both floors appear to represent rather small, circular structures. No evidence is present to suggest what the superstructure consisted of. Presumably, they could have been earth-covered, but we feel that small pole- and grass-covered houses are represented, since the earth covering would require posts in the central area of the house to sustain the weight of the roof.

Features 3 and 4. Feature 3 consisted of four large, flat stone slabs along with north edge of Unit 2S-16W at a depth of 110 cm. from the surface (Fig. 5b). Two of the slabs were inverted slab mortars. Below this was a concentration of large cobbles and natural, flat slabs resting just on and into the sterile base soil. This lower concentration occurred at a depth of 128 to 155 cm. from the surface (Fig. 5c). Associated with this cobble concentration were two small fragments of polished bone tools and a flat-ended cobble pestle. The purpose of this feature (3 and 4) is not clear. Possibly, it represents the cairn for a burial, but no human bones were noted in the area. Attempts to remove the cairn (?) were unsuccessful, as it extended into an unexcavated unit to the north.

Feature 5. This feature consisted of a concentration of flat, perforated cobbles (actually fragments) in the basal soil of Unit 6N-2W at a depth of 204 to 231 cm. Included were 11 segments of perforated cobbles and one fragmentary, partially shaped pestle (Fig. 5d). All of these specimens were well below the base of the midden, but intrusive

rodent holes were clearly in evidence at the same level. There is little doubt that the bulk of the specimens were *in situ*, however. Other concentrations of the perforated cobbles were not assigned feature numbers, but are noted in the section on this artifact type.

Feature 6. This feature consisted of a hard-packed house floor segment at a depth of 65 cm. in Unit ON-2W. It measured ca. 80 by 80 cm. horizontally and was located adjacent to the south wall of the unit. It was badly disturbed by rodent activity. No ash lenses, postholes, etc., were noted in association. A large elongate cobble resting just on the floor apparently represents later fill over the floor proper.

Feature 8. This feature was a large sandstone boulder located at the extreme north-east edge of the site (Fig. 2). It was situated in a streambed, but was high enough to be above the water level at all times. Four shallow mortar pits were pounded into the top surface of the boulder, none more than 10 cm. deep. Two are represented by half sections due to exfoliation of the sandstone, and one has been split by a deep crack in the stone subsequent to its placement. It is obvious that the pits had but slight use, probably over a relatively short period. The high degree of weathering suggests they date prior to the late protohistoric period, but since the sandstone is rather soft and fractured, it is possible that they date to the last occupation.

Of the known sites with bedrock mortars, only two (including 4-Mer-S94) indicate occupation definitely older than the protohistoric period. This certainly suggests, at least, that all of them date to the terminal period throughout the area.

BURIALS

A total of 41 burials were recorded in the field. Investigation in the laboratory indicated that one burial (1966 season, Burial 21) was too fragmentary to class as such; thus, this number was reused in the 1967 season. Table 19 presents the pertinent data regarding depth, position, orientation and associated grave goods. Representative burial photographs are presented in Figures 5e, 6a to f and 7a to f.

Fragmentary skeletal material was recovered in all of the units excavated, but more or less *in situ* burials were rarely encountered above 100 cm. in the deposit. Of 40 burials recovered, 30 were adults or

near adults, one was an adolescent, six were children and two were infants. Field observations suggest that the adults were about evenly divided between the sexes, but the fragmentary condition of the critical bones leaves much to be desired.

Of the 25 burials with recorded position, four were flexed on their back, eight on the right side, eight on the left side, one on the left side and face, one on the right side and back and two flexed but lacking other details. One burial was semiflexed on the left side. Orientation was variable with five oriented north; and four each, northwest, west, east and southeast. The other directions had three or less burials including three oriented northeast, two south, and one southwest. When plotted by depth, there is no observable pattern, either for position or orientation.

The condition of the bone, that is, degree of mineralization or amount of concretions, suggests that considerable time difference is involved. The deeper burials all have a heavy layer of calcareous deposit on the bones, from 1 to 2 mm. thick in several instances. Other burials such as Burial 15 had no accretion on the bones and were definitely intrusive as earlier interments had been displaced. No clear-cut differences in grave goods were noted; thus, the precise time span involved is unknown.

The associated grave goods were for the most part nondiagnostic. The comments on them in the various descriptive sections are pertinent in this respect. Most notable is the association of definite Middle period ornaments (Type C(1)1b and C(1)2b) with a Late period bead type (Thin, Rectangular *Olivella*, Type 2a1), a stone pipe and incised bird bone whistle. The pipe and whistle suggest a protohistoric date completely at variance with the shell ornaments. The rectangular *Haliotis* beads and *Macoma* clam beads from the midden also suggest a relatively old date for the site.

Possibly, this situation regarding the conflicting grave lots will be resolved with further work in the area, but it is possible that both Middle and Late period association is present with the bulk of the midden attributable to the older occupation.

MIDDEN CONSTITUENTS

For this report, the chipping waste, bone and shell from three units was weighed and/or counted. The results are presented in Tables 17, 17A and 17B. Several points of clarification must be noted at this

time. First, the figures presented include both the material passed through 1/8- and 1/4-in. screen combined. Secondly, the term silicate includes a variety of crypto-crystalline materials including these commonly termed chert, jasper, chalcedony, agate, etc. Typically, these tend to range in color from white or pink through orange or reddish in color. The categories classed as basalt include that material as well as related material such as andesite.

The tabulation of the chipping waste indicates clearly that more or less local siliceous material was the most popular frequency-wise. Basalt, also locally obtained, is never frequent, but does occur at all levels. The obsidian waste is clearly representative of imported material. The bulk of the flakes are small and most of them represent waste from retouching broken artifacts. Apparently, no raw obsidian entered the area, since no large unworked or partly worked fragments have been recovered.

The bone waste, not yet analyzed as to species, is composed primarily of large mammal bone by weight. This tends to mask the obvious importance of the small mammals which are definitely present in some quantity. The amounts of bone waste varied greatly between the units. No obvious reason for this is apparent.

Shell in the midden was scarce at all levels and its distribution is more or less regular throughout the site. Unlike the bone and stone, the shell debris was tabulated by number of pieces, as the amount is negligible. While complete data on only three units are presented, all of the shell has been tabulated. The results suggest that both *Gonidia angulata* and *Anodonta* (sp) are frequent in the upper 80 cm. of the deposit, while below that point *Gonidia angulata* is prevalent. Specimens of *Haliotis*, *Mytilus* and a small clam shell of unidentified species occurred; all are ocean-dwelling species. These clearly indicate contact with groups to the west as does the shell fishhook described earlier.

In general, the depth distribution of midden constituents suggests two intense periods of occupation are present. The first is in the upper 40 cm. of the deposit, while the second occurs from about 80 to 180 cm. in the deposit. The latter clearly has a greatest intensity from 110 to 140 cm., the depth range which includes many of the burials and midden artifacts.

Though not specifically noted in the

tabulation, a number of cores occurred. Several of these represent prepared examples which exhibit the removal of small prismatic blades. The few used blades suggest that these do not represent a true blade industry. Study of the chipping waste revealed a few additional small blades, none of which exhibit use wear.

In 1967, one 1 by 1 m. unit was passed through 1/4-in., 1-in. and 2-in. mesh screen to provide some data on the frequency of large rock within the midden. As has been noted previously, the deposit at 4-Mer-S94 contains an abundance of large fire-fractured cobbles, primarily of sandstone; but basalt, andesite, quartzite and various metamorphics occur. The data derived from this unit are presented in Table 18. The figures indicate that the upper portion of the deposit contains the greatest frequency of large rock, that is, 2-in. size or larger. The break in overall frequency is at 60 cm., somewhat above the stratigraphic break suggested by the profiles in the same area as the test unit. For purposes of discussion, 80 cm. has been used as the stratigraphic break. Visual study of the deposit supports this decision.

The less rocky midden, referred to in the text as the "lower midden", is certainly not free of rock. It contains appreciably less rock, however. The lower midden does not include the 60 to 70 and 70 to 80 cm. levels. The frequency of rock for these levels seems abnormally low. Possibly the 60 to 70 cm. level represents a collecting error, since the 50 to 60 cm. level figures are obviously high. A gradual reduction in large rock content in the lower levels, below 150 cm., is clearly indicated. Much of the small rock one inch and under, from the deep levels below 180 cm., consisted of streamworn pebbles which were included in the yellow terrace soil. These show as a continuation from the midden in the 1/4-in. screened material. Below 200 cm. some of the larger rocks also were natural cobbles. It is also clear that the rock in the basal terrace deposit differs considerably from that in the midden proper. Some mixing of the zone was noted in the field, however. In almost all instances the fire-fractured rock in the deep levels was from rodent holes or had traces of midden in the dirt covering the object. Such was not the case with the perforated cobbles, indicating that they were deposited at the same time as the stream-rolled gravel in the terrace, or at least prior to the midden deposition. Since they are not stream rolled, the possibility of transport in an active streambed can be ruled out. We assume that they must have been deposited as the yellow material settled or became

included while it was still soft.

SUMMARY AND CONCLUSIONS

On the basis of our sample from the Grayson site, it is difficult to define recognizable complexes. It is clear, however, that only a trace of protohistoric Panoche complex is present in the site, and all of the late elements are confined to the upper 40 to 50 cm. of the deposit. At the present time, we feel that the two small side-notched concave based projectile points, the single Type c.1.a *Haliotis* ornament and a single shallow flexed burial (27) represent the protohistoric period in the site. Several items dubiously associated with Burial 13 may also derive from this period.

In general, below this the deposit is essentially homogeneous to a depth of ca. 160 to 180 cm. With the exception of two or three burials, this entire assemblage would appear to relate generally to the Central California Middle period but with indications of an affinity to the west or southwest. The projectile point assemblage (large side-notched or stemmed), for example, suggests a relationship with the south coast while the beads and ornaments suggest a central valley source. The dominance of flexed burials is also typical of the Central California Middle period. It is curious to note that extended burials occur during the middle period in the lower San Joaquin Valley, but this burial posture was not present at 4-Mer-S94. This suggests that the trait was either lacking in some groups in the Valley or that the group at 4-Mer-S94 was not native to the area. We assume, on slim evidence, that the latter is a possibility, since some definite coastal elements are present.

The polished stone inventory again suggests a Middle period relationship. Especially typical are the slate rings and rods, but the atlatl spur and charmstone also fit in this period. The beads and ornaments, especially ornament Types C(1)1b, C(1)2b and B(1)1, are Central California "Middle" period forms, as are the Types 3b1, 3b2, 3c *Olivella* beads and the *Macoma* disc beads. The latter suggest that this phase of occupation dates in the earlier portion of the Middle period.

The few possible later elements from the deeper levels include one lot of variant Type 2a1 *Olivella* beads. This bead form is typical of the Late Period Phase I in the Delta region suggesting that the sequences may not be exactly the same in both areas. Possibly this confusion is due to the entrance of

elements from the west and may reflect a different source for these beads than for those further north.

The basal segment of the site produced few diagnostic elements. These include the perforated flat cobbles, a few small cobble mortar fragments, a partially shaped pestle fragment, and several fragmentary bone and chipped stone items. This assemblage, if it may be termed that, suggests an affinity with the south coast at a date prior to 2000 B.C. The dating is postulated on the basis of the Central California shell bead sequence, since several distinctive forms occur above this assemblage.

The few unplaced elements include the Large Rectangular *Olivella* beads (Type 2b), two square *Haliotis* beads and a square freshwater mussel shell bead. These forms are typical of the transitional Early-Middle or Early period in the Central Valley. Some, but not all, of these specimens are from a deep mixed zone transitional between the lower midden and the yellow terrace deposit, suggesting that they do form a definite, though weakly attested, complex.

The house floors have not been mentioned in connection with the occupation periods as their temporal placement is problematical. Conceivably, they could represent deep housepits which date to the protohistoric period. As no artifacts from this period occur with them, we assume that they are to be placed in the earlier Pacheco complex A. If so, they clearly predate the known structures in the area and suggest that the earliest houses were small single family dwellings.

POSTULATED TEMPORAL SEQUENCE FOR THE SAN LUIS-LITTLE PANOCHÉ LOCALITY

The protohistoric period in the San Luis-Little Panoche region (west side San Joaquin Valley) is known from at least four excavated sites and two unexcavated sites. This protohistoric occupation has been named the "Panoche complex" since it is best defined from Sites 4-Fre-128 and 129 where the entire occupation is assigned to the Late period (Olsen and Payen 1968). The complex is also known from 4-Mer-3, where it comprises the A component of the site (Pritchard 1966: 157). It is also known from Site 4-Mer-S130, as yet not published. Diagnostic elements include rare clamshell disc beads; *Tivella* tubular clam beads; steatite disc beads; *Haliotis* epidermis disc beads; side-ground *Olivella* beads; spire-ground *Olivella* beads; small, thin *Olivella* discs (Type 3d); small, thick *Olivella* discs (Type 3e) (some incised); small, rough *Olivella* disc beads; and

lipped *Olivella* beads. *Haliotis* ornaments are rare but include simple circular, rectangular or "tabbed" end forms. Projectile points are usually of the small side-notched, concave-based tradition, termed "Panoche side-notched", along with rare desert side-notched or serrated obsidian points, small triangular concave-based and, rarely, large stemmed points. Especially distinctive is the abundance of well chipped flake scrapers. Bone objects include awls and scapulae grass cutters, incised bird bone tubes or whistles, short bone beads, and long awl or dagger-like pieces. Ground or polished stone objects include both small and large steatite ear spools, simple conical pipes, ground actinolite or slate pins and a variety of mortar and pestle forms. Presumably, bedrock mortars were also in use during this period. Use of the milling slab and muller is weakly attested; usually, the latter are unifacial cobbles. Steatite vessels are known, but rare, and vessel sherd arrowshaft straighteners are also known. One site also produced a number of sherds of a crude brownware pottery.

The structures include large (ca. 75 ft. diameter) circular assembly or ceremonial houses, smaller circular dwellings, usually 30 to 50 ft. in diameter, and one instance of a small semi-subterranean sweat-house.

The burial complex includes primary and secondary cremations at one site (4-Mer-3) and primary flexed burial at four sites (4-Fre-128 and 129, 4-Mer-S94 and 4-Mer-S130). Apparently, definite cemetery plots were in use as evidenced by the data from 4-Mer-3, 4-Mer-S130 and 4-Fre-129.

This complex exhibits clear relationships to the south including the use of steatite vessels; tubular *Tivella* beads; steatite disc beads; and small, delicate, concave-based or side-notched projectile points (Walker 1947, Wedel 1939: Fig. 18). Possibly, the house forms are also of a southern derivation, but this is not certain. The small rubbish or cooking pits associated with these sites certainly link with those reported ethnographically by Latta (1949) for the area. Trade with the Sacramento-San Joaquin Delta region is evidenced by rare clamshell disc beads, Desert Side-notched points and small serrated points.

This period has been dated by Pritchard (1966: 157) as coeval with the Central California Phase II occupation (ca. A.D. 1500-1850) on the basis of several traits evidenced at 4-Mer-3. The same guess date is applied to the Little Panoche area by Olsen

and Payen (1968). Two radiocarbon dates were obtained which pertain to this complex. One sample from 4-Fre-129 and one from 4-Mer-3 returned dates of less than 185 B.P. (A.D. 1765) (Samples I - 3163 and I - 3164). We feel confident that extending the beginnings of this period to ca. A.D. 1500 to 1600 is justified.

The prehistoric Late period occupation, termed the Gonzaga complex, is represented by 4-Mer-3B and 4-Mer-14. Diagnostic elements from this period are almost wholly confined to those objects included as grave goods, as both excavated components consist of cemeteries. The frequent *Olivella* bead forms include: Whole Spire-ground (Types 1a, 1b); Thin Centrally-perforated Rectangular (Type 2a1); Split-punched (Type 3a2); Oval; and several variant forms of the Thin Rectangular bead. Freshwater mussel shell disc beads and whole limpet shells (*Megathura crenulata*) also occurred. *Haliotis* shell ornaments (all *Haliotis rufescens*) of frequent occurrence include simple circular, oval and tear-drop shapes. Less frequent are forms with a flat end and round top or split "fishtail" end and round top. All types are frequently decorated with the distinctive X - or V-shaped incising on the edges. Specimens with bead applique set in asphaltum are known, some of the discs have the convex surface smeared with asphaltum and may have served as ear-spool facings.

Projectile points are rare. One large squared stem and a large tapered stem point are definite occurrences along with fragments of large incipient serrated obsidian points from one component.

Bone items include a few awls, pins, incised mammal bone tubes, bird bone whistles and several scapulae grass cutters. Most of the latter have notched rather than ground edges. Polished stone objects include large spool-shaped ear ornaments and small cylindrical "plugs".

The heavy stone tools include large bowl mortars; shaped pestles; rare slab mortars; and the slab milling stone and muller. The latter are rarely shaped. The relative frequency of the mortar versus milling stone is not known from our excavated samples. It is clear, however, that the use of the milling stone and muller is more important here than in the later period, but less frequently than the preceding Pacheco complex.

The burial complex includes both fully extended burials (supine) and flexed burials. The

former are frequent at both excavated sites and are a valuable marker for the period so far as is known. No cremations are known from this period.

The single house, two floors superimposed, includes a simple circular basin and a basin with secondary mud "rim" with built-in firepit. Both floor surfaces indicate larger structures than those from 4-Mer-S94. No postholes were evident, suggesting that the superstructure was not earth covered.

In general, this period links closely with the Late Period Phase I occupation in the Delta region. The shell ornament and bead complex is similar, as is the burial posture, that is, dorsal extension. The few serrated or notched-edge obsidian points may be trade pieces, as are at least some of the ornaments. Clearly, this period in the Los Banos region is aberrant and must be considered as a distinct cultural entity even though it forms a basic portion of the sequence.

The "Middle" period (Pacheco Complex A and B) in the locality is that represented by 4-Mer-S94 B and C components. It has been termed the Pacheco complex and is divided into two periods as noted in the Summary and Conclusions.

The Pacheco A complex presumably includes the following diagnostic elements: Spire-ground; Modified Saddle (Type 3b2); Saucer (Type 3c); and Split-drilled (Type 3b1) (all of *Olivella*); and *Macoma* clam disc beads. One *Haliotis* disc bead and a few centrally perforated *Haliotis cracherodii* shell ornaments are known, as well as several rare stone bead types. These bead and ornament forms are clearly related to the Middle period in central California.

Distinctive bone artifacts include perforated canine teeth, bird bone whistles, a few crude bone awls, scapulae grass cutters with ground edges and a few other types of less diagnostic value. Large spatulate bone tools and various perforated "pin" forms do not occur, though they are distinctive in the Delta.

Polished stone objects include rings of slate and jade slate, pins and flat pebble pendants. These lack variety and are often poorly made.

Especially distinctive is the heavy stone tool complex. A variety of mortar and pestle forms occur. Milling slabs and mullers are frequent. Some of the

latter are of well made rectangular forms. All forms of grinding tools are especially abundant.

The projectile point complex includes large to medium silicate and obsidian points, frequently stemmed or side-notched. Almost all are percussion flaked and weigh from 3 to 10 gm. Some of the points, on the basis of form and material, certainly are derived from the coast, presumably the Monterey Bay area.

A limited number of other elements indicate contact to the west. These include fragments of *Mytilus* and clamshell in the midden, a *Mytilus* shell fishhook and possibly a fragmentary jade ring. The burial complex (flexed burials at a time when extension was prevalent in the Central Valley) suggests that this period marks an incursion of coastal people to the west edge of the valley. At any rate, the pattern is not consistent with what little we know of the burial complex from the San Joaquin Valley proper.

The Pacheco B complex is represented by only a few distinctive items which suggest a relationship to the Central California Early period. These include Thick, Rectangular *Olivella* beads, the rare occurrence of rectangular *Haliotis* or freshwater mussel shell beads, several large points and a few examples of heavy food-processing tools. Possibly, the graver-like tools and the large leaf-shaped biface point fragments belong here, also.

The complex is not distinct and far from a complete or comparable inventory. There is little doubt that it differs from that exhibited in the midden, however. This period, if indeed it may be termed such, is not heavily considered in the summary section of this report. It has been suggested *only* on the basis of typological relationships and, thus, cannot be clearly defined on the basis of depth within the site. We have assumed that this is due to rodent and human disturbance, but clearly these few specimens may be viewed as rare elements associated with the lower midden complex.

The earliest complex, termed the Positas complex, is represented by the material at the base of 4-Mer-S94. We have arbitrarily selected those items which appear to be deposited in the yellow terrace soil. These include the bulk of the perforated, flat cobbles; a few flake scrapers; rare examples of small, shaped mortars; short cylindrical pestles; and at least several milling slabs and mullers. Two or three deep

projectile point fragments may belong here, but it is doubtful. Several other chipped stone objects (such as small plane scrapers) also could be associated with this complex. One Spire-Lopped *Olivella* bead and several perforated pebble pendants also occurred in the deep levels and could belong to the complex.

The relationships of this complex are not clear. So far no other reported assemblage is clearly related to the deep level material, but in general it has a southern flavor in that "doughnut stones" occur along the south coast and are not typical of any known assemblage to the north. This is extremely tenuous, however, and is suggested with caution, as little data are available from the intervening areas. It certainly does not relate to such sites as Tranquillity or Early Buena Vista Lake, however. Gifford and Schenck's (1926) material from the Alpaugh-Tulare Lake area is not comparable either. In the main, these relate more closely with the Lower Midden levels of 4-Mer-S94, but this relationship, as well as any coastal (Monterey Bay area) relationship, lacks clarity at this time.

DATING

The following temporal chart is presented to indicate our present knowledge of the western Merced-Fresno County area. For clarification, we include the Central California sequence. (Note disagreement of C14 dates and estimated temporal span for each complex; the latter are based on cross-dating of artifact styles.)

The dates for the late portion of the sequence have been noted previously. In addition, there is one date from 4-Mer-14 of 450 B.P. (I-968) or A.D. 1500, a date which is unacceptable on the basis of the Central California sequence where comparable material is dated at prior to A.D. 1000 (early Phase I is dated at A.D. 300-700). The sample was from a disturbed burial and thus may have been contaminated by later material. No evidence of such a late occupation, in the form of distinctive artifact forms, is present in the collection however.

Two radiocarbon dates have been run on the basal portion of 4-Mer-S94. The first was from charcoal collected from the 200 to 220 cm. level (yellow terrace fill and disturbed lower midden zone). It assayed at 645± 90 B.P. (I-3166) or A.D. 1305. The second, also from charcoal, is from the 220 to 240 cm. level, well into the terrace deposit and presumably not contaminated by the lower midden material. It ran 2400± 100 B.P. (I-3167) or 450 B.C.

It is clear that the dates are considerably different than the expected results, and we feel they are entirely unacceptable as dates for the associated cultural material. Possibly, the samples were contaminated by rodent activity or decomposed tree roots which was not apparent at the time of collection. The difference between the two dates definitely suggests that such is the case, since they should have been more closely comparable.

One obsidian hydration date has been run by the University of California, Davis, laboratory on a specimen (W-29-1884) from the 180 to 200 cm. level. It had a reading of 2.5 microns or 1475 years B.P. on the Central California scale. Until the remainder of the specimens are tested, we reserve judgment on this single date.

As has been indicated above, we feel that the dates so far derived for the complexes included are in error on the basis of the dated Central California sequence. The temporal chart expresses our guess dates for the sequence at this time, although future work may greatly modify this. Clearly, if the Grayson site represents an intrusive group which retained an older cultural pattern, such as that hinted at in the Monterey Bay area, our dating for the site and our sequence in general is unacceptable. We feel that this is not a strong likelihood, but it must be considered. If this is so, then the basic pattern for the San Joaquin Valley should be readily definable and could be separated from the coastal-oriented groups to the west. Presumably, the sequence would be quite different in each area and would necessitate a regional sequence for each, almost independent of the other. It clearly is premature to speak of such regional sequences at this time, however.

TENTATIVE SEQUENCE FOR THE LOS BANOS REGION

WESTERN MERCED-FRESNO COUNTY

Western Yokuts (Costanoan?)

CENTRAL CALIFORNIA

(Heizer 1958: 6)

Nisenan, Patwin, Plains Miwok

YEAR	INDICATED	ESTIMATED	
A.D.	<u>Panoche Complex</u>	<u>Panoche Complex</u>	
1800	A.D. 1765 (I-3163-3164)	4-Mer-3A, 4-Fre-128,	Late (Horizon) Period
1600	<u>Gonzaga Complex</u> A.D. 1500 (I-968)	4-Fre-129, 4-Mer-S94A 4-Mer-S130, 4-Mer-119	Phase II
1400	<u>Pacheco Complex</u> ^A		-----
1200	A.D. 1305 (I-B166)	?	Late (Horizon) Period Phase IC
1000			-----
800		<u>Gonzaga Complex</u> 4-Mer-3B, 4-Mer-14	Late (Horizon) Period Phase IB
600		4-Mer-S94?, 4-Mer-56?	-----
400	A.D. 493 (O.H. UCD)		Late (Horizon) Period Phase IA
200			
0	<u>Positas Complex</u>		
200			
400	450 B.C. (I-3167)	<u>Pacheco Complex A</u> 4-Mer-S94B	
600		Tranquility?	
800			Middle (Horizon) Period
1000			
1200			
1400			
1600			
1800	?	4-Mer-S94B	
2000			
2200		<u>Pacheco Complex B</u>	
2400			
2600			Early (Horizon) Period
2800			
3000		<u>Positas Complex</u> 4-Mer-S94C	
3200			
3400			
3600			?
3800		?	
4000			
B.C.			

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TABLE 2: Depth Distribution of Shell and Bone Beads 4-Mer-S94

Depth (cm.)	Bead Type		Haliotis & Mussel (also 3d callus)										Thick Rect. Bone Frag. Total													
	A1a	A1b	A1c	A2a	B2a	B2b	B2c	B3a	B3b	2a1	2b	3b1		3b2	3b1	3c	Rough Saucer	Macoma Steat. Disc	Calcite Steat. Disc							
0-20	3	1	3			1					1				2	1			1	14						
20-40	5	1					1				1				1					9						
40-60	3	2			1										2				1	9						
60-80	4	2		2								1			3				1*	13						
80-100	1	2		2	1	1						3			1				1	15						
100-120	3	6	1	2								1			3		1		1*	20						
120-140	7	4	2	1					1								1		2	19						
140-160	9	6	1								1							1	1	20						
160-180	6	5									1	1							2	15						
180-200	1	3									1								9	6						
200-220																				1						
220-240																				0						
240-260	1																			1						
Bur. 6	63		1												1					103						
Bur. 7	2	1									1									5						
Bur. 10	1		1																1	3						
Bur. 16											1									1						
Bur. 27	4	56	28														95	10		118						
Bur. 29	1																		20	1						
Bur. 39																				28						
Total	113	90	37	7	1	2	1	1	1	1	38	7	1	4	1	41	1	100	14	2	1	1	20	11	1	401

*Bird bone.

TABLE 3: Data on *Haliotis* and Mussel Shell Objects 4-Mer-S94

Type	Burial		Dia. or Length*	Width	Species	Notes
	Midden Assoc.	Total				
B.-	3	3	11-27	9-10	<i>H. rufescens</i> (2)	One is a rim section.
B(1)1	1	1	36	16	<i>H. rufescens</i>	
B.?b	1	1	---	9	?	
B.1.?	2	2	---	9-13	<i>H. rufescens</i> (1)	One is ground on back.
C.1.a	1	1	15(dia)	---	?	Ground on back.
C(1)?b	1	1	---	---	?	Badly broken.
C(1)1b	1	1	34(dia)	---	<i>H. cracherodii</i>	Ground on back.
C(1)2b	1	1	43	39	?	One is ground on back.
RC(1)	2	2	20-33+(dia)	---	<i>H. rufescens</i> (1)	
M2dII	1	1	87	45	<i>H. rufescens</i>	
Rim Fragments	8	8	13-26	5-10	<i>H. rufescens</i> (2)	Six are ground on back.
Unclassified Frags.	11	1	16-30**	7-23**	<i>H. rufescens</i> (8)	Four are ground on back.
Mussel Disc	1	1	17	14	<i>Gonidea angulata</i> (?)	
Serrated Mussel Fragment	1	1	---	---	?	
Ground Mussel Fragment	1	1	---	---	?	
<i>Mytilus</i> Fishhook	1	1	---	---	<i>Mytilus californianus</i>	Medial section.
Total	33	5				
						38

* Measurements are in millimeters.

