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SITE LAN-2

A Late Manifestation of the Topanga Complex in Southern California Prehistory

BY

KEITH L. JOHNSON

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PREFACE

Archaeological excavation of LAn-2 was undertaken in 1957 in an attempt to establish firmly the chronological and cultural position of this site in southern California prehistory. The site itself is located on the eastern side of Topanga Canyon in the Santa Monica Mountains near Los Angeles, California. It represents the village of a group of simple hunters and gatherers who manufactured crude hammerstones, choppers, scraper planes, and scrapers. These people subsisted primarily on wild seeds and plant foods which they ground on milling stones preparatory to cooking or roasted in uniquely constructed stone-lined earth ovens. Bits of shell and sea mammal bone in the midden indicated some contact with the coast 5 miles away.

Charcoal from the fire pits yielded carbon 14 dates which place the occupation of LAn-2 at around 600 B.C., the only known site of this period in Los Angeles County.

Comparisons with sites in Topanga Canyon and on the adjacent coast indicate that LAn-2 belongs within the general Milling Stone Horizon of southern California. It is true, however, that the relatively high frequency and variety of projectile points, mortars, and pestles at the site show some tendency toward a hunting orientation diagnostic of the Intermediate Horizon.

The Topanga complex is briefly compared with milling stone assemblages in Santa Barbara and San Diego counties. In addition, it is suggested that ecological differences may inhibit comparisons between middens on the Channel Islands off the California coast and milling stone sites on the mainland.

Finally, excavation of LAn-2 has resulted in a slight revision of Phases I and II of the Topanga complex and the addition of a new phase (III), characterized in part by flexed burials, earth ovens, and stones with simple incised designs.

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INTRODUCTION

The Topanga complex of southern California was first recognized in 1946 (Heizer and Lemert, 1947) and has been described by A. E. Treganza with C. G. Malamud (1950) and with A. Bierman (1958). A semipopular summary appears in Archaeology (Greenwood, 1959). On the basis of different artifact types and burial patterns, Treganza and Bierman have defined two phases within the complex: Phase I is typified by the large Tank Site (LAn-1), which Treganza tentatively dates at between 8000 B.C. and 4000 B.C.; Phase II is based upon limited excavation of the LAn-2 site, which Treganza suggests may date from 5000 B.C. to 2500 B.C. Since the above publications are concerned primarily with data obtained from excavation of the Tank Site, the present paper is intended to supplement the previous reports with a full and more detailed description of site LAn-2.

In 1947 and again in 1948 Treganza supervised excavation at LAn-2, although in both years he focused his attention mainly upon the Tank Site some 165 yards away. In 1957, on the weekends of March through May, further excavations were carried on at LAn-2 by students from the University of California, Los Angeles, under my direction. The present report is based upon the data obtained during the 1957 season.

The specimens recovered in 1957 were given the accession number 175 and are stored in the Department of Anthropology Museum, University of California, Los Angeles.

I wish to thank the owners of the site, Mr. and Mrs. H. G. McHose, Mr. R. John Wisda, and Mrs. James Wisda, for granting permission to excavate on their land. My thanks go also to the following crew members who worked many hours, carefully uncovering the burials, stone features, and artifacts reported herein: James Anderson, Mr. and Mrs. Robert Ascher, Fred Brauer, Richard Givens, Jerry Handler, Elizabeth Hatheway, Tom Hinton, Evelyn Jacobson, Basil Katem, John Kennedy, Noel Korn, C. S. Littleton, Rita Loeb, Muriel Markel, Roger Owen, Irene Roggia, Jean Rubin, Rolf Schock, Richard See, Jeanette Snyder, Mira Vorkapich, Mr. and Mrs. Russell V. Webb, Joan Whitlock, and Aram Yengoyan.

Dr. Adan E. Treganza kindly furnished maps of his excavations and suggested areas of the site which might repay further investigation.

UCLA geologists Dr. Joseph Murdock, Thomas Menzie, Helen Duggan, and Bruce Blackerby identified much of the lithic material, and Ed Mitchell of the Los Angeles County Museum identified the mammal bones. The aid of these specialists was invaluable.

I am indebted especially to Dr. Clement W. Meighan for his encouragement and assistance whenever problems arose.

Finally, I must thank my wife, Karen, who worked with me in the field and in the laboratory in addition to gathering much of the botanical data and typing the manuscript.

DESCRIPTION OF THE SITE

LAn-2 is located on the eastern side of Topanga Canyon in the Santa Monica Mountains of Los Angeles County, California. It lies approximately 5 road miles inland from the Pacific Ocean and is at an elevation of 1,169.9 feet above sea level.

The site covers an estimated area of 110 feet by 70 feet along a ridge 75 feet wide (map 1). It is impossible to determine the actual extent of the deposit since the site has been bulldozed and the midden dragged along the ridge (Treganza and Bierman, 1958, p. 69). The Tank

Site (LAn-1) is located on this same ridge at a higher elevation (1,214 feet above sea level), approximately 165 yards east of LAn-2. LAn-2, like most of the surrounding countryside, is covered with dense chaparral vegetation (pl. 1, a, b). The roots from this vegetation were found throughout the midden, which averaged 25 inches in depth but never extended more than 30 inches to the sandstone subsoil.

