30. EXCAVATION OF ISABELLA MEADOWS CAVE, MONTEREY COUNTY, CALIFORNIA

By Clement W. Meighan

Introduction

The site here described is located on Church Creek in the Southern Coast Ranges of Monterey County, California. It is about 40 airline miles south of Monterey and 20 miles east of the Pacific Ocean. The cave is near the center of the region inhabited at the time of white contact by the Esselen Indians. This is the first archaeological site in Esselen territory to be reported upon, and since the occupation of the site extends into the historic period, the objects recovered are presumably attributable to Esselen manufacture. The Esselen constituted a small group of only a few hundred individuals, and they became extinct almost immediately after contact with the Spanish Missions. The tribe is thus virtually unknown, and the site described here is of importance because of the light which it throws on Esselen culture.

Meadows Cave was discovered in 1949 by a survey party under the direction of A.R. Pilling, then Assistant Archaeologist of the U.C. Archaeological Survey. The latter named the cave after Isabella Meadows, the last known informant on the now-vanished Esselen Indians. Isabella Meadows' grandfather was a Mission Indian who had transmitted some details of Esselen life to her. Although she was herself a Costanoan (Rumsen), she was also a speaker of the Esselen language.

As in all archaeological excavations, the cooperative effort of many individuals is represented in the report presented here. My thanks are due the crew of University of California students whose enthusiastic and skillful labor enabled us to obtain a maximum sample of the site in a few working days. The crew included Leroy G. Fischer, William C. Gonsalves, David M. Pendergast, and James Siegel. We are also indebted to the personnel of the Church Ranch, which borders the site area, for permission to enter and to make use of private roads and other facilities. For courtesies rendered, thanks are here expressed to Mr. Bruce Church, owner of the ranch, and to Mr. John Nardone, both of Salinas. Mr. Jack Thompson, foreman of the ranch, extended the crew every courtesy and assisted the excavation in many ways.

Technical advice on specimens was given by Miss Chérie N. Grégoire of the University of California. Mrs. Sheilagh Brooks kindly assisted in determining facts regarding the age and sex of the human burial. Finally, my personal gratitude is owed to Mr. Arnold R. Pilling of the University of California. As the discoverer of the site and the instigator of archaeological exploration in this part of California, the excavation was rightfully his. Being prevented by other commitments from doing the field work, he very generously encouraged others to carry it out and also aided the project by permitting use of his personal records on the site area.

The excavation was carried out in May, 1952. The cost of the work was borne by the University of California Archaeological Survey. Since the site is located in the Santa Barbara National Forest, it was necessary to obtain a government permit from the U.S. Department of Agriculture, which has jurisdiction over the site region. The specimens recovered are permanently deposited in the University of California Museum of Anthropology in Berkeley, and catalog numbers used in this report are the numbers assigned by that institution.

The Site

Despite its relative nearness to "civilization," Meadows Cave is located in one of the most remote and little visited portions of California. Access to the region is by dirt roads which are closed by winter rain and snow, and at best one cannot get within a mile of the site by motor vehicle.

The cave is located in a large outcrop of Vaqueros sandstone on the south bank of Church Creek. The immediate surroundings form an area of steep slopes and a very narrow canyon, the north wall of which is covered with oak and pine forest, the south wall being the extensive tilted layer of sandstone. At its bottom, the ravine is just wide enough for Church Creek which is only a few feet wide at this point. The cave itself is a little less than 100 feet above the creek and is reached by climbing a very steep slope bearing a few pine trees.

In this area, the Vaqueros Sandstone forms isolated but fairly extensive outcrops. The rock is tilted and layered in such a way that it contains a great many small erosion caves. The U.C. Archaeological Survey has records on about 40 sites in this one outcrop, most of which are small caves containing petroglyphs but no site deposit.

Meadows Cave differs from other caves in the region in that it is a fissure or split in the rock rather than a rock shelter or simple erosional pocket. The cleft which forms Meadows Cave is slightly over 50 feet in length and 10 or 12 feet wide at the level of the site deposit. From the floor of the cave, the cleft extends upward at an angle of 45 degrees toward the south, narrowing to a foot in width some 25 or 30 feet from the floor. The cave appears to derive ultimately from a very soft layer of sandstone between two harder layers. The fissure probably opened in an earthquake and later enlarged slightly by weathering of the soft layer. The latter, which is sufficiently soft to be crumbled with the fingers, has sloughed enough to deposit 6 to 12 inches of sterile sand on the floor of the cave since it was abandoned by the Indians. This wear, however, must have been due to temperature change and wind action alone, plus some mechanical abrasion from animals scrambling around on the walls. Water action is not present; the interior of the cave is perfectly dry and must have remained so for the last several hundred years.

At its west end, the fissure opens onto a large cavern which is less protected from the elements but which does have a roof of massive stone. The entire north wall is open, and rain enters this portion of the cave

easily. There is occupation deposit here, but it is buried under tremendous boulders which have fallen from the roof. Lacking facilities to move these rocks, the excavation was confined to the dry portion of the site which extends into the long fissure. It is of interest to note that the large rockfall must have occurred during the period of occupation of the cave, for there appears to be occupation material under the rock, and the upper surfaces of some of them have been utilized to make bedrock mortars. Very little rock appears to have fallen during the last hundred years or so, although some extensive segments of the roof appear to be precariously attached.

Occupation deposits

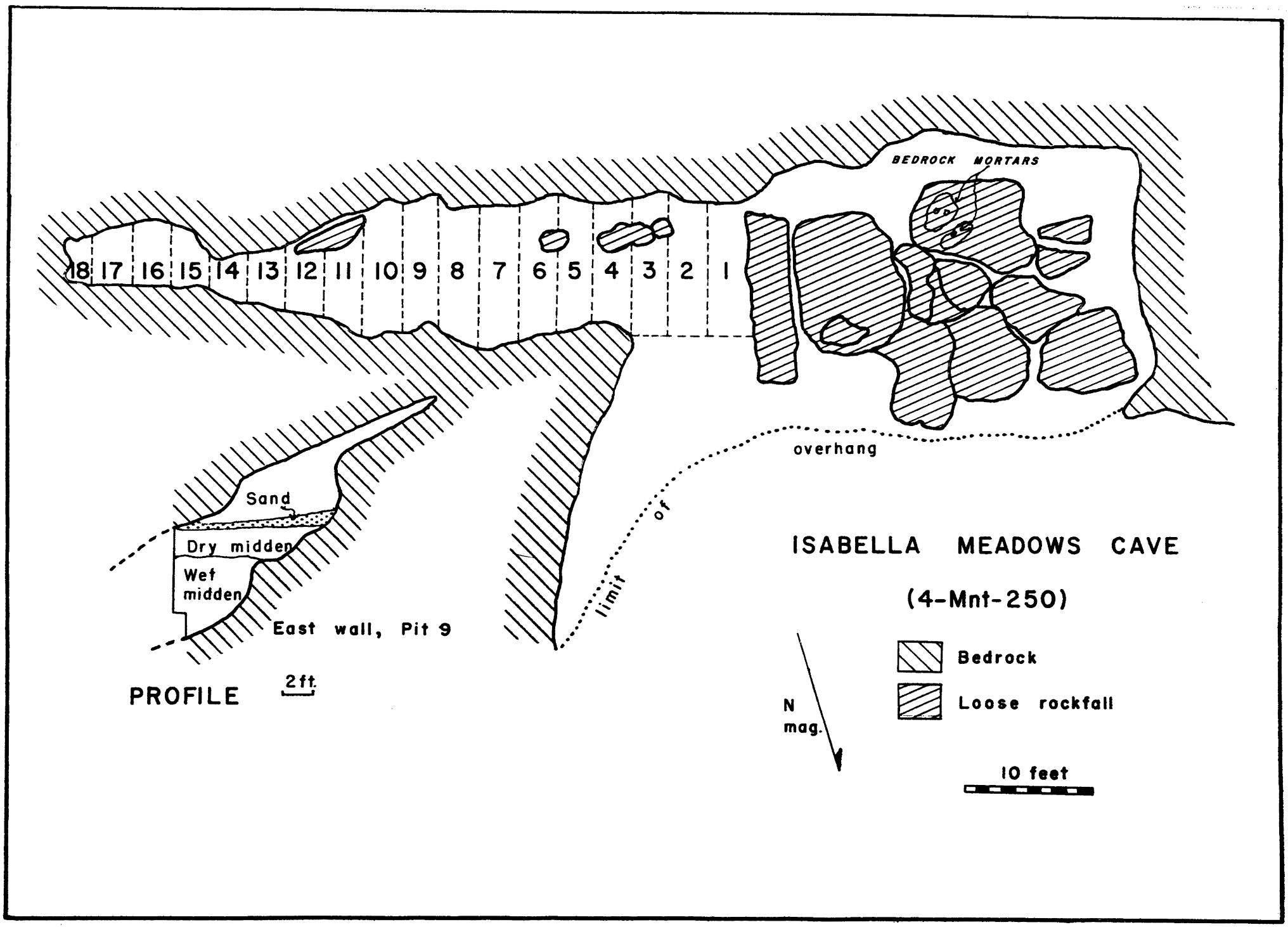
Meadows Cave is immediately recognizable to the archaeologist as a shelter which supported a fairly intensive human habitation. The walls, particularly of the sheltered fissure, bear a heavy deposit of black, greasy-appearing soot, with only a few white patches showing where there has been surface exfoliation. In addition, there are the bedrock mortars in the open area of the cave, charcoal petroglyphs at the entrance and on one of the boulders of the rockfall, and finally, the grey-black midden refuse which fills much of the cave.

The cave deposit was quite uniform from the entrance to the rear, with the exception that the entrance area contained a large number of fist-size stream cobbles, most of which were burned. These were most likely cooking stones, formerly used for stone-boiling in basketry containers. In pits 2 to 5 (see map), fully half of the dry deposit was composed of such stones.

Except for the immediate entrance of the fissure, the deposit was capped by a layer of sterile yellow sand which averaged about 6 inches in thickness. As mentioned previously, this layer has resulted from the slow disintegration of the walls of the cave since its abandonment. The surface layer contained small bits of plant material and excrement, no doubt attributable to the rodents which inhabited the cave. (Two large pack-rats were dispossessed by the archaeologists.) The layer exhibited none of the darkening from fire action which was characteristic of the lower levels. Since the rate of deposition of the sand can be fairly reliably calculated, the proportion of such sloughed material in the midden affords some evidence for determining the length of occupation of the site. This point is discussed further in a following section.

Below the sterile layer, there was a layer of exceedingly dry, dusty occupation midden. This level, which varied from 24 to 36 inches in thickness, contained charcoal, cooking stones, discarded artifacts, and a quantity of leaves, grass, and twigs.

At about 36 inches depth, the deposit began to contain some moisture, so that plant material and artifacts of perishable substances were considerably damaged. Below this level, the deposit was quite wet, the moisture apparently deriving from capillary action. However, all of the


BEDROCK MORTARS
18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
overhang
limit of
Sand
Dry midden
Wet midden
East wall, Pit 9
PROFILE
2ft.
ISABELLA MEADOWS CAVE
(4-Mnt-250)
Bedrock
Loose rockfall
N mag.
10 feet

deposit appears to be full of occupation material, the wet level containing abundant charcoal and a few bits of mussel shell. In pit 9, at about the center of the cave, the excavation was extended into the wet levels in order to determine the total depth of the site. The pit was dug to a depth of 102", but the bottom of the occupation deposit was nowhere in sight. Since the deposit follows the slope of the fissure (see map), working below 9 feet in depth involves a tunneling operation unless the entire surface is worked at the same time. A charcoal sample was taken from the 90-100 inch level; one bucketful of deposit contained several ounces of charcoal.