**Only three measured.

TABLE 4: Depth Distribution of *Haliotis* and Mussel Shell Objects 4-Mer-S94

Type Artifact	No loc.	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180	180-200	Total
B.-		1										3
B(1)l						1	1					1
B.?.b						1						1
B.1.?							2					2
C.1.a			1									1
C(1)?b					(1)*							1
C(1)1b					(1)							1
C(1)2b										(1)		1
RC(1)				1				1				2
M2dII	1											1
Rim Fragment		1	1	3	1			1		1		8
Unclass. Frags.			3	2	1(1)	1		2	1	1		12
Mussel Disc										1		1
Serrated Mussel Fragment												1
Ground Mussel Fragment			1							1		1
<i>Mytilus</i> Fishhook				1								1
Total	1	2	6	7	5	3	3	5	1	4	1	38

* Parentheses indicate burial-associated artifacts.

TABLE 5: Data on Polished Stone Artifacts 4-Mer-S94

	Midden	Burial Assoc.	Total	Dia. or Length*	Width	Thickness	Other	Material
Stone "Ring"	7		7	14-36(d.)	---	3.5-5	5-16(perf)	Sl. * 6, Sch. 1.
Incised Stone "Ring"	1		1	30-32(d.)	10	5		Jade? or Sp. Dense Sd.
Perforated Gorget	1		1	106	102	9	4-8	Sl. 3, Green Sch. 7.
Perf. Flat Pebble	9	1	10	20-29+	11-26	1.5-6		Sl. 2
Perforated "Rod"	2		2	.49+	7-10	3-5		Sl. 1, Sp. 1.
Grooved "Rod"	2		2	20+-34	8-11	6(1)		Sl. 3.
Flat Pendant Fragment	2	1	3	---	13-31	4-5		Sl. 11, Sp. 4, Sch. 1.
Slate Pin or Rod Frag.	16		16	33+-39+(2)**	4-9	2-7		Ac.
Flat Pointed Splinter	1		1	35	7	3		Sd. 2, Sl. 1.
Worked Flat Slab	3		3	78-124	17-51	5-10		Sl. 1.
Grooved Flat Slab	1		1	61	45	8		Gr.
Charmstone	1		1	51	19(d.)	---		Sp.
Atlal Spur	1		1	28	10	8		St.
Tubular Pipe	1	1	2	144	---	---	22-32(d)	Sp., St., possible labret.
Polished Fragments	2	1	3	28+	24-33+	16+		Ba.
Edge-Polished Flake	1		1	39	27	15		
Total	50	4	54					

* Measurements in millimeters.

** Only 2 fragments measured.

***Sl - slate, Sch - Schist, Sp. - Serpentine, Sd. - Sandstone, Ac. - Actinolite, Gr. - Granite, St. - Steatite, Ba. - Basalt.

TABLE 6: Depth Distribution of Polished Stone Artifacts 4-Mer-S94

Artifact Type/Depth	0-20		20-40		40-60		60-80		80-100		100-120		120-140		140-160		160-180		180-200		200-220		220-240cm		Total
	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180	180-200	200-220	220-240cm	240cm	240cm	240cm	240cm	240cm	240cm	240cm	240cm	240cm	240cm	240cm	240cm	
Stone "Ring"			1	2	2							2													7
Incised Stone "Ring"														1											1
Perforated Gorget			1																						1
Perf. Flat Pebble	1	2	2			(1)*															1				10
Perforated "Rod"		1	1																						2
Grooved "Rod"	1				1																				2
Flat Pendant Fragment	1		1			(1)																			3
Slate Pin or Rod Frag.	1		1	2	2	4							1	1											12
Flat Pointed Splinter					1																				1
Worked Flat Slab												2													3
Grooved Flat Slab						1																			1
Charmstone																									1
Atlatl Spur																									1
Tubular Pipe							(1)																		1
Polished Fragments		1				(1)																			3
Edge-Polished Flake																									1
Total	4	4	7	6	8	7	8	5	3	0	1	1	54												

* Parentheses indicate burial-associated objects.

TABLE 7: Data on Bone and Antler Artifacts 4-Mer-S94

	Burial		Length*	Width	Thickness	Notes
	Midden	Associated Total				
Awl	5	5	98-141	8-18	4-6	All are splinters of heavy bone.
Awl Fragments	52	54	--	5-23	2-7	Base, tip, and medial fragments.
Bipoint Pin	1	1	41	6	5	One end pointed, one blunt.
Pin Fragments	9	10	102+(1)	4-7	4-6	All are cylindrical or oval in cross section.
Small Pointed Tools	14	14	26-36	3-9	2-4	Most are worked short splinters.
Narrow Spatula	6	6	--	6-7	2	Medial and blunt pointed fragments.
Wide Spatula Fragments	18	19	98+(1)	9-17	2-7	Medial frags. or flattened end frags. One with serrated edges.
Flakers	12	12	58(1)	7-9	5	2 bone, 1 cut antler, 9 antler tine tips.
Antler Wedge	1	1	75+	18	11	Cut, polished section.
Y-Shaped Antler	1	1	--	30	22	Split, polished fragment.
Scapula Tools	7	7	160	13-22	6	Only one measurable.
Drilled Tibia	1	1	--	--	--	Perforation 10 mm. diameter in proximal end.
Drilled Toe Bone	1	1	42	--	--	Toe bone drilled longitudinally.
Perf. Canine Tooth	2	2	28	8	6	Burnt and fragmentary.
Mammal Tube	3	3	--	--	--	Fragments, possibly waste material.
Worked Bone and Antler Fragments	93	98	86+(1)	19(1)	10(1)	All small fragments of worked bone except one.
Pointed Antler Fragments	6	6	--	--	--	Broken tine segments, ground tip.
Bird Bone Whistle	2	6	108-173	10-13	6-11	One is incised, one fragmentary.
Mammal Bone Whistle	1	1	115	14	10	Medium mammal.
Worked Bird Bone	1	1	125	10	8	Ends Broken out, shaft polished.
Bone Skewer	1	1	37+	7	5	End obliquely ground off.
Polished Bird Bone Fragments	5	5	--	--	--	Small cut or polished fragments.
Polished Deer Rib	1	1	130+	12-28	5-?	Polished near one end.
Incised Bone Frags.	2	2	--	--	--	One bird bone, one small mammal.
Misc. Faunal Remains		2	--	--	--	Canid mandible frag., bird wing bone.
Total	243	17	260			

*Measurements given in millimeters.

TABLE 8: Depth Distribution of Bone and Antler Artifacts 4Mer-S94

	0-20		20-40		40-60		60-80		80-100		100-120		120-140		140-160		160-180		180-200		200-220		220-240		No Depth	Total
	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180	180-200	200-220	220-240	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180	180-200	200-220	220-240			
Awl			1	1							2													1	5	
Awl Fragments		4	9	3	6	8(1)*	10	7	4	1													(1)		54	
Bipoint Pin						1																			1	
Pin Fragments	1	3	1	2	3	1	1	1	1											(1)					10	
Small Pointed Tools	2			1	3	1	3	2	1																14	
Narrow Spatula	2			1	1	1																			6	
Wide Spatula	3	1	1	4	2	1**														2					19	
Flakers	2	2	1	2	1															2(1)					12	
Antler Wedge																				1					1	
Y-Shaped Antler						1																			1	
Scapula Tools				1	3		2		1																7	
Drilled Tibia			1																						1	
Drilled Toe Bone					1																				1	
Perf. Canine Tooth					1																				1	
Mammal Tube	1	1			1																				3	
Worked Bone and Antler Frags.	8	8	6	12	16	8	12(1)	7	8	3	5													(4)	98	
Pointed Antler																										
Fragments	1			2	1	1	1																			6
Bird Bone Whistle				(2)	1	(1)	1(1)																			6
Mammal Bone Whistle				1		(1)																				1
Worked Bird Bone																										1
Bone Skewer																										
Polished Bird Bone				1	1																					5
Fragments								1	1																	1
Polished Deer Rib																										1
Incised Bone Frag.																										2
Misc. Faunal Remains	1					(1)														(1)						2
Total	20	22	20	32	37	29	34	22	23	7	7	0	7	260												

*Parentheses indicate burial-associated objects.

**Serrated.

TABLE 9: Data on Projectile Points 4-Mer-S94

Type	Midden	Burial	Total	Length*	Width	Thickness	Weight	Material
1a	11		11	39-70(4)	16-25(6)	5-12(11)	3.5+-13.2+(5)	Ob. ** 6, Ch. 4, J. 1.
1b	5		5	44-53(2)	18-27(5)	6-10(5)	4.2+-14.3(4)	Ob. 2, Ch. 1, Ca. 1, Sl. 1.
1c	1		1	56	29	9	10.8	Ca. 1.
2	1		1	39+	23	9	8.2+	Ob. 1.
3	5		5	33-42(5)	17-20(5)	7-8(5)	3.8-5.2(5)	Ob. 2, Ch. 2, Ca. 1.
4	2		2	44-45+(2)	23-24(2)	8-9(2)	8.1-10.0(2)	Ch. 1, Ca. 1.
5	2		2	76-104(2)	25-27(2)	8-12(2)	11.6-27.8(2)	Ch. 1, J. 1.
6	11	1	12	34-71(3)	20-35(7)	7-13(9)	5.4-17.6(9)	Ch. 7, Ca. 3, J. 2.
7a	2		2	---	32(1)	6-7(2)	5.0+(2)(est.)	Ob. 2.
7b	4		4	30-34(3)	18-21(4)	6-9(4)	2.9-4.9(4)	Ch. 3, Q. 1.
7c	2		2	19(1)	11-15(2)	4(2)	.6-1.5(2)(est.)	Ca. 2.
8	22		22	22-35(8)	15-24+(18)	5-11(18)	1.7-7.6+(9)***	Ch. 8, J. 7, Q. 3, Ob. 2, Ca. 2.
9	1		1	55+(1)	32(1)	13(1)	22.7+(1)	Ca. 1.
10	1		1	34(1)	23(1)	8(1)	5.2(1)	Ch. 1.
Unclass. Frags.	158		158	---	---	---	---	Ch. & Ca. 82, Ob. 76.
Large Biface Frags.	33		33	---	25-34	7-16	all 5+	Ch. 25, Ca. 3, J. 2, Ob. 3.
Total	261	1	262					

*Measurements in millimeters, weight in grams, number measured in parantheses.

**Ob. - Obsidian, Ch. - Chert, J. - Jasper, Ca. - Chalcedony, Q. - Quartz.

***Two under three grams.

TABLE 10: Depth Distribution of Projectile Points 4-Mer-S94

Point Type	0-20		20-40		40-60		60-80		80-100		100-120		120-140		140-160		160-180		180-200		200-220		220-240cm.		No Loc.	Total
	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180	180-200	200-220	220-240cm.	200-220	220-240cm.	220-240cm.	220-240cm.	220-240cm.	220-240cm.	220-240cm.	220-240cm.	220-240cm.	220-240cm.	220-240cm.	220-240cm.		
1a	1	1	1	4	2	1	1								1										11	
1b	1		2			1							1												5	
1c					1																				1	
2					1																				1	
3		2	1			2																			5	
4							1						1												2	
5			1									1													2	
6	2	4	1	1		1						2										1			12	
7a				1		1						1													2	
7b			2	1		1						1													4	
7c	1		1			1							1												2	
8	1	3	4	2		2					7		3	1							1				22	
9																									1	
10		1																							1	
Unclass. Frags. (Obsidian)	14	15	22	17	22	20	22	22	20	22	22	11	7	3	2			3							158	
Large Biface	(5)	(7)	(9)	(6)	(11)	(12)	(14)	(14)	(12)	(14)	(5)	(4)	(4)	(1)				(1)							(76)	
Fragments	3	4		4	3	6	2	6	6	2	5	6													33	
Total	23	20	35	30	30	30	33	24	15	3	1	3	5	262												

* With Burial 40.

TABLE 11: Data on Miscellaneous Chipped Stone Artifacts 4-Mer-S94

Artifact Type	Midden	Burial Assoc.	Total	Length*	Width	Thickness	Material
Drills & Gravers:							
Type 1	7		7	27-34(3)	6-10(5)	5-7(5)	Obsidian 4, Chert 2, Slate 1.
Type 2	5		5	25+(3)	9-10(4)	6-7(4)	Chert 2, Jasper 1, Chalcedony 1, Ob. 1.
Type 3	14		14	13-35(11)	7-24(12)	3-7(12)	Obsidian 7, Chalcedony 5, Chert 2.
Knives:							
Type 1	3		3	47(1)	20-37(3)	7-9(3)	Jasper 3.
Type 2	11		11	22-42(10)	16-30(7)	6-10(11)	Chalcedony 4, Chert 4, Obsidian 3.
Type 3	5		5	28+44(5)	18-30(5)	8-12(5)	Chalcedony 5.
Type 4	7		7	22+37(7)	11-31(7)	3-11(7)	Chalcedony and Chert 7.
Type 5	2		2	85-99(2)	60-70(2)	17-22(2)	Basalt Cobble Flakes.
Flake Scrapers:							
Small	72		72	18-56(72)	11-33(72)	3-16(72)	Chalcedony 64, Obsidian 8.
Large	37		37	34-80(37)	29-50(37)	10-26(37)	Chalcedony and Chert 32, Basalt 5.
Plane Scrapers:							
Small	42	1(No. 40)	43	18-40(43)	11-33(43)	9-22(43)	Chalcedony and Chert 42, Basalt 1.
Medium	56	1(No. 39)	57	30-78(56)	26-55(57)	18-42(57)	Chalcedony and Chert 44, Basalt 13.
Core Scrapers:							
Small	43		43	30-61(43)	22-49(43)	17-41(43)	Chalcedony and Chert 42, Basalt 1.
Core Choppers	6		6	72-120(6)	46-84(6)	42-69(6)	Chert 2, Chalcedony 1, Basalt 3.
Core Hammerstones	27		27	60-105(27)	56-91(27)	43-84(27)	Chalcedony 4, Basalt 23.
Large Cores**	6		6	65-132(6)	60-110(6)	44-62(6)	Chalcedony 6 (mostly large nodules).
Total	343	2	345				

*Measurements given in millimeters, number measured in parentheses.

**Not further utilized. Smaller cores not tabulated as they are included in the chipping waste.

TABLE 12: Depth Distribution of Miscellaneous Chipped Stone Artifacts 4-Mer-S94

Artifact Type	0-20		20-40		40-60		60-80		80-100		100-120		120-140		140-160		160-180		180-200		200-220		220-240cm.		Total	No Loc.	
	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180	180-200	200-220	220-240cm.	240cm.	240cm.	240cm.	240cm.	240cm.	240cm.	240cm.	240cm.	240cm.	240cm.	240cm.	240cm.			240cm.
Drills & Gravers:																											
Type 1	1		3			1	1				1	1	1													7	
Type 2		1	1		2																					5	
Type 3	4	2			1	1								3	1											14	
Knives:																											
Type 1	2																									3	1
Type 2	1		1				4				1	3	1									1				11	
Type 3		2								1		2														5	
Type 4		1										1			5											7	
Type 5		1	1																							2	
Flake Scrapers:																											
Small	13	14	10	9	6	3	6	6	6	6	3	6	6	4	2									1**	2	72	2
Large	6	7	3	2	6	3	1	1	1	1	3	1	1									2				37	
Plane Scrapers:																											
Small	2	9	6	2	3	2	7	4	3	2	2	7	4													43	1
Medium	3	12	5	7	7	5	6	3	7	5	5	6	3	1	4	2										57	1
Core Scrapers:																											
Small	3	8	6	6	5	3	5	5	5	3	3	5	5													43	
Core Choppers																											
	1		4					1																		6	
Core Hammerstones																											
	3	3	2			1	5	9	3	1	5	9	3													27	1
Large Cores*																											
		1	2				1	2			1	2														6	
Total																											
	39	61	44	26	31	20	37	39	17	12	6	7	345														

* Not further utilized. Smaller cores not tabulated as they are included in the chipping waste.

** From 240-260 cm. level.

TABLE 13: Data on Ground and Pecked Stone Artifacts 4-Mer-S94

	Midden	Burial Assoc.	Total	Length*	Width	Thickness	Perf. Dia.	Material*****
Girdled Cobble	2		2	83+	67-70	52		Sd.
Perf. Flat Cobble	77 **	2	79	67-260	67-260	10-47	15-90 (avg. 30-60)	Sd. 75, Sh. 3, Ms. 1.
Perf. Flat Cobble Blank	6		6	103-265	100-205	13-61		Sd., ground or pitted.
Cobble Hammerstone	14		14	69-130	46-88	32-64		Sd. 7, An. 3, Q. 2, Ch. 2.
Pitted Hammerstone	4		4	100-140	74-88	33-64		Gr. 2, Sd. 2.
Small Grinding Slab	5		5	100-205	73-124	16-26		Sd.
Rect. Milling Stone	1		1	383	190	20		Sd.
Pitted Milling Stone	10	1	11	280-447	195-320	40-130	under 5 deep	Sd.
Slab Milling Stone	20	2	22	220-550	187-345	18-100		Sd.
Slab Mortar***	7	4	11	200-452	150-390	35-150	5-19 deep	Sd. 10, An. 1.
Large Bowl Mortar	6	4	10	210-335	180-330	165-250(?)		Rv. 6, An. 4.
Large Cobble Mortar	2		2	220+-305	180+-240	165-195		Ry. 1, An. 1.
Sm. Globular Cobble	10		10	124-200	80-200	74-140		Ry. 6, An. 2, Sd. 2.
Small Flat Cobble	8		8	103-163	65-175	32-98		Sd. 5, An. 2, Sc. 1.
Rim Fragments	29	1	30	--	--	20-76		Ry. 13, An. 13, Sd. 4.
Basal and Side Frags.	19	1	20	--	--	31-120		Ry. 8, An. 8, Sd. 3, Q. 1.
Rect. Biface Mano (Edgeshaped)	39		39	91-174	72-105	37-66		Sd. 30, An. 5, Ry. 3, Q. 1.
Oval Biface Mano (Edgeshaped)	19		19	82-128	65-98	35-58		Sd. 12, An. 1, Ry. 5, Q. 1, Gr. 1.
Biface Mano Frags. (Edgeshaped)	12		12	--	83-100	38-62		Sd. 6, An. 2, Ry. 2, Q. 2.
Biface Cobble	18		18	77-163	68-109	35-68		Sd. 13, Gr. 1, Q. 1, An. 1, Un. 2.
Uniface Mano (Edgeshaped)	11		11	85-153	80-116	36-64		Sd. 7, An. 3, Q. 1.
Uniface Cobble	23		23	84-216	69-108	27-72		Sd. 17, An. 4, Ry. 1, Un. 1.
Pestles:								
Flat End	4		4	150-181	60-76	51-67		Sd. 1, Ry. 1, An. 1.
Pointed End	1		1	160+	78	65		Sd.
Round End	27		27	100-313	29-76			Sd. 20, Ry. 2, An. 5.
Partly Shaped Flat End	8		8	125-178	53-73	45-62		Sd. 5, Un. 3.
Shaped Blank		1	1	171+	107	81		Sd.
Partly Shaped Round End	24	1	25	198-340	41-91	37-75		Sd. 19, An. 1, Un. 1.
Partly Shaped (Pointed)	1		1	288	95	71		Sd.
Partly Shaped Frags.	4		4	44-79	44-79	31-61		Sd. 3, Un. 1.
Cobble (Flat Ends)	8		8	125-199	60-87	53-75		Sd.
Cobble (Round Ends)	54	1	55	107-290	20-107	18-74		Sd. 50, Sch. 1, An. 3, Un. 1.
Cobble (Pointed Ends)	4		4	168-257	55-83	42-65		Sd.
Total	477	18	495					

*Measurements in millimeters.

**Includes 2 from sample column.

***One is reused bowl fragment.

****Pestle diameter.

*****Sd. - Sandstone, Sch. - Schist, Ms. - Metasediment, An. - Andesite, Q. - Quartz, Ch. - Chert, Gr. - Granite, Ry. - Ryolite, Sh. - Shale, Un. - Unidentified.

TABLE 14: Depth Distribution of Ground and Pecked Stone Artifacts 4Mer-S94

Depth (cm.)	0-20		20-40		40-60		60-80		80-100		100-120		120-140		140-160		160-180		180-200		200-220		220-240		240-260		Total
	0-20	20-40	40-60	60-80	80-100	100-120	120-140	140-160	160-180	180-200	200-220	220-240	240-260	260-280	280-300	300-320	320-340	340-360	360-380	380-400	400-420	420-440	440-460	460-480	480-500	No Depth	
Girdled Cobble																											2
Perf. Flat Cobble			1	1(1)*																							5**
Perf. Flat Cobble Blank																											6
Cobble Hammerstone	1	1	2	1	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14
Pitted Hammerstone		1				1				1	1																4
Small Grinding Slab			1			1				1	1	2															5
Rect. Milling Stone						2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11
Pitted Milling Stone				1	(1)	2	2	2	2	2	1(1)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22
Slab Milling Stone				1		1	1	1	2	2	(3)	(1)															10
Slab Mortar				1		1	1	1	1	1	2																10
Large Bowl Mortar																											2
Large Cobble Mortar																											4
Sm. Globular Cobble	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8
Small Flat Cobble	1	1		2	3	3	5	3	3	3	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	30
Rim Fragments	2	3	2	3	5	3	1	2	2	2	2	4	4	1	1	1	1	1	1	1	1	1	1	1	1	1	20
Basal and Slide Frags.			2																								
Rect. Biface Mano (Edgeshaped)	4	2	4	3	9	4	1	4	4	4	2	2	3	2	2	3	3	3	3	3	3	3	3	3	3	3	39
Oval Biface Mano (Edgeshaped)	3	2			3	5	3	5	5	5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19
Biface Mano Frags. (Edgeshaped)	2	2	1	3	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
Biface Cobble	1	1	2	2	1	3	1	3	3	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	18
Uniface Mano (Edgeshaped)	1		1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	11
Uniface Cobble	5	2	2	3	4	1	4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23
Pestles:																											
Flat End																											3
Pointed End																											4
Round End	2		3	1	4	2	4	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	27
Partly Shaped Flat End		1				1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8
Shaped Blank	3	3	3	1		2		2	2	2	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	25
Partly Shaped Round End																											1
Partly Shaped (Pointed)																											1
Partly Shaped Frags.	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	8
Cobble (Flat Ends)	4	8	2	1	6	5	6	5	5	5	9	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	55
Cobble (Round Ends)																											4
Cobble (Pointed Ends)																											4
Total	32	31	26	25	44	48	50	32	14	14	24	37	3	121	498												

*Burial-associated objects in parentheses.

**Includes 2 from sample column.

***All from subsoil but depth uncertain; probably all over 140-150 cm. deep.

TABLE 15: Data on Miscellaneous Stone Objects and Baked Clay 4-Mer-S94

	Burial		Length*	Width	Thickness	Notes
	Midden	Associated				
Serpentine and Actinolite Splinter	23	23	13-39	2-25	1-12	All unworked.
Quartz Crystals**	19	3	12-27	7-20	4-17	Two burial specimens, possibly ground.
Pigment Lumps***	108	108	---	---	---	All less than thumb-sized, 100 red, 8 yellow.
Clay Spindle Whorl	1	1	---	13(dia.)	12	Perforated.
Impressed Clay Fragments	26	26	54-150	42-100	35-52	Four largest measured. Others are small frags.
Clay and Ash Frags.***	41	41	---	---	---	
Total	218	3				221

*Measurements in millimeters.

**Includes calcite crystals. Only more or less whole crystals included. Chips are lumped with chipping waste.

***1966 season only.

TABLE 16: Depth Distribution of Miscellaneous Stone Objects and Baked Clay 4-Mer-S94

	0-20		20-40		40-60		60-80		80-100		100-120		120-140		140-160		160-180		180-200		200-220		220-240		No Depth Total
Serpentine and Actinolite Splinter	6				5		1		5		1		3		2										23
Quartz Crystals	2	3	2	2	2(1)	3	2	3	2	2		2	2	3(1)								(1)			22
Pigment Lumps	7	7	7	7	9	9	9	13	17	17	18	18	15	6											108
Clay Spindle Whorl								1																	1
Impressed Clay Fragments	4	6			2	2	2	4	3	3	1	1	1	1	1	1	1	1	1	1	1	2	2		26
Clay and Ash Fragments	6	2	3	3	6	9	9	6	6	5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	41
Total	25	18	12	12	25	24	24	31	31	26	26	26	21	7	3	3	3	3	3	3	3	3	3	3	198

Note: Parentheses indicate burial associated objects.

TABLE 17: Depth Distribution of Chipping Waste, Bone Waste and Shell by Unit* 4-Mer-S94

Depth	Unit 10S 2W			Unit 4N 2W			Unit 4S 2W			Totals						
	Silicate	Basalt	Obsidian	Bone	Shell	Silicate	Basalt	Obsidian	Bone	Shell	Silicate	Basalt	Obsidian	Bone	Shell	Total**
0-10 cm.	161	Tr.	Tr.	25	1	122		Tr.	6		101		1	10	1	384
10-20	87	4	-	30		120	65	Tr.	65	2	86	15	1	18	1	293
20-30	89	1	Tr.	47	1	102	46	Tr.	39		113	54	Tr.	18	1	304
30-40	156	18	Tr.	46	1	299	115	Tr.	92	2	33	6	1	16	1	488
40-50	76	3	1	7		74	6	Tr.	42		75		Tr.	40	1	225
50-60	114	1	Tr.	20		104		Tr.	65		59		Tr.	27	1	277
60-70	81		1	70	2	57	1	Tr.	57	1	116	11	Tr.	41	1	254
70-80	81	2	1	48		167	5	Tr.	96		89	1	Tr.	65	1	337
80-90	132	Tr.	Tr.	43	1	150	72	Tr.	104	1	68		Tr.	46	1	350
90-100	115	Tr.	Tr.	73	1	134	15	Tr.	80	1	145	6	Tr.	56	1	394
100-110	131	20	Tr.	61		113	16	Tr.	105		110	13	Tr.	59		354
110-120	213	16	Tr.	70		286	39	Tr.	204	3	148	2	Tr.	47	1	647
120-130	203	21	Tr.	92		290	67	Tr.	110	1	189		Tr.	104		682
130-140	300	42	Tr.	105		242	4	Tr.	107	1	123	7	Tr.	92		665
140-150	165	66		19	1	187	75	Tr.	86		301	8	Tr.	69	1	455
150-160	72	37		17		85	79	Tr.	57		129	5	Tr.	62	1	286
160-170	111+	15	Tr.	33		152	42	Tr.	107	1	137	17	Tr.	58		400
170-180	2*			3		214	33	Tr.	88	3	107	6	Tr.	29	1	323
180-190						310	18	Tr.	98	1	66	1	Tr.	31	1	376
190-200						181	48	Tr.	67	1			Tr.	24		181
200-210						57	29	Tr.	21				Tr.	21		57
210-220						63**	2	Tr.	18				Tr.	18		63
220-230						51	12		45					45		51
230-240						12			6					6		12
Total	2,289	246	3	809	8	3,572	789	5	1,765	18	1,997	152	4	912	10	7,858
																1,187
																3,486
																36
																12,579

*Figures are weight in grams. Trace is less than 1 gram.

Figures for shell are number of pieces.