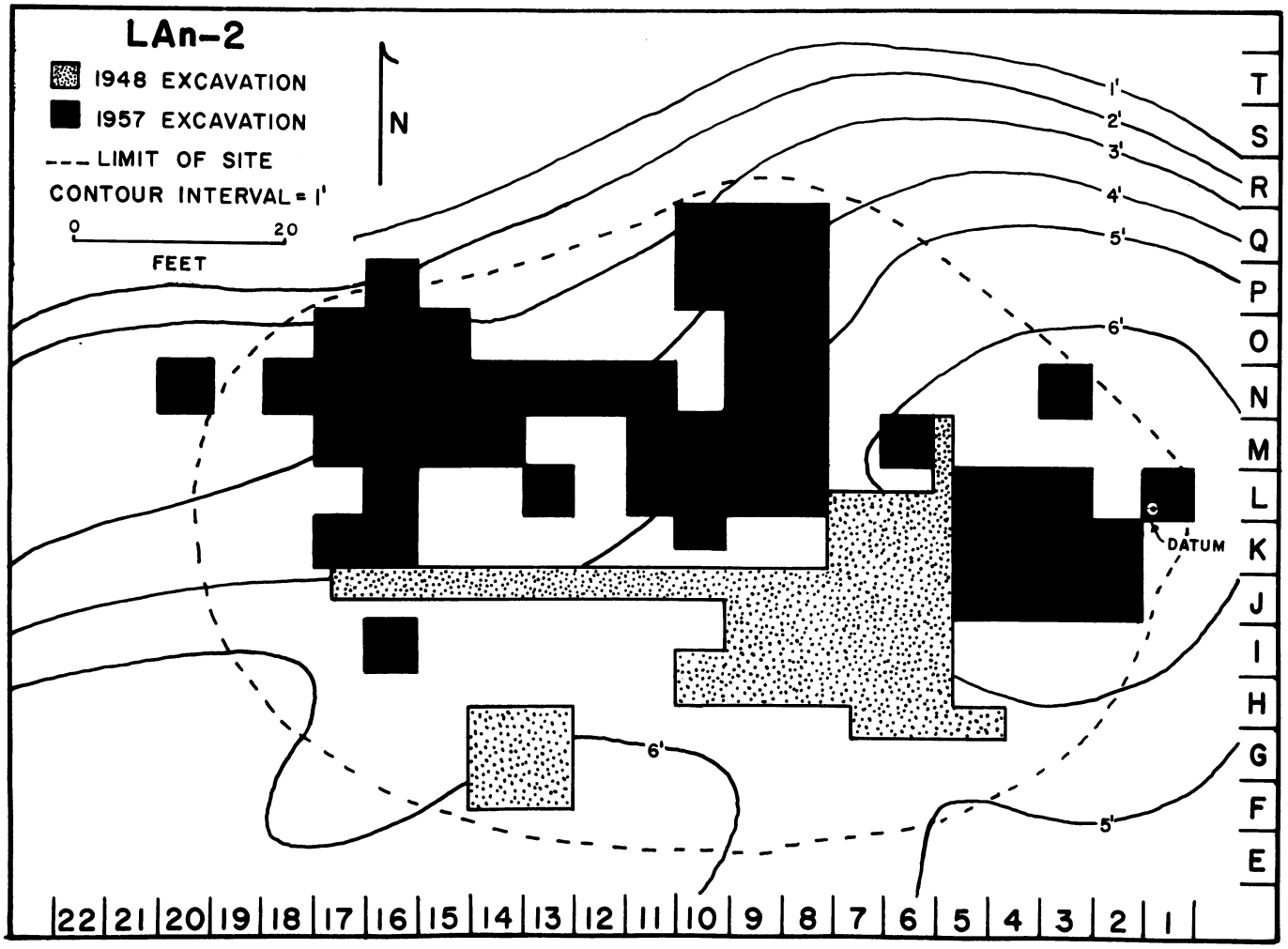
THE SITE DEPOSIT

In general the midden deposit (pl. 3, d) consisted of a 1-inch top layer of soft, brown, sandy humus followed by 6 or 7 inches of loose sandy soil, light brown in color. This light-brown soil, which appeared to be leached midden, became darker, often black, as greater depth was reached. At 20 to 30 inches the dark layer of loose sandy soil gave way to sterile yellow sandstone. Small flecks of charcoal, roots, and large amounts of unmodified rocks and flakes were always present throughout the midden.

METHOD OF EXCAVATION

The site was marked off in a 5-foot grid system (map 1), and each pit was troweled at descending 6-inch levels. A trench N and several test pits were first excavated in an effort to (1) find the richest regions of the site, (2) determine the limits of the deposit, and (3) locate definitely the areas of previous excavation. Subsequent pits were dug where the deposit yielded burials or features.

In 1957, 2,600 cubic feet of midden were excavated and 374 artifacts recovered. This is an average yield of one artifact per 7 cubic feet of midden, or approximately seven artifacts in every pit. An estimated 75 percent of the total site deposit was excavated in the three seasons (1947, 1948, and 1957). The unexcavated remainder is mostly peripheral and of little depth.



Map 1. LAn-2

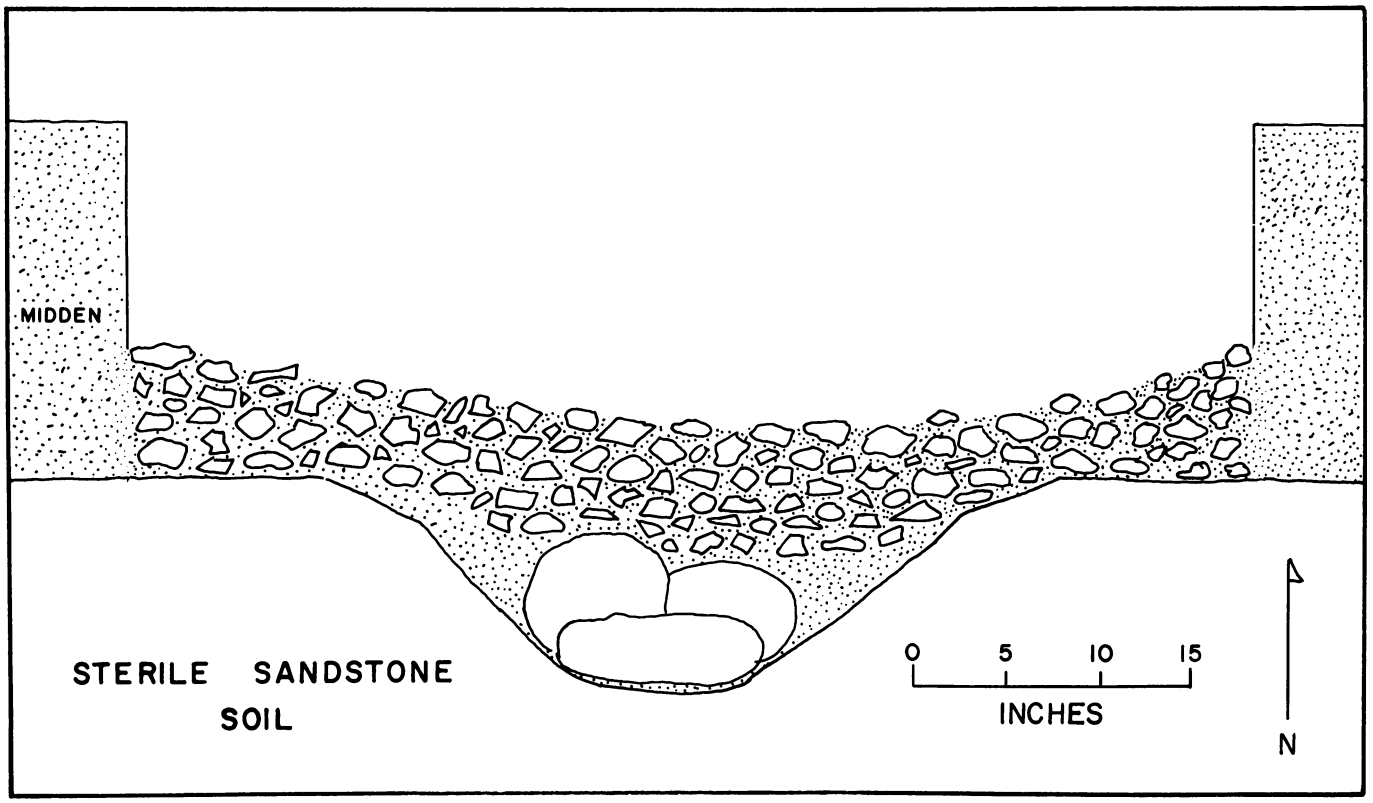


Figure 1. Cross section of Feature 1 fire pit

FEATURES

Treganza and Bierman (1958) report no features or unusual rock accumulations from LAn-2. We were fortunate to find seven, at least three of which were large stone-lined fire pits.

Feature 1 (pl. 1, c, d; fig. 1).—Pits K3, L3; depth from surface, 12 to 30 inches. A circular fire pit or earth oven 5 feet across and composed of approximately 400 angular stones, each 3 or 4 inches in diameter. Among these unmodified rocks, two scraper planes, four mano fragments, one milling stone fragment, and one stone mortar fragment were found. The stone assemblage rested on sterile sandstone at a depth of 19 inches. Stones along the periphery of the circle sloped up about 4 inches from those in the center of the assemblage. The midden in and around the feature was very black and contrasted sharply with the dark-brown soil characteristic of most of the site. Charcoal samples were taken from the circular stone assemblage as well as from beneath it. Directly below the accumulation of stones, and dug 11 inches into the sterile yellow sandstone, was a sloping pit 39 inches in diameter which contained three large boulders. There was a red ring of oxidized sandstone around this subsoil pit.

Feature 2 (pl. 2, a).—Pits K2, K3, J2, J3; depth from surface, 14 to 18 inches. An assemblage of grinding implements composed of unmodified rocks, two scraper planes, seven manos (one complete), sixteen milling stone fragments representing fourteen milling stones, and three reconstructible mortar fragments. This feature begins about 1 foot south of feature 1 and extends 6 feet north-south by 2.5 feet east-west.

Features 3 and 5 (pl. 2, c, d).—Pits K4, K5, L4, L5; depth from surface, 9 to 24 inches. A circular fire pit extending 5 feet north-south and 6 feet east-west, composed of 450 rocks of varying sizes. One mano fragment, one scraper plane, and a carbonized fragment of unidentified organic material were recovered from the stone assemblage. This feature had the same characteristics and was constructed in the same manner as the feature 1 fire pit.

Feature 4 (pl. 2, b).—Pit L9; depth from surface, 10 to 16 inches. An accumulation of about eighty unmodified rocks with one scraper plane. Burial 7 was discovered directly beneath this feature at a depth of 23 inches, but any relationship between the two remains uncertain.