As will be shown later, the cave contained very few non-perishable artifacts. The wet layers may therefore be expected to have a somewhat meager artifact yield. Nonetheless, it seems reasonable to expect the wet levels to contain shell ornaments, stone tools, and possibly burials. Although lack of time prevented any extensive digging of the wet levels, a thorough job here might prove to be extremely rewarding, and it is hoped that future work may throw some light on the earlier portions of what must have been a very long occupation period.

Soil samples were taken from the top 24" of the cave deposits, and in Table 1 these samples are broken down into their component parts. The samples were taken from completely dry levels of the site, and since all food refuse is preserved, one might expect to gain some insight on the food habits of the cave's inhabitants. The information to be derived is regrettably meager, there being almost no food resources indicated in the samples taken. About the only source of dietary information in the samples is in the "plant" category, which could be further sorted to yield some identifiable seeds. However, it was my observation at the time of separating the samples that nearly all of the plant material consists of leaves, pine-needles, and small twigs which are more likely to represent bedding material than food resources. A larger number of soil samples might give more satisfactory information, but it appears that for this site nearly all of the observations on food resources must be derived from the traditional "level bag" method of collecting samples of identifiable material from each level. The best technique, from the quantitative point of view, would be the analysis of human fecal specimens, of which several were found.

Excavation

The dry deposit in the fissure was laid out in pits 3 feet wide which extended the width of the cave. This plan had the advantage of great simplicity in recording, but proved to be somewhat unsatisfactory due to the angle of the fissure. In effect, the working surface "moved over" with each level dug, so that the total length of the pit might be several feet longer than its surface length. The artifacts were measured to the southwest corner of the pits, which got further and further away from the artifacts as one dug progressively deeper. This was not a serious problem, since the pits were relatively shallow, but some modification of the system should be made if further work is done in the deeper

Table 1

Dry Midden Analysis, MNT-250, by Weight*

Pit	Level	Total Wt. of Sample	Residue[1]	Plant[2]	Shell[3]	Rock[4]	Bone[5]	Excrement[6]
9	0-6"	1298	1226	7	0	57	0	8
13	6-12"	1292	1213	29	0	40	0	10
13	12-18"	1556	1350	42	0	152	2	10
13	18-24"	1216	1027	79	2	97	0	11

[1]Almost entirely sand which has sloughed from cave walls and ceilings.

[2]Includes bits of charcoal, which were small but numerous.

[3]Mussel shell occurred in all levels, usually two to five whole shells per level. There is virtually no fragmented shell in the site.

[4]Includes chips from wall and ceiling and a few small stream pebbles. Large cooking stones are numerous but could not be included in the small samples taken.

[5]Bone is very scarce in the site. The figure given for the 12-18" level represents rodent bone.

[6]The figures for excrement represent only rodent excrement, although human and dog (or coyote) fecal specimens were found, particularly at the rear of the cave. The figures given suggest continuous occupation by rodents.

*Figures given are grams. Sample was screened in a one-eighth screen and separated by hand.

levels.

The deposit was trowelled by six-inch levels, carried to the mouth of the cave, and screened in a quarter-inch rocker screen. The man on the screen caught the bits of cordage and other artifacts overlooked in the cave, and he also collected a sample of each type of plant material from each level. All bone and shell fragments were retained.

We were aided by use of a small gasoline-driven electric generator which was packed into the cave. Set up at the cave entrance, this permitted us to string three 100 watt bulbs in the working area. Even so, more light would have been desirable, and any lesser source, such as gasoline lanterns, would have seriously reduced the efficiency of the crew.

Nearly all of the dry deposit was excavated, although pits 1 to 3 remain as a control for future workers. Certainly less than half the total deposit (including wet midden) was excavated, and extensive areas of deep midden still remain. The remaining portions of the site, being wet, are in no danger of further climatic damage.

Archaeological features

Special features of the site include pictographs and bedrock mortars at the entrance, plus some internal concentrations of artifacts.

The pictographs at this site appear to have been made exclusively by means of burned sticks which produced black lines of varying thickness. Pictographs in both red and white occur commonly at other sites in the area, and their absence at Meadows Cave is puzzling.

The charcoal pictographs at Meadows Cave are in three locations -- on a boulder from the rockfall, an extensive face about 20 feet long at the entrance of the cave, and a small area a few inches square at the west end of the site. All areas are subject to some weather action, and the pictographs are too faint to copy with full completeness and accuracy. Pictographs of the large face (feature 2) are reproduced in plate 6. This includes only the lines which could be clearly seen; much of the pattern has been obliterated by the elements. The most common element appears to be a sort of random cross-hatching of selected areas; other elements include concentric circles (made on a circular inclusion in the sandstone which is a slightly different color), arrows, and vague geometric designs. No attempt at representational art is apparent, and the pictographs give the impression of random scratchings on the wall by people idling around the adjacent campfires. It is difficult to see anything of ritual significance in these pictographs, particularly in view of the much more elaborate paintings that are found at other sites within two miles of the site.

It is of interest to note that many of the Mnt-250 pictographs occur on exfoliated areas of sandstone, showing that the exfoliation took place

before the cave was abandoned. Some of the pictographs are on soot-covered areas, and a few lines cross both blackened and exfoliated portions of the wall.

The remaining pictographs (feature 3) are on two boulders fallen from the roof in the large western chamber. The pictographs were applied after the rock had fallen, and they appear to be composed of irregular cross-hatching. Finally, there is a small area at the west end of the shelter containing similar markings.

In the center of the rockfall, in smaller boulders at the top of the rock heap, there are six bedrock mortars. All of these appear to have been in one large slab of rock which is now broken into four fragments lying a few inches apart. Three of the mortar holes are fragmentary and lie on fracture lines in the rock. The mortars range from 3 1/2 to 8 inches in diameter and from 2 to 9 inches in depth. Since the rock is quite soft, these mortars must represent a relatively short period of use. No pestles were found with the mortars, but one shaped cobble pestle was excavated just inside the long fissure (pit 3).

Within the excavated area, three features of interest were recorded. The most notable of these was a cache of 3 deer skins and a sheep skin (feature 1) buried in a carefully lined cache-pit in pits 6 and 7. The sheep skin, of course, dates the cache to the historic period. From the other dating evidence in the cave, it seems most likely that the cache dates from the Mission period in California, and one may speculate that the sheep skin was carried into the hills by a runaway from one of the nearby missions. (See Plate 4A)

In the dusty debris filling the cache-pit, several aboriginal artifacts were found, including a fire-drill, a wooden arrow foreshaft, an antler flaker, a chunk of shaped steatite, and several basketry fragments. The scattered nature of these objects argues against their intentional burial and suggests that they were fortuitous inclusions in the midden used to fill the pit.

The cache-pit itself was four feet in diameter and about two feet deep. The base of the pit was at 31", indicating that only a few inches of rock detritus lay over the upper edges of the pit. Most of this was sloughed material from the walls, and the pit may be confidently assigned to the latest phases of aboriginal occupation. The pit was lined with twigs and further protected by an inner layer of sycamore leaves three to four inches thick. The lining extended on three sides of the pit, the fourth (south) side being formed by the surface of a large buried slab of sandstone which had fallen from the roof many years previously.

In the center of the pit lay the heap of skins, the sheep-skin resting on top. They were not folded or arranged in any special order, but rather crumpled and wadded into place. All the deer skins bore peripheral holes where they had been staked out while being scraped. Additional description of the specimens is given below.

1-132731, Sheepskin: 55 x 48 cm., no edge holes, probably just half a skin. Skin is cleaned but is stiff and was not tanned. Wool is up to 5 cm. long and is dirty white in color. (See Pl. 4B)

1-132730, Deerskin: 130 x 100 cm. The whole skin except for head and tail. Still moderately soft and pliable -- must have been treated to some sort of tanning. There are 38 holes around the edge for staking out the skin; 3 of the holes are broken out. The center has a few small holes which appear to be natural tears, but there are two intentional holes in the center of the skin, 2 cm. in diameter and 26 cm. apart. The hair is gone from the center part of the skin, and this appears to be from wear rather than from rot, since the hair is in perfect condition around the edges. It seems likely that this skin represents a finished garment or blanket of some sort. Possibly it was attached to the waist by means of a cord through the central perforations, or it could have been worn as a cape. (See Plate 4C)

1-132729, Deerskin: 76 x 76 cm. There are 9 stake holes along one edge only; this may be a piece of the specimen described below. The piece is not as pliable as the skin above, but may have been partially tanned. There are 2 small holes, 1 to 2 cm. in diameter and 18 cm. apart, near the center of the skin. Near one edge there is a large hole 15 cm. in diameter which may be intentionally cut. This might have served as a child's cape. It is notably similar, except in size, to the piece above.

1-132728, Deerskin: 98 x 75 cm. A very stiff fragment, with 4 stake holes in one corner. May be a piece of the above specimen, but appears to be an unused fragment.

An additional cache-pit (feature 6) was found in pits 10 and 11. This one was 42 by 36 by 13 inches in size and was 24 inches below the surface. It was lined with handfuls of grass and twigs, with a large fragment of close-twined basketry lying across the floor of the pit. Presumably the pit served for the storage of seeds or other food, but it was empty when found.

Finally, there was a concentration of basketry fragments (feature 5) found in pit 7. The basketry lay at a depth of 36" beneath a hundred pound boulder which was a fragment of the rock forming the wall of feature 1. There were 27 pieces of basketry, all of which were very fragile due to moisture seeping up from the lower levels. All of the pieces appear to be part of the same basket, a large conical burden basket of close twining. The rock covering them had apparently fallen on the basketry indicating at least one large cave-in during occupancy of the site. Some basketry lay under the end fragment of a much larger rock, weighing a ton or more, which could not be moved. Since this large slab slid down the fissure while the cave was inhabited, it may be expected that additional specimens remain to be found beneath it.

Burial

The partially mummified body of a small child was found toward the rear of the fissure, in pits 11 and 12 (UCMA No. 12-8576). The burial was at a depth of 61 inches, which meant that it had suffered considerable moisture damage. Nonetheless, sufficient body tissue was preserved so that the bones could not be completely exposed, and traces of dry materials were found in the grave.

The body was tightly flexed on the back, with the head oriented toward the entrance to the fissure (west). The base of the grave pit was lined with grass and pieces of bark. The burial was accompanied by the following artifacts:

1. A pubic apron of cordage, bearing ornamentation of spire-lopped olivella beads. The cordage was almost entirely disintegrated, but seven fragments up to 12 cm. in length were capable of preservation. The cordage is 0.25 cm. in diameter and differs from all other cordage found in that it is 2 ply Z twist. The material is rotted so that it is impossible to be sure of its identity, although it looks as if there were two types of plants used.

   There were 217 shell beads, made of olivella shells, in the pubic region. Some of these still had bits of cordage remaining within them, but the cordage between them had disappeared. No two beads were found in a position suggesting an extended string, and it is possible that each bead was at the end of one string of the apron. This would leave about 100 strings hanging down before and behind.

   The beads were made by breaking out the entire spire of the shell. The tips are not ground off, as is commonly found with this kind of bead.

2. A fragment of a leather belt, found lying across the occiput and probably originally a head-band. The piece is 36 cm. in length, 2.5 cm. wide, and 0.5 cm. thick. It is made by folding the edges of a piece of leather in until they meet and then sewing the edges together. The thread has disappeared, but the needle holes are somewhat uneven, being 2.5 to 3.5 mm. apart, and the belt was probably hand-sewn. This is the rounded buckle end of the belt, but there are no holes for a belt buckle.

   This artifact is no doubt to be attributed to Caucasian contact. It may be a scrap of harness from one of the missions.

3. About ten glass trade beads, only two of which are whole, from the head region. They are exceedingly crumbly and break on being touched. They appear to be made of short pieces of glass tubing bearing irregular facets. The beads have a pink-red, almost rose, color and are translucent but not transparent. They are 2 mm. long, 2.7 mm. in diameter, with perforation of 1.0 mm in diameter.