**Only one-half of unit level screened.

TABLE 17A: Depth Distribution of Bone Waste by 10 cm. Level (Three Units Combined) 4-Mer-S94

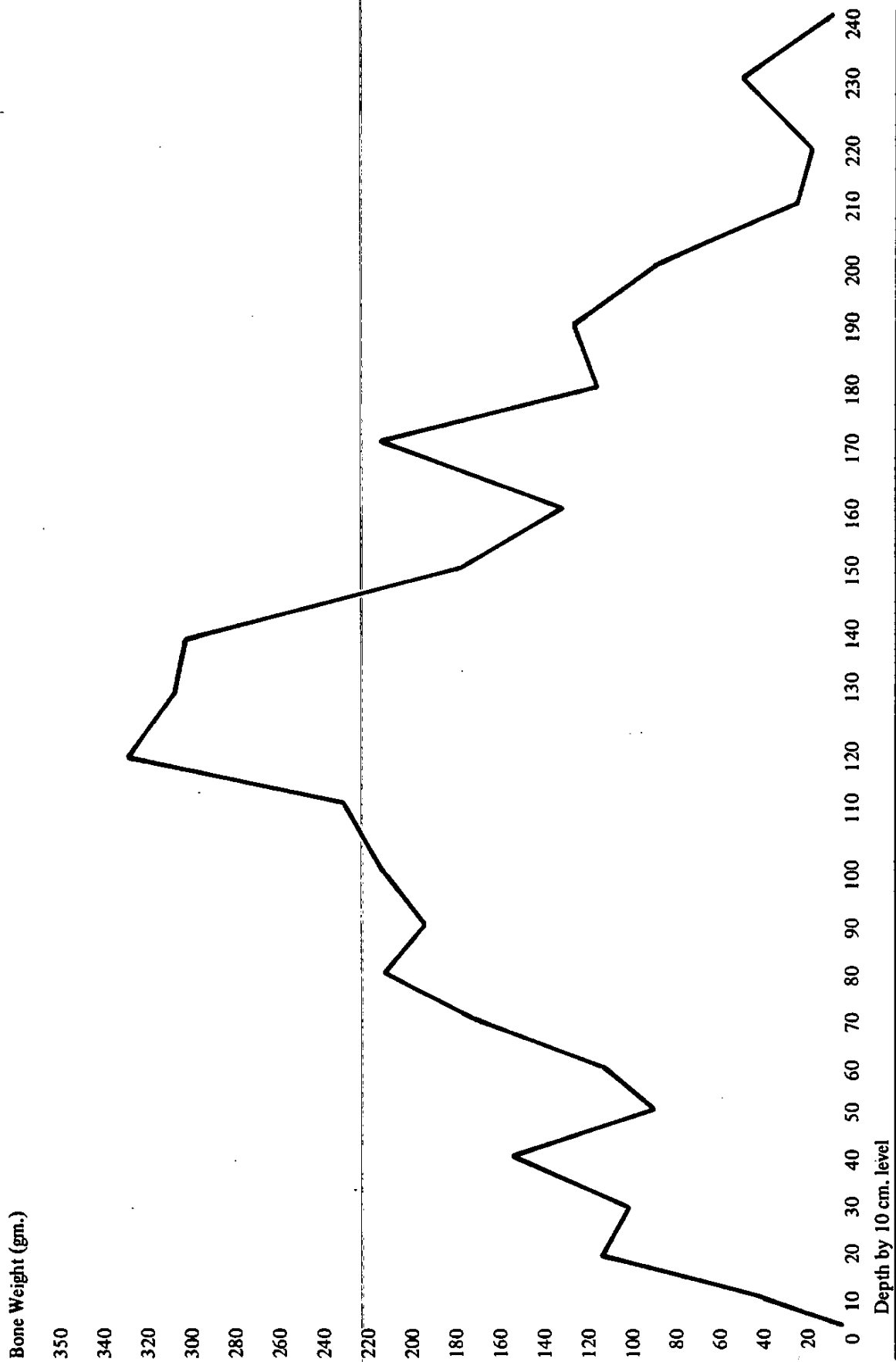


TABLE 17B: Depth Distribution of Silicate Chipping Waste 4-Mer-S94

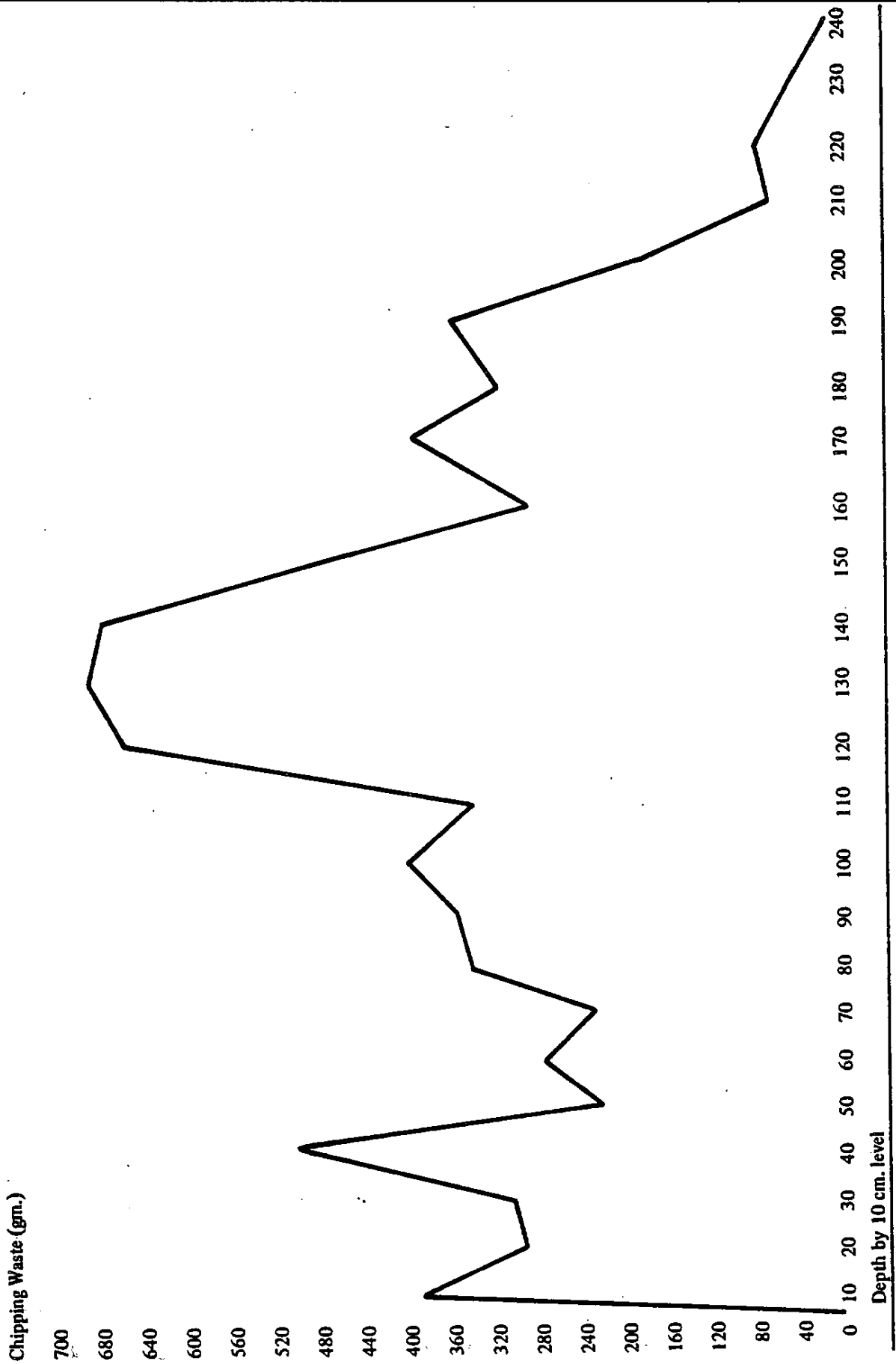


TABLE 18: Unmodified Rock (By Screen Size in Pounds)**For 1 m. by 1 m. Column in Unit 10N 2W, 4-Mer-S94**

Depth (cm.)	1/4 inch (6 mm.)	1 inch (25 mm.)	2 inch (50 mm.)	Total
0-10	51.2	63.8	117.1	232.1
10-20	22.6	31.4	93.9	147.9
20-30	13.0	30.9	103.1	147.0
30-40	22.0	67.0	123.0	212.0
40-50	20.0	55.0	131.0	206.0
50-60	42.0	64.0	230.5	336.5
60-70	12.5	11.0	41.0	64.5
70-80	21.5	26.0	84.0	131.5
80-90	35.5	33.0	104.0	172.5
90-100	33.5	26.0	70.0	129.5
100-110	43.5	34.5	89.0	167.0
110-120	33.5	25.5	61.0	120.0
120-130	30.0	16.5	87.0	133.5
130-140	24.0	16.0	83.0	123.0
140-150	27.0	17.5	44.0	88.5
150-160	25.0*	13.0	43.0	81.0
160-170	45.0	9.5	16.0	70.5
170-180	42.5	0.0	52.0	94.5
180-190	38.0	12.0	35.0	85.0
190-200	41.0	9.5	16.0	66.5
200-210	41.0	12.5	19.0	72.5
210-220	31.5	6.0	12.0	49.5
220-230	27.5	6.0	18.0	51.5
230-240	25.0	8.0	12.0	45.0
Total	478.3	594.6	1,684.6	3,027.5

*Below 150 cm., 1/4-inch weights include some dirt clods.

TABLE 19: Burial Data and Associated Artifacts 4-Mer-S94

Burial	Unit	Depth (cm.)	Age	Sex	Position	Orientation	Associated Objects
1	10S 2W	73	A.	?	?	?	Possible cobble cairn, quartz crystal, ground serpentine fragment.
2	10S 2W	95	A.	?	?	?	None in direct association.
3	10S 2W	107	A.	?	?	?	None in direct association.
4	12N 2W	86	A.	?	?	?	Slab milling stone
5	4S 2W	165	A.	M(?)	r. side, flex	E	None. In semisterile subsoil.
6	4N 2W	183	A.	?	?	NW	Red pigment, bone pin frags., obsidian frag., Olivella beads Type A1a, A1b, A1c, A1c, 2a1 and 3c, Halotis ornament Type C(1)2b.
7	4E 2S	100	A.	?	?	?	Slab metate, slab mortar, small cobble mortar, tar, mortar frag., 2 pestles, Olivella beads Type A1b, 2b, Type 1 Halotis bead, ground slate fragment.
8	4E 2S	140	A.	?	l. side, flex.	NW	Possibly part of large stone items from Burial 7 (in semisterile subsoil).
9	6N 2W	91	A.	F(?)	dorsal, flex	S	None
10	6N 2W	103	A.	M	r. side, flex	N	Olivella beads, A1a, A1c, perforated pebble pendant, bone bead, bird bone whistle, worked bird bone, two proj. pt. frags., possibly clay spindle whorl and bone avil frag.
11	16W 2S	90-100	A.	?	?	SE	None
12	6N 2W	133	Adol.	?	l. side, flex	SE	Polished bone fragment.
13	6W 2S	60-100?	Inf.	?	?	?	Halotis ornament Type c(1)2b, stone pipe, incised bird bone whistle, plain bird bone whistle, perforated flat cobble frag., (all are in loose assoc. from screening).
14	2E 2S	100-120	A.	F	r. side, flex(?)	NW	Mano, canid mandible fragment.
15	2E 2S	100-140	A.	F	r. side, flex	SW	None
16	2E 2S	120	A.	M	l. side, flex	N	Olivella Type 2b.
17	2E 2S	120	A.	M	l. side, flex	NE	Slab metate(?)
18	6W 2S	120-160	A.	M	?	?	Pestle, bird bone whistle, proj. pt. frag.
19	2S OE	50	Ch.	?	?	?	None.
20	2E 2S	100-120	A(?)	?	?	?	Two slab metates in area.
21	8N 2W	120	A.	?	?	?	Badly fragmented skull, few other remains.
22	2S 2W	102	A.	F(?)	l. side, flex	N	None.
23	2S 2W	169	A.	M	R. side, flex	E	Red pigment, two bird wings, 4 bones unmodified. In semisterile subsoil.
24	ON 2W	165	A.	F	dorsal flex	SE	Quartz crystal, bone spatula or awl frag., perforated flat cobble frag., obsidian frag., (in semisterile subsoil).
25	10N 2W	164	Inf.	?	l. side, flex	S	None. (In semisterile subsoil.)
26	2S 12W	135-160	A.	?	l. side, flex	W	Cairn over bones (lying on gravel terraces). None.
27	14N 4E	ca. 50-60	A.	?	l. side, semiflex	N	Halotis shell ornament Type M2d11, Olivella bead Types A1a, A1b, A1c, 3d, Halotis callos disc beads, small steatite disc beads.
28	12N 14E	ca. 80	Ch.	?	r. side, flex	SE	Grave pit 60 x 65 cm. dia., intrusive into sterile gravel terrace. None.
29	14N 12E	ca. 90-100	A.	?	l. side and ventral flex	SE	Bowl mortar, pitted milling stone, pestle, Olivella bead Type A1a. (Grave pit into sterile base soil.)
30	18N 6E	ca. 90-100	Ch.	?	dorsal flex	N	Bowl mortar, large cairn over bones. (Grave pit intrusive into sterile soil.)
31	20N 6E	ca. 90	Ch.	?	flexed(?)	E(?)	None.
32	22N 4E	ca. 75	A.(?)	?	l. side, flex	W	None. Grave pit 70 x 30 cm.
33	6S 2W	80-100	Ch.	?	?	?	Bowl mortar, splinter awl.
34	22N 4E	ca. 90	A.	?	l. side, flex	E	Quartz crystal below and slightly north of Burial 32. Grave pit intrusive into base soil.
35	14S 2E	ca. 180	A.	?	r. side, flex	W	Red pigment, split antler segment, possibly worked. Grave pit intrusive into sterile subsoil.
36	14S OE	ca. 170	A.	F(?)	r. side & back flex	NE	Bowl mortar, pestle, blank (unfinished).
37-38	14N 4E	ca. 60-70	Ch.	?	flexed(?)	NW	None
39	16S OE	ca. 140	A.(?)	?	?	?	None
40	10S 12W	ca. 150	A.	?	dorsal flex	W	Two worked mammal rib frags., mortar frag., Olivella beads Type 3c, medium steep scraper. (Grave pit intrusive into sterile subsoil.) Small steep scraper, polished bone frags., bone steaver fragment, projectile point Type 6 embedded in sacrum. Grave pit intrusive into sterile soil.

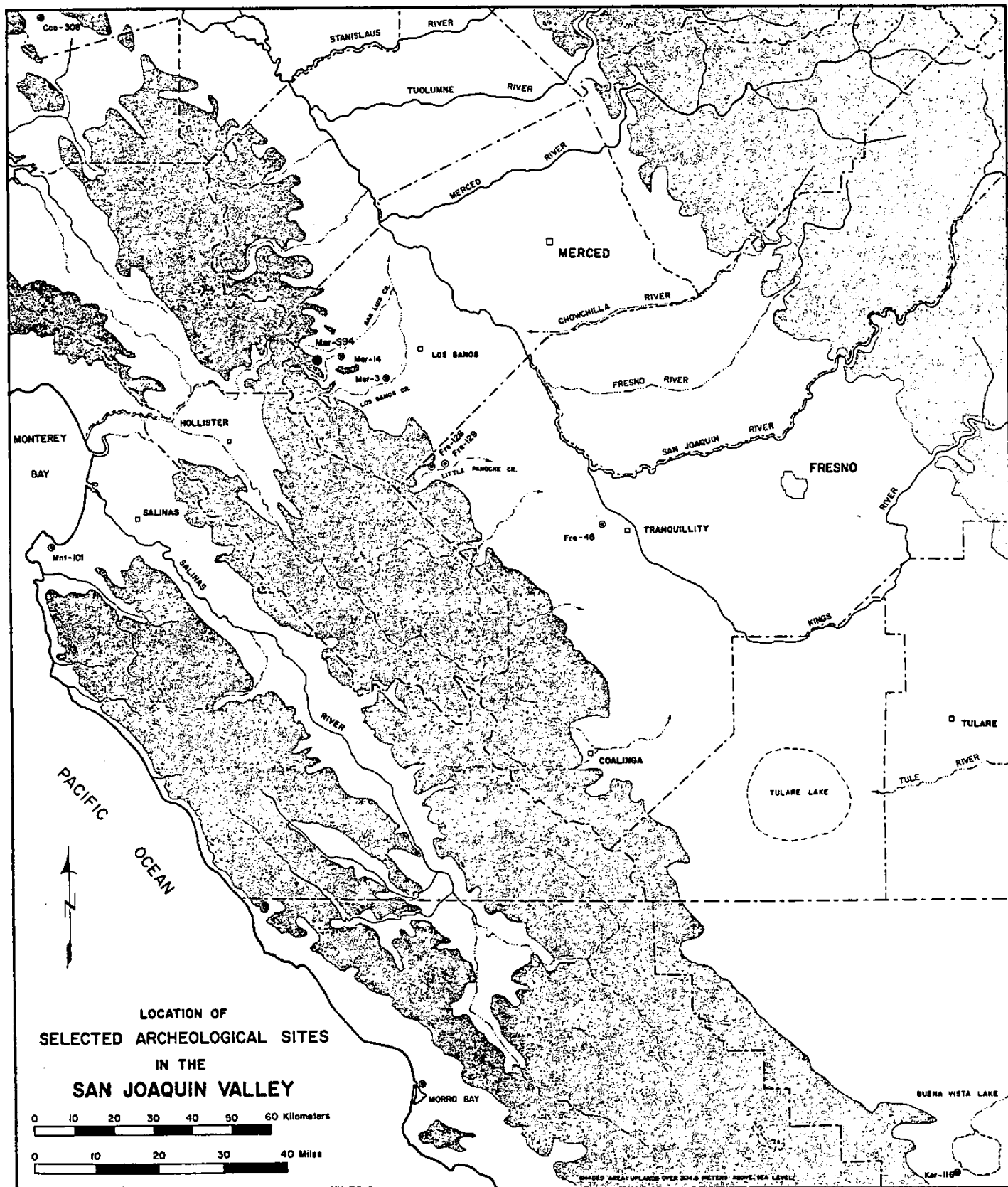
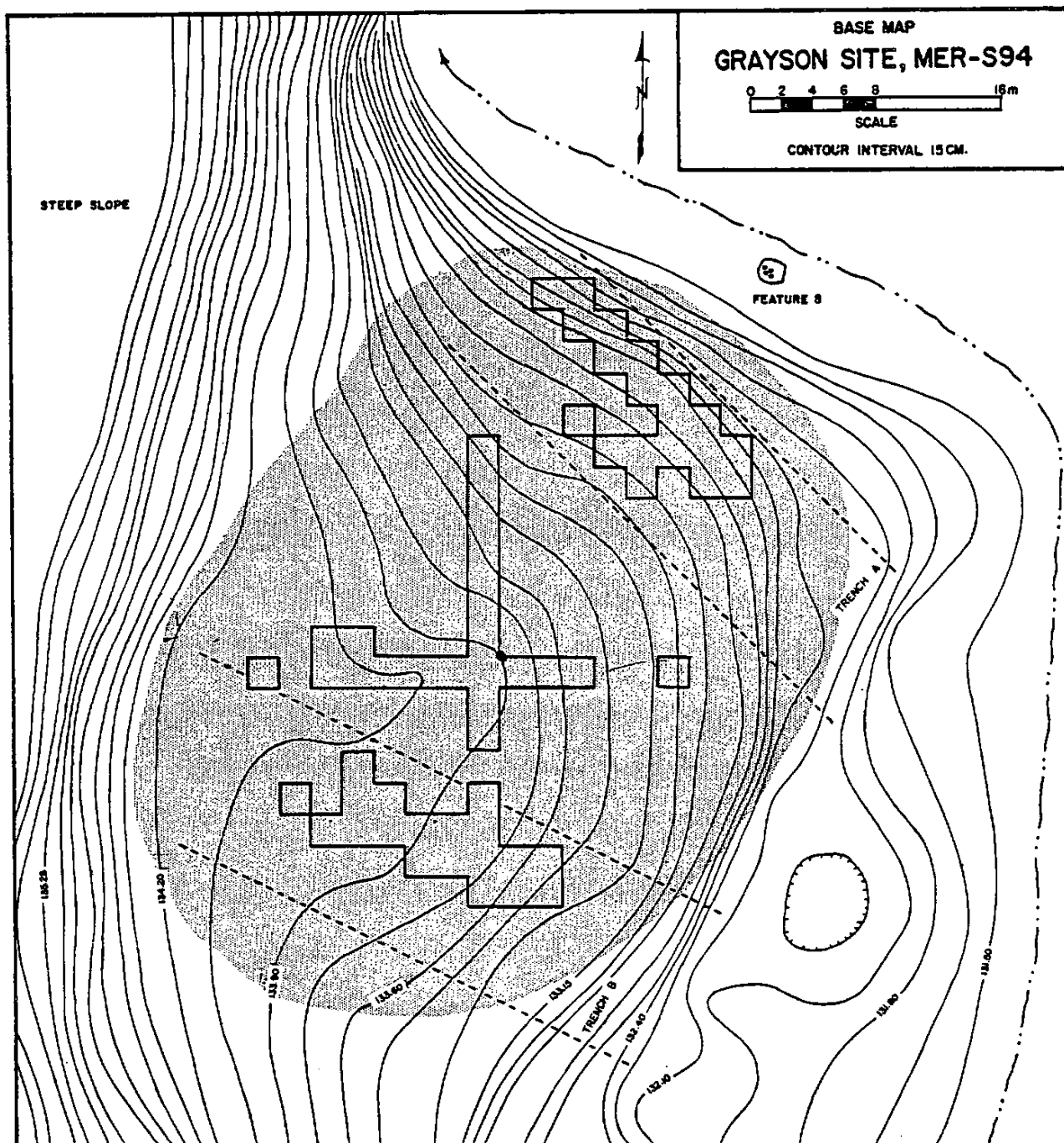


FIGURE 2



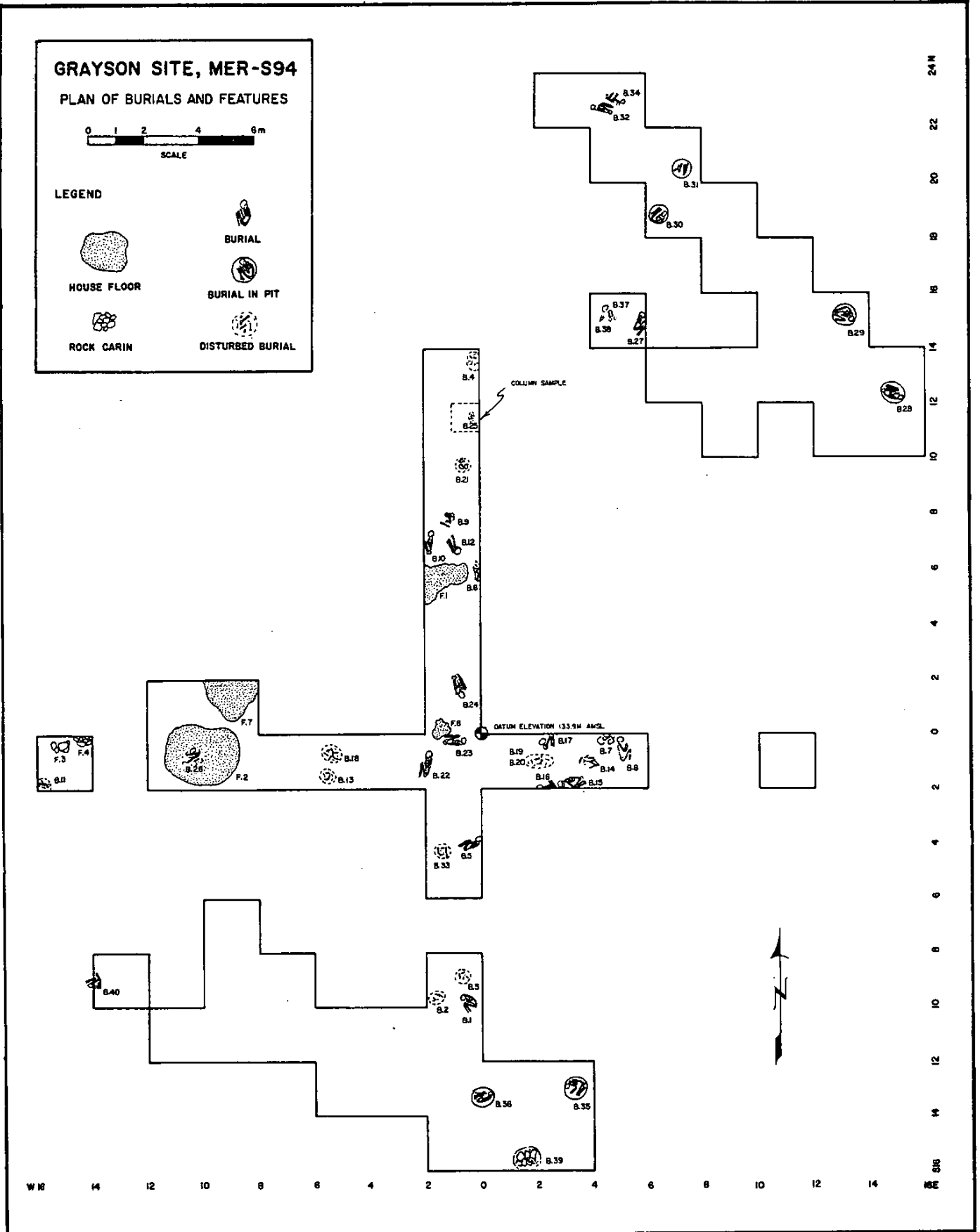


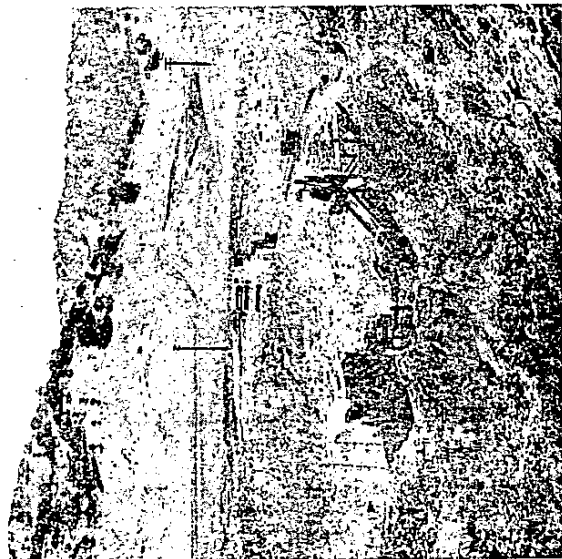
FIGURE 4

General Views of Site and Excavations at 4-Mer-S94.

- a) Aerial view showing excavations, Summer 1966.
- b) View looking east across site.
- c) View of slide screen and bulldozing, Summer 1967.
- d) View to west across site, note oak parklands in background, Summer 1966.



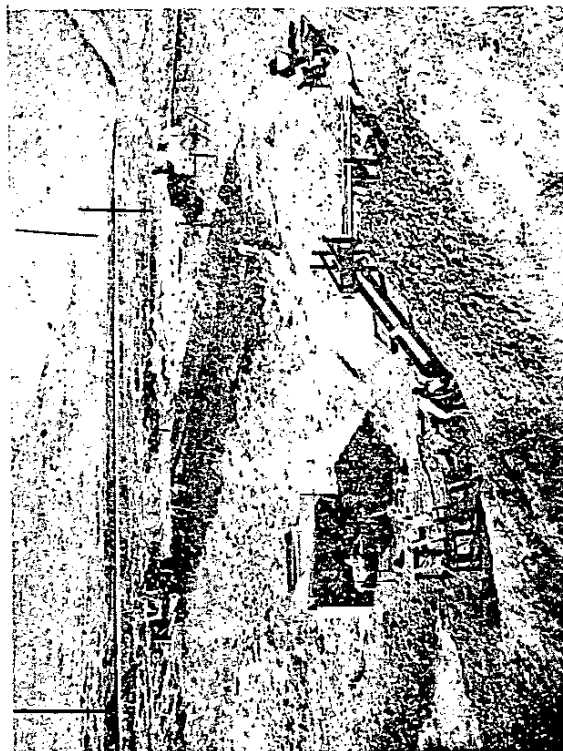
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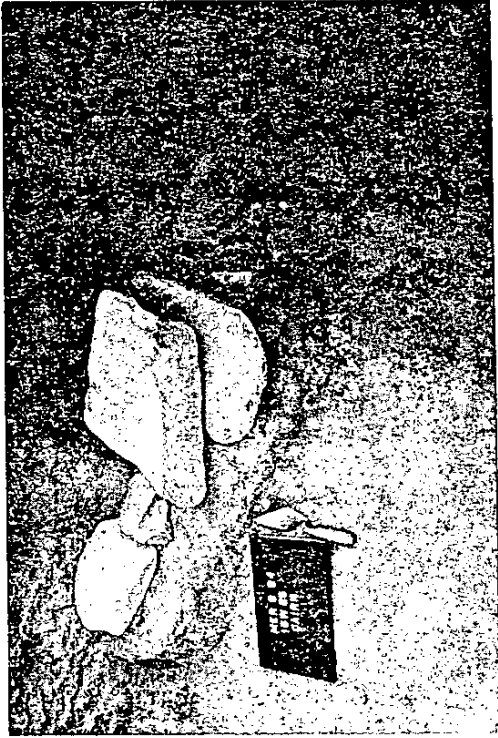


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FIGURE 5

Features and Burial at 4-Mer-S94.