Feature 6 (pl. 3, a).—Pit J4; depth from surface, 12 to 18 inches. A stone assemblage composed of about 180 unmodified rocks, three decomposed mano fragments, and one milling stone fragment. The feature covers an area approximately 4 feet by 3 feet. Two large boulders in the center and red oxidized sandstone around the edges of the feature suggest that this stone assemblage might once have been a fire pit, even though characteristics of the

have been a fire pit, even though characteristics of the other fire pits—such as a well-defined circular accumulation of stones, very black midden, abundant charcoal, and a pit dug into the sterile soil—were absent.

Feature 7 (pl. 3, b).—Pits J2, J3; depth from surface 14 to 20 inches. An assemblage of twenty unmodified sandstone rocks which extended 2.5 feet north-south by 3 feet east-west and rested on sterile soil. The stones varied in size but most of them averaged 10 to 12 inches in length, 6 to 8 inches in width, and 6 to 8 inches in thickness. No artifacts were associated with this feature, nor were there any indications of fire. Perhaps this accumulation of unworked stones represented raw material for the manufacture of artifacts or for the construction of fire hearths.

Feature 8 (pl. 3, c).—Pits L10, K10; depth from surface 18 to 28 inches. A circular fire pit 2.5 feet in diameter and composed of 200 unmodified rocks, one mano fragment, one milling stone fragment, and one piece of incised pink mudstone. Feature 8 was a replica on a somewhat smaller scale of the other two fire pits previously described.

Stone accumulations similar although not identical to the fire pits at LAn-2 are commonly found in other milling stone sites, but it is not always easy to determine whether or not they represent fire pits. Thus we cannot be sure which, if any, of the stone features reported for the Tank Site were actually used for roasting food. A possible earth oven was uncovered in San Diego County and has a carbon 14 date of 6300 ± 200 B.P. (Warren and True, 1961, pp. 255, 260; pl. 2, c). Stone-lined roasting pits are more clearly recognized archaeologically in northern California (Meighan, 1955, pp. 8-9; pl. 2, r, s) and in the state of Washington (Collier et al., 1942, pp. 37-38).

Ethnographically, earth ovens were used to cook a variety of foods. Yucca and agave were roasted by the Cahuilla (Barrows, 1900, p. 58), the Luiseño (Sparkman, 1908, p. 195), and the Chemehuevi and Koso (Kroeber, 1925, p. 695) in southern California; the Kiliwa (Meigs, 1939, p. 9) and the Paipai (Hicks, 1963, p. 114) in Baja California; and the Yavapai (Gifford, 1932, 1936) and the Havasupai (Spier, 1928, p. 106) of Arizona. The Yuki in northern California are reported to have used stone-lined pits for baking acorn bread (Foster, 1944, pp. 165-166). The Tolowa of southern Oregon cooked sea-lion meat in earth ovens (Drucker, 1937, p. 235), and several groups in Washington roasted onions, camas, and other wild plant foods (Spier and Sapir, 1930; Ray, 1932; Olson, 1936).

BURIAL DESCRIPTION

Seven flexed burials have been recovered from LAn-2; Treganza and Bierman report four and three more were recovered in 1957. The latter are described below. Table 1 compares the salient features of all seven.

Burial 5
(Pl. 4, a)

Location: pits N16, N17.
Depth: 15-1/2 inches to skull, 18 inches to rest of skeleton.
Matrix: in midden, resting on sterile sandstone base.
Type: primary inhumation.
Condition: fair; skull, long bones, some foot-bone and rib-bone fragments present. All bones are fragile and most were broken by plant roots.
Position: tight flex on left side; head on left side.
Orientation: head west.
Age: adult.
Sex: undetermined.
Associated artifacts: none.

Burial 6
(Pl. 4, b)

Location: pit M9.
Depth: 30 inches to skull.
Matrix: in midden resting on sterile sandstone base.
Type: primary inhumation.
Condition: fair; only skull and long bones present. Bones fragmented by plant roots.
Position: loose flex on back; head on back.
Orientation: head west-southwest.
Age: adult
Sex: undetermined.
Associated artifacts: none.
Remarks: Part of burial pit was dug 6 inches into sterile soil.

Burial 7
(Pl. 4, c, d)

Location: pit L9.
Depth: 23 inches to skull.
Matrix: in midden resting on yellow sandstone subsoil.
Type: primary inhumation.
Condition: fair; skull, limbs, ribs, vertebrae present. All bones were broken.
Position: loose flex on right side; head on right side.
Orientation: head southeast.
Age: child, 7 years old.
Sex: undetermined.
Associated artifacts: none.
Remarks: Burial 7 was under a rock cairn composed of approximately thirty-five rocks which covered an area 4 feet north-south by 2 feet east-west. All the rocks were unmodified except for one small bifacial mano fragment. Feature 4 was 7 inches above the burial and its rock cairn, but any relationship between the burial and the feature is conjectural.

TABLE 1

Burials at LAn-2

Burial data	Burial number						
	1	2	3	4	5	6	7
Depth from surface (inches)	21	13	15	26	15	30	23
Primary inhumation	x	x	x	x	x	x	x
Loose flex on side	x	x	x	-	-	-	x
Tight flex on side	-	-	-	-	x	-	-
Loose flex on back	-	-	-	-	-	x	-
Tight flex on back	-	-	-	x	-	-	-
Head pointed	NE	WSW	N	N	W	WSW	SE
Under rock cairn	-	-	-	x	-	-	x
Associated artifacts	-	-	-	-	-	-	-

ARTIFACT DESCRIPTION

Local lithic resources were exploited by the inhabitants of LAn-2 to manufacture most of their tools and ornaments. Only the impure, grainy obsidian sometimes referred to as fused shale could represent an import. The nearest known locality for this type of material is in Grimes Canyon near Fillmore, Ventura County (Walker, 1936, p. 15). Table 2 lists the number of artifacts made from the various kinds of stone encountered at LAn-2. No artifacts of bone, shell, or plant materials were recovered.

TABLE 2

Frequency of Artifacts According to Material

Type of material	Number of artifacts
1. Fine-grained basalt	159
2. Sandstone	92
3. Granite	35
4. Quartzite	24
5. Chert	19
6. Chalcedony	10
7. Grainy obsidian	9
8. Volcanic	8
9. Shale	6
10. Porphyry	3
11. Quartz	3
12. Mica schist	1
13. Slate	1
14. Siltstone	1
15. Pink mudstone	1
16. Jasper	1
Total	373*

*One missing artifact not included.

The following classification of artifacts from the 1957 season at LAn-2 is based upon the tool types set up by Treganza, Malamud, and Bierman for the Topanga complex. In some instances, however, it has been necessary to modify their typology in order to facilitate description of the new material. Artifact counts, types of stone used, and measurements are given in table 10.

CHIPPED STONE

Scraper Planes

Manufactured from cores or thick flakes and varying considerably in size, shape, and craftsmanship, all scraper planes are characterized by a relatively flat platform surface, sometimes called the base, which may be either natural or manufactured. In addition, each specimen has been unifacially percussion-flaked at a relatively steep angle along all or part of the periphery of its platform face. Although scraper planes are the most numerous artifacts from the site, their function rests more on speculation than on fact. Rogers (1939) has suggested that tools of this type were used in two ways: those that exhibited little or no retouching functioned as pulping planes for the preparation of plant fibers; those that had been resharpened were used in dressing hides. Of the sixty-seven scraper planes excavated in 1957, sixty-two show definite retouching and/or use-chipping. If these were used as skin-dressing tools, their abundance in the site should indicate that the LAn-2 people were primarily a hunting group. There is, however, conclusive evidence against such an interpretation. The expected large quantities of animal bone and projectile points which would indicate the basic economic importance of hunting do not occur at LAn-2. Instead, there is an abundance of seed-grinding implements—manos, milling stones, and a few mortars and pestles. Together, these outnumber all the faunal remains and projectile points by 2 to 1, a clear indication that gathering of plant food, not hunting, was the major economic concern of the LAn-2 people.