These glass beads appear to have been partly decomposed by body acids or soil conditions, although their fragility may be due to some manufacturing defect. Because of their poor condition, it is difficult to identify them with certainty, but they appear most likely to be type 129 of the type collection of trade beads in the U.C.M.A. This type has been found at the following sites, in addition to Mnt-250:

Santa Rosa Island, site 4 (P.M. Jones)
Santa Rosa Island, site 15, with a burial (P.M. Jones)
Santa Rosa Island, site 18, with a burial (P.M. Jones)
4-Sac-56 (Mosher)
La Purisima Indian Barracks (2 specimens only)

All of these sites represent Spanish contact, although the La Purisima site could extend into the 1840's. However, the general occurrence suggests that the Mnt-250 specimens are not later than 1830 and may date from several years before this time.

4. One green glass bead, sub-spherical, transparent, 2.6 x 3.0 mm., 1.0 mm. diameter of perforation. Type 228 in the U.C.M.A. type collection, reported from Santa Cruz Island (site 138), Fort Vancouver, and La Purisima Indian Barracks. Again, an early nineteenth century date is suggested.

5. Minute shell disc beads, probably of olivella, 2 mm. diameter; 0.5 to 0.8 mm. thick; 0.6 mm. perforation. Twelve specimens found; others could have been lost in the site because of their small size. Two were found stuck together in stringing position.

6. Beads made of the chitinous leg segments of beetles; 95 specimens recovered, which is not more than half of those present since many were decomposed. Specimens are black, ca. 1.0 cm. long and 0.2 cm. thick. Only the larger leg segments, possibly only femora, were used, and the "necklace" must have utilized at least 30 insects, possibly as many as 60 or 70. About the only insects which are common enough and large enough to serve for this purpose are ground beetles of the family Tenebrionidae. A couple of these were observed living at the mouth of the cave itself and the beads could well have been made there.

7. Additional fragments of cordage at the head region. One piece is 10 cm. long, of 2 ply S twist cordage. It is imbedded in scalp tissue in the occipital region and is not further identifiable. There are 8 additional pieces of 2 ply S twist cordage, each only about 1 cm. long, black, ca. 0.15 cm. in diameter.

8. Finally, there is a fragment of the edge of a twined object of grass or tule. It is composed of 2 ply S twist cordage, 3.5 mm. in diameter. The fragment may be part of the cordage skirt, although the loose bits of cordage were all left (Z) twist. The specimen is 5.8 x 5.0 x 0.9 cm. (See pl. 5c).

Summing up, we have the burial of an Esselen child not more than a few years old, interred wearing a shell-decorated string apron, a head band of leather and possibly a cordage hair-net, and a string of beads including small shell discs, glass trade beads, and beetle legs. The child was buried in a prepared grave, lined with grass and bark, but was not covered with baskets or matting. Since boys of this age probably went naked, one may infer that this child was a girl. As a reasonable inferential dating, the child was probably buried about 1825, possibly earlier but not likely very much later. It is not unlikely that this child succumbed to one of the illnesses so prevalent in the Missions, for the glass beads suggest some more-or-less direct contact with Mission personnel.

Artifacts

The dry deposit of Meadows Cave held a relatively great number of objects, there being over 250 artifact entries in the catalog. Most of these specimens consist of fragments of cordage, basketry, or arrows, of standardized and well-defined types. Most notable is the extremely small number of non-perishable artifacts recovered, there being only 12 such specimens (not counting the beads with burial 1). This figure represents less than 5% of the material culture at Meadows Cave, and it is a striking example of the great reliance placed on wood and fiber by the Esselen. A second consideration is that the archaeology of open sites in Esselen territory is likely to be exceedingly meager. Had Meadows Cave been wet, only a handful of non-diagnostic artifacts could have been collected from a rather extensive excavation. This emphasizes the extreme importance of dry caves in much of California. Without some dry material, the California archaeologist may be forced to deal with much less than half of the material culture which once existed.

Basketry

A total of 91 fragments of basketry were excavated, counting pieces used for patches on other basketry. Almost a third of the total, 27 pieces in all, represent fragments of one large burden basket recovered from feature 5. The remainder of the pieces were scattered more or less evenly throughout the midden.

The basketry from Meadows Cave is simple in technique, but it is remarkably consistent and is sufficiently distinctive to be readily recognizable in California basketry. All of the basketry recovered, without exception, was closely twined with wefts passing under two over two on alternate pairs of warps ("diagonal twining"). No coiled basketry was found, although the coiling technique was known, as shown by a mend on a twined basketry fragment. The mend, which fills in a hole 9 cm. in diameter, is made by coiling, secured at the center by a couple of stitches. The coiling apparently was begun at the edges of the hole and

worked into the center. (See plate 2A). The coiling is single rod, non-interlocking, up to the left, (clockwise).

Stitches are basically woven in an up-to-the-right direction, although the direction of work is often changed to provide zones of contrasting stitches. This is the most common method of achieving decoration, only two fragments (described below) showing a different sort of decoration. The decoration also shows a strong conformity to a formalized and much restrained pattern. It consists almost exclusively of encircling horizontal bands which are only 2 weft rows in width and are several centimeters apart. There are fifteen examples of this sort of decoration, with as many as 3 encircling zones on the same fragment. The spacing between these narrow bands varies from 15 to 45 weft rows, a distance of 4 to 10 cm. Six of the fragments are decorated by the inclusion of a single weft row of up-to-the-left twining. (See Plate 2A)

A more striking decoration is attained on some pieces by varying the direction of twining with alternate rows. That is, one row is woven up to the right; the next up to the left, and so on. (See plate 2G). This technique appears to be confined to the smaller baskets, although the size of the fragments will not permit certainty on this point. Twenty-seven fragments are of this technique.

Finally, a single fragment (No. 1-132687) bears a decoration of interwoven diamonds which were probably a different color at one time. This is described below under the number of the piece.

The following shapes may be inferred from the fragments: large, conical burden-baskets, large trays which are elliptical (possible seed-beaters), and small elliptical "bowls." Probably there are also pieces of hemispherical cooking baskets, but the form could not be surely ascertained.

Ten examples of patches are present. One patch was made by coiling, as mentioned previously; eight others were made by attaching other fragments of basketry over the weak or broken portions. One patch is made by coarsely twining a twig through the weakened area.

In four cases, patches are attached by being coarsely sewed on with whole pine needles. The latter are tightly cinched up and were probably green when used; no doubt an awl was necessary to perforate the patch and the basket. Two patches are sewn on with strips of bark; two are attached by means of sewing with weft elements; and one is sewn on with cordage. Three additional basket fragments bear pieces of interwoven cordage which may have served to attach mends.

A few of the larger basketry fragments are described below in order to give structural details not previously mentioned. The whole collection is quite homogeneous, and it therefore seems unnecessary to describe the pieces individually here. A detailed tabulation of all pieces is on file with the U.C. Archaeological Survey.

1-132687. 59 x 24 cm. Warps are round twigs 2 to 3 mm. in diameter (32 warps per 10 cm.); wefts are flat splints 2 mm. in diameter (38 wefts per 10 cm.). See plate 2A.

Basically this piece is a fragment of over 2 under 2 twining on alternate pairs of warps. It is a fragment of a large close twined burden basket and has the following modifications:

1. Design made of tightly woven elements (two rows). Up to right, wefts slightly smaller and more round than rest of basket. This forms a diamond design of diamonds 10 x 13 cm. This may have been a different color at time basket was made, but cannot be differentiated at present except by size.

2. Design made by altering usual direction of work and including at intervals of 5 to 7 cm. an encircling band of up to left twining. This is done in bands of two rows of twining. (There are three bands showing on the fragment.) The two types of design do not interlock and appear to have been applied independently without an attempt to see them as parts of a more complicated pattern.

3. Attachment for rigid support. Support was attached to inside of basket by a hastily stitched weft element (up to left) which skips from 1 to 8 warps and from 3 to 7 wefts. Stitches lie flat on exterior and are broken on inside. Encircles fragment 7 cm. from one edge.

4. Mend -- at one edge, a circular mend 9 cm. in diameter filling in a hole in the basket. Mend is made by coiling single rod, non-interlocking, up to left (clockwise), secured at center by 3 or 4 stitches.

5. Mend -- 3 x 6 cm. in center. Additional twining of a heavy weft element, irregular in technique.

6. Mend -- 12 x 4 cm., one corner of fragment, made by stitching on a piece of twined basketry (w/pitch coating) with a weft element. This is on inside of basket. There is a small piece of additional twined basketry (3 x 2 cm.) sewed onto the patch.

7. Mend -- 3 x 2 cm. on inside. Twining over break, plus addition of 4 short warps, 3 cm. long, sharpened on both ends before adding.

New warps were added at intervals to make conical basket. These were probably sharpened before insertion. New wefts are caught under one stitch of the adjoining weft element.

1-132878. 24 x 22 cm.; 40 warps and 36 wefts per 10 cm. This is a fragment of a large, non-circular tray, possibly a seed-beater. It is twined, over two under two on alternate pairs of warps. Wefts

cross at the rim and proceed back across the basket. The basic weave is alternating, with change from up-to-right to up-to-left on every other weft row. A pattern of bands 3 weft rows wide is included at intervals of 12 weft rows (ca. 3.5 cm.). The pattern is up-to-right. The weft rows above and below the pattern are also up-to-right, but the pattern rows are lighter in color and presumably formed white bands against a darker background.

1-132785. 13 x 5 cm. 48 warps and 66 wefts per 10 cm. This is the most finely-woven piece found; the rest of the fragments have a weft count between 30 and 45 to 10 cm. See plate 2F.

This is a rim fragment, with warps cut off flush with the top weft row. The weft rows alternate in the direction of the stitch, but there are also bands of up-to-right twining which vary from 2 to 4 weft rows in width.

1-132795. 7 x 7 cm. 35 warps and 38 wefts per 10 cm. Typical fragment in alternating weave. See plate 2G.

Cordage

A total of 160 fragments of cordage and fiber were found at Meadows Cave. This figure includes 42 fragments of untwisted fiber, 3 pieces of twisted animal skin, and 4 pieces of twisted bark. (See table 2). These types are not properly cordage, but are included in this category for convenience in description.

Of the true cordage, there is one piece of three-strand braid and 7 fragments of 2 ply left ("Z") twist cordage. The great majority of pieces, 106 in all, are simple 2 ply right ("S") twist cordage. The materials used, in order of their importance, were grass, yucca fiber, a silky apocynum-like fiber, and human hair (see table 2). Only one piece of the latter was found, woven through a fragment of basketry. Representative cordage specimens are illustrated in plate 3.

Mrs. Cherie Bennyhoff of the University of California has submitted a sample of the cordage specimens to microscopic examination with a view to determining the plant species used. I am indebted to her for the information below.

The cordage which I have called "grass" remains unidentified thus far. The pieces classified as "yucca" are of that fiber, most probably Yucca whipplei which grows in the immediate vicinity of the site. The cordage called "apocynum" appear definitely to be made of some plant in the family Apocynaceae, but the exact genus is not certain. Possibilities which occur in the site area include Apocynum androsaemifolium and Cycladenia humilis. Mrs. Bennyhoff is inclined to identify the cordage tentatively as Cycladenia, but further comparative work is necessary to be certain of this.

Table 2

Enumeration of Cordage Specimens

"Knotted fiber" (Yucca)	42
Yucca cordage, 2 ply S	20
Grass cordage, 2 ply S	57
"Apocynum" cordage, 2 ply S	10
Unidentified, 2 ply S	18
Human hair (?)	1
3 strand braid (Yucca)	1
Twisted animal skin, single strand	3
Twisted bark, single strand	1
Unidentified 2 ply Z	7
Total	160

A puzzling artifact type is the class called "knotted fiber." The first specimens found consisted merely of knots made in untwisted bundles of Yucca fiber (see plate 3H, J). Later finds showed the knots to be portions of rude nets, and 10 fragments large enough to indicate the mesh size were found. The nets had a mesh of 3 to 9 cm., but none of the pieces is large enough to indicate the overall size of the net. The nets appear to have been relatively small, hastily made and readily discarded. The function of such nets is problematical; presumably they were used to transport some fairly sizeable food resource, possibly roots or tubers of some sort.