- a) Features 2 and 7, house floors in Units 10W-2S, 12W-2S and 12W-OS.
- b) Feature 4, cairn of slab mortars before removal, Unit 16W-2S.
- c) Feature 4 after removal of slab mortars showing lower portion of cairn.
- d) Feature 5, perforated flat cobble fragments and pestle *in situ*.
- e) Burial 1, note slab cairn over bones.



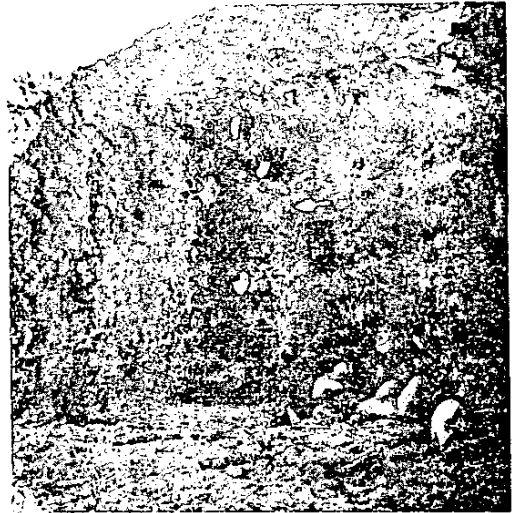
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d

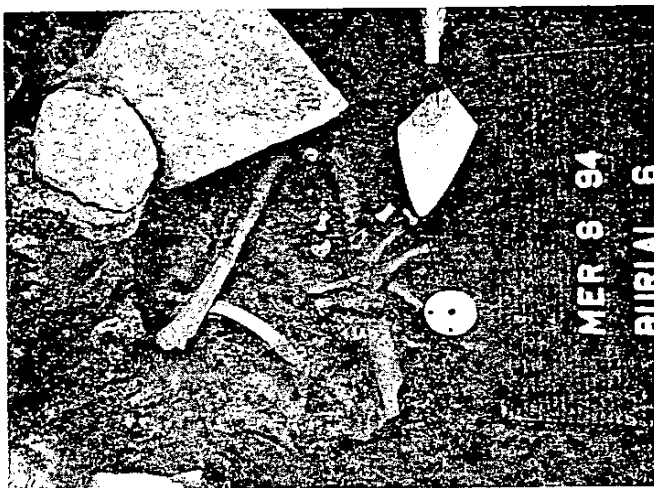


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FIGURE 6

Burials at 4-Mer-S94.

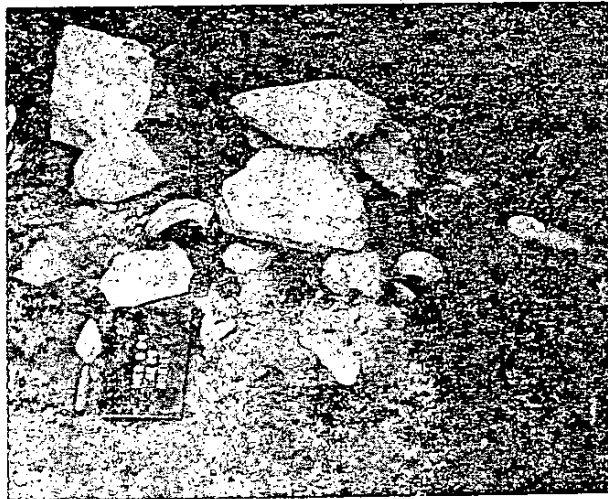
- a) Burial 6, closeup of *Haliotis* shell ornament.
- b) Burial 20, associated (?) slab mortars and perforated flat cobble.
- c) Burial 7, cairn and associated artifacts.
- d) Burials 9 and 10, note bowl mortar in south unit wall.
- e) Burial 5 prior to final exposure.
- f) Burial 23, note bird bones over legs.



a



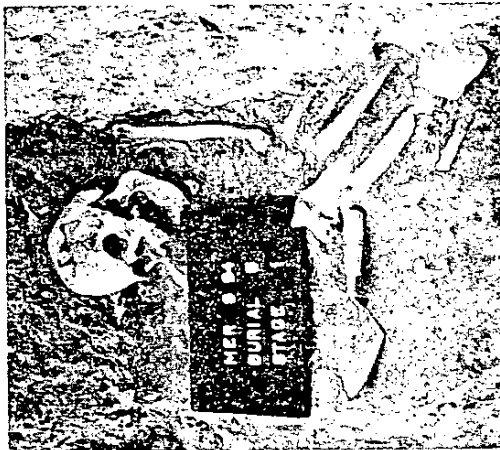
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f

FIGURE 7

Burials at 4-Mer-S94.

- a) Burial 15, intrusive through Burial 16.
- b) Burial 17, note associated (?) slab mortar.
- c) Burial 39, cobble cairn prior to removal.
- d) Burial 24, note unfinished perforated cobble over legs and rodent burrows into lighter colored matrix.
- e) Burial 30, cairn and associated bowl mortar.
- f) Burial 36, cairn and associated bowl.



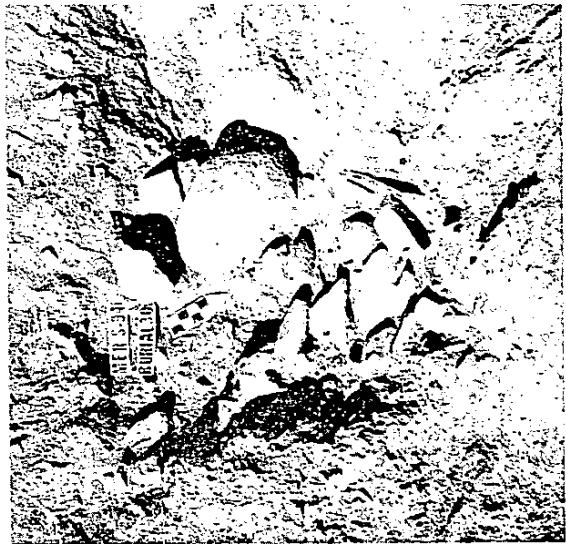
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a



d

FIGURE 8

Shell, Stone, and Bone Beads and Ornaments (Actual Size).

- a-b) Small spire-lopped *Olivella* beads, Type A1a, Burial 6 (W-29-1805).
- c) Large spire-lopped *Olivella* bead, Type A1c (W-29-1830).
- d) Diagonal ground spire-lopped *Olivella* bead, Type A2a (W-29-301).
- e) Small barrel *Olivella*, Type B3a (W-29-705).
- f) Medium barrel *Olivella*, Type B3b (W-29-1943).
- g) Medium end-ground *Olivella*, Type B2b (W-29-1549).
- h) Thin rectangle *Olivella*, Type 2a1 (W-29-1806), associated with Burial 6.
- i-m) Thick rectangle *Olivella*, Type 2b: i, (W-29-653); j, (W-29-1813) associated with Burial 7; k, (W-29-2294); l, (W-29-1187); and m, (W-29-779).
- n) Thick rectangle *Olivella*, Type 2b (variant), (W-29-2887).
- o) Split-drilled *Olivella*, Type 3b1 (W-29-174).
- p) Split-drilled *Olivella*, Type 3b1 (variant), (W-29-1263).
- q) Modified saddle *Olivella*, Type 3b2 (W-29-101).
- r) Large disc *Olivella*, Type 3c (W-29-2799) associated with Burial 39.
- s) Small thin disc *Olivella*, Type 3d (W-29-2768).
- t) Rough saucer *Olivella* (W-29-2040).
- u) *Macoma* disc (W-29-495).
- v) Square *Haliotis* (W-29-1811) associated with Burial 7.
- w) *Haliotis* disc (W-29-2451).
- x) *Haliotis* epidermis or callus disc (W-29-2766) associated with Burial 27.
- y) Freshwater mussel bead (W-29-2214).
- z) Freshwater mussel blank (W-29-1310).
- aa) Steatite disc (W-29-2767) associated with Burial 27.
- bb) Calcite disc (W-29-2362).
- cc) Tubular steatite bead (W-29-2279).
- dd) Small mammal bone bead (W-29-1072).
- ee) Bird bone bead (W-29-935).
- ff) Small mammal bone bead (W-29-1055).
- gg) *Haliotis* blank (W-29-1035).
- hh) *Haliotis* blank (W-29-869).
- ii) *Haliotis* ornament, Type B(1)1 (W-29-1178).
- jj) *Haliotis* ornament, Type C1a (W-29-315).
- kk) *Haliotis* "Ring" ornament fragment (W-29-770).
- ll) *Mytilus* shell fishhook fragment (W-29-2512).
- mm) *Haliotis* ornament, Type C(1)1b (W-29-1839), probably associated with Burial 13.
- nn) *Haliotis* ornament, Type C(1)2b (W-29-1802) associated with Burial 6.
- oo) *Haliotis* ornament, Type M2dII (W-29-2770) associated with Burial 27.

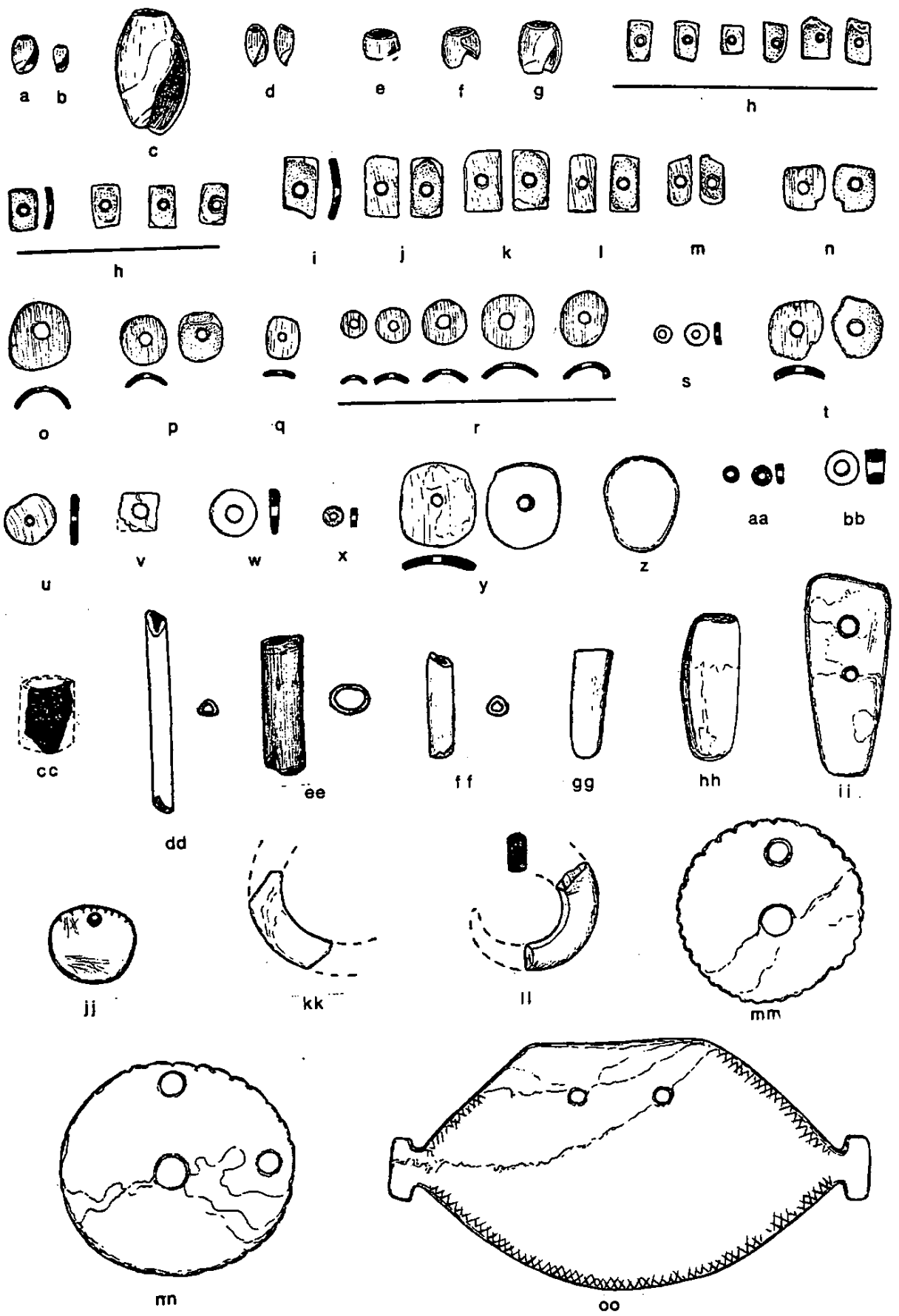


FIGURE 9

Tooth and Bone Artifacts from 4-Mer-S94 (Actual Size).

- a) Perforated canine tooth (W-29-169), 170-180 cm.
- b) Drilled Coyote tibia (W-29-719), 50-60 cm.
- c) Bone skewer fragment (W-29-2808), associated with Burial 40.
- d) Phalanx tube (W-29-1454), 80-100 cm.
- e) Bipointed bone pin (W-29-2097), 100-120 cm.
- f) Cut bird bone (W-29-1493), 140-160 cm.
- g) Bird bone whistle (W-29-1834), associated with Burial 10.
- h) Incised bird bone whistle (W-29-1844), 60-80 cm.
- i) Bird bone whistle (W-29-83), 80-90 cm.
- j) Mammal bone whistle (W-29-1917), 70-80 cm.
- k) Bird bone whistle, note asphalt stop (W-29-1859), 140-160 cm.
- l) Bird bone whistle (W-29-1843), 60-80 cm.

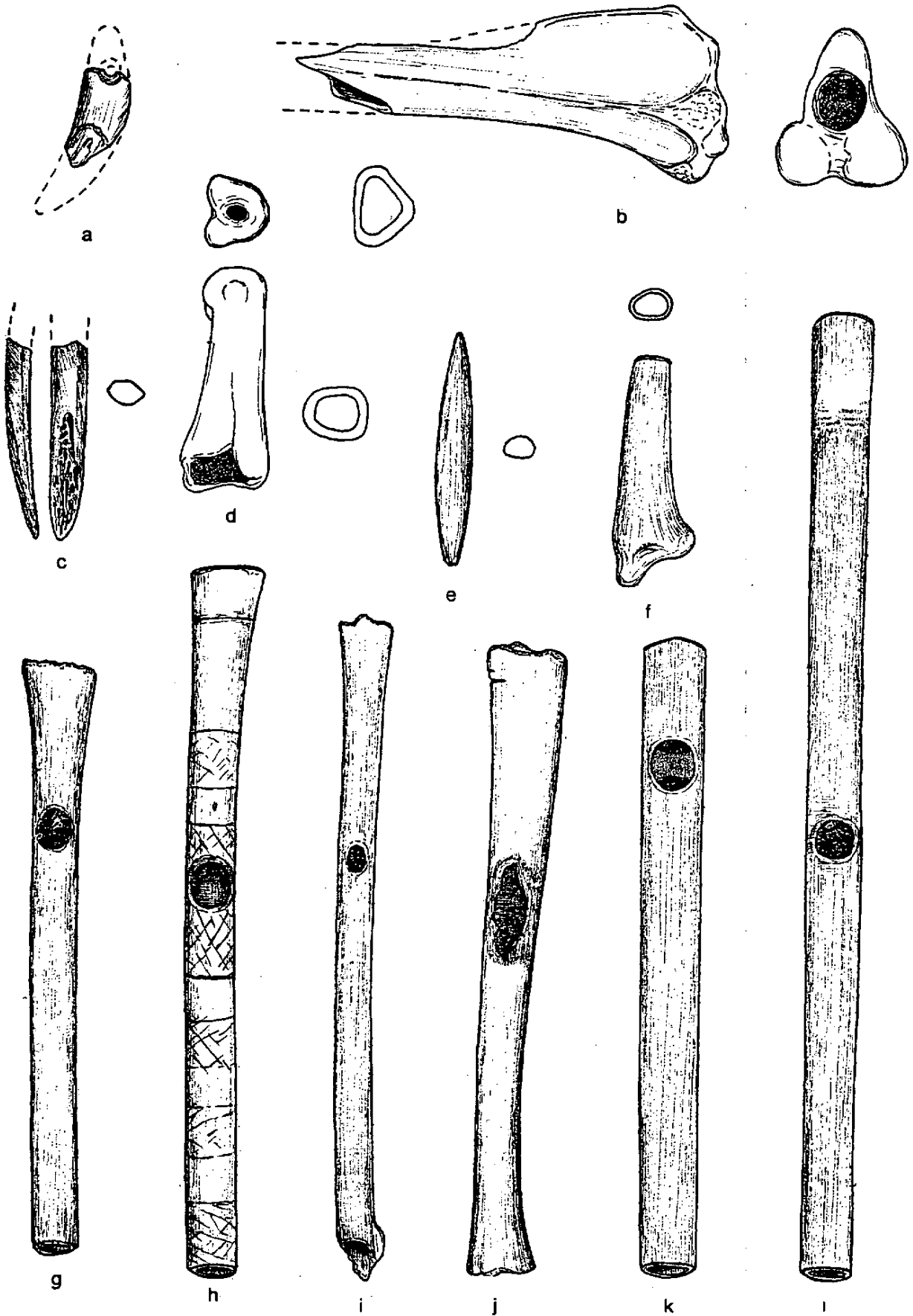


FIGURE 10

Bone and Antler Artifacts from 4-Mer-S94 (Actual Size).

- a) Polished bone pin fragments (W-29-1803), 180-190 cm.
- b) Polished bone pin fragment (W-29-1073), 190-240 cm.
- c) Spatulate bone object fragment (W-29-1829), 110-120 cm.
- d) Spatulate bone object fragment (W-29-643), 150-160 cm.
- e) Spatulate bone object fragment (W-29-54), 50-60 cm.
- f) Polished bone pin tip fragment (W-29-1296), 140-160 cm.
- g) Spatulate bone object fragment (W-29-1450), 80-100 cm.
- h) Bone pin tip fragment (W-29-671), 30-40 cm.
- i) Antler flaker (W-29-1138), 60-80 cm.
- j) Antler flaker fragment (W-29-360), 190-200 cm.
- k) Antler flaker fragment (W-29-423), 70-80 cm.
- l) Spatulate bone object (W-29-1871), associated with Burial 24.
- m) Antler wedge (W-29-126), 120-130 cm.
- n) Spatulate antler object (W-29-190), 190-200 cm.
- o) Bone awl base fragment (W-29-186), 180-190 cm.
- p) Bone awl tip (W-29-138), 130-140 cm.
- q) Bone awl tip (W-29-446), 90-100 cm.
- r) Bone awl fragment (W-29-1430), 40-60 cm.
- s) Bone awl (W-29-272), 70-80 cm.

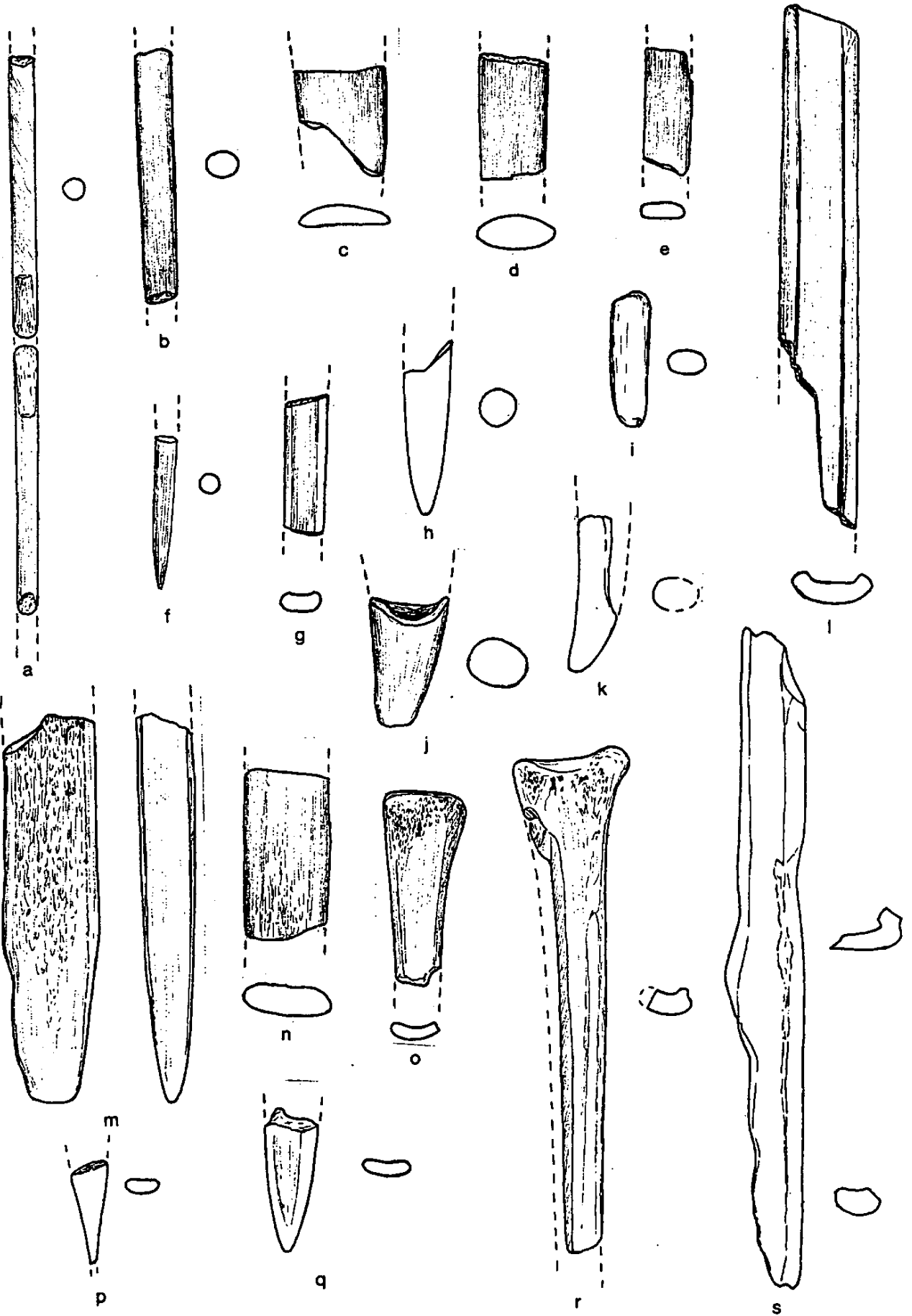


FIGURE 11

Bone Artifacts from 4-Mer-S94 (Actual Size).

- a) Bone awl (W-29-678), 40-50 cm.
- b) Bone awl (W-29-1573), 100-120 cm.
- c) Polished bone splinter (W-29-2787), associated with Burial 33.
- d) Bone awl, reworked fragment (W-29-2667), 140-150 cm.
- e) Pointed bone splinter (W-29-1105), 10-20 cm.
- f) Pointed bone splinter (W-29-768), 120-130 cm.
- g) Scapula tool (W-29-2850), 80-90 cm.
- h) Scapula tool (W-29-591), 90-100 cm.

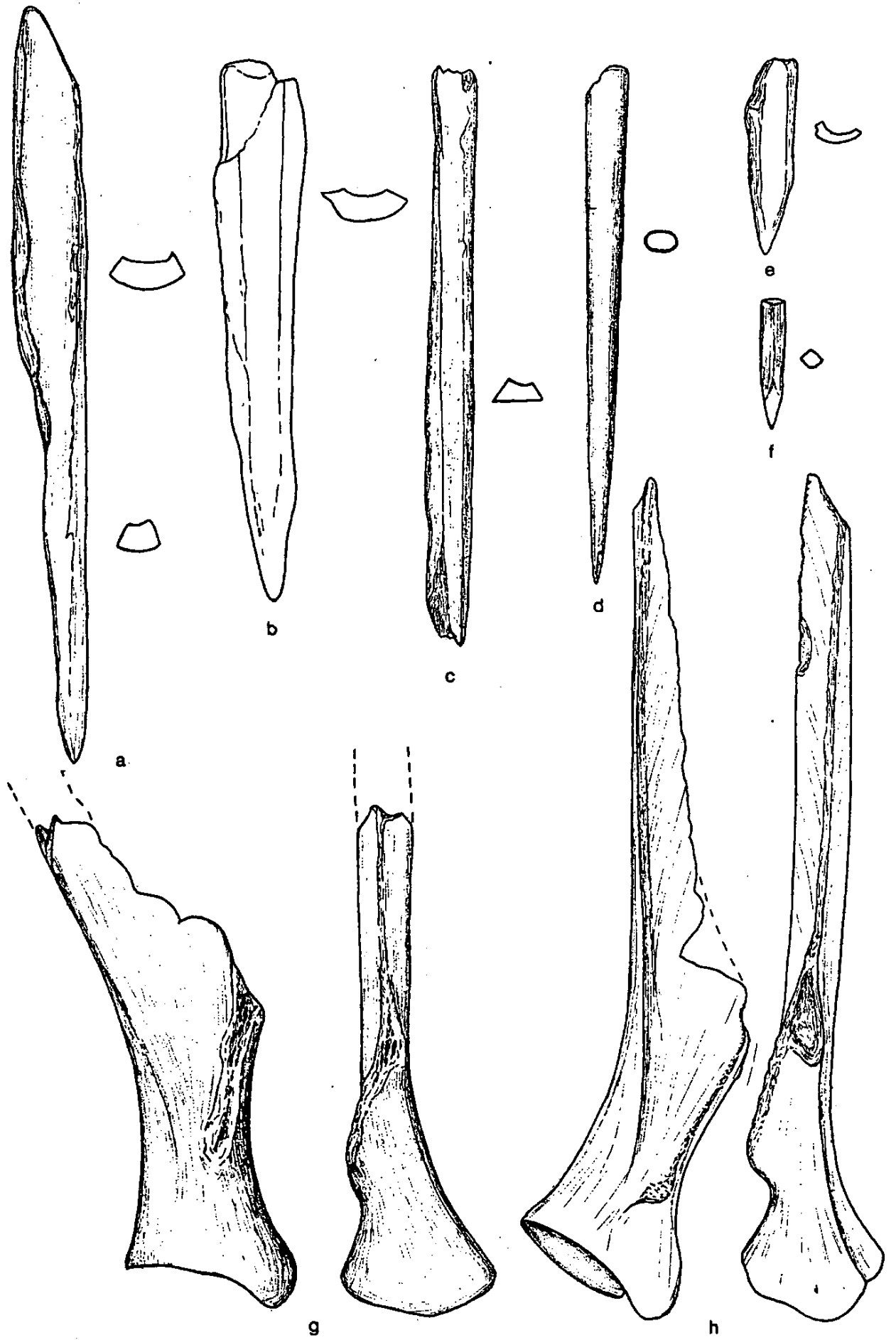


FIGURE 12

Objects of Polished Stone and Baked Clay from 4-Mer-S94 (Actual Size).