Treganza and Bierman (1958, p. 56) probably solved the problem when they suggested that scraper planes from the Tank Site and LAn-2 functioned as generalized all-purpose tools. Analysis of the specimens recovered in

TABLE 3

Additional Scraper Plane Characteristics

Characteristic	Type							Total
	IA	IB	IIA	IIB	IIC	IID	III	
1. Use								
a. No evidence of use or retouch	0	0	1	3	0	1	0	5
b. Unifacial retouch	4	3	10	7	7	1	1	33
c. Bifacial retouch	0	0	3	0	0	0	0	3
d. Light abrasion on platform surface	0	0	0	0	0	0	0	0
e. Battered other than along platform perimeter	0	0	0	0	0	0	0	0
b, c, & e	0	0	1	0	3	0	0	4
c & e	2	0	1	0	0	0	0	3
b & e	2	0	3	2	2	0	1	10
b & c	0	0	4	0	0	1	2	7
b & d	0	0	1	0	0	0	0	1
c & d	1	0	0	0	0	0	0	1
2. Height								
a. Less than half the length	1	0	6	4	2	0	0	13
b. Exceeds length	0	0	1	1	0	0	0	2
c. Half to equal the length	8	3	17	7	10	3	4	52
3. Platform formed by								
a. Original cortex	3	0	5	6	2	0	1*	17
b. Percussion bulb	0	0	6	2	1	0	0	9
c. Split core (no percussion bulb evident)	6	3	13	4	9	3	3*	41

*Both platform surfaces on each specimen are alike.

1957 lends support to their argument. The scraper planes from LAn-2 appear to be too many in number and to vary too much in size for all to have had the same special function. In addition, the evidence of use or retouching on these tools differs, suggesting they were used in several ways and perhaps for different purposes (see table 3). Thus, although most of the LAn-2 planes have been unifacially retouched along the platform perimeter, more than 25 percent display bifacial flaking along this edge. Two specimens show light abrasion over their platform surfaces, thereby furnishing the only real evidence that the Topanga people, at least occasionally, utilized these tools in a planing manner. Twenty-five percent of the scraper planes have been battered along edges other than the platform perimeter. Some of this battering may be attributed to unsuccessful attempts at shaping the convex surface of the tool, but other instances must reflect the use of the plane as a hammer or chopper. Indeed, four of the scraper planes had received such a beating that they have been classified as hammerstones in this report. The fact that more than one of the several kinds of use just enumerated may occur on a single specimen further reinforces the idea that the majority of planes served generalized hammering, chopping, scraping, and cutting purposes. Finally, it is possible that some scraper planes (e.g., pl. 5, d) functioned as platform cores for the manufacture of flake tools. Several flake scrapers appear to have been struck from prepared platforms.

On the basis of the form of the platform face and the extent to which its periphery has been modified, the following seven types of scraper plane have been defined. See table 4 for depth distribution and table 3 for additional characteristics of scraper planes.

Type IA (pl. 5, a).—This type is characterized by the removal of relatively steep flakes from all or more than 90 percent of the platform perimeter. The form of the planar face is ovoid, never round. The top surface may be keeled, domed, or flat. In general these specimens fall far short of the fine craftsmanship that is characteristic of many of the scraper planes from the Tank Site.

Type IB (pl. 5, b).—This type differs from type IA only in the form of the platform base. Type IB specimens have a square or roughly rectangular base, producing straight rather than curved working edges.

Type IIA (pl. 5, c).—Type IIA is characterized by a curved working edge produced by the removal of steep flakes around one-half to three-fourths of the platform perimeter. The unworked part of the margin is a straight edge formed either by the natural cortex of the stone or by a previously fractured flat surface. On specimens made from thick flakes, the remnant of the striking platform usually serves as the straight edge and the percussion-bulb face forms the planar surface.

The shape of the type IIA platform face is always semiovoid owing to the characteristic straight edge. The top or convex surface may be keeled, domed, flat, or irregular.

Two aberrant scraper planes have been included in this type because of the semiovoid shape of their platforms. Each displays two nonadjacent and unretouched straight edges along its otherwise curved platform margin.

Type IIB (pl. 5, d).—Type IIB is a variant of type IIA. The IIB specimens show a steeply flaked curved edge which extends around one-half to one-fourth of the platform perimeter; the remainder of the platform margin is composed of more than one unused straight edge. Of the twelve planes in this category, nine have two straight edges and three have three. The shape of the platform face varies, sometimes resembling the section of a circle

TABLE 4

Frequency of Scraper Planes by Depth

Type	Depth (in inches)					Total	Treganza
	0-6	6-12	12-18	18-24	24-30		
I	0	0	0	0	0	0	7
IA	2	3	2	2	0	9	0
IB	3	0	0	0	0	3	0
II	0	0	0	0	0	0	62
IIA	6	5	8	5	0	24	
IIB	7	3	2	0	0	12	
IIC	6	3	1	2	0	12	
IID	1	1	0	1	0	3	
III	2	1	1	0	0	4	12
Total	27	16	14	10	0	67	81

but more often displaying an angular and irregular outline.

Type IIC (pl. 5, e).—Type IIC scraper planes have straight rather than convex working edges; one plane, however, shows a concave worked edge. Of the twelve specimens represented, four have one worked straight edge, three have two, and five show three modified edges. Flaking on these planes may occur around less than one-fourth to more than three-fourths of the platform perimeter.

Characteristically, the chipped portion of the basal margin is continuous and never segmented by unworked areas. Only one specimen differs in this respect; it has three modified edges, one of which is separated from the others on either side by a straight unmodified edge.

The form of the platform base is variable on type IIC tools; one specimen is square and another is rectangular, but the majority are angular and irregular. The convex or dorsal surface may be pointed, keeled, flat, or irregular.

Type IID (pl. 5, f).—Scraper planes manufactured from split pebbles or cobbles are most representative of this type. The split face formed the platform base. Then steep flakes were struck from more than half the platform periphery to produce a curved working edge. The remaining unflaked margin was formed by the naturally curved cortex of the pebble.

The platform base is round or ovoid in outline, while the shape of the top surface may be flat, domed, or keeled.

Type III (pl. 5, g).—Type III scraper planes are characterized by two distinct platform faces, each with its own worked edge. These tools are very irregular in shape and therefore their platforms do not occur in a common pattern; instead, any relatively flat surface may be used to form a working edge. Were it not for their double platforms, the four specimens classified here as type III would be variants of type II planes. Indeed, they may be so described, for each one has both a type IIB and a type IIC platform.

Scrapers

In general, scrapers can be distinguished from scraper planes on the basis of overall size and the angle of marginal flaking. The former are made from smaller, thinner flakes whose perimeters have been flaked back at low angles, in contrast with the scraper planes which are made from cores or thick flakes and characterized by steep, sometimes vertical, flaking around the base.

The twenty-six scrapers recovered in 1957 have been placed in the following categories on the basis of size, shape, and amount of modification.

Side scrapers (pl. 6, a).—These are made from irregular flakes most of which retain their bulb of percussion. Part of the margin of each specimen has been flaked back at a low angle or modified through use. The fourteen scrapers in this type are further described as follows: six have had flakes removed from the side opposite the bulb of percussion, with this side being formed by the cortex of the parent core on four specimens; four show unifacial chipping along one edge of the percussion-bulb surface; two have been unifacially flaked along opposite edges on opposite sides; and two specimens show bifacial chipping along one edge.

The side scrapers as defined above would include side scraper and straight-edge side scraper types set up by Treganza and Malamud (1950, p. 138).

End scrapers (pl. 6, b).—Only one end scraper was found at LAn-2 in 1957. It was manufactured from a relatively thick flake by unifacially chipping one end. The dorsal surface of this tool displays a circular pecked area 1.0 cm in diameter. Perhaps this scraper was used briefly as a hammerstone.

Multiedged scrapers (pl. 6, c).—Made from irregularly shaped flakes, multiedged scrapers have been unifacially worked along two or more edges. This type is represented by two scrapers from the 1957 excavation; both show modification from wear or deliberate shaping along their entire peripheries.