Fragments of an additional net, made of "apocynum" cordage, were found in pit 7. (See plate 5A). Two fragments of the same net were found, one piece being tied around the other in an overhand knot. The net had a mesh of 4 cm. and bore a row of loops along the edge. This sort of net could have been used in fishing or hunting, but it seems more likely that it was a carrying net used for the transport of food or valuables. Such carrying nets are known to have been used in this region.

A small piece of "apocynum" cordage is of interest because it tapers from 0.35 cm. to 0.10 cm. in thickness, with the thin portion forming a small loop secured by a slip knot (see plate 5B). The specimen could well have been part of a snare used for securing small game.

A total of 102 knots was counted in the fragments of cordage and fiber. The following knots were present:

Net knots	63
Overhand knots	24
Square knots	1
Granny knots	5
Slip knots	1
Unidentified	8

Wooden objects

Arrow fragments

The collection includes nine hardwood foreshafts and five possible shaft fragments. One foreshaft was found bound to a fragment of cane shaft with sinew (see plate 2B; other foreshafts in plate 2C, D).

Two types of foreshaft are present, a blunt form and a pointed form. Of the former, there is only one example (plate 2C). A hardwood twig was sharpened and inserted in a cane shaft, where it was secured with asphaltum. The other end of the foreshaft was blunt. Unfortunately, the only specimen has the end split, and it is not possible to ascertain whether the tip was slit for insertion of a stone point or whether the arrow is simply a stunning arrow. Since no stone points were found, the

latter explanation seems most acceptable.

The common form of foreshaft was bi-pointed. The two whole specimens are 21.0 and 22.5 cm. long by 0.6 and 0.7 cm. in thickness. Three other fragments are definitely of this type of foreshaft; the remainder are too small to be definitely assigned a type. In the bi-pointed form, about one-fourth of the total length was sharpened to a point and inserted in the arrow shaft. The remaining three-fourths of the foreshaft was trimmed to a long, tapering point. The arrow was used this way, the sharpened foreshaft serving as the point. No evidence of stone points was found, and it seems likely that the Esselen did not use stone points at all.

Four of the foreshafts show traces of asphaltum on 5 to 6 cm. of the end which was inserted in the shaft. The one piece which remains attached to a shaft fragment does not have asphaltum, but is bound into place with sinew.

Cane of some sort appears to have been the material for arrow shafts. There is the small fragment attached to one of the foreshafts, plus four other possible shaft fragments. All of the latter are very straight and smooth, cane or possibly elder, 0.8 or 0.9 cm. in diameter and from 11 to 33 cm. in length. One piece (1-132741) has 3 turns of wrapping material around one end, probably sinew. Two pieces (1-132980, 1-132836) are marked with shallow scorings 1 mm. apart, extending around the shaft. These are not the result of wrapping, for they are complete circles, not spirals. The former fragment bears a red stain on 2 cm. of one end; this may be painting or may be a stain from pitch or other adhesive material.

Unfortunately no fragment of the butt of an arrow was found, and it is not possible to say anything about the feathering. Neither can one be certain of the length of the arrow, although it could not have been less than about 70 cm.

Fire drills

Two possible fire drills of soft wood were recovered. Both have rounded and charred ends; they are a few cm. long and slightly more than one cm. in diameter.

Wooden awl

A sharpened wooden splinter, 14 by 0.6 cm., may represent an awl; it is definitely not an arrow foreshaft. (1-118169)

Fire pokers

Three sticks have charred and rounded ends as if used for fire pokers. A representative piece (1-118152) is 46 cm. long, 1.8 cm. in diameter, and retains the original bark.

Cut twigs

Seven sticks show evidence of cutting and more or less workmanship None can be interpreted as artifacts of specific use. One stick is sharpened on the end; the pieces are 8 to 25 cm. in length and 0.6 to 2.5 cm. in diameter.

"Worked twigs"

This amorphous class of objects is a catch-all for the puzzling objects which seem to occur in all cave sites. It is difficult to conceive of uses for these artifacts; they may represent random "play." The pieces are described briefly below:

1-132714 -- l., 20 cm. Two bundles of about 6 twigs each, one bundle tied around the other in an overhand knot.

1-132723 -- l., 36 cm. A central stick with bundles of twisted twigs across it at right angles. The top bundle is of 3 twigs; a few cm. below this there is another group of twigs, doubled back on itself. The cross pieces were twisted and the other stick was thrust through them.

1-132786 -- l., 48 cm. A group of three willow twigs twisted together, S twist.

1-132852 -- l., 59 cm. (See plate 5F.) A stick with a short twig bound to one end by several turns of bark tied in an overhand knot.

Three additional wooden objects include the following:

1-132685 -- l., 76.5 cm., thickness 0.5 to 0.6 cm. A long, straight wand with rounded ends and carefully smoothed surfaces. Function unknown.

1-132703 -- l., 20 cm. (See plate 3G). A possible child's toy made from a sycamore twig. The seed-bearing twigs are twisted until they have become pliable, leaving the hard seed cores suspended as small balls.

1-132749 -- l., 25.5 cm., thickness 1.2 cm. A stick with a blunt point on one end; possibly a wooden flaker.

Shell objects

Abalone containers

Two nearly whole Haliotis cracherodii shells were found, which had

been used as containers for asphaltum. (See plate 3M.) In both cases, the asphaltum was apparently applied while melted; one specimen (1-118160) bears brush marks where the asphaltum was scraped out. Three additional fragments of Haliotis cracherodii were recovered which bore traces of asphaltum on the interior surface. All of these are probably pieces of a third asphaltum container.

One whole shell of Haliotis cracherodii was found which has the lip broken and worn as if used in digging or scooping earth.

Limpet spoon (?)

One large whole limpet shell (Lottia gigantea) was found. (1-132793, length 7.8 cm., see plate 3N.) It shows no modification, but as the only one found it is perhaps a utensil of some sort.

Haliotis pendants

Two small oblong Haliotis pendants were recovered (see plate 5D, E). The backs are ground off, so the species cannot be determined.

Olivella shell beads

In addition to the 217 spire-lopped Olivella beads found with burial 1, a single bead of this type was recovered from the 24-30 inch level of pit 9. As with the burial accompaniments, the entire spire of the shell is broken out.

Minute disc beads of shell were also found with burial 1, and are described with the burial.

Antler objects

Two worked tines of deer antler were recovered. Both are battered at the base and show bevelling and polishing of the tip (see plate 2J, K). These are tentatively interpreted as antler flakers, but since no pressure-flaked stone object was found, this view is subject to future verification or correction.

Stone objects

Stone artifacts were remarkably scarce. As mentioned previously, no stone arrow points were found. The four stone objects recovered include:

1-132802, 1-132845 -- Two crude chert scrapers (see plate 5G, H).

1-132788 -- A roughly shaped chunk of steatite, 10 cm. long and 6 cm. in diameter. An exceedingly soft piece, bluish-white in color. Could well have been used for pigment, but it is too soft for artifact manufacture.

1-132852 -- A cobble pestle, 19 x 7.5 cm. A natural stream cobble, roughly shaped to cylindrical form with nearly flat pounding surfaces. Both ends used, but one end shows much more use than the other.

Miscellaneous artifacts

The following additional specimens were found:

1-118165 -- The quill of a very large bird feather, 34 cm. long (not complete) and 1.1 cm. in diameter at the base. Must be from an eagle or condor. All the soft parts are missing, apparently from insect damage.

1-132702 -- A tuft of reddish black hair, probably a lock of human hair.

1-132739 -- A coil of basketry weft material, 10 cm. in diameter and 1 cm. thick (see plate 3K).

1-132792 -- A bundle of rushes, possibly iris or some sort of marsh grass. 25 cm. long, 8 cm. in diameter; one end tied in a loose overhand knot.

Materials of historic date

The following evidences of post-Caucasian occupation were recovered:

1. One sheep skin, with feature 1.
2. Ca. ten glass trade beads, of two kinds, with burial 1.
3. Fragment of a leather belt, with burial 1.
4. Small fragment of a red wool blanket.
5. Two fragments of a single large blue trade bead.

The first named objects have been described with the burial or feature in which they occurred. The last two are described below:

1-132781 -- A small strip of simply woven wool, 16 x 1 cm. (0.18 cm. thick). It is red and from the texture looks like a piece of a wool blanket. There is an overhand knot tied in the center, and it is not unlikely that the piece was tied in the hair as an ornament. Found at a depth of 24 inches in the cache-pit containing feature 1.

1-132823, 1-132835 -- Two fragments of a blue glass bead, 1.2 cm. in diameter when whole. Undoubtedly pieces of the same bead, but the fragments do not fit together. One piece was found at 12" in pit 4; the other at 9" in pit 5. The bead is light blue, verging on a turquoise blue, and is opaque. It has very fine surface cracks, corresponding to crazing in glazed pottery, and also contains occasional hair lines of a reddish color. This is type 78 in the U.C. Museum of Anthropology collection; it has also been found at 4-Sha-22 in northern California, at four sites in Alaska (collected by Frederica de Laguna) and at the Indian Barracks of La Purisima Mission.

As mentioned earlier, the overall evidence suggests that the historic occupation was during the first part of the nineteenth century, terminating by about 1825. However, since "wild" Indians are reported to have occupied this region until 1850 or later, the possibility of post-1825 occupation must be considered. The writer considers such late occupation to be extremely unlikely because of the scarcity of historic materials and the complete absence of metal, glass, nails, or other functional materials which might be expected to occur as soon as the Indians could obtain such things. Further, the bead types which can be dated suggest the earliest portion of the nineteenth century.

Stratigraphy

No stratigraphic change can be derived from the material found in the dry levels. The artifacts are quite evenly distributed in depth and appear to represent a cultural unit with no temporal changes visible.

Areally, the distribution is also fairly even, although the number of artifacts diminishes sharply in the rear of the cave, between pits 12 and 18. Pits 13 and 14 were not completely excavated of dry material, and pits 15 to 18 were quite shallow.

Numerical distribution of artifacts by depth and pit is given in Table 3. It will be seen that most of the occupation was in the outer half of the fissure; the deeper recesses being little used. In depth, the top 6 inches were virtually sterile; the 17 objects recovered from this layer are small bits of cordage, two broken foreshafts, and three small pieces of basketry.

Table 3

Occurrence of Artifacts by Level and Pit

Level	No. Artifacts
0- 6	17
6-12	66
12-18	48
18-24	56
24-30	28
30-36	19
36+	8

Pit	No. Artifacts
1	(Not excavated)
2	(Not excavated)
3	(Not excavated)
4	10
5	29
6	28
7	43
8	49
9	44
10	19
11	12
12	3
13	0
14	2
15	1
16	1
17	2
18	0

Period of occupation

For reasons previously given, the abandonment of Meadows Cave can be dated about 1825. Fortunately, the conditions of midden development are such that a possible dating for the early levels is also derivable from the data.

The midden analysis made in Table 1 shows the greater amount of the site material to be composed of residue which has sloughed from the walls and ceiling. The top six inch layer is clean sand which has accumulated since abandonment of the site, that is, in the last 125 years. By computing the percentage of sloughed sand in the other layers, one can readily calculate the length of time which they represent. This assumes that the material has been weathering at a constant rate, an assumption which of course cannot be proven. However, the dry and sheltered nature of the cave tends to support the assumption.

In comparing levels within the site, the top level cannot be used as a unit, for even this level contains a small amount of rock, plant material and excrement attributable to rodent action. Actually, only 94.4% of the top level is clean slough material. The following formula should therefore yield the time occupied by each level:

$$\frac{94.4}{125 \text{ years}} = \frac{\%\text{ of sand in other level}}{X \text{ years}}$$

Applied to the midden samples, the following results are obtained:

Level	% of residue	Years
0- 6	94.4	125
6-12	93.8	119
12-18	86.7	115
18-24	84.5	112

Below 24 inches, moisture begins to appear and the proportion of material declines until the levels are almost pure sand again, differing only in the presence of bits of charcoal and an occasional fragment of shell.