- a) Ground actinolite splinter (W-29-1149), 80-100 cm.
- b) Slate pin tip fragment (W-29-1179), 120-140 cm.
- c) Slate pendant fragment (W-29-1815), associated with Burial 7.
- d) Slate pendant fragment (W-29-1452), 80-100 cm.
- e) Jade? rod fragment (W-29-1640), 0-20 cm.
- f) Slate pendant (W-29-1535), 40-60 cm.
- g) Slate pendant fragment (W-29-1973), 20-30 cm.
- h) Schist pendant fragment (W-29-204), 210-220 cm.
- i) Slate pendant fragment (W-29-2896), 220-230 cm.
- j) Slate pendant fragment (W-29-668), 30-40 cm.
- k) Slate pendant fragment (W-29-704), 10-20 cm.
- l) Schist pendant fragment (W-29-679), 40-50 cm.
- m) Slate pendant fragment (W-29-2053), 20-30 cm.
- n) Slate pebble pendant (W-29-344), 160-170 cm.
- o) Sandstone pebble pendant (W-29-313), 130-140 cm.
- p) Slate "ring" fragment (W-29-1496), 140-160 cm.
- q) Jade "ring" fragment (W-29-177), 170-180 cm.
- r) Slate "ring" fragment (W-29-75), 80-90 cm.
- s) Slate "ring" fragment (W-29-2530), 80-100 cm.
- t) Small slate "ring" (W-29-273), 70-80 cm.
- u) Small slate "ring" fragment (W-29-1996), 60-70 cm.
- v) Atlatl engaging hook (W-29-1287), 120-140 cm.
- w) Baked clay spindle whorl fragment (W-29-1094), 100-110 cm.

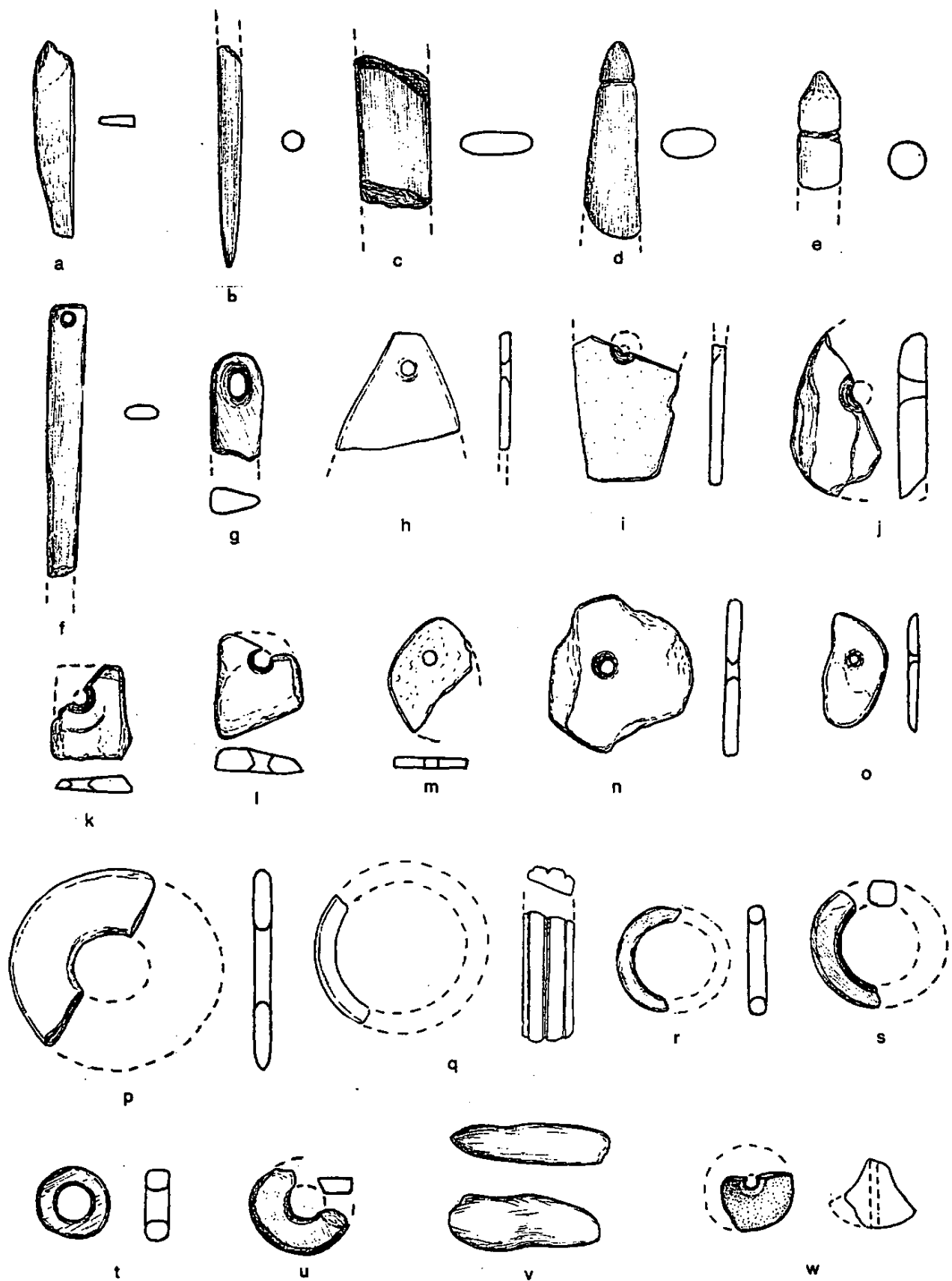


FIGURE 13

**Objects of Polished and Ground Stone from 4-Mer-S94 (Actual Size Unless
Otherwise Stated).**

- a) Steatite pipe (W-29-1841), 60-100 cm., possibly associated with Burial 13.
- b) Granite charmstone (W-29-880), 120-130 cm.
- c) Ground stone spatula (W-29-1288), 120-140 cm. (½ actual size).
- d) Slate pendant (W-29-788), 140-150 cm.
- e) Grooved sandstone object (W-29-2541), 100-120 cm.
- f) Polished sandstone "gorget" (W-29-2415), 50 cm.

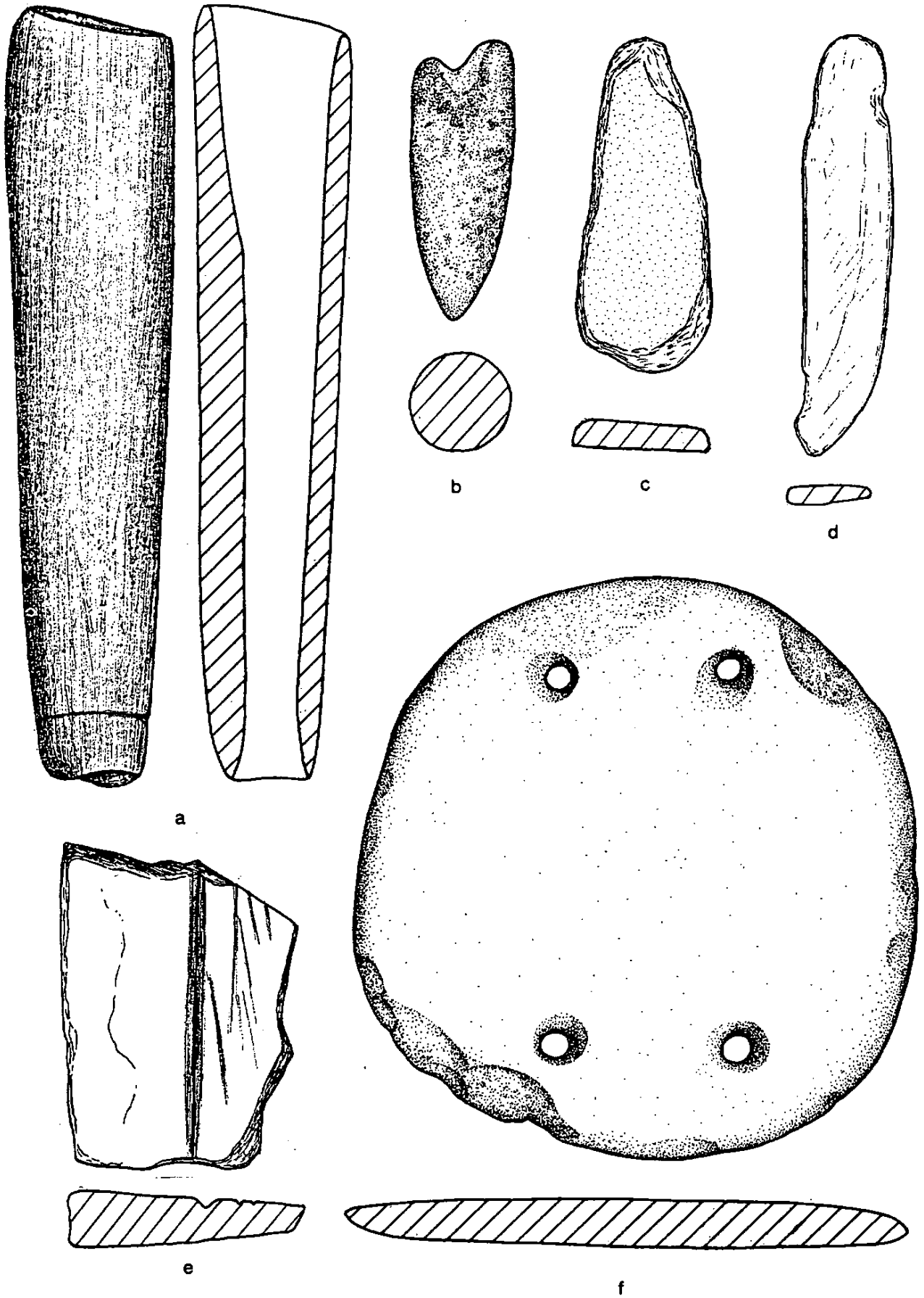


FIGURE 14

Projectile Points and Knife Blades from 4-Mer-S94 (Actual Size).

- a) Type 1A, obsidian (W-29-745), 80-90 cm.
- b) Type 1A, chert (W-29-1918), 70-80 cm.
- c) Type 1A, chert (W-29-1410), 0-20 cm.
- d) Type 1A, obsidian (W-29-1207), 160-170 cm.
- e) Type 1A, Franciscan chert (W-29-1645), 20-40 cm.
- f) Type 1B, chert (W-29-2392), 0-10 cm.
- g) Type 1B, obsidian (W-29-2028), 40-60 cm.
- h) Type 1B, silicate, note asphaltum on base (W-29-1566), 100-120 cm.
- i) Type 1C, silicate (W-29-1924), 80-100 cm.
- j) Type 2, obsidian, stream rolled (W-29-1363), 80-100 cm.
- k) Type 9, silicate, note asphaltum on base (W-29-2670), Trench A, no depth.

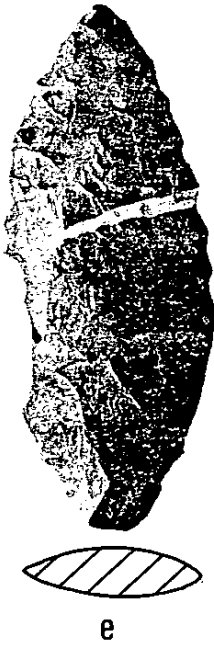


FIGURE 15

Projectile Points from 4-Mer-S94 (Actual Size).

- a) Type 3, obsidian (W-29-117), 110-120 cm.
- b) Type 3, obsidian (W-29-383), 20-30 cm.
- c) Type 3, chert (W-29-1464), 100-120 cm.
- d) Type 3, silicate (W-29-1114), 20-40 cm.
- e) Type 3, chert (W-29-686), 50-60 cm.
- f) Type 4, silicate (W-29-1676), 80-100 cm.
- g) Type 4, chert (W-29-1387), 140-160 cm.
- h) Type 5, Franciscan chert (W-29-1228), 40-60 cm.
- i) Type 5, green chert (W-29-2441), 120-140 cm.
- j) Type 6, silicate (W-29-2809), found imbedded in the sacrum of Burial 40.
- k) Type 6, chert (W-29-2402), 20-30 cm.
- l) Type 6, silicate (W-29-1495), 140-160 cm.
- m) Type 6, silicate (W-29-2124), 0-20 cm.

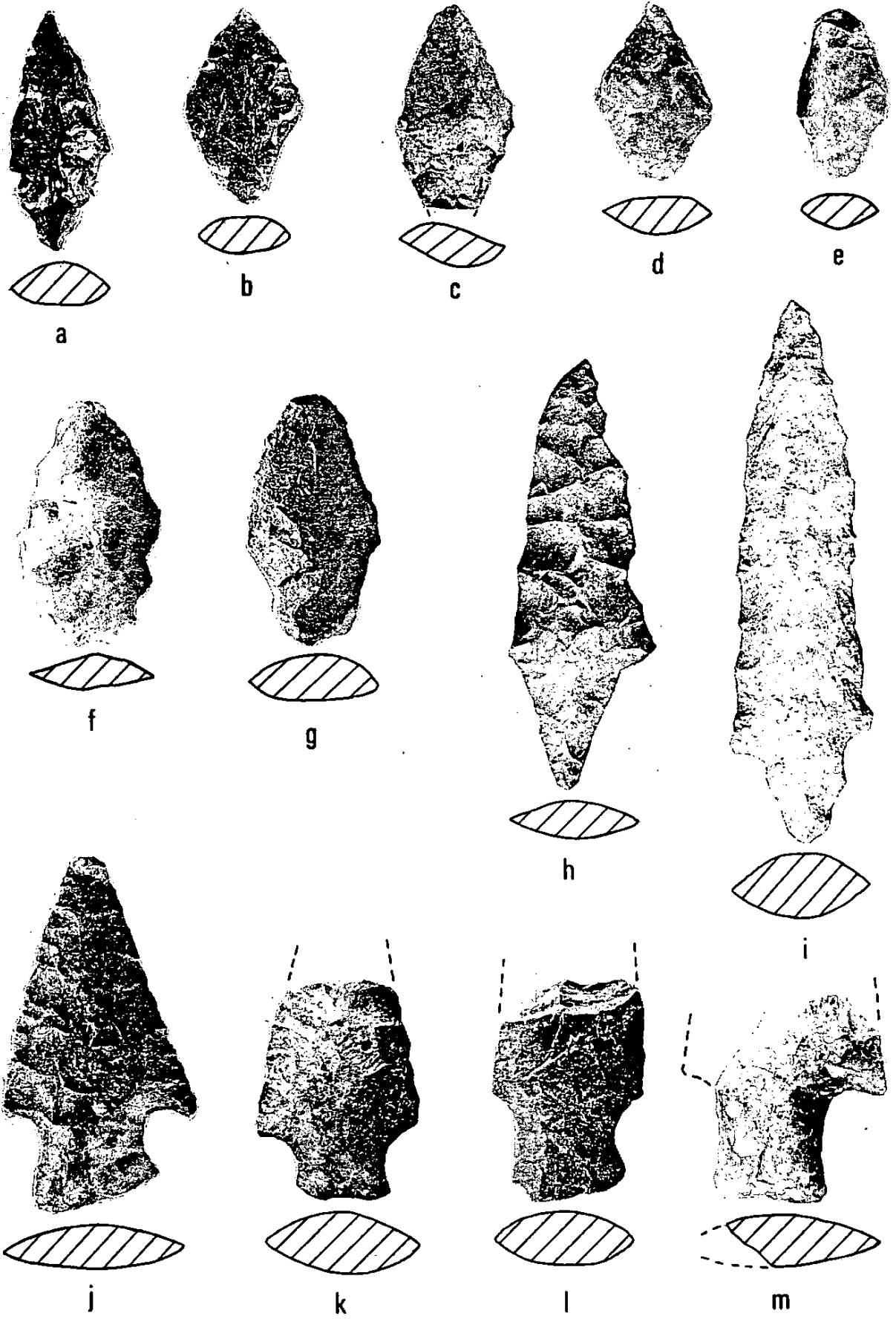


FIGURE 16

Projectile Points from 4-Mer-S94 (Actual Size).

- a) Type 6, chert (W-29-2579), 220-240 cm.
- b) Type 6, chert (W-29-49), 40-50 cm.
- c) Type 6, silicate (W-29-800), 20-30 cm.
- d) Type 6, silicate (W-29-901), surface.
- e) Type 6, Franciscan chert (W-29-934), 60-70 cm.
- f) Type 6, green chert (W-29-551), 30-40 cm.
- g) Type 7A, obsidian (W-29-2189), 120-140 cm.
- h) Type 7A, obsidian (W-29-1241), 60-80 cm.
- i) Type 7B, silicate (W-29-2078), 60-80 cm.
- j) Type 7B, silicate (W-29-1714), 140-160 cm.
- k) Type 7B, green chert (W-29-251), 40-50 cm.
- l) Type 7B, Franciscan chert (W-29-683), 40-50 cm.
- m) Type 7C, "Panoche Side-notched", silicate (W-29-1347), 40-60 cm.
- n) Type 7C, "Panoche Side-notched", silicate (W-29-694), 0-10 cm.
- o) Type 8, quartz crystal (W-29-1274), 120-140 cm.
- p) Type 8, quartz (W-29-559), 40-50 cm.

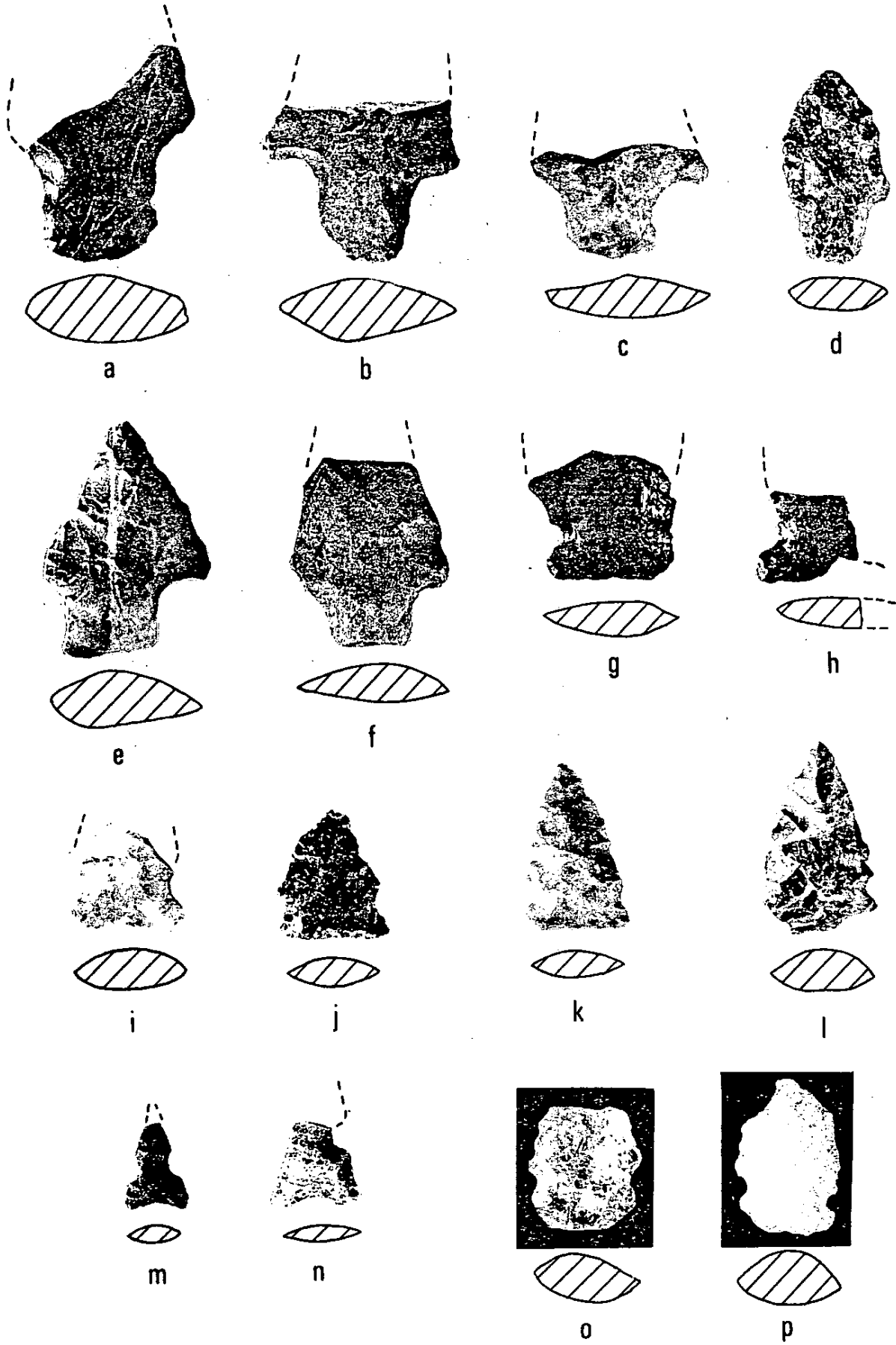


FIGURE 17

Projectile Points and Chipped Stone Tools from 4-Mer-S94 (Actual Size).

- a) Type 8, chert (W-29-1582), 120-140 cm.
- b) Type 8, chert (W-29-1427), 40-60 cm.
- c) Type 8, chert (W-29-1904), 60-70 cm.
- d) Type 8, chert (W-29-1196), 140-160 cm.
- e) Type 8, quartzite (W-29-2505), 30-40 cm.
- f) Type 8, chert (W-29-1543), 60-80 cm.
- g) Type 8, chert (W-29-2396), 10-20 cm.
- h) Type 8, silicate (W-29-1339), 20-40 cm.
- i) Type 8, chert (W-29-633), 130-140 cm.
- j) Type 8, chert (W-29-1173), 120-140 cm.
- k) Type 8, silicate (W-29-485), 120-130 cm.
- l) Type 10, silicate (W-29-986), 20-30 cm.
- m) Obsidian graver, Type 3 (W-29-1094), 100-110 cm.
- n) Obsidian graver, Type 3 (W-29-1617), 160-180 cm.
- o) Obsidian graver, Type 3 (W-29-2296), 160-180 cm.
- p) Obsidian graver, Type 3 (W-29-1399), 160-180 cm.
- q) Obsidian graver, Type 3 (W-29-1600), 140-160 cm.
- r) Prismatic flake knife of chert, Type 4 (W-29-1878), 160-180 cm.
- s) Biface silicate knife, Type 3 (W-29-516), 140-150 cm.
- t) Ovate silicate knife, Type 2 (W-29-1299), 140-160 cm.
- u) Ovate silicate knife, Type 2 (W-29-2464), 200-220 cm.



a



b



c



d



e



f



g



h



i



j



k



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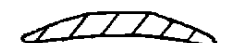
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FIGURE 18

Chipped Stone Artifacts from 4-Mer-S94 (Actual Size).

- a) Quartzite drill, Type 1 (W-29-1712), 140-160 cm.
- b) Chert drill, Type 1 (W-29-2319), 40-60 cm.
- c) Obsidian drill, Type 1 (W-29-819), 40-50 cm.
- d) Obsidian drill, Type 1 (W-29-1227), 40-60 cm.
- e) Silicate drill, Type 2 (W-29-743), 80-90 cm.
- f) Chert drill, Type 2 (W-29-2265), 80-100 cm.
- g) Silicate drill, Type 2 (W-29-2403), 20-30 cm.
- h) Silicate graver, Type 3 (W-29-1633), 0-20 cm.
- i) Obsidian graver, Type 3 (W-29-1289), 120-140 cm.
- j) Silicate biface knife, Type 1 (W-29-900), surface.
- k) Silicate biface knife, Type 1 (W-29-1516), 0-20 cm.
- l) Ovate obsidian knife, Type 2 (W-29-2815), 0-10 cm.
- m) Ovate silicate knife, Type 2 (W-29-1036), 120-130 cm.
- n) Ovate obsidian knife, Type 2 (W-29-1268), 120-140 cm.
- o) Ovate silicate knife, Type 2 (W-29-2464), 200-220 cm.
- p) Silicate biface knife, Type 3 (W-29-1465), 100-120 cm.
- q) Silicate biface knife, Type 3 (W-29-516), 140-150 cm.

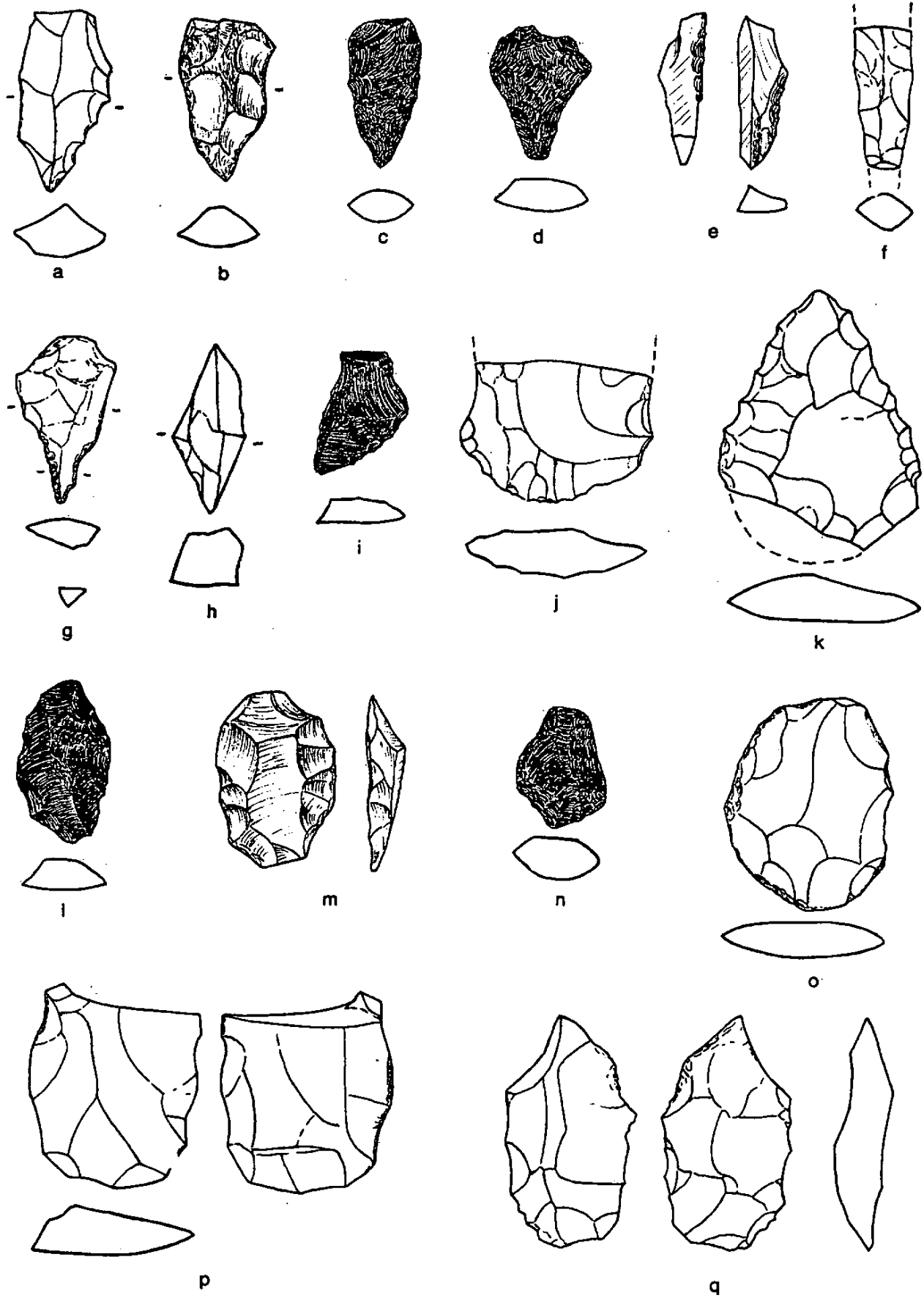


FIGURE 19

Chipped Stone Artifacts from 4-Mer-S94 (Actual Size).

- a) Prismatic flake knife of chert, Type 4 (W-29-1878), 160-180 cm.
- b) Prismatic flake knife of silicate, Type 4 (W-29-2457), 160-180 cm.
- c) Prismatic flake knife of silicate, Type 4 (W-29-1419), 20-40 cm.
- d) Prismatic flake knife of green chert, Type 4 (W-29-1599), 140-160 cm.
- e) Basalt flake knife, Type 5 (W-29-1646), 20-40 cm.
- f) Silicate flake scraper (W-29-783), 130-140 cm.
- g) Silicate flake scraper (W-29-1012), 70-80 cm.
- h) Silicate flake scraper (W-29-1710), 140-160 cm.
- i) Silicate flake scraper (W-29-417), 70-80 cm.
- j) Obsidian flake scraper (W-29-361), 190-200 cm.
- k) Chert flake scraper (W-29-11), 0-10 cm.