Discoidal scrapers (pl. 6, d).—Only one specimen approaches this type. It is a large percussion bulb, unifacially flaked around most of its periphery and lenticular in cross section. Apparently the toolmaker desired a scraper that, if not circular in outline, at least had rounded edges.

Semiovoid scrapers (pl. 6, e, f).—These are generally made from thin flakes, lenticular in cross section. Each specimen is characterized by a unifacially flaked curved margin and a straight unused edge. The unmodified edge on two scrapers is formed by the cortex of the parent core; the other three scrapers of this type have straight edges resulting from relatively long fractured faces. It is possible that two of these scrapers may be fragments of larger tools.

Thumbnail scrapers (pl. 6, g).—There are two of these, both plano-convex in cross section and unifacially flaked. One is subrectangular in outline with primary flakes removed from more than one-fourth of its perimeter; the other is irregular in outline with flaking over the entire convex surface. Both of these scrapers are crudely made; neither shows extensive wear or resharpening. Small size is the only feature that distinguishes these two scrapers from the other scraper types.

Miscellaneous scrapers (pl. 6, h).—There is one unusual scraper that does not fit well into the types described above. It is roughly subrectangular in form and has a plano-convex cross section. Two more or less parallel sides have been unifacially retouched by pressure flaking at very steep angles, producing blunt but strong working edges. One end is unworked, the other is slightly concave and secondarily retouched. The top and bottom surfaces have not been modified. This specimen displays the finest flaking of all the scrapers.

Snub-nosed and concave scrapers have been reported from LAn-2 (Treganza and Bierman, 1958, p. 70), but none that would fit specifically into either of these types were recovered during the 1957 excavation.

Choppers

Choppers are rough, percussion-flaked tools manufactured from cores or large thick flakes. They are often difficult to distinguish from scrapers, and indeed many may have functioned as scraping implements. In addition to being generally larger and thicker, however, choppers usually display more battering along their worked edges than do scrapers.

Unifaced choppers (pl. 6, i).—Though varying somewhat in size and shape, all unifaced choppers are characterized by unifacial chipping along part of the periphery. The specimens in this type show the least use of all the choppers.

Three are semiovoid in shape, and each has had a part of its curved margin flaked back. Two are ovoid in shape and have been used as hammerstones on the thicker, more rounded margins opposite their chopping edges. Two specimens are angular in outline; one of these exhibits percussion flaking along two adjoining sides, and the other is flaked along a curved margin and shows additional use as a hammerstone.

Bifaced choppers (pl. 6, j).—There are only four choppers in this category. Two are ovoid and have bifacial flaking around the entire periphery; two are irregular in outline with flakes removed from more than three-fourths of the periphery.

Unifaced-bifaced choppers (pl. 6, k).—Seven specimens show a combination of unifacial and bifacial flaking along their edges.

One is semiovoid and shows bifacial and unifacial modification along its entire perimeter. Three specimens are long-ovoid in outline. One of these has two sides unifacially flaked and one end bifacially worked; the other two have one end and one side bifacially chipped and one side unifacially worked. Each of these three has one unused end.

Three choppers are irregular in outline, and each has at least one edge unifacially chipped and one edge bifacially chipped. Flaking ranges from less than one-fourth to more than three-fourths of the perimeter on these specimens.

One of the angular unifaced-bifaced choppers (pl. 6, k) appears to represent a reshaped and reused tool. The whole specimen, made of basalt, is patinated, but some of the flake scars are more heavily patinated than others, indicating a considerable but undetermined lapse of time between the first use of this specimen as a tool and its later manufacture into a chopper.

Hammerstones

Next to scraper planes, the most numerous type of artifact recovered at LAn-2 is the hammerstone. The abundance may be attributed to the fact that this is a generalized tool that could serve for any number of rough percussion tasks, including the manufacture of seed-grinding implements, choppers, scrapers, projectile points, and blades. In addition, worn-out scraper planes and choppers with considerably smashed and blunted edges are classified in this category. Hammerstones are distinguished from other core tools primarily on the basis of heavy use; most are very battered.

The hammerstones from LAn-2 are grouped into the two following types.

Core hammerstones (pl. 6, l, m).—These are cores, broken or worn tools, and rejects that generally have been irregularly flaked over all or part of their surfaces to produce tough working edges for a variety of hammering purposes. Also, some secondary uses of these tools are evident. Several specimens show worked edges, in addition to their battered surfaces, which indicate their minor function as choppers or scraper planes; one granitic hammerstone shows slight secondary use as a bifacial mano.

Cobble hammerstones (pl. 6, n, o).—There are only three of these. They vary greatly in size and shape, but all are cobbles that have been modified mainly through use; one is a broken cobble battered on the unbroken end; another is a flat oblong piece of mica schist used on both ends; the third is a flat ovoid pebble, pecked around most of its perimeter.

Cores
(Pl. 6, p)

Two cores, both of chalcedony, were recovered in 1957. One is irregular in shape with flakes removed from many faces over its entire surface; the other is a platform core which has had long flakes struck from the whole perimeter of its flat platform. The flake scars on this latter core indicate that some of the flakes removed were wide and relatively thick, whereas some approached the dimensions of true microblades.

Projectile Points and Knife Blades

These are classified primarily on the basis of weight after a typology set up by Fenenga (1953). He argues that small points (0.4 to 3.5 grams) probably functioned as arrow points, while larger points (4.5 grams and up) were either dart projectiles or blades. It is significant that the LAn-2 specimens fall largely into the latter category.

Small points (pl. 9, r, s, t, u).—This type is represented by four specimens recovered in 1957: one is lozenge-shaped; one is leaf-shaped with a straight base

TABLE 5

Frequency of Scrapers, Choppers, Hammerstones, and Cores by Depth

Type	Depth (in inches)					Total	Treganza
	0-6	6-12	12-18	18-24	24-30		
Scrapers							
Side	9	3	2	0	0	14	25
End	1	0	0	0	0	1	5
Snub-nosed	0	0	0	0	0	0	5
Concave	0	0	0	0	0	0	4
Multiedged	1	1	0	0	0	2	0
Discoidal	0	0	0	1	0	1	0
Semiovoid	3	0	0	2	0	5	0
Thumbnail	1	0	1	0	0	2	0
Miscellaneous	1	0	0	0	0	1	0
Choppers							
Unifaced	4	2	1	0	0	7	2
Bifaced	3	1	0	0	0	4	12
Unifaced-bifaced	1	5	0	1	0	7	0
Hammerstones							
Core	35	11	20	9	0	75	63
Cobble	2	1	0	0	0	3	0
Cores	0	0	2	0	0	2	0
Total	61	24	26	13	0	124	116

TABLE 6

Frequency of Projectile Points and Knife Blades by Depth

Type	Depth (in inches)				Total	Treganza
	0-6	6-12	12-18	18-24		
Small points						
Lozenge-shaped	0	1	0	0	1	4
Leaf-shaped	1	0	0	0	1	0
Contracting stem	1	0	0	0	1	0
Side-notched	0	0	1	0	1	2
Convex-based	0	0	0	0	0	1
Large points						
Leaf-shaped	1	3	1	1	6	0
Flaring sides	0	1	0	0	1	0
Contracting stem	0	1	1	0	2	1
Small-stem	0	0	0	1	1	0
Basal-notched	0	0	0	1	1	0
Concave-based	0	0	1	0	1	0
Fragments	7	5	4	3	19	2
Total	10	11	8	6	35	10

and slightly developed stem; one is triangular with a contracting stem; and one is side-notched with a concave base. These points range in weight from 3.0 to 4.0 grams; the average is 3.5 grams. Actually only the lozenge- and leaf-shaped points fit into Fenenga's small-point class; the weights of the other two points lie in the range between his small-point and large-point categories.

Large points

Because it is difficult to distinguish between them, both projectiles and presumed knife blades are included in this class. Very few of the specimens approach the size, shape, and crudity of those reported from the lower levels of the Tank Site.

The large points from LAn-2 range in weight from 4.6 to 19.8 grams, averaging 10.5. The eight complete specimens and four basal fragments are further described as follows:

Unstemmed points (pl. 9, f, g, h, i, j, k, l).—Six are leaf-shaped with convex or straight bases; one of these, flat in cross section and unifacially chipped, may be a scraper. A seventh specimen is straight-based and displays sides that flare out sharply near the base; the tip end has been broken off.