It will be seen that there is practically no decline in the percentage of sand between levels 1 and 2, and indeed, the percentage of residue remains high throughout. However, the levels are not as similar as the figures make them appear. The top level is clean yellow sand, while the lower levels are considerably darker due to fire discoloration. Further, the increase of plant material in the lower levels is more striking than it appears because of the great volume occupied by even a few grams of dried leaves and grass. The writer had the distinct impression, while working at the site, that about half of the midden proper was plant material.

This was an illusion, as shown by the weight of residue which packed down between the plant remains.

According to the figures, the top four levels occupied about 470 years, or the period between 1350 and 1825 A.D. This is a not unreasonable conclusion, although it is a slightly greater time than the writer would assign on purely subjective grounds. Since a few dry specimens were deeper than 24", some of the pieces may date back as far as about 1100 A.D., and if the whole site accumulated at the same rate, the initial occupation must date from before 500 A.D. A charcoal sample was taken from what is here dated the 500 A.D. level, and it is possible to check the validity of the calculations when C14 dates become more readily obtainable.

Since the central test pit did not succeed in finding the bottom of the cultural deposit, it is not possible to speculate on the date of earliest occupation. Nonetheless, there is reason to believe that the site was occupied for more than a thousand years, and the chances of obtaining a cultural stratigraphy in the site seem very good. To mention only one possibility, stone projectile points could occur in the wet levels, although they are entirely absent from the proto-historic dry midden. Stone projectile points are relatively common in both the surface and buried Willow Creek midden deposits (Mnt-281, Mnt-282), which is also in Monterey County and is C14 dated at about 1800 years ago.* In any case, Meadows Cave must be recognized as a most significant and still promising site in an area which was previously unknown archaeologically.

Comparison and cultural sketch

There can be little doubt that Meadows Cave was inhabited in the proto-historic and early historic period by Indians of the Esselen tribe, for the site is not far from the center of known Esselen territory. Unfortunately, ethnographic accounts of the Esselen, and archaeological reports which might serve to amplify the present information are virtually lacking. No publication is available for an archaeological excavation within a couple of hundred miles of Meadows Cave. Kroeber (1925) was able to devote only a few paragraphs of ethnological data to the Esselen, and they have remained a nebulous group with little specific information available.** So far as the published information goes, Meadows Cave offers more solid facts about Esselen life than any other available source, meager though the archaeological data are. In view of this situation, it seems desirable to present a brief cultural sketch of the Esselen, derived from the archaeology of Meadows Cave, without reference to such ethnographic information as is available.

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*INS sample 628 (1840 ± 400 years); INS sample 695 (1879 ± 250 years).

** The recently published Esselen vocabulary of Pinart (UC-Anthrop. Records, Vol. 15, No. 1, 1952) will permit of some further ethnological reconstruction of the culture of this group (Ed.).

One may infer that the Esselen lived in small groups, in some cases probably as small as a family or two. They were migratory but probably returned to the same camps year after year. They inhabited caves where these were available, but open sites were also occupied and probably held the bulk of the population.

The Esselen derived their livelihood from both littoral and inland sources, occupying the interior during the fall of the year and probably intermittently during other seasons. From the coast, the Esselen obtained mussels, limpets, and abalone. The coast also supplied asphaltum which was transported in whole abalone shells and used for a general purpose adhensive. Mussels (Mytilus edulis and M. californianus) were carried inland in some numbers, probably whole and alive for purposes of preservation. Abalone meat, if carried inland at all, was removed from the shells first, for no waste Haliotis shells are found. There is no evidence of fish or fishing in the inland site, although such marine foods were probably utilized when a sufficiently large body of water was nearby.

Inland, food resources included deer and rabbits, but birds seem to have been very little hunted. There were also plant foods, not well attested in the site, although one can assume that plant seeds and acorns were utilized, being ground in bedrock mortars with cobble pestles. Pinenuts may have been used, but if so were of minor importance.

In hunting, the only weapon indicated archaeologically is the bow and arrow. Bows were probably simple; arrows were of cane with pointed hardwood foreshafts. No stone arrow points were used, and stone working of any sort is quite rare. Snares of some kind were probably used, and there is a suggestion that the people had dogs to aid them in hunting (inferred from fecal specimens only).

Children, probably only the girls, wore pubic aprons of cordage, decorated with Olivella shells. Other ornaments include small shell discs, oblong Haliotis pendants, and necklaces or other ornaments of some sort made of beetle legs. Capes or skirts of deer skin were worn by adults. There is no evidence of sandals or other foot wear.

Closely twined baskets were probably the principal items of household furnishings. They included large conical burden baskets, hemispherical cooking bowls, trays, and small boat-shaped baskets which may have been seed-beaters. It appears that all of the complete baskets bore some decoration, although this was of a very restrained and simple type. Other aesthetic manifestations are seen in the numerous pictographs in black, white, and red, which are found in the region.

Of religion and other intangible aspects of the culture, there is no archaeological information that would permit speculation. It is interesting to note, however, that none of the artifacts traditionally interpreted as "ceremonial" in California were found. This includes charmstones, quartz crystals, red ocher, and fancy non-utilitarian objects of any sort. The one burial found was accompanied only by the clothing and ornament which was presumably worn at the time of death, and no evidence

of mortuary offerings was seen. It is apparent that so far as religion goes the archaeologist will draw a blank until some especially fortunate find is made.

Material comparable to that in the Meadows Cave collection is rare, but a few similar objects are mentioned. Mason (1912, pl. 36, fig. 2) illustrates a "Costanoan twined winnowing tray" which displays the exact techniques of decoration found in the Meadows Cave basketry. The one other Costanoan basket and all of the Salinan basketry illustrated are very distinct from the Meadows Cave techniques, and it may be that the single comparable piece derives ultimately from Esselen, rather than Costanoan manufacture.

Mason also illustrates several pestles picked up in Salinan territory which are identical to the specimen excavated (op. cit., plate 26, fig. 2, left).

Material traits attested for the Costanoan and Salinan, also demonstrated for the Esselen in Meadows Cave, include (all from Harrington, 1942):

Bedrock mortars
Natural stone pestles (for Southern Costanoan and Salinan)
Cane arrows with hardwood foreshafts
Asphalt adhesive (Southern Costanoan only)
Charcoal for black pigment
Apron of "net work" (presumably cordage; attested by Southern Costanoan only)
Carrying net
Twined conical carrying basket (Southern Costanoan only)
Apocynum cordage
Whole Olivella beads

All of the traits are general throughout much of California, and specific cultural affinities for the Esselen cannot be demonstrated. The few scraps of evidence available suggest that the Esselen were culturally more similar to the Costanoan than to the Salinan. Further archaeological work may settle this problem, but for the present the Esselen must be regarded as a group with a fairly distinctive technological pattern (in basketry, arrows, and cordage) which may be indicative of cultural isolation and specialization.

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EXPLANATION OF ILLUSTRATIONS

Plate 1
Site Mnt-250 and surrounding area

A. Church Creek Canyon, showing typical view in the Central Coast Ranges, with oaks on the near slopes and pine-chaparral on the far slope. Various outcrops of Vaqueros Sandstone can be seen. Meadows Cave is in the center of the white circle, about 3 miles west and 2000 feet below the point from which the photo was taken. The site itself cannot be seen, for it is behind and below the ridge in the foreground.

B. Interior of the excavated fissure of Meadows Cave. Note soot on the ceiling with light patches where the surface has exfoliated. Man in the foreground is in pit 5.

C. Exterior of Meadows Cave. The large pile of rocks at the right is rockfall from the roof. It is within the shelter but does not contain any deposit.

D. Bed rock mortars on top of the rock pile in the photo above.

Plate 2
Artifacts from Meadows Cave

A. Basketry fragment (1-132687) showing mend made by coiling. This piece also shows both of the common methods of decoration -- use of smaller and presumably different colored wefts (right-hand edge of fragment); and altering direction of work to insert two weft rows of up to the left twining (lower left corner of fragment). Size scale in centimeters.

B. Arrow foreshaft, bound to cane shaft fragment with sinew. The lower end of the foreshaft extends to the break (1-132797, l., 21 cm.).

C. Arrow foreshaft. Pointed end was inserted in cane shaft and secured with asphaltum, which is visible on 6.6 cm. of pointed end. Other end is split but length is complete and this end was blunt (1-132774, l., 11.7 cm.).

D. Arrow foreshaft fragment. 6 cm. of pointed end bears asphaltum; other end is burned (1-132860, l., 9.8 cm.).

E. Arrow foreshaft fragment. 5.7 cm. of pointed end bears asphaltum; other end is broken. (Not shown - lost in lithography)

F. Basketry fragment bearing pattern achieved by varying direction of work. This is the most finely woven piece found, with 48 warps and 66 wefts per 10 cm. (1-132785, l., 13 cm.).

G. Basketry fragment showing technique of alternating direction of work with each weft row (1-132795, l., 7 cm.).

H. Spire lopped Olivella beads from burial #1. Note the large perforations resulting from the breaking out of the entire spire (1-132982, l. ca. 1 cm.).

J. Antler flaker (1-132775, l., 6.8 cm.).

K. Antler flaker (1-132857, l., 13.0 cm.).

Plate 3
Cordage and other artifacts from Meadows Cave

A. Tapered "apocynum" cordage, varying from 0.2 to 0.5 cm. in thickness (1-132689, l., 77.5 cm.).

B. Simple 3 strand braid of Yucca whipplei (1-132864, l., 10.5 cm.).

C. Cordage of grass (1-132801, l., 48.0 cm.).

D. Fragment of twisted animal skin, probably rabbit (1-132735, l., 11.5 cm.).

E. Fragment of twisted animal skin, probably rabbit (1-132883, l., 17.0 cm.).

F. Cordage made of Yucca fiber (1-132659, l., 9 cm.).

G. Possible child's toy made from a sycamore twig. The seed-bearing twigs are twisted until they have become pliable, leaving the hard seed cores suspended as small balls (1-132703, l., 20 cm.).

H. Yucca fiber tied in a net knot (1-132696, l., 9 cm.).

J. Yucca fiber tied in a net knot (1-132708, l., 7 cm.).

K. Coil of basketry weft material (1-132739, diameter 10 cm.).

L. Knotted Yucca fiber (1-132709, l., 50 cm.).

M. Shell of Haliotis cracherodii used as a container for asphaltum (1-132813, l., 13 cm.).

N. Shell of a large limpet. No visible modification, but since this is the only one found it may have served as a spoon or dipper (1-132793, l., 7.8 cm.).

Plate 4
Cache of skins (feature 1)

A. The cache of skins in position as found. Note sycamore leaves and twigs behind the skins, forming wall of the cache pit.

B. Sheepskin found in the cache (1-132731, l., 55 cm.).

C. Deerskin found in the cache (1-132730, l., 130 cm.).

Plate 5
Various artifacts from Meadows Cave

A. Fragment of a net made of "apocynum" fiber. Loops at the top are tied in overhand knots, all other knots are net knots. Net has a 4 cm. mesh, length extended 78 cm. (1-132722).

B. Tapered "apocynum" cordage tied in a slip knot, possibly part of a snare for small game (1-132803, l., 14.0 cm., illustrated actual size).

C. Selvage edge of cordage object found with burial 1. May be part of apron or sandals. Sketch is diagrammatic; in the actual piece the cords are much closer together and because of poor condition of the piece details are difficult to make out (l., 5.8 cm.).