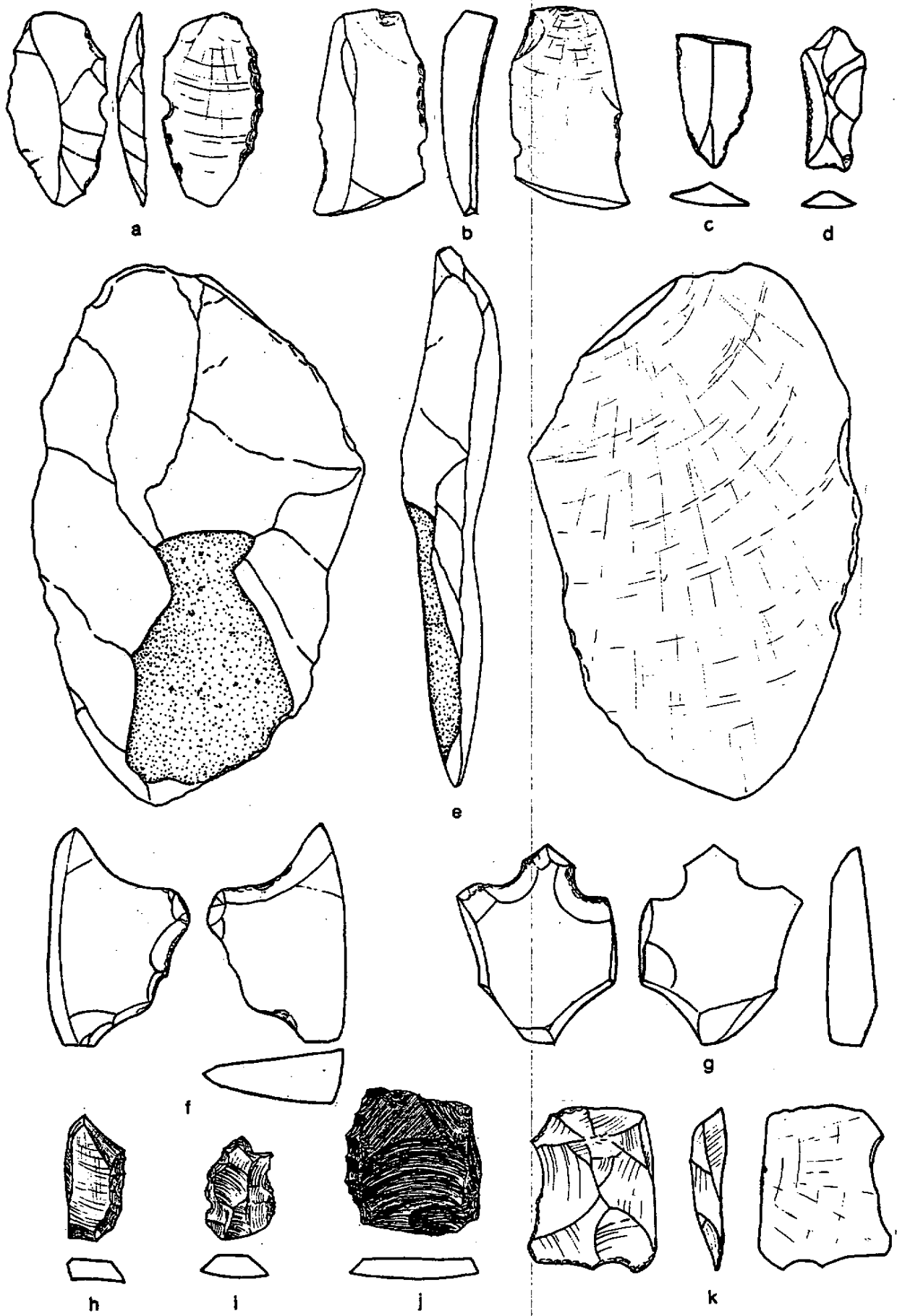


FIGURE 20

Chipped Stone Artifacts from 4-Mer-S94 (Actual Size).

- a) Silicate flake scraper (W-29-1632), 0-20 cm.
- b) Silicate flake scraper (W-29-682), 40-50 cm.
- c) Silicate flake scraper (W-29-1056), 170-180 cm.
- d) Silicate flake scraper (W-29-501), 130-140 cm.
- e) Silicate flake scraper (W-29-1355), 60-80 cm.
- f) Silicate flake scraper (W-29-31), 20-30 cm.
- g) Small plane scraper, silicate (W-29-1269), 120-140 cm.
- h) Small plane scraper, silicate (W-29-42), 30-40 cm.
- i) Small plane scraper, silicate (W-29-1531), 40-60 cm.
- j) Small plane scraper, silicate (W-29-1002), 50-60 cm.
- k) Small plane scraper, silicate (W-29-1336), 20-40 cm.

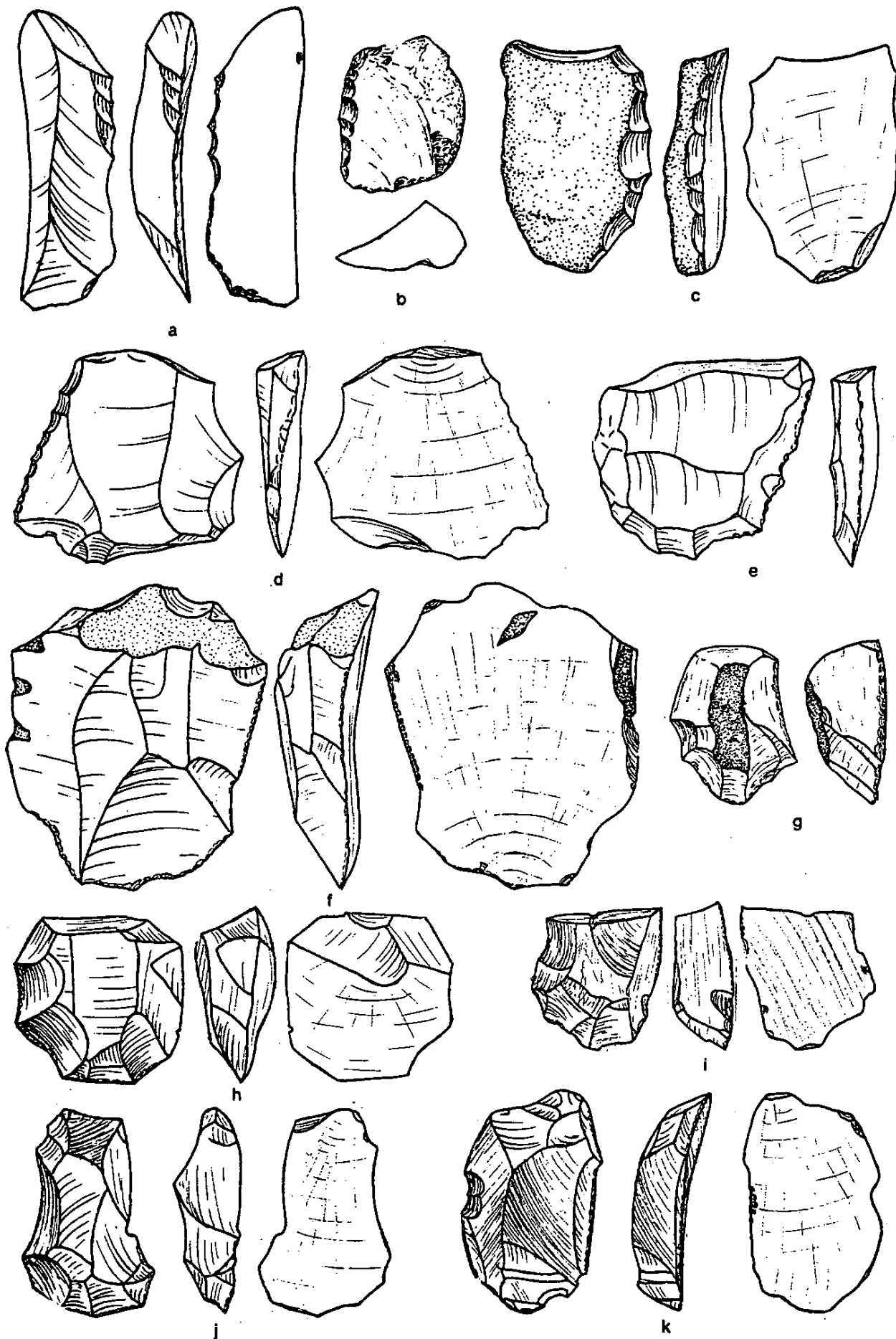
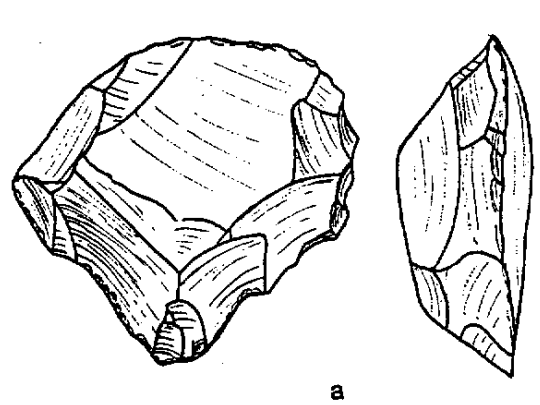


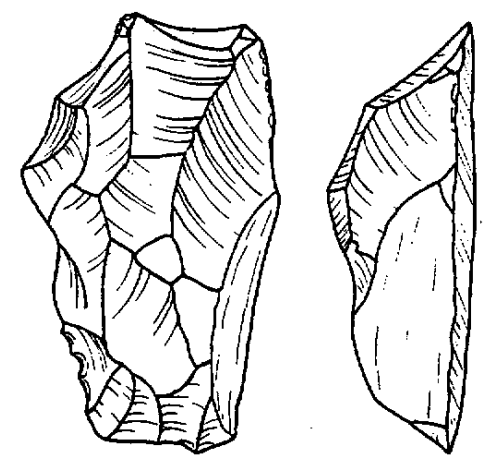
FIGURE 21

Chipped Stone Artifacts from 4-Mer-S94 (Actual Size).

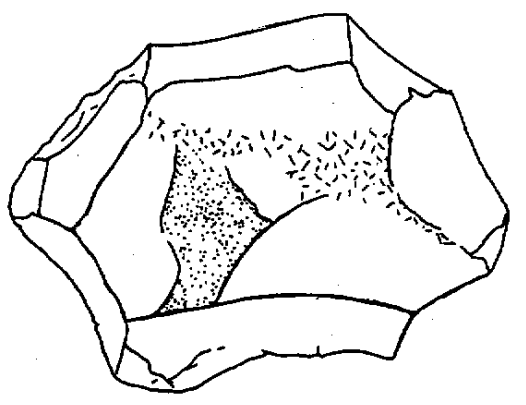
- a) Flake scraper plane, silicate (W-29-1061), 180-190 cm.
- b) Flake scraper plane, silicate (W-29-1711), 140-160 cm.
- c) Turtle-back scraper plane, basalt (W-29-744), 80-90 cm.
- d) Flake scraper plane, green chert (W-29-849), 80-90 cm.
- e) Utilized basalt core (W-29-2447), 140-160 cm.
- f) Utilized silicate core (W-29-568), 50-60 cm.



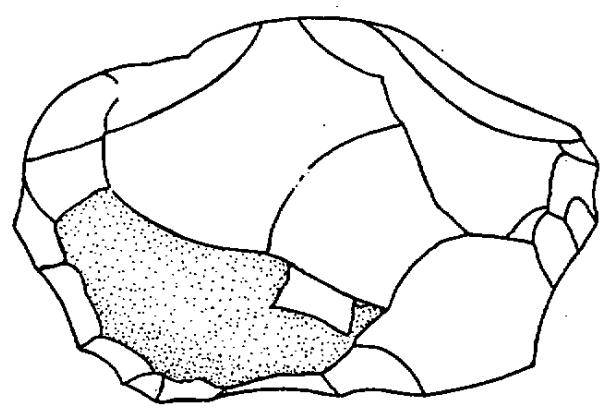
a



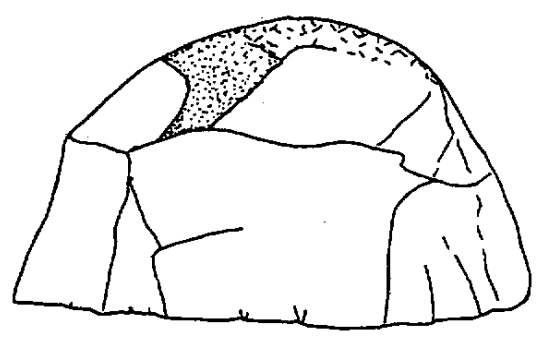
b



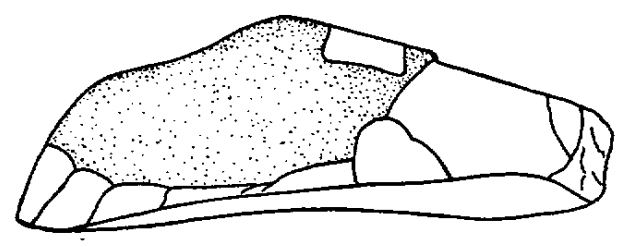
c



d



e



f

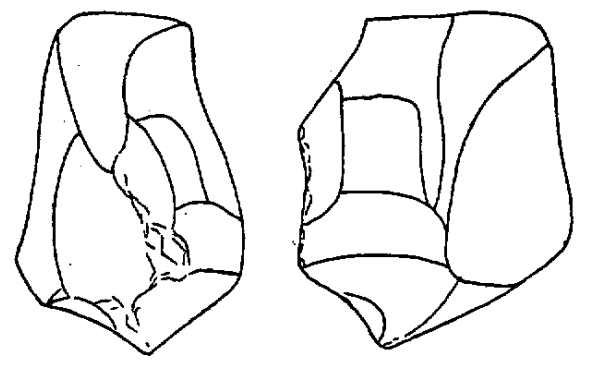
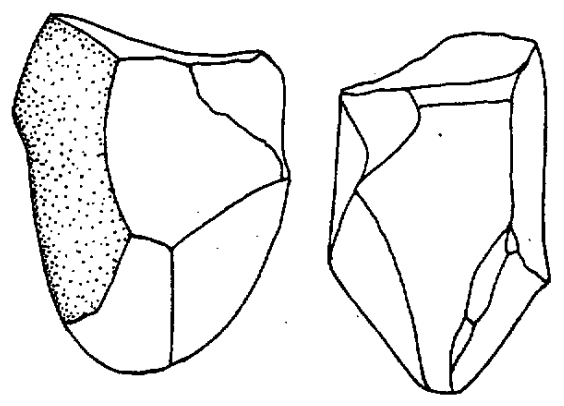


FIGURE 22

Chipped Stone Artifacts from 4-Mer-S94 (Actual Size).

- a) Utilized silicate core (W-29-1597), 140-160 cm.
- b) Utilized silicate core (W-29-757), 100-110 cm.
- c) Utilized silicate core (W-29-1338), 160-180 cm.
- d) Utilized silicate core (W-29-829), 60-70 cm.
- e) Utilized silicate core (W-29-1734), 180-200 cm.
- f) Basalt chopper (W-29-2125), 0-20 cm.
- g) Green chert chopper (W-29-1433), 40-60 cm.

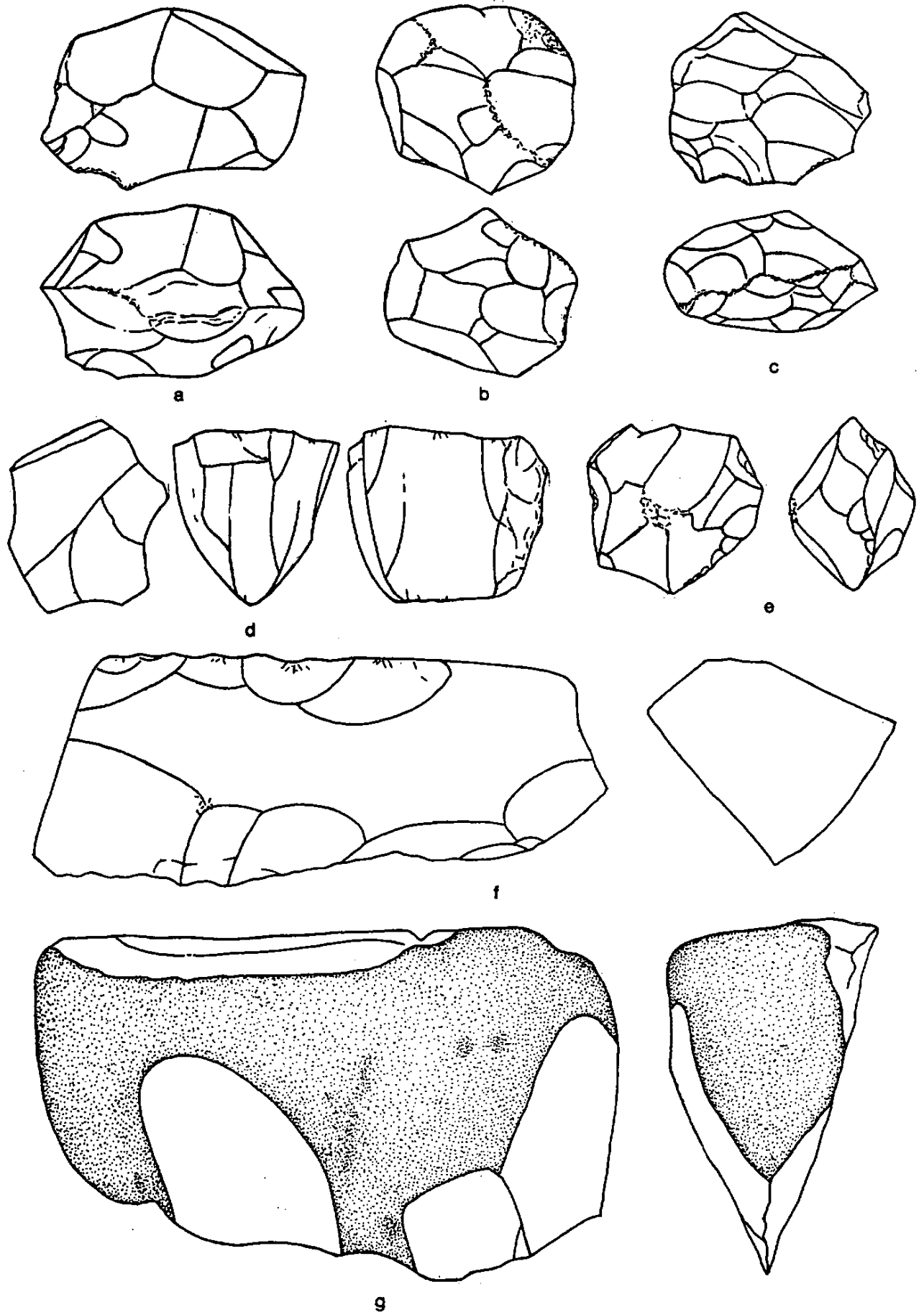
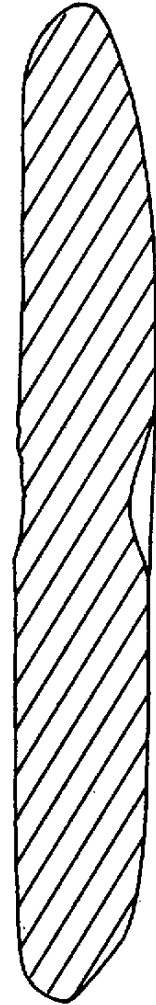
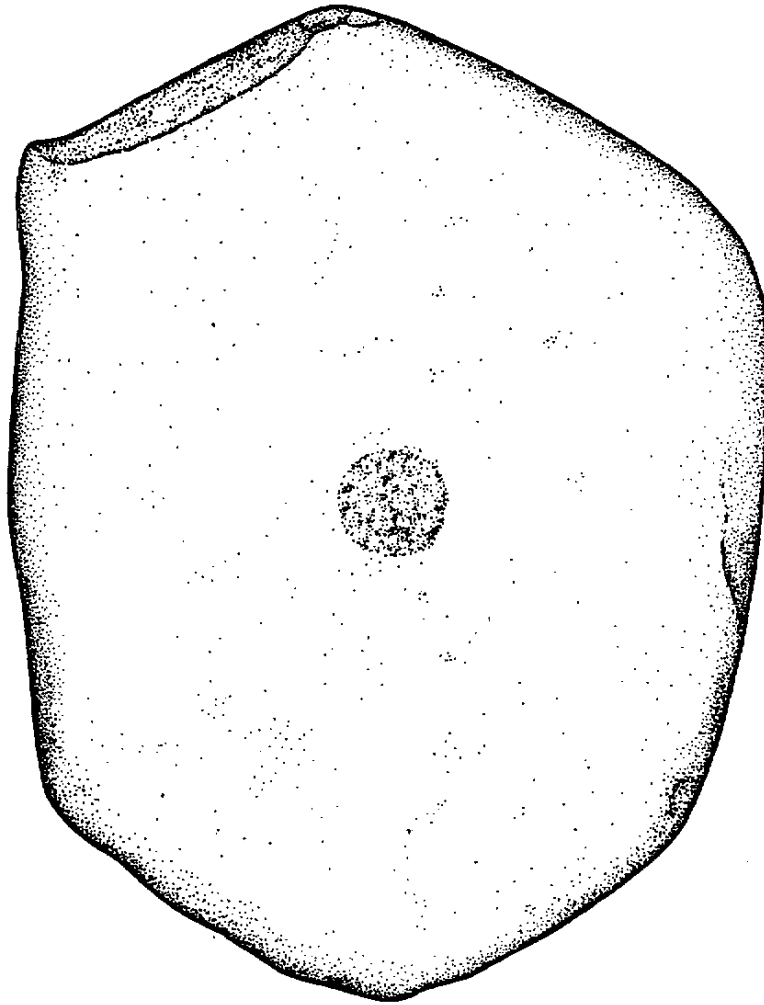


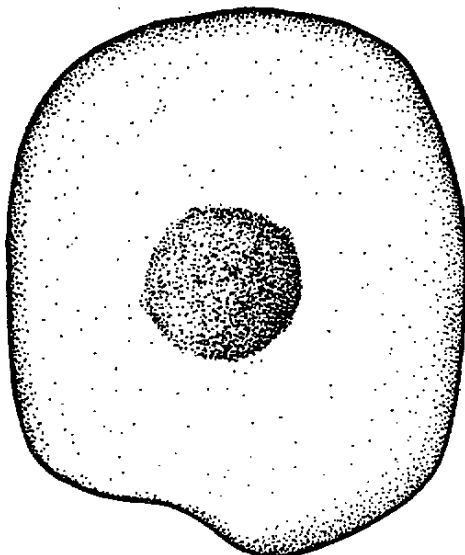
FIGURE 23

Unfinished Perforated Flat Cobbles ($\frac{1}{2}$ Actual Size).

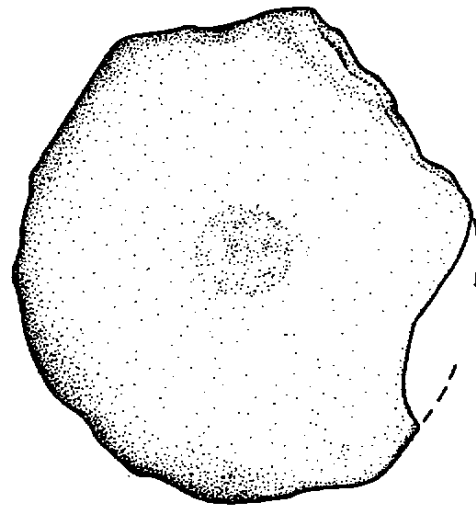
- a) (W-29-2724), Trench B, no depth location.
- b) (W-29-1534), 40-60 cm.
- c) (W-29-2476), 220-240 cm.



a



b



c

FIGURE 24

Unfinished and Finished Perforated Flat Cobbles (½ Actual Size).

- a) (W-29-1873) unfinished, associated with Burial 24.
- b) (W-29-2624) unfinished, 140 cm.
- c) (W-29-2482) unfinished, 220-240 cm.
- d) (W-29-1400), 160-180 cm.
- e) (W-29-2591), 220-240 cm.
- f) (W-29-2601), 220-240 cm.
- g) (W-29-185), 180-190 cm.
- h) (W-29-2621), yellow base sand, Trench B.

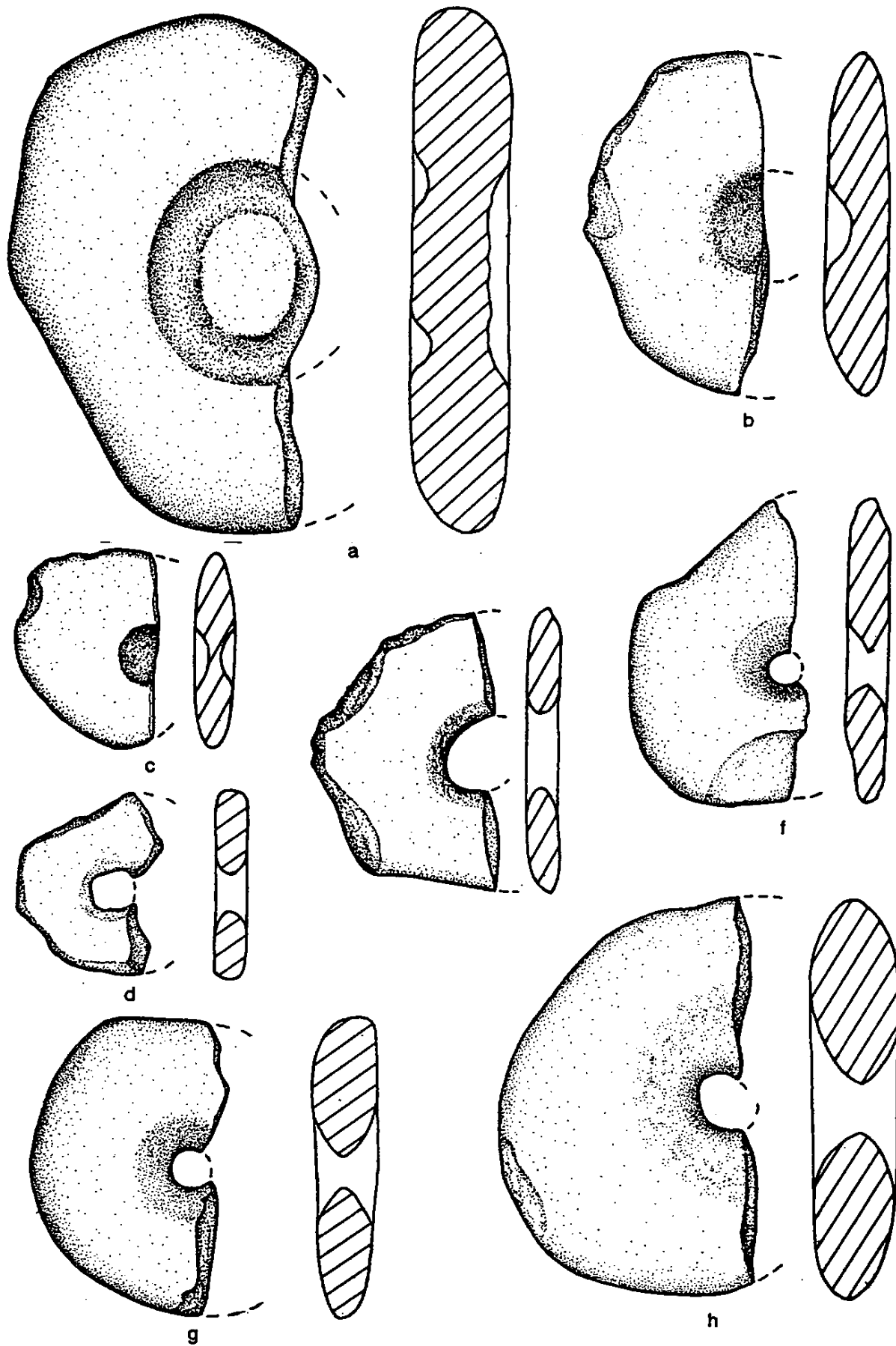


FIGURE 25

Perforated Flat Cobbles (½ Actual Size).