Stemmed points (pl. 9, m, n, o, p, q).—Five are represented. Two fragments have contracting pointed stems and one of them has been reworked along its broken edge;

another point, roughly made, has a small stem and rounded shoulders. The fourth example is fragmentary and shows two basal notches; the stem is broken. The fifth specimen, resembling a Pinto point, has a slightly developed stem with a concave base.

Fragments (pl. 9, a, b, c, d, e).—In addition to the points just described, nineteen untypable fragments were collected in 1957. Of these, all but two definitely would be classed as large points if they were complete.

Two unusual fragments show heavy use, one at its tip end and the other at a point formed by the break (pl. 9, d, e). Flakes in the manner of burin spalls have been removed from the battered point of each specimen. It is a matter of speculation whether this flaking is accidental or indeed represents the use of the point as an engraving tool. One fragment was recovered at a depth of 3 inches, the other at 6 inches.

Crescent
(Pl. 9, v)

One bifacially flaked crescent-like fragment was recovered from the 0- to 6-inch level at LAn-2. Pointed at the unbroken end and simple in outline, it varies considerably from the eccentric notched specimen found in the Tank Site.

GROUND STONE

Milling Stones
(Pl. 7, a, b)

Milling stones are represented by thirty-three sandstone specimens, of which all but two are fragmentary. More than half (nineteen) of these grinding tools were found associated with rock features; this fact accounts for their abundance in the 12- to 18-inch level at the site. Most of the specimens are in varying degrees of decomposition; some crumble easily upon handling, and a few would disintegrate if washed with water. Twenty-four milling stones have been purposely shaped by means other than usage; two appear to be unshaped; and seven are too fragmentary and/or decomposed for determination of the presence or absence of this trait.

All the milling stones are of the basin type. In outline they are generally ovoid or rectangular with rounded corners. Each has an oval grinding basin which varies in size and depth but never extends over the entire face of the utensil. There is no apparent advantage in distinguishing between a shallow and a deep basin here, as basin depth is primarily a reflection of the amount of use the milling stone has received. Measurements (in cm) of the two complete specimens recovered in 1957 are as follows:

	Catalogue No. 175-289	Catalogue No. 175-350
Length	19.0	43.8
Width	6.7	31.3
Thickness	7.4	9.4
Basin length	11.7	30.5
Basin width	8.5	18.0
Basin depth	0.5	4.8

Manos

Because they are fragmentary, most manos can be classified only as unifacial, bifacial, or trifacial. Those few that lend themselves to further description have been placed in subcategories following the typology of Treganza and Malamud (1950, pp. 144-146).

Type I (pl. 8, c).—Manos of this type were used unifacially. In general, they are unshaped cobbles and show relatively slight wear on their grinding surfaces. Of the ten specimens represented, eight have been modified only through use; one fragment also has a battered end. One of the shaped manos was employed secondarily as an abrading stone.

Type II.—Manos of this type are all fragmentary and show bifacial grinding surfaces. They are the most common type of mano at the site, sixty-six in number. Some differences among them were noted as follows; thirty-eight fragments were shaped and six of these had an end battered; twenty-six were unshaped and six of these also displayed battering on the unbroken end; two specimens, one very fragmentary and the other decomposed, did not yield information on these two characteristics. Two manos are centrally pitted on their grinding faces; one of these has two pits on each side. One mano appears to have been used as a hammerstone along its fractured edge; the broken surface of another is covered with red ocher, probably from use as an abrading stone to grind or crush the solid pigment into powder.

Type IIA (pl. 8, a).—Three bifacial manos, ranging from round to oval in outline, represent this type. Two are unshaped and symmetrical; one is asymmetrical and has been heavily pecked on both ends and one side.

Type IIB (pl. 8, b).—There are two elongated oval manos, bifacially worn, of this type. One is unshaped but battered at one end; the other is shaped and has been battered at both ends.

Type IIC (pl. 8, d).—Type IIC manos have wedge-shaped cross sections and bifacial grinding surfaces. All five of the 1957 specimens are fragmentary and all have been shaped. Two of them probably were used to grind paint; one has red ocher on one grinding face, the other on both faces. Battering was noted on the unbroken ends of two other manos.

Type IID.—One bifacial mano fragment shows superimposed wear over the greater portion of one grinding surface. The worn portion was too slight to produce a keeled cross section. Further use would have turned the mano into a type IIC or possibly a type III mano. This specimen was shaped and also battered on its unbroken end.

Type III (pl. 8, e).—Type III manos are trifacial. Of the four fragments recovered in 1957, all have been shaped and all but one show prominent battering on their unbroken ends. Reconstructed, they would be more oval in outline and not so thick as the long and narrow type III manos characteristic of the Tank Site collection.

The ratio of 1.5 milling stones for every mano previously reported for LAn-2 (Treganza and Bierman, 1958, p. 71) is completely reversed now by the addition of 94 manos and 33 milling stones recovered in 1957. In total, LAn-2 yielded 122 manos and 74 milling stones, a ratio of 1.6 manos to 1 milling stone. This is in keeping with the other milling stone sites in southern California which, although their ratios vary, usually have more manos than milling stones.

TABLE 7

Frequency of Grinding Implements by Depth

Type	Depth (in inches)					Total	Treganza
	0-6	6-12	12-18	18-24	24-30		
Millingstones							
Slab	0	0	0	0	0	0	3
Basin	3	3	21	5	1	33	19
Unidentifiable fragments	0	0	0	0	0	0	19
Manos							
Type I	4	3	2	1	0	10	4
Type II	19	10	25	11	1	66	0
Type IIA	1	0	2	0	0	3	0
Type IIB	0	0	2	0	0	2	20
Type IIC	1	0	2	2	0	5	3
Type IID	0	1	0	0	0	1	0
Type III	0	1	1	2	0	4	0
Unidentifiable fragments	2	0	1	0	0	3	0
Mortars	1	0	2	1	0	4	2
Pestles	0	0	0	0	0	0	4
Abrading stone	1	0	0	0	0	1	0
Rubbing stones	0	0	1	1	0	2	7
Total	32	18	59	23	2	134	81

Mortars

Four fragmentary mortars were excavated in 1957; one is part of a base and the others are rim fragments. The most complete of these, recovered from feature 2, consists of three rim pieces which, when reconstructed, measure 24.9 cm in diameter and 15.4 cm (incomplete) in height. The exterior surfaces of all specimens have been shaped by pecking and/or grinding.

Pestles

Treganza and Bierman (1958) report four pestles from LAn-2. None were found in 1957.

Abrading Stone
(Pl. 8, f)

A small, shaped, rectangular block of fine-grained sandstone has been used as an abrading stone on one surface. The abraded face is concave and shows grinding over its entire surface. No grooved abrading stones or projectile-shaft straighteners were found at LAn-2.

Stone Disk

One discoidal stone was excavated in 1957. As it is unfortunately missing from the collection, data concerning its size and type cannot be obtained. A single bevel-edged specimen is known from the excavations in 1948.

Rubbing Stones
(Pl. 8, g)

These are represented by two small, flat cobbles which show bifacial wear. Both are broken and both display battering on the unbroken end; otherwise they are unshaped. One specimen is centrally pitted on each grinding surface; in addition, the entire periphery of its broken side has been worn down from use, producing a smooth beveled edge. This pitted example comes from the 12- to 18-inch level; the other rubbing stone was found between 18 and 24 inches.

Pendants
(Pl. 10, g, h)

Two shaped pendants were uncovered in 1957. They are much smaller than the three previously reported for LAn-2.

The first specimen is incomplete but probably was long and rectangular in outline. It has a lenticular cross section and is finely serrated along the edges of both sides and the unbroken margin of one end. A biconical perforation, now broken out, was drilled off center toward one side. Whether or not this hole was originally near the top of the piece cannot be established as the determining end is missing.