D. Haliotis pendant fragment with biconical perforation (1-132807, l., 2.9 cm.).

E. Haliotis inset or unfinished pendant -- shaped but not perforated (1-132880, l., 3.2 cm.).

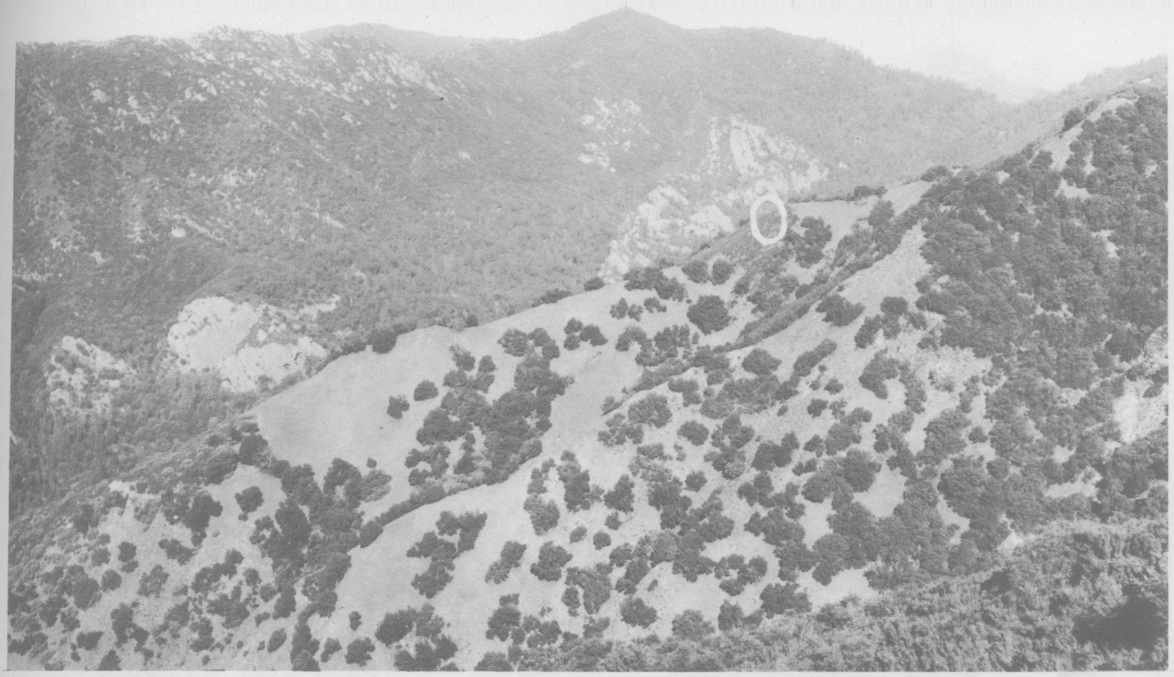
F. Problematical wooden object. A short twig, 15 cm. long, is bound to a longer one by several turns of bark tied in an overhand knot. Use unknown (1-132852, l., 59 cm.).

G. Side scraper of white chert, which may have been used as a plane (1-132845, l., 5.0 cm.).

H. Flake scraper of gray chert. An unmodified longitudinal flake with use retouch along one long edge (1-132802, l., 4.4 cm.).

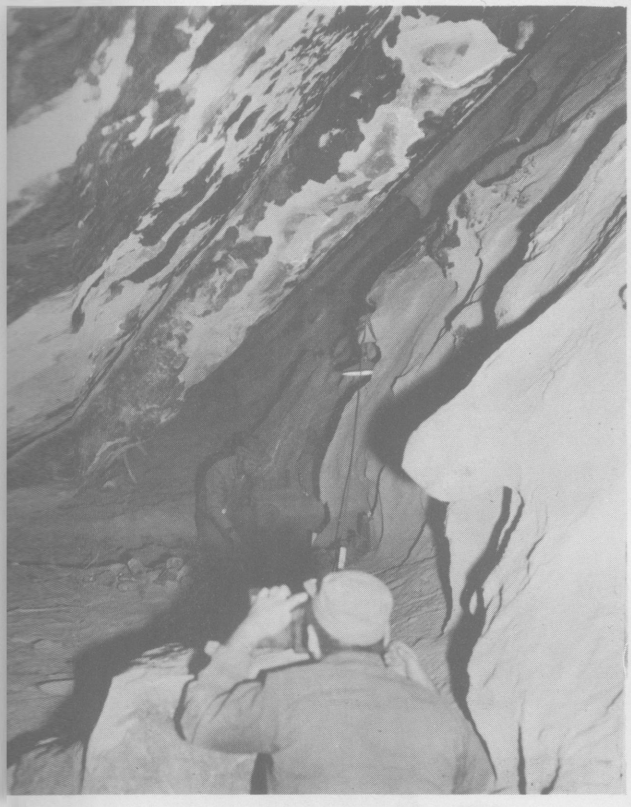
Plate 6

Charcoal petroglyphs at mouth of Meadows Cave



A.

C



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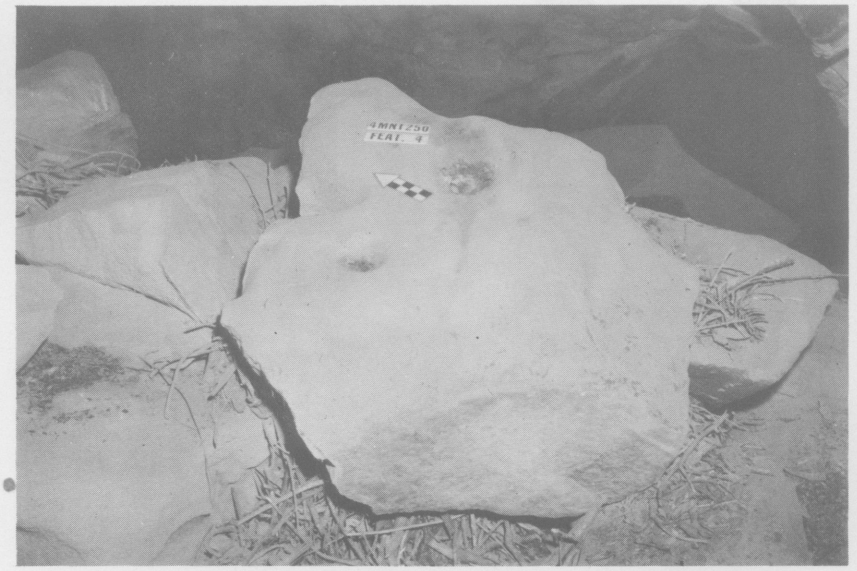
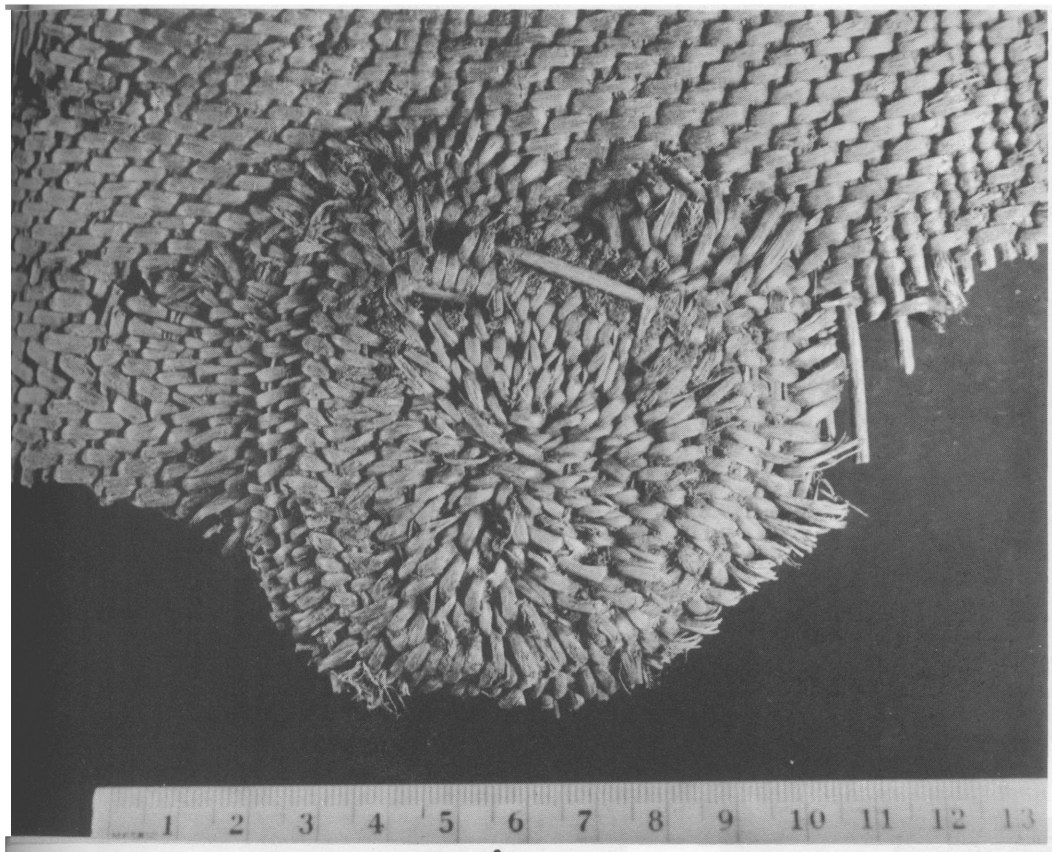


D

PLATE I.



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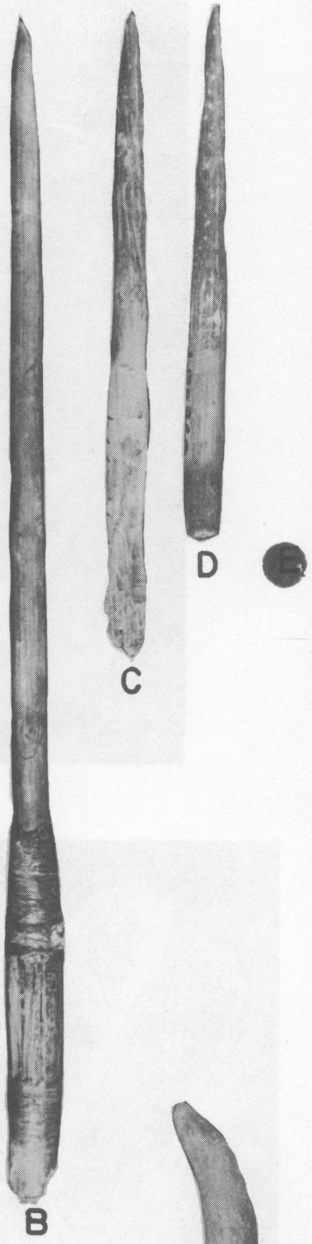
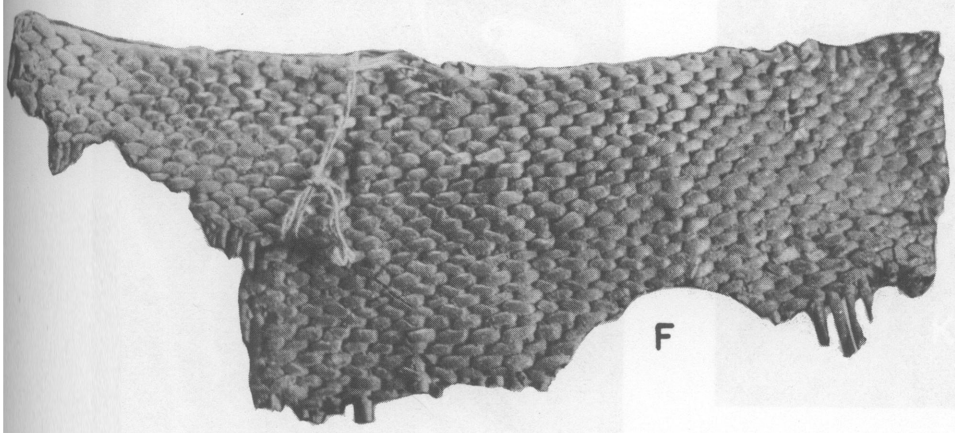