- a) (W-29-2611), 200-220 cm.
- b) (W-29-1081), 204-231 cm.
- c) (W-29-2585), 220-240 cm.
- d) (W-29-2587), 220-240 cm.
- e) (W-29-1385), 140-160 cm.
- f) (W-29-1507), 180 cm.

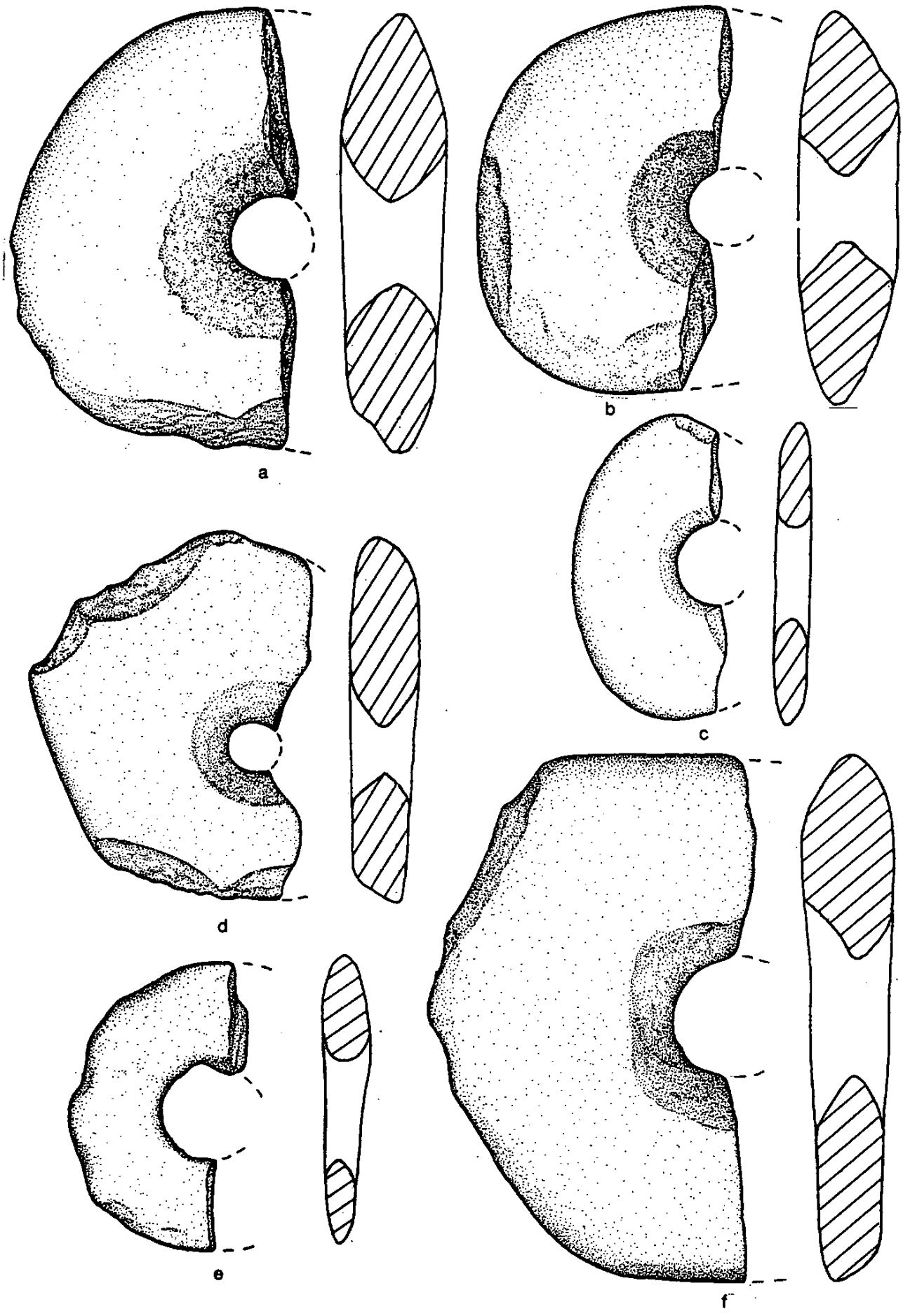


FIGURE 26

Perforated Flat Cobbles (½ Actual Size).

- a) (W-29-1896), 220-240 cm.
- b) (W-29-2481), 220-240 cm.
- c) (W-29-189), 190-200 cm.
- d) (W-29-2377), 180-200 cm.
- e) (W-29-1079), 204-231 cm.
- f) (W-29-1895), 220-240 cm.
- g) (W-29-1083), 204-231 cm.

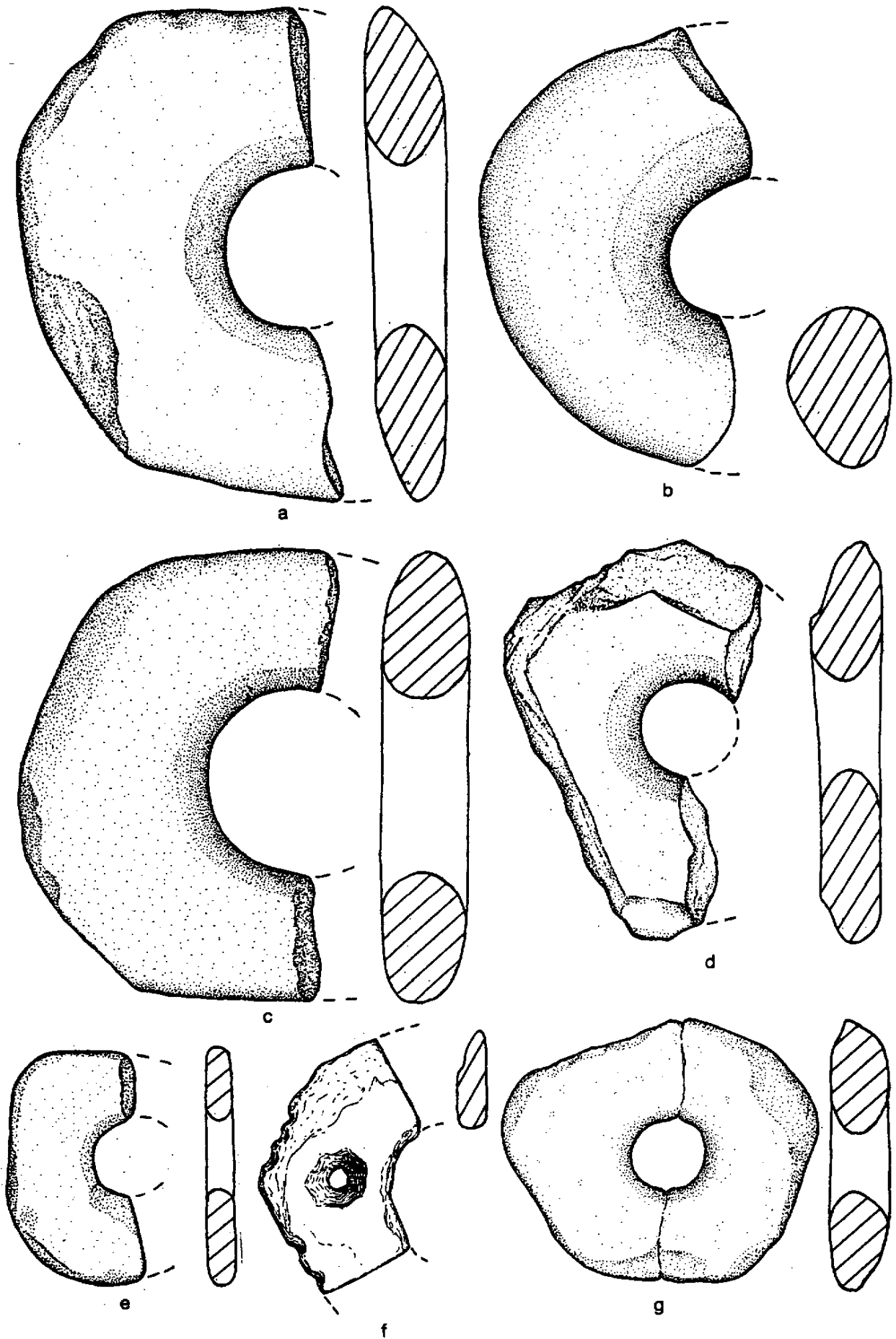


FIGURE 27

Perforated Flat Cobbles (½ Actual Size).

- a) (W-29-2478), 220-240 cm.
- b) (W-29-2106), 120-140 cm.
- c) (W-29-2479), 220-240 cm.
- d) (W-29-1075), 204-231 cm.
- e) (W-29-1077), 204-231 cm.

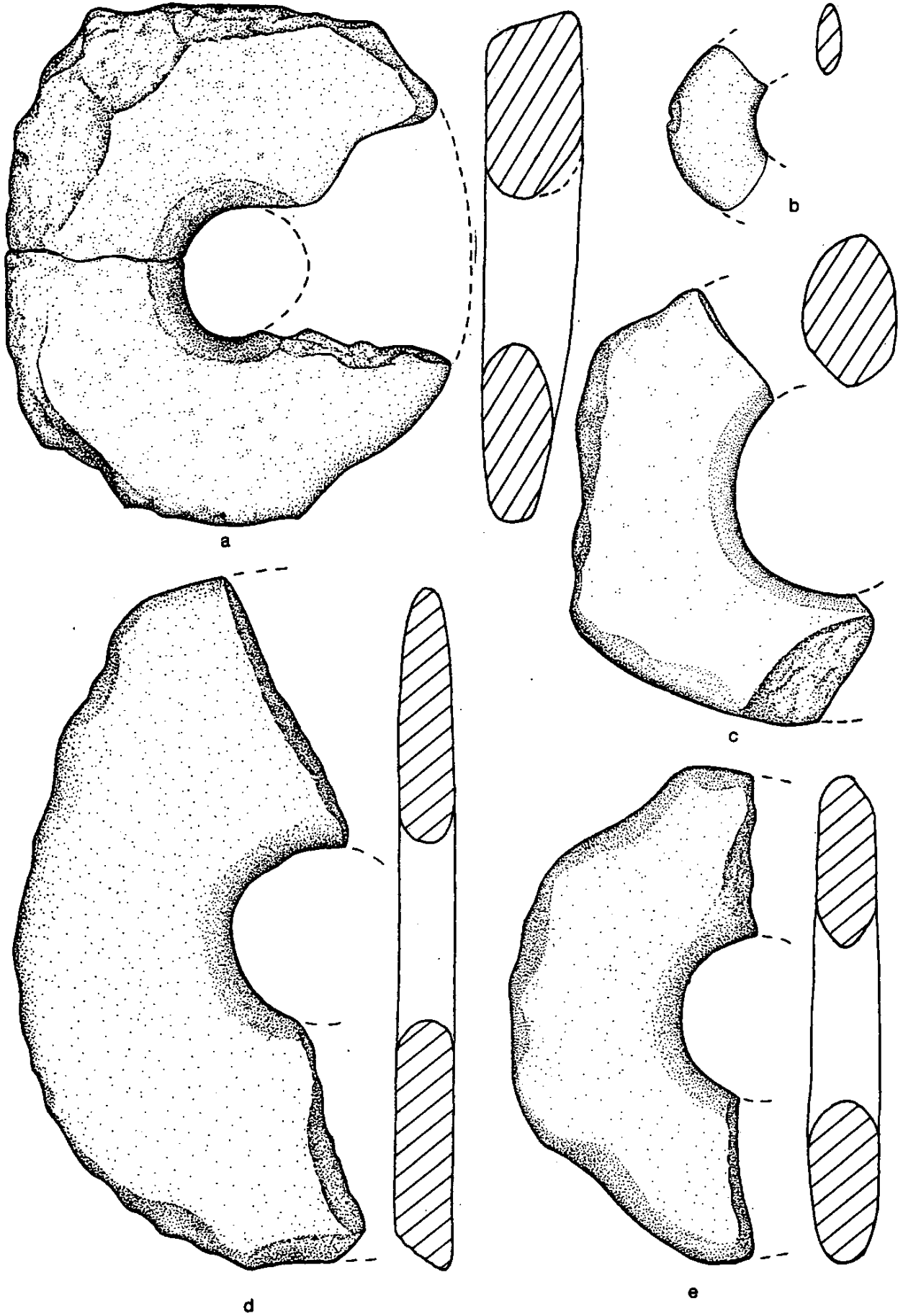


FIGURE 28

Hammerstones, Girdled Cobble, and Pestles from 4-Mer-S94 (½ Actual Size).

- a) Basalt hammerstone (W-29-1648), 20-40 cm.
- b) Basalt hammerstone (W-29-1616), 160-180 cm.
- c) Basalt hammerstone (W-29-631), 130-140 cm.
- d) Basalt hammerstone (W-29-1434), 40-60 cm.
- e) Basalt hammerstone (W-29-1165), 100-120 cm.
- f) Girdled cobble (W-29-1401), 160-180 cm.
- g) Shaped pestle with round end (W-29-2668), upper midden.
- h) Shaped pestle with round end (W-29-363), 190-200 cm.
- i) Shaped pestle with round end (W-29-578), 60-70 cm.
- j) Shaped pestle with round end (W-29-161), 150-160 cm.

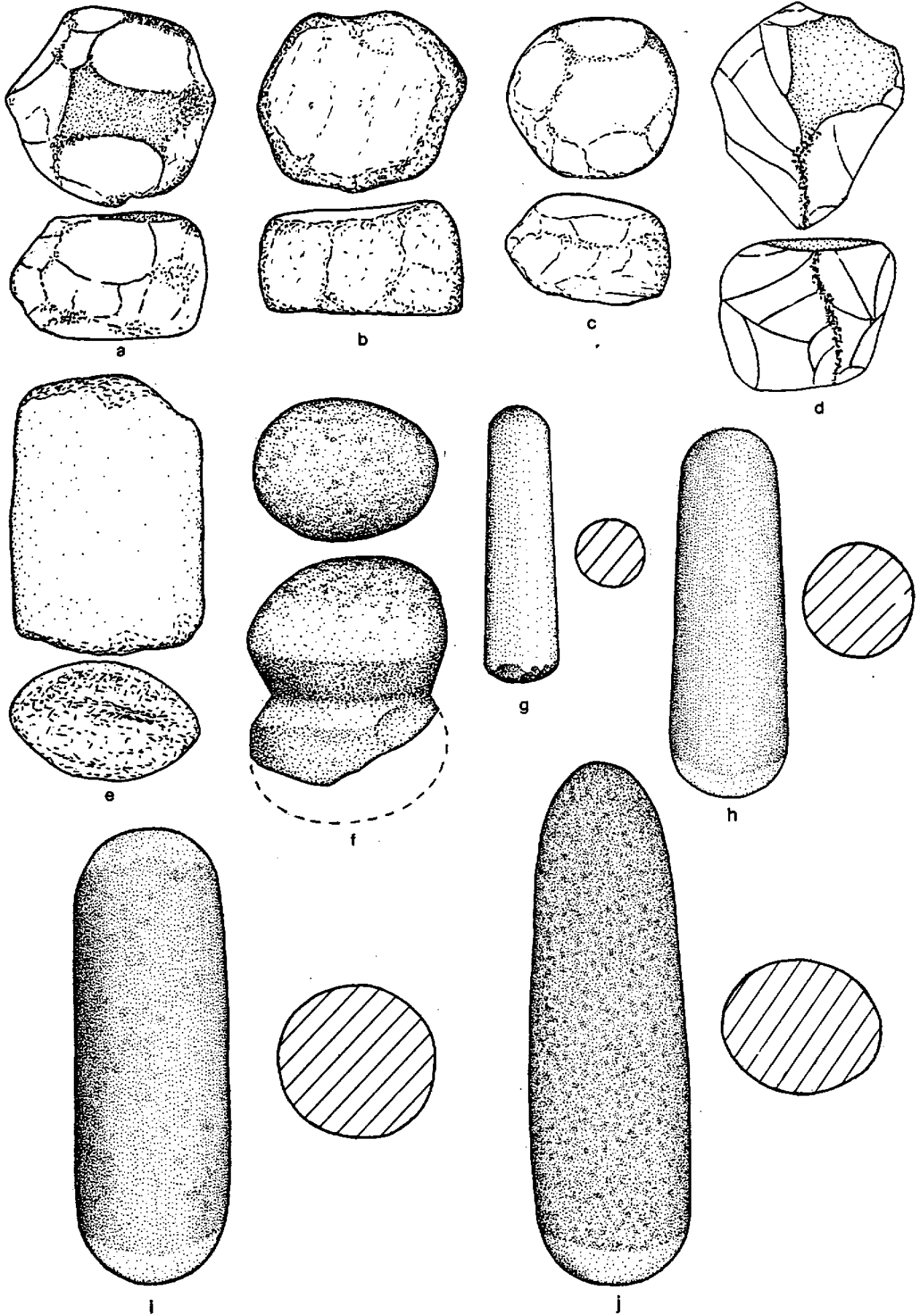
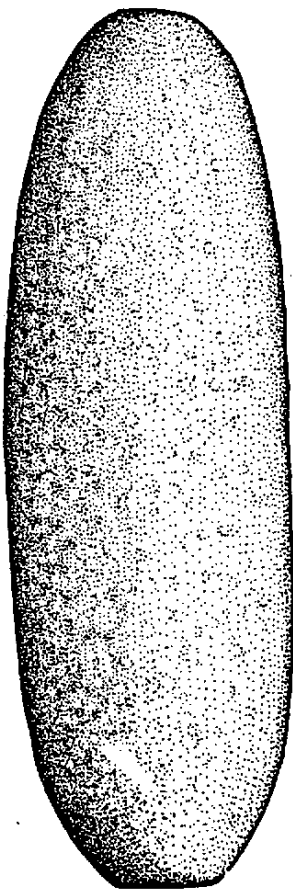


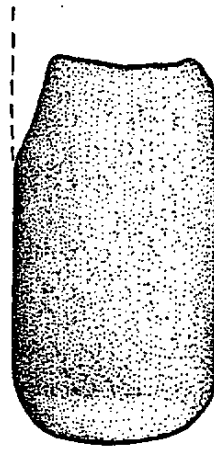
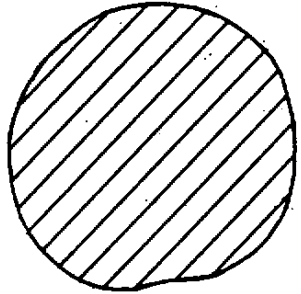
FIGURE 29

Pestles from 4-Mer-S94 (½ Actual Size).

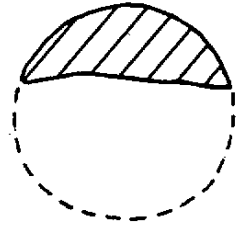
- a) Shaped round end pestle (W-29-2208), 160-180 cm.
- b) Shaped round end pestle fragment (W-29-2749), 200-220 cm.
- c) Cobble round end pestle (W-29-2054), 20-30 cm.
- d) Cobble round end pestle (W-29-2581), 220-240 cm.
- e) Cobble round end pestle (W-29-1164), 100-120 cm.
- f) Cobble flat end pestle (W-29-897) Feature 4, 128-155 cm.



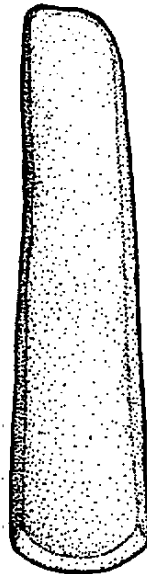
a



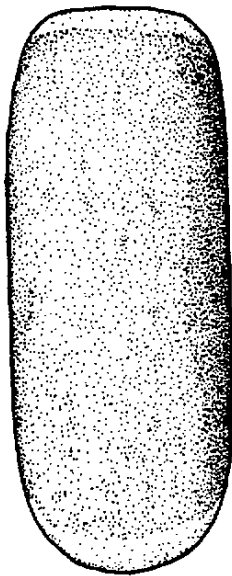
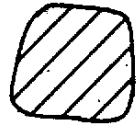
b



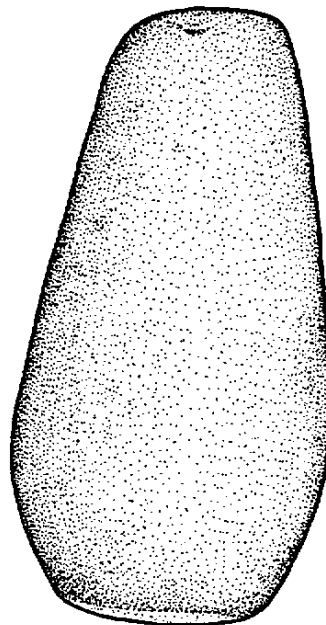
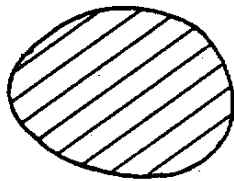
c



d



e



f

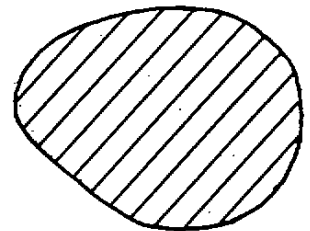


FIGURE 30

Pestles and Pitted Hammerstone from 4-Mer-S94 (½ Actual Size).

- a) Cobble pestle with pointed end (W-29-1469), 100-120 cm.
- b) Partly shaped round end pestle (W-29-374), 10-20 cm.
- c) Partly shaped flat end pestle (W-29-860), 90-100 cm.
- d) Pitted hammerstone (W-29-774), 120-130 cm.

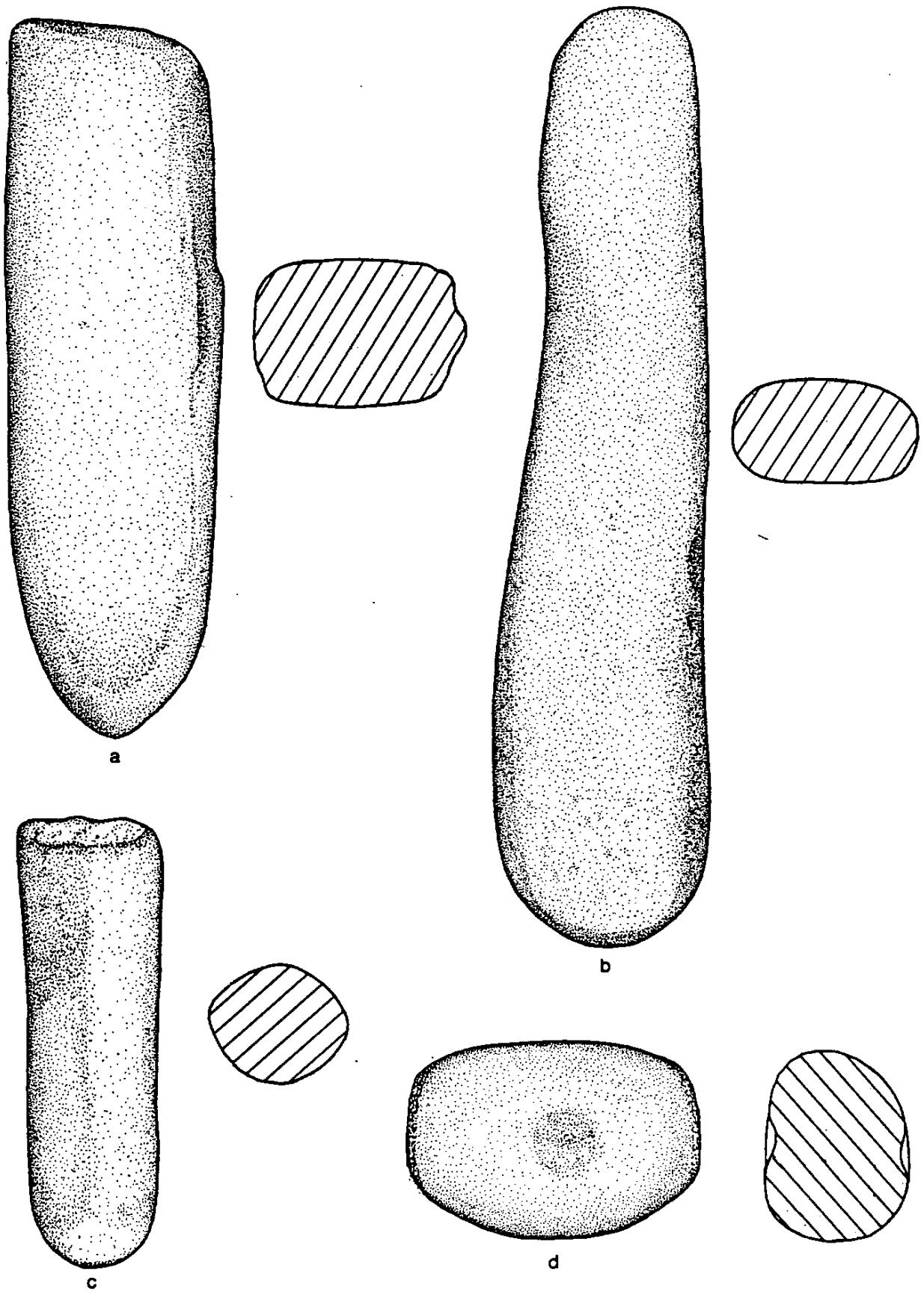
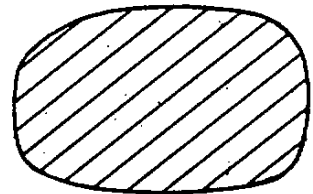
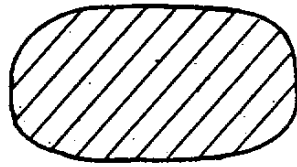
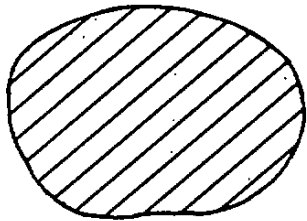
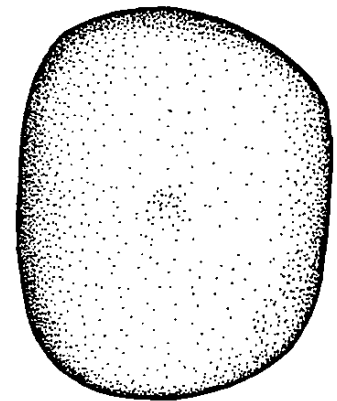
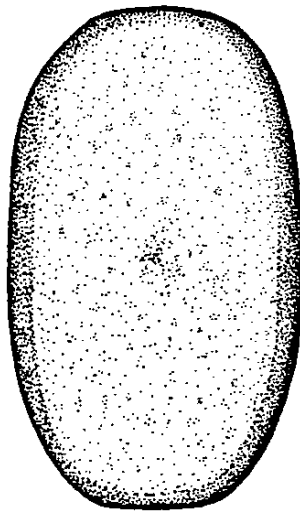
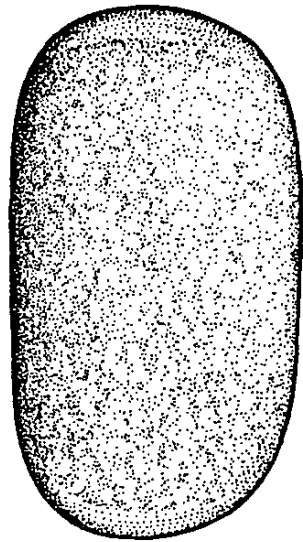


FIGURE 31

Pestle and Mullers from 4-Mer-S94 ($\frac{1}{2}$ Actual Size).