The second pendant is complete but not so well made as the first. It is irregular in outline, being rounded at the top and angular at the bottom with more or less parallel sides. In cross section it is plano-convex and has a centrally located biconical hole near its top edge. The body of the pendant is 0.3 cm thick, but the upper third has been ground down on both faces and tapers to a thickness of 0.1 cm at the perforated end.

TABLE 8

Frequency of Pendants and Miscellaneous Stone Objects by Depth

Type	Depth (in inches)					Total	Treganza
	0-6	6-12	12-18	18-24	Unknown		
Pendants	0	0	1	1	0	2	3
Shaped stones	0	2	1	0	1	4	0
Incised stones	2	0	0	2	0	4	0
Quartz crystals	0	0	1	1	0	2	0

MISCELLANEOUS WORKED OBJECTS

Eight small unperforated stones fall into two general classes: those that show shaping and marks of abrasion, and those that show incised designs. The former category comprises four specimens. One of these, broken at both ends, is long and narrow; the others are ovoid in shape. All of them taper toward one end and show evidence of abrasive modification over their entire areas; two are flat in cross section and two have irregular sections owing to the uneven grinding of their surfaces. (Pl. 8, h, i, j, k.)

Objects belonging to the second class display incised designs which in general may be described as variations of a simple grid pattern, that is, two sets of straight lines which intersect at angles approaching 90 degrees. Four specimens are represented.

Specimen number 175-103 is a tapered piece of shale which is 7.7 cm long, 1.6 cm wide (maximum), and 0.6 cm thick. It was recovered at a depth of 23 inches. It is rhomboidal in cross section and has artificially rounded ends. Indeed, its entire margin has been shaped, although not enough to render all the edges completely smooth. The design, executed on one side only, is composed of deeply incised lines running lengthwise and crosswise over all but a small area at the tapered end of the piece; a small pit, apparently drilled, is located off center near the wide end. It would seem that the design was accomplished quickly with no real effort to keep once-parallel lines from coming together, occasionally crossing, or swerving off the edge of the stone. Such haphazardness is especially true of the wider half of the piece, where the lines are shallower, more numerous, and more irregular, as if the workman became careless after completing half of the design. (Pl. 10, b.)

Specimen number 175-108 is the largest example of this class of objects, measuring 8.9 cm in length, 5.2 cm in width, and 2.0 cm in thickness. It was found at a depth of 3 inches and is completely unshaped. In this instance the material selected for incising was an irregular piece of basalt with a heavily patinated yellow, chalky surface which could be scratched easily. The grid design was incised on two opposite sides, one of which is sharply keeled, thereby making the piece triangular in cross section. Parallel running lines sometimes merge but do not cross or swerve off the edge of this specimen. Generally, each line extends from one edge to the opposite edge; this was accomplished by one or sometimes two strokes with a sharp incising tool. A few small shallow pits produced by a pointed implement appear to be scattered at random over both incised surfaces. (Pl. 10, a.)

A third incised stone, number 175-192, was recovered from the feature 8 fire pit 18 to 28 inches below the surface of the ground. This fragmentary specimen is made of soft, pink mudstone, and measures 2.2 cm (incomplete) by 1.9 cm (incomplete) by 0.8 cm. The grid design covers both sides and the one unbroken edge that has been artificially rounded. One incised line extends across one side, around the curved unbroken edge, and across the other side. Lines running parallel to the unbroken edge are more numerous and generally shallower than those perpendicular to it. Parallel lines frequently merge but seldom cross each other. (Pl. 10, c.)

The last of this class of objects, specimen number 175-306, was found at a depth of 4 inches. It is an unshaped fragment of light-colored shale which still retains one natural edge. Angular in outline and flat in cross section, this piece is 3.5 cm long, 3.4 cm wide, and 0.4 cm thick. The incised design was applied to one side only and, though crude, it is much more sophisticated than the designs on the other three objects. Basically two irregular grid systems, one large and one small, were used. The larger grid pattern covers the entire design surface. The smaller pattern was placed diagonally, and often carelessly, in certain of the sections formed by the larger design, while other sections were left blank. The whole design is lightly incised and thus difficult to see in detail without the aid of a magnifier. (Pl. 10, d, d'.)

Small, flat stone objects showing abrasion or incised lines turn up archaeologically in both early and late time periods in southern California (e.g., Curtis, 1959; Meighan, 1953; Treganza and Malamud, 1950; Walker, 1951; and Wallace et al., 1956). With the exception of one associated with a burial (Wallace et al., 1956), these objects have not been found in any context that might indicate their function. As a result, they are often given ceremonial or aesthetic importance which cannot be demonstrated. Unfortunately, the eight shaped or incised stones from LAn-2 do not contribute to the solution of the problem. One incised fragment was associated with a fire hearth (feature 8) but the rest of the objects were scattered at random through the midden; none were associated with burials.

The grid design characteristic of the four incised stones from LAn-2 is not reported from other Milling Stone Horizon sites, including the Tank Site, but can be found in "later" sites in southern California. Site SLO-157, which has a carbon date of A.D. 340 ± 80, yielded an incised pebble with this grid motif (Reinman, 1961, p. 17). A similar pattern was incised on a roof-tile fragment from a historic Indian site in Riverside County (McCown, 1955, pl. 21, e). The Chatsworth Cairn Site in the San Fernando Valley produced a soapstone gorget (?) with an incised cross-hatched design running diagonally over its surface (Walker, 1951, p. 95, Pl. XXXVII, a). Perhaps the earliest example of this design is on a small piece of slate from the Stahl Site near Little Lake, Inyo County (Harrington, 1957, fig. 49, d).

TABLE 9

Classification, Frequency, and Weights of Unmodified Lithic Material from LAn-2

Pit	Depth	Granite		Sandstone		Basalt		Quartzite		Trace
		No. of pieces	Weight (lbs)	No. of pieces	Weight (lbs)	No. of pieces	Weight (lbs)	No. of pieces	Weight (lbs)	
N11	0-6	103	22.0	23	3.0	54	2.0	13	1.0	Quartz, Chert
N12	0-6	188	24.5	76	8.5	188	9.0	58	3.0	Quartz, Chert, Shale
N11	6-12	97	17.0	73	14.5	76	8.0	17	2.0	Quartz, Chert
N12	6-12	90	16.0	90	17.5	91	9.5	18	2.5	Chert
N11	12-18	67	12.0	62	15.0	112	8.5	14	1.0	Chert
N12	12-18	67	14.0	70	15.5	65	6.0	12	0.5	Quartz, Chert
N11	18-24	14	4.0	5	0.5	42	2.5	0	0.0	Chert, Shale
N12	18-24	47	12.0	50	9.0	43	3.0	4	0.25	
N11	24-30	2	0.5	0	0.0	2	trace	2	trace	Chert
N12	24-30	5	1.0	2	trace	6	0.5	2	trace	Chert
Total stone (1,950 pieces)		680		451		679		140		
Total weight (265.75 lbs)			123.0		83.5		49.0		10.25	

OTHER REMAINS

QUARTZ CRYSTALS
(Pl. 10, e, f)

Two unmodified crystals of quartz were recovered from the general midden deposit. They were not associated with burials or other features in the site. However, the fact that in California quartz crystals are known ethnographically to be ritual objects and have been found in ritual context in other archaeological sites strongly suggests that the LAn-2 crystals possessed some kind of supernatural power. They were not necessarily the property of shamans or religious leaders, but could have brought good luck to ordinary owners.

UNMODIFIED LITHIC MATERIAL

An attempt was made to gain some estimate of the kinds, amounts, and weights of lithic waste materials in the site. A sample representing 125 cubic feet of midden was taken from two adjacent pits, N11 and N12. All the unmodified stones from these pits were saved, roughly classified as to material, and weighed (see table 9). From the two pits, 28 artifacts and 1,950 unmodified rocks were recovered. The quantity of lithic debris leaves little doubt that most of the LAn-2 artifacts were manufactured on the site. Much of the basalt and quartzite waste material was represented by small flakes, whereas the granite and sandstone pieces were larger in size, although usually no bigger than a man's fist. The small size of the sample may account for the unusual abundance of granite, as more artifacts were made of basalt or sandstone than of this material (see table 2).