B C D E



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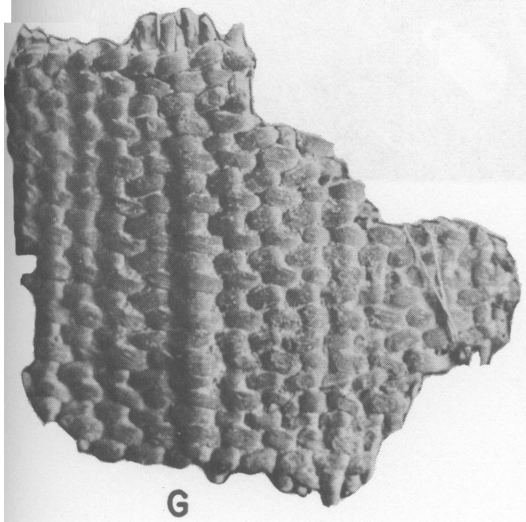

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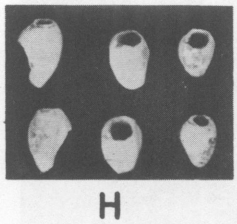
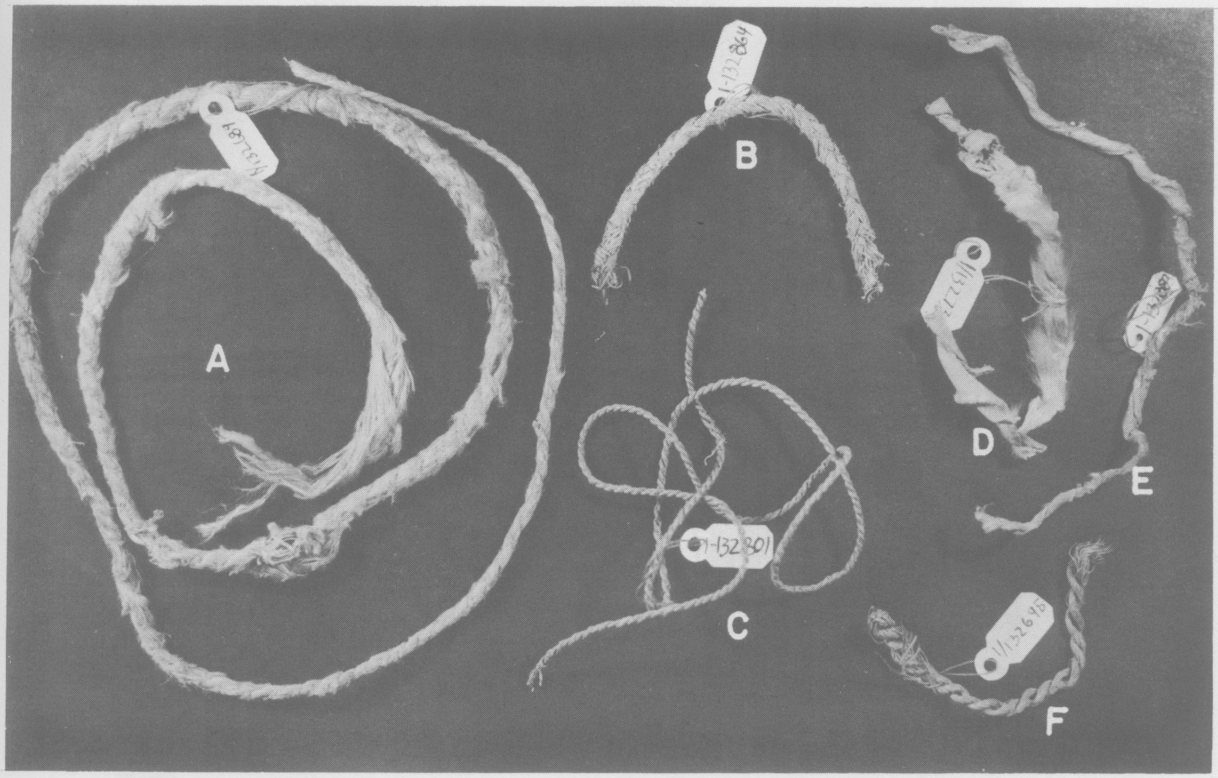


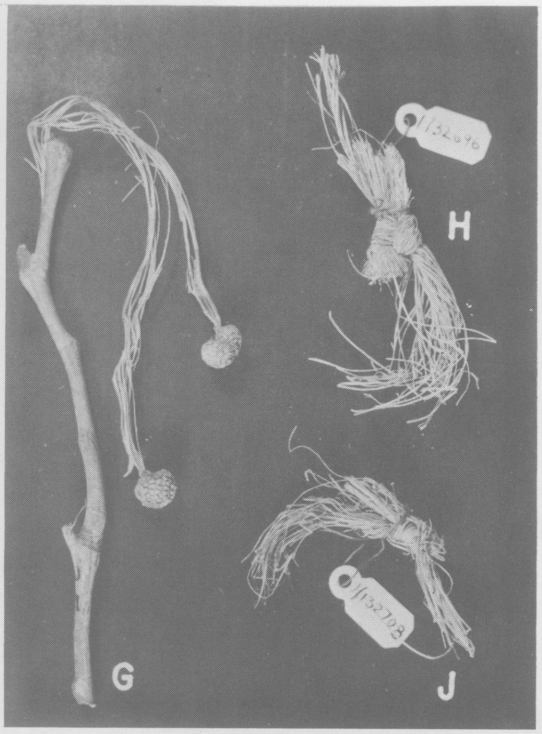
H

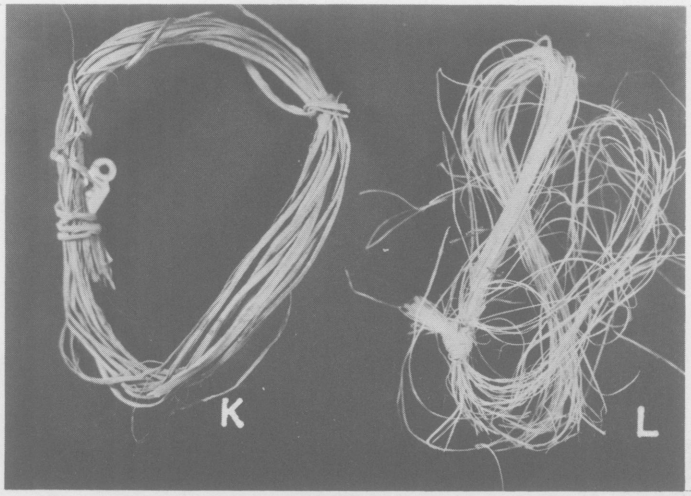
J

K

PLATE 2.







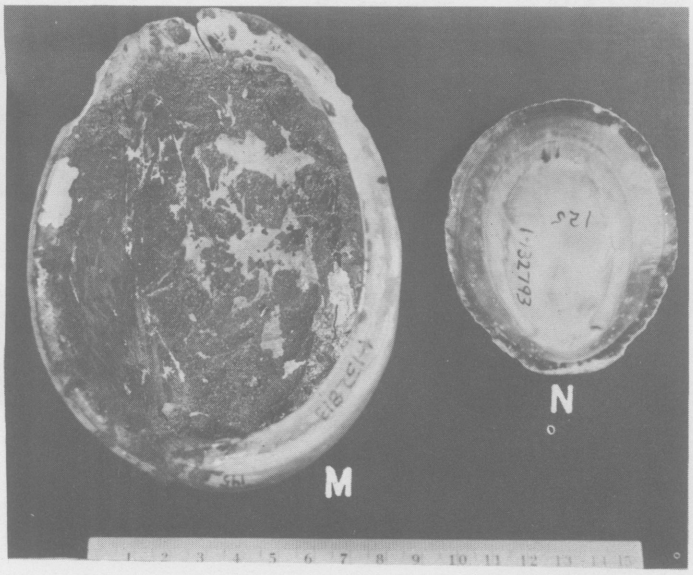
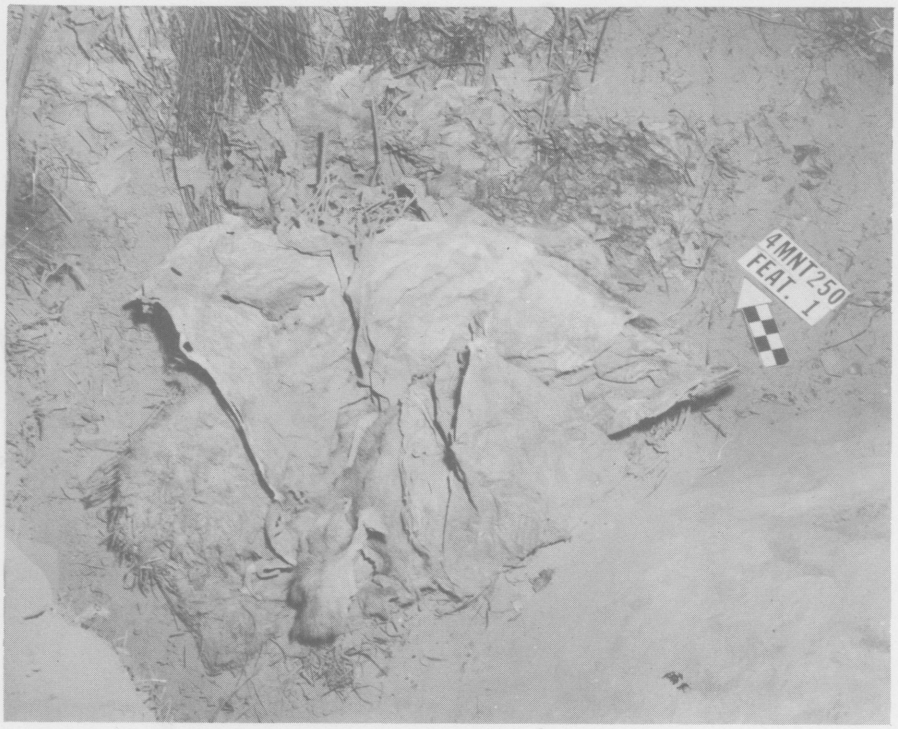


PLATE 3.