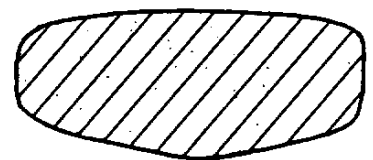
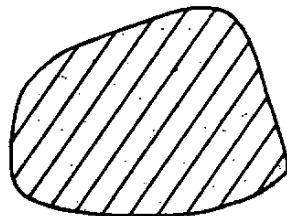
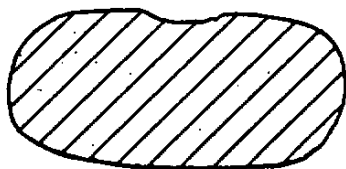
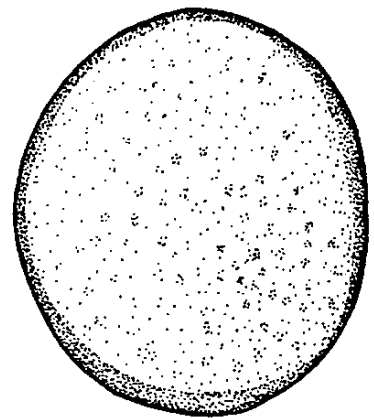
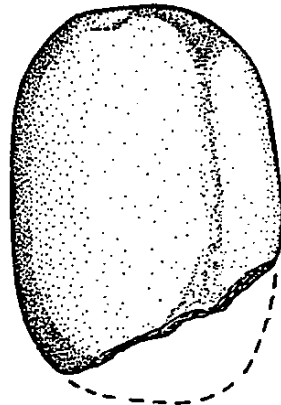
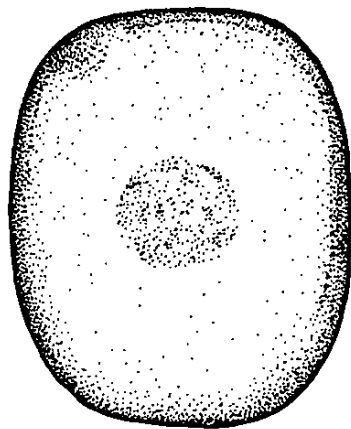
- a) Shaped round end pestle (W-29-2702), Trench B, midden.
- b) Shaped rectangular muller (W-29-589), 90-100 cm.
- c) Shaped rectangular muller (W-29-167), 160-170 cm.
- d) Shaped rectangular pitted muller (W-29-298), 110-120 cm.
- e) Shaped oval muller (W-29-2697), Trench B, midden.
- f) Shaped oval muller (W-29-507), 30 cm.



a

b

c



d

e

f

FIGURE 32

Mullers and Small Mortar from 4-Mer-S94 (½ Actual Size).

- a) Shaped oval muller (W-29-773), 120-130 cm.
- b) Shaped oval muller (W-29-1257), 80-100 cm.
- c) Shaped oval muller (W-29-1588), 120-140 cm.
- d) Uniface muller with edges shaped (W-29-2639), 130-140 cm.
- e) Unshaped uniface cobble muller (W-29-1275), 120-140 cm.
- f) Small globular cobble mortar (W-29-890), 140-150 cm.
- g) Unshaped uniface cobble muller (W-29-1070), 190-240 cm.

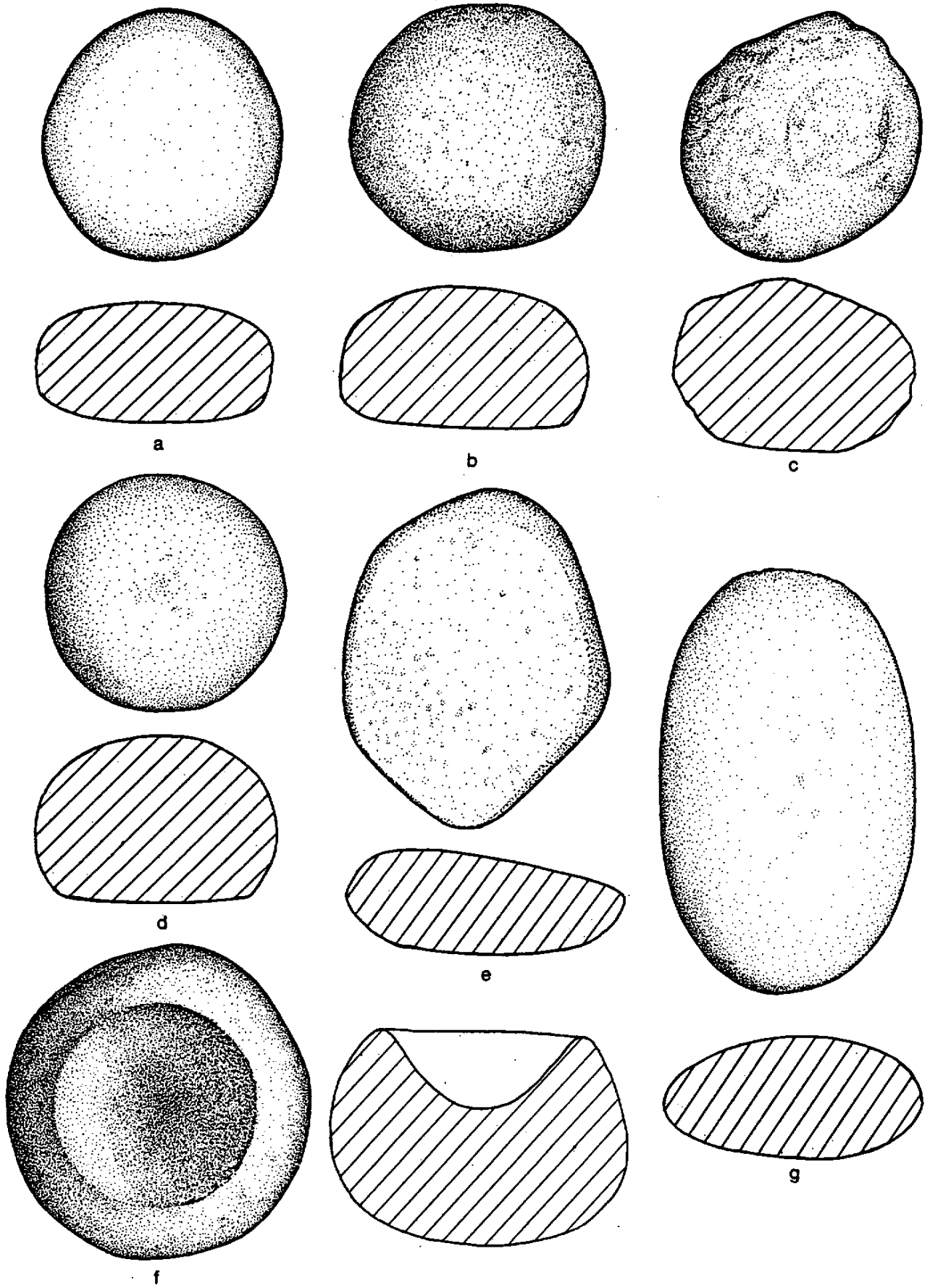


FIGURE 33

Large Bowl Mortars (¼ Actual Size).

- a) (W-29-2786), associated with Burial 33.
- b) (W-29-1291), unfinished, 120-140 cm.
- c) (W-29-1100), 100 cm.
- d) (W-29-2743), Trench B, midden.

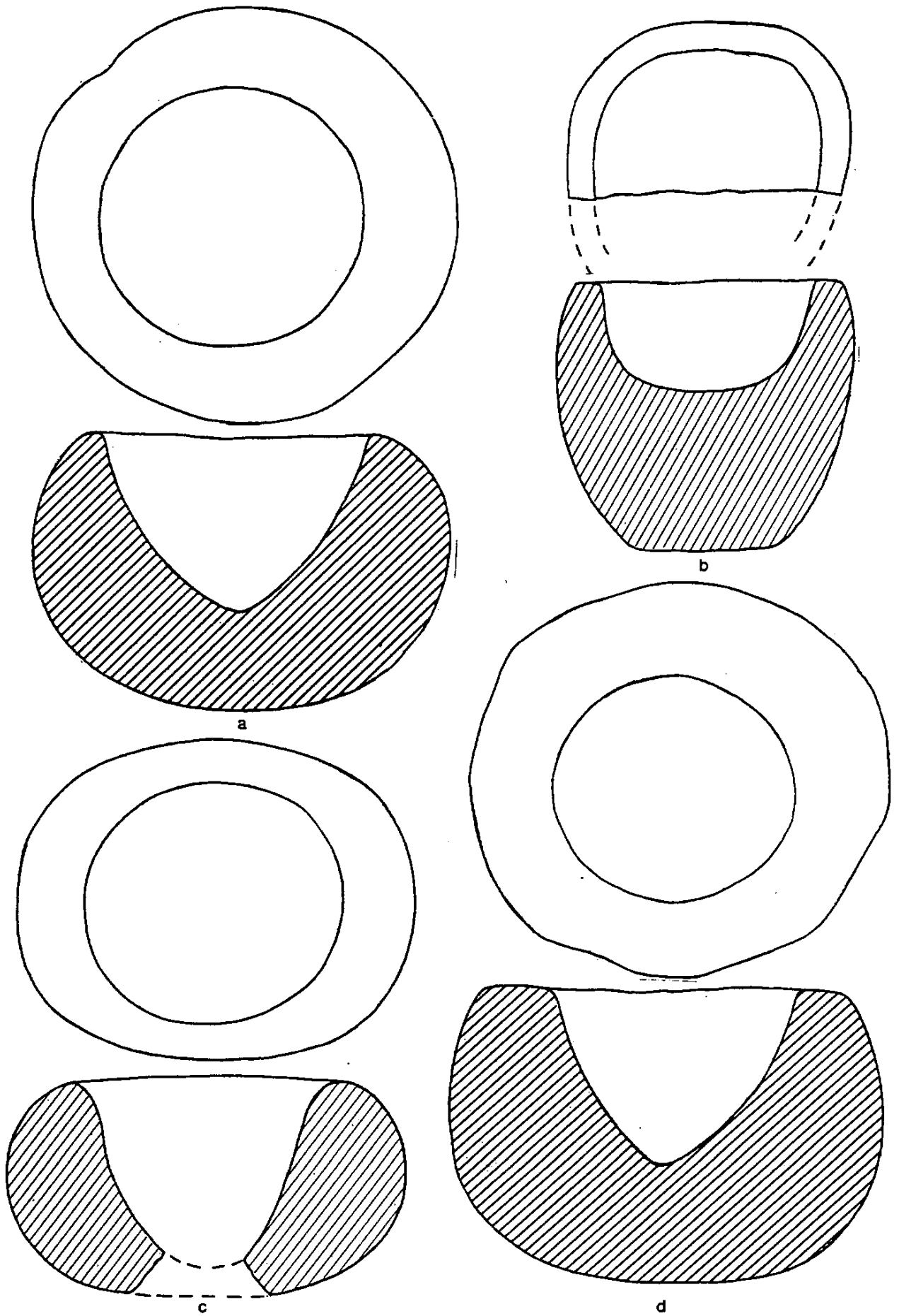


FIGURE 34

Mortars and Pigment "Bowl" from 4-Mer-S94.

- a) Small cobble mortar (W-29-790), 140 cm. ($\frac{1}{4}$ size).
- b) Small cobble mortar (W-29-2688), Trench B, midden ($\frac{1}{4}$ size).
- c) Small cobble mortar (W-29-2687), Trench B, midden ($\frac{1}{4}$ size).
- d) Irregular Block mortar (W-29-2737), Trench B, midden ($\frac{1}{4}$ size).
- e) Flat cobble mortar (W-29-10), surface ($\frac{1}{2}$ size).
- f) Small shaped bowl fragment (W-29-2173), 100-120 cm. (actual size).
- g) Red pigment lump (W-29-2024), 40-60 cm. (actual size).

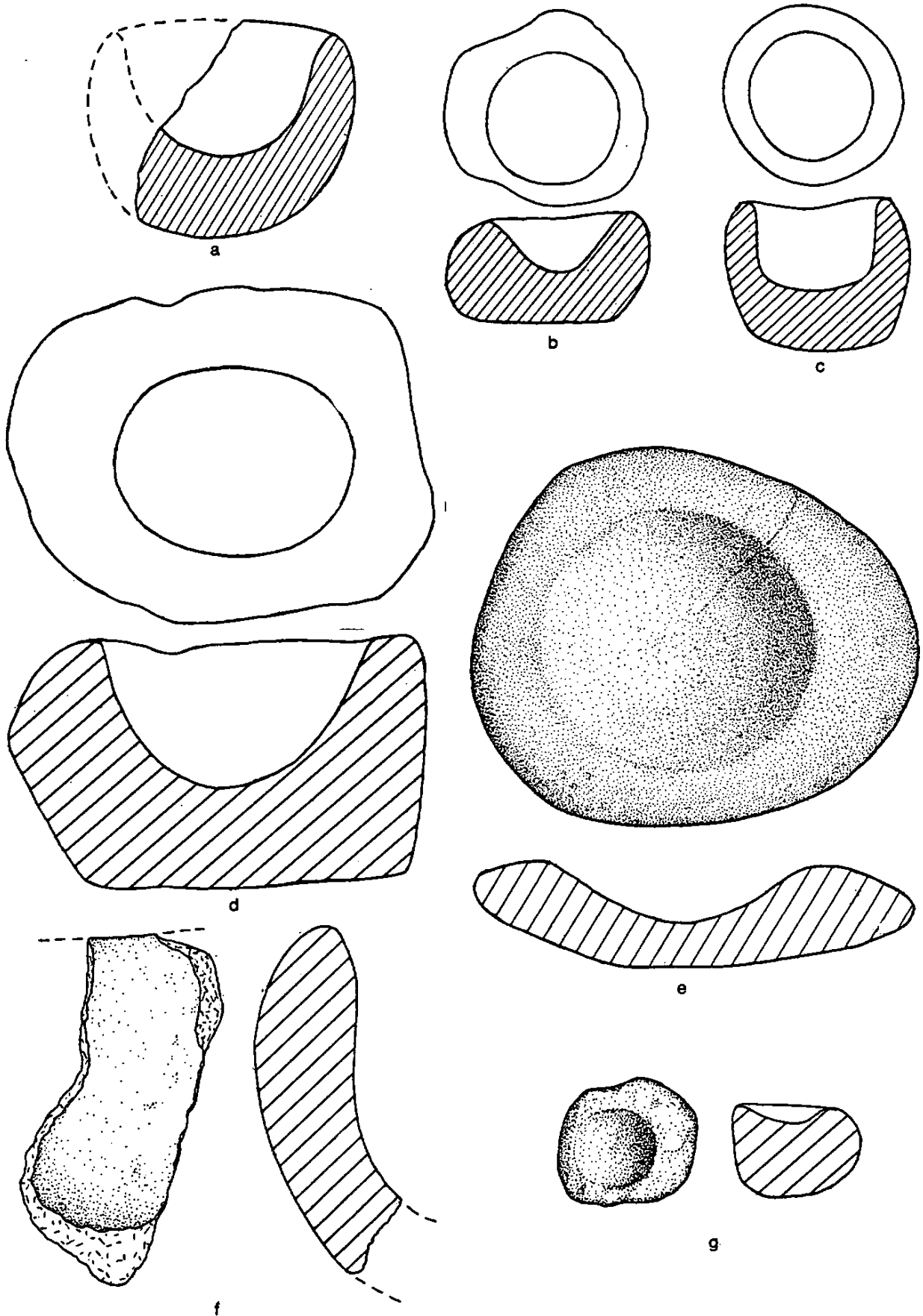
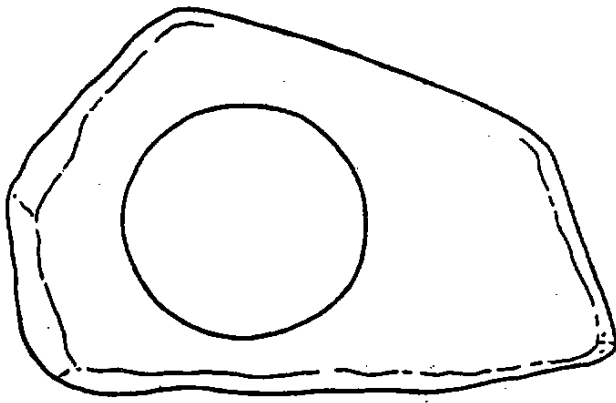


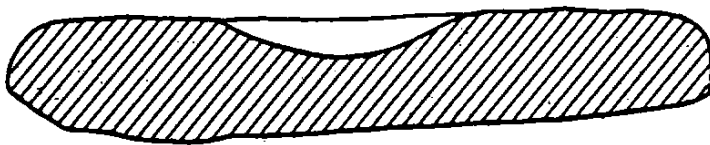
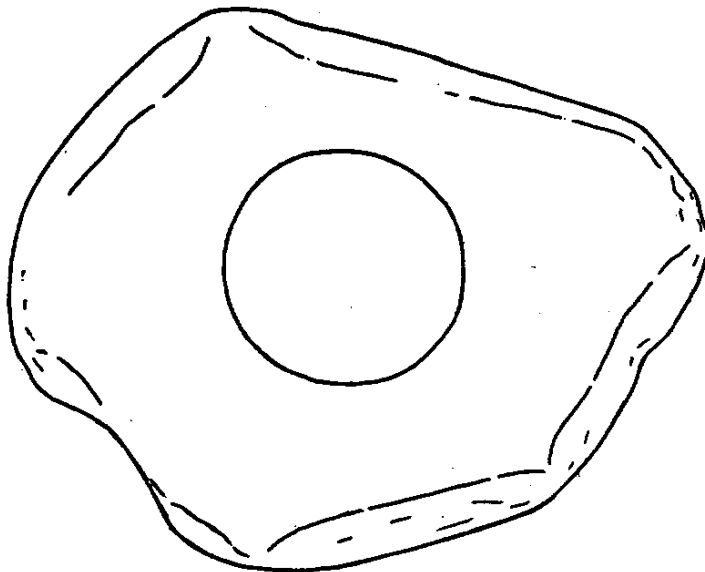
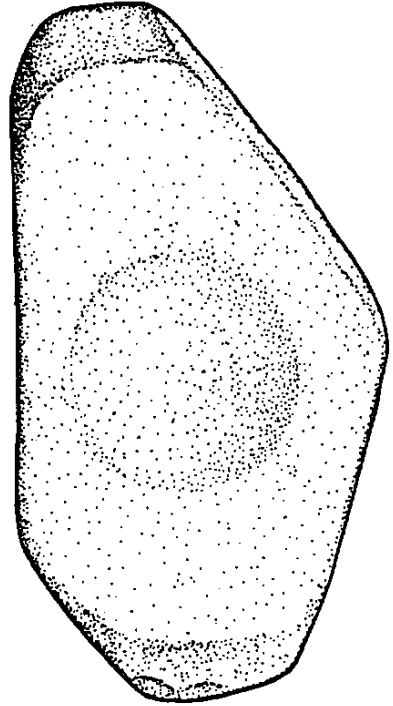
FIGURE 35

Slab Mortars and Pitted Slab Millingstone from 4-Mer-S94 (¼ Size).

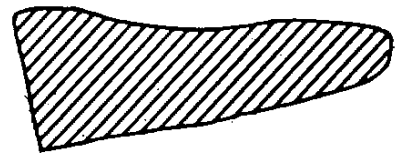
- a) Slab mortar (W-29-1485), 120-140 cm.
- b) Slab mortar (W-29-1484), 120-140 cm.
- c) Pitted slab millingstone (W-29-2733), Trench B, midden.



a



b



c

FIGURE 36

Millingstones from 4-Mer-S94 (¼ Size).

- a) Pitted slab millingstone (W-29-1952), 120-140 cm.
- b) Shaped pitted millingstone (W-29-2684), Trench A, midden.
- c) Slab millingstone (W-29-2730), Trench B, midden.
- d) Slab millingstone (W-29-2754), 60-80 cm.

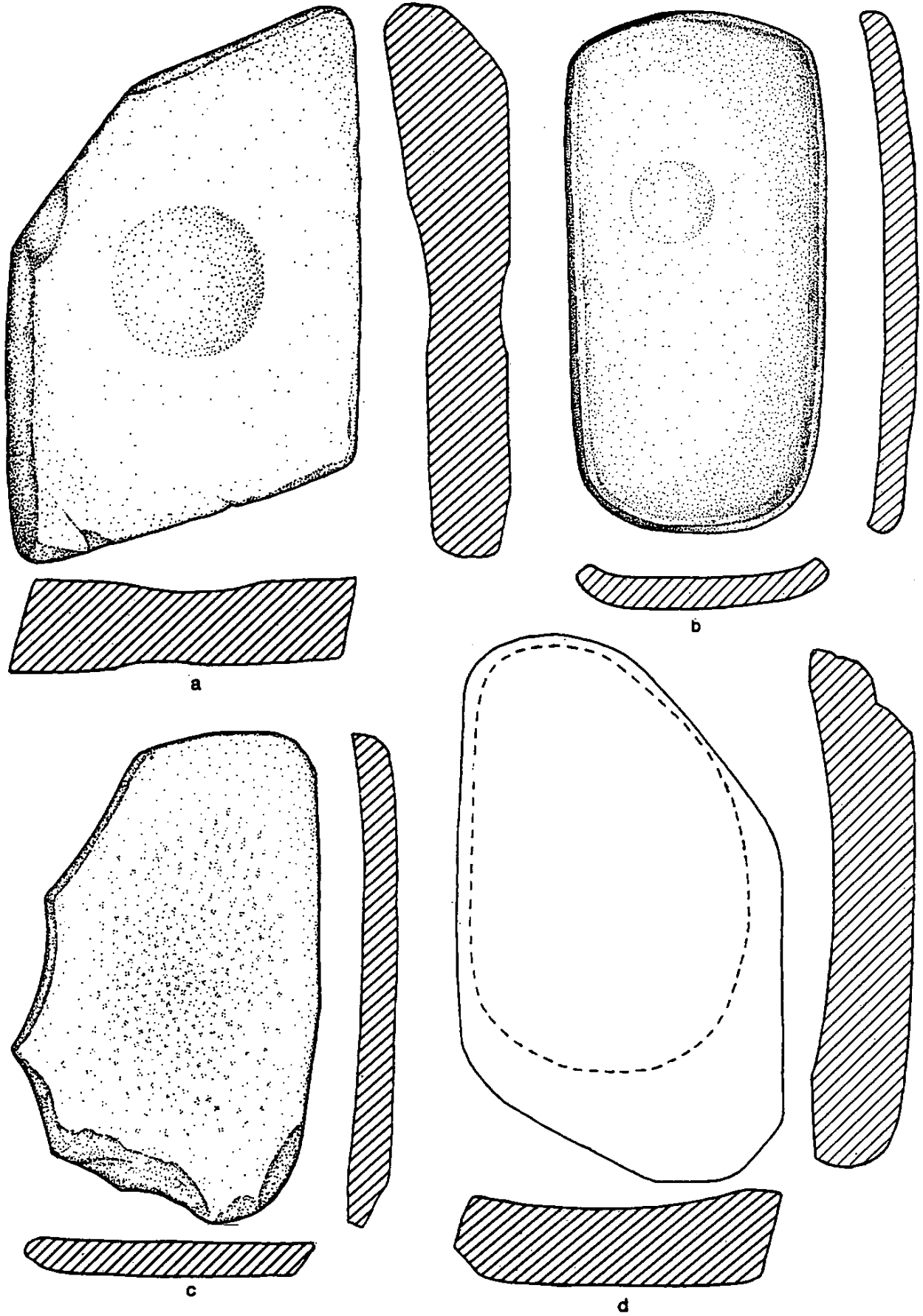
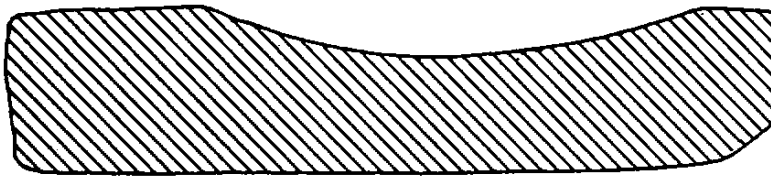
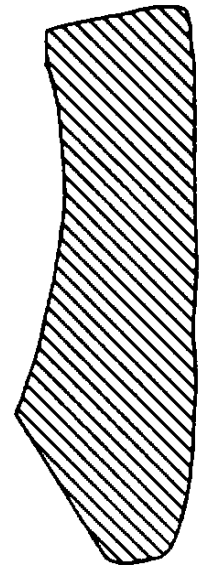
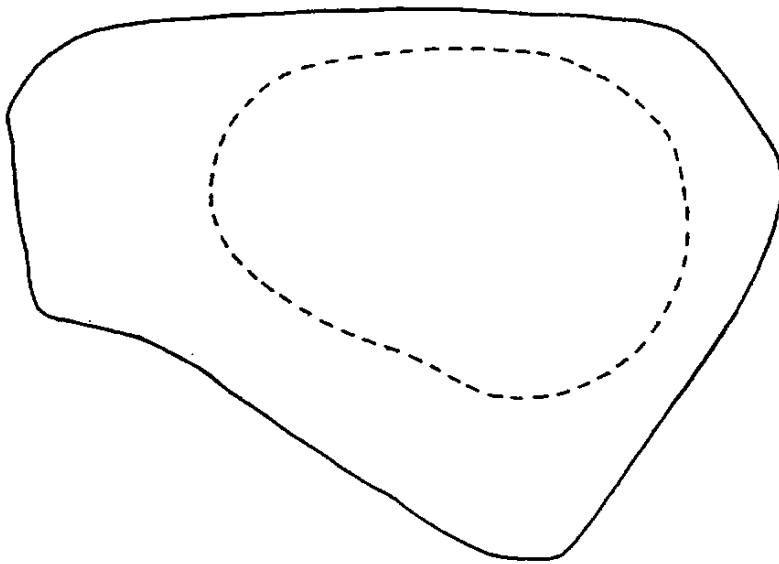


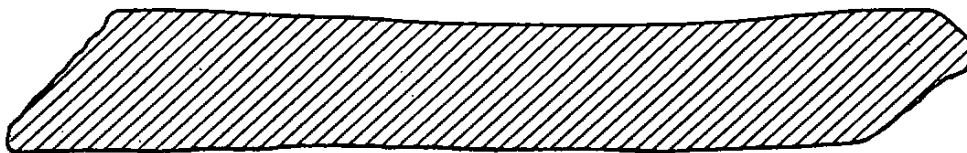
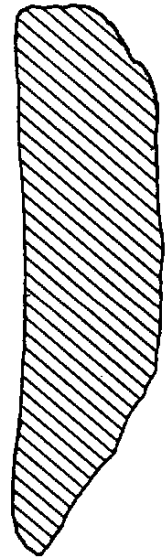
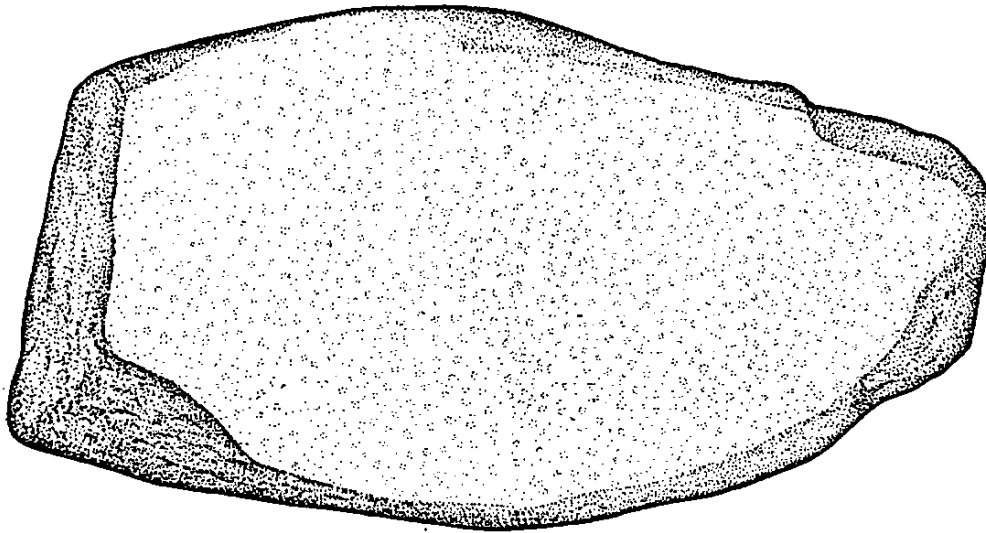
FIGURE 37

Millingstones from 4-Mer-S94 (¼ Actual Size).

- a) Slab millingstone (W-29-2739), Trench B, midden.
- b) Slab millingstone (W-29-1798), associated with Burial 4.



a



b

FIGURE 39