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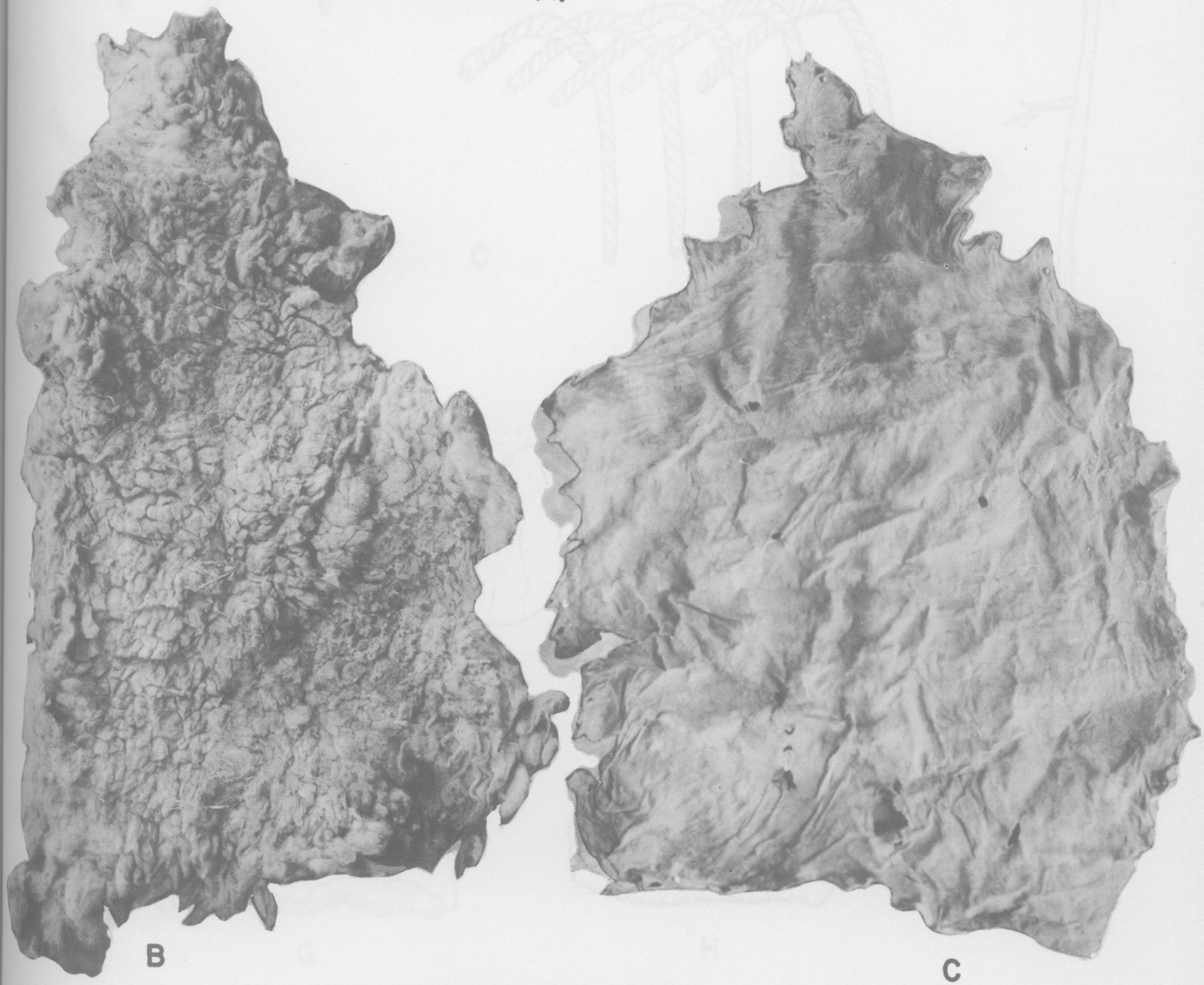
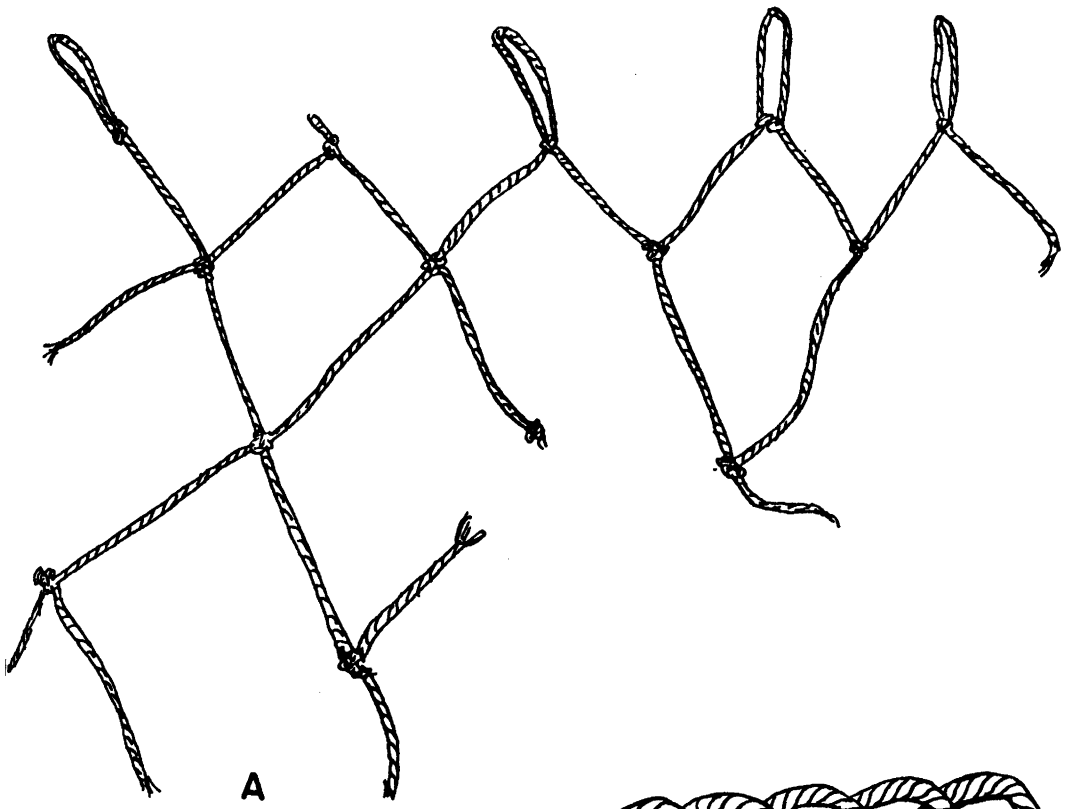


B

C

PLATE 4.



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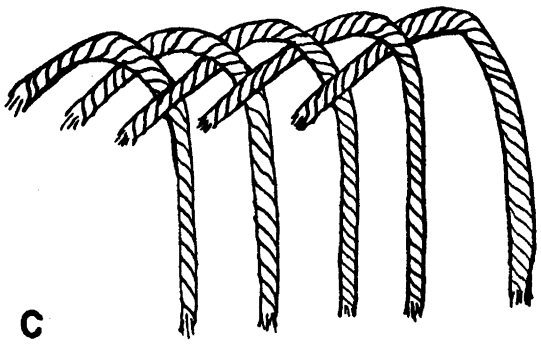

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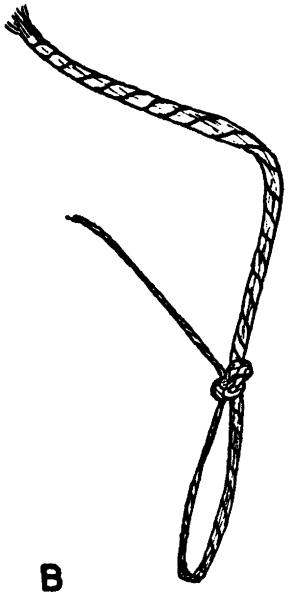

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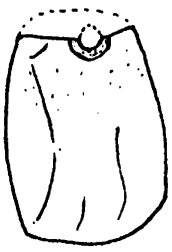
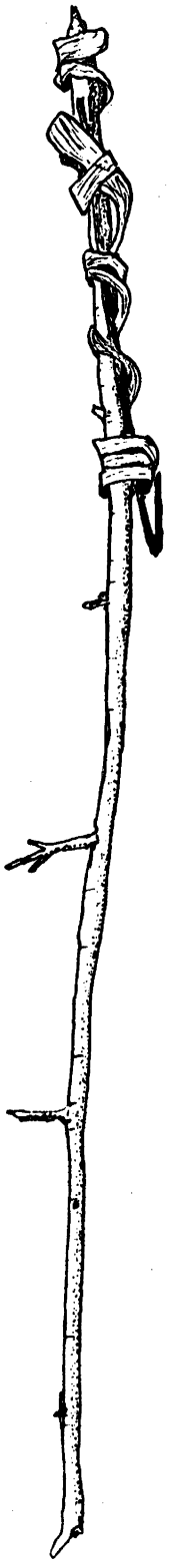


D

E



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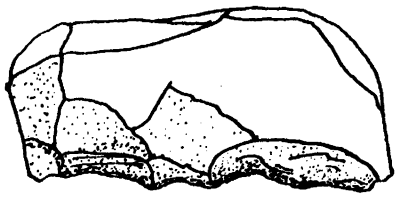

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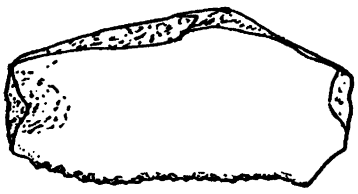

H

PLATE 5.

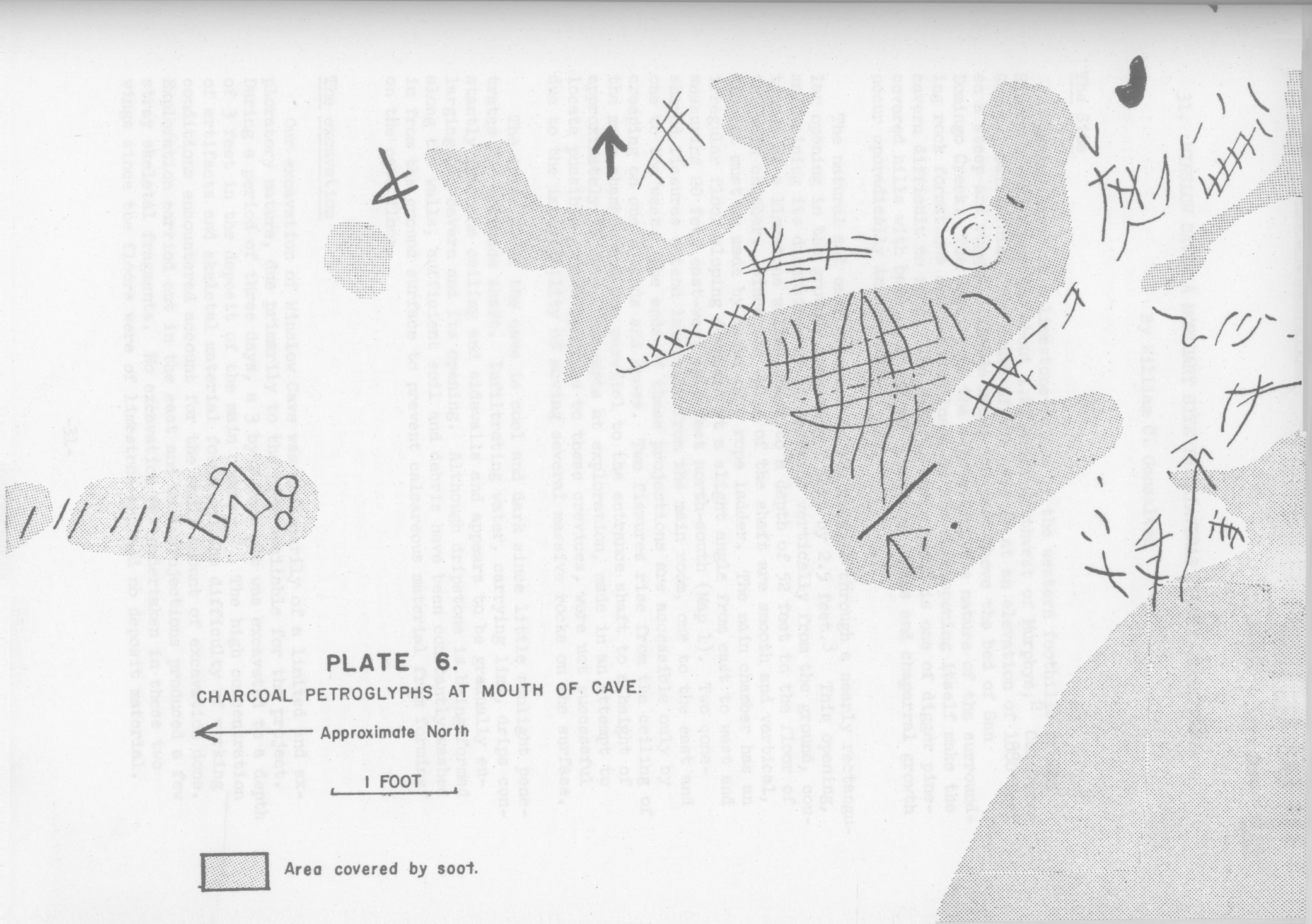

PLATE 6.

CHARCOAL PETROGLYPHS AT MOUTH OF CAVE.

← Approximate North

1 FOOT

Area covered by soot.