PIGMENTS

Small chunks of hematite and pink, chalky mudstone were found throughout the midden deposit. The red ocher evident on several manos indicates that hematite, at least, was used for paint. No pigments were significantly associated with any of the burials.

UNWORKED SHELL AND BONE REMAINS

Treganza and Bierman (1958, p. 71) found only two unidentifiable shell fragments at LAn-2; no shell was noted in 1957.

All bone was carefully saved during the 1957 season and totaled forty-eight pieces; all but two were fragments, and most were not more than an inch long. Some were burned. Previous excavation yielded a few deer bones, the lower jaw of a wildcat, and the teeth of a fox or coyote (Treganza and Bierman, 1958, p. 71). The 1957 work added to this small list two more deer bones (Odocoileus hemionus) and the left humerus of a sea lion (Arctocephalus townsendi, southern fur seal). The latter was recovered from the 0- to 6-inch level and, if not intrusive, indicates an economically undeveloped relationship between the coast and the interior.

TABLE 10

Artifact Count, Materials, and Dimensions
(Measurements in cm)

Artifact type	No.	Material	Maximum size			Minimum size			Average size		
			L	W	T	L	W	T	L	W	T
Scraper planes											
Type IA	9	8 basalt, 1 quartzite	9.6	8.6	6.7	5.3	4.6	3.0	7.2	5.8	4.7
Type IB	3	basalt	6.9	5.0	4.9	5.0	4.3	3.6	6.2	4.7	4.3
Type IIA	24	21 basalt, 3 quartzite	8.7	7.7	6.1	4.5	3.5	2.3	6.5	5.3	4.1
Type IIB	12	basalt	9.5	7.7	6.2	4.5	4.3	2.5	6.8	5.7	4.4
Type IIC	12	11 basalt, 1 quartzite	7.8	7.1	6.0	4.3	3.2	3.1	6.6	5.2	4.4
Type IID	3	1 basalt, 2 quartzite	8.0	6.1	4.5	6.2	4.5	3.7	6.8	5.4	4.0
Type III	4	3 basalt, 1 tuff	6.9	6.1	4.9	5.7	5.3	3.0	6.4	5.6	4.1
Scrapers											
Side	14	9 basalt, 3 quartzite, 2 chert	8.5	6.5	2.6	2.7	2.5	0.8	6.4	4.6	1.7
End	1	basalt	6.0	5.0	2.7						
Multiedged	2	1 basalt, 1 quartzite	5.5	4.6	2.3	5.2	3.2	2.0	5.4	3.9	2.2
Discoidal	1	basalt	6.9	6.9	2.3						
Semiovoid	5	3 basalt, 1 chert, 1 quartzite	9.3	6.4	2.4	4.4	2.9	1.4	5.8	5.4	1.8
Thumbnail	2	1 chert, 1 grainy obsidian	2.4	2.1	0.9	2.2	1.3	0.5	2.3	1.7	0.7
Miscellaneous	1	chert	3.3	1.9	0.9						
Choppers											
Unifaced	7	basalt	11.5	9.1	6.4	6.3	5.3	3.7	8.6	7.1	4.4
Bifaced	4	3 basalt, 1 porphyry	9.4	8.9	6.2	6.7	6.4	3.0	7.7	7.2	4.2
Unifaced-bifaced	7	4 basalt, 3 quartzite	13.5	8.5	4.0	7.0	5.5	2.7	8.7	6.9	3.4
Hammerstones											
Core	75	68 basalt, 4 quartzite, 2 porphyry, 1 granite	9.0	7.8	7.0	4.6	3.7	3.4	6.8	5.6	4.9
Cobble	3	1 mica schist, 2 quartzite	10.5	8.0	7.3	5.9	4.6	1.7	8.4	5.7	3.6
Cores	2	chalcedony	6.1	5.6	6.0	4.3	3.4	4.0	5.2	4.5	5.0
Small points											
Lozenge-shaped	1	grainy obsidian	2.9	2.0	0.7						
Leaf-shaped	1	grainy obsidian	3.1*	1.7	0.6						
Contracting stem	1	quartzite	3.1	2.3	0.8						
Side-notched	1	chert	3.2*	2.0	0.6						
Large points											
Leaf-shaped	6	2 chert, 2 basalt, 1 grainy obsidian, 1 chalcedony	5.8	3.4	1.2	3.3	1.8	0.6	4.7	2.4	0.8
Flaring sides	1	chert	3.7*	3.3	0.9						
Contracting stem	2	1 chert, 1 grainy obsidian	4.9	3.1	0.9	4.9	2.9	0.9	4.9	3.0	0.9
Small-stem	1	grainy obsidian	3.6	2.3	1.0						
Basal-notched	1	grainy obsidian	2.0*	2.8	0.9						
Concave-based	1	quartz	3.8	2.2	1.1						
Point fragments	19	8 chert, 7 chalcedony, 1 jasper, 2 grainy obsidian, 1 dehydrated volcanic									
Crescent	1	chert	3.1*	2.5	0.7						
Milling stones	33	1 volcanic, 32 sandstone	*	*	12.6	*	*	3.1	*	*	7.3

*Incomplete.

TABLE 10
(Continued)

Artifact type	No.	Material	Maximum size			Minimum size			Average size		
			L	W	T	L	W	T	L	W	T
Manos											
Type I	10	4 sandstone, 5 granite, 1 quartzite	*	10.8	6.7	*	5.9	3.9	*	8.2	5.3
Type II	66	2 volcanic, 23 granite, 41 sandstone	*	11.7	7.7	*	6.2	2.8	*	9.1	4.9
Type IIA	3	1 granite, 2 sandstone	14.1	12.6	7.0	9.2	7.5	4.1	11.7	10.6	5.6
Type IIB	2	sandstone	15.6	9.7	5.2	11.4	6.9	3.4	13.5	8.3	4.3
Type IIC	5	1 granite, 3 sandstone, 1 volcanic	*	10.7	5.6	*	7.8	4.1	*	9.2	4.8
Type IID	1	granite	8.3*	10.1	5.4						
Type III	4	1 granite, 3 sandstone	*	10.8	5.9	*	8.6	4.9	*	9.6	5.3
Not typed	3	2 granite, 1 quartzite									
Mortars	4	2 sandstone, 2 volcanic									
Abrading stone	1	sandstone	14.0	8.0	5.9						
Stone disk	1										
Rubbing stones	2	sandstone	6.2*	5.5	3.1	6.0	5.2	2.6	6.0	5.4	2.9
Pendants	2	1 shale, 1 slate	3.3*	1.2	0.3	3.0	1.0	0.3	3.0	1.1	0.3
Shaped stones	4	3 shale, 1 siltstone	8.2	5.2	0.9	6.7	1.4	0.5	7.5	3.4	0.8
Incised stones	4	1 basalt, 2 shale, 1 mudstone	8.9	5.2	0.8	3.5	1.6	0.3	6.7	3.7	0.9
Crystals	2	quartz	4.5	1.5	1.6	1.7	0.9	0.8	3.1	1.2	1.2

*Incomplete.

DATING

Abundant charcoal was collected from the three stone-lined fire pits at LAn-2 and sent to the Geochronology Laboratories of the University of Arizona for carbon 14 analysis. The following five dates were obtained (Dr. Paul E. Damon, personal communication, 1961).

Sample A-94: combined charcoal from feature 1, pits K3 and L3, 30 inches; feature 3, pit K4, 15-24 inches; feature 5, pit K5, 14 inches.

Date: solid carbon method: 2500 B.P.
carbon dioxide gas method
5-liter counter: 2450 ± 150 B.P.
2-liter counter: 2440 ± 200 B.P.

Sample A-197: charcoal from feature 3, pit K4, 15-24 inches.

Date: carbon dioxide gas method
5-liter counter: 2700 ± 150 B.P.
2-liter counter: 2600 ± 240 B.P.

The four dates determined by the carbon dioxide gas method give an average date of approximately 2550 ± 150 years, or 590 B.C. This is 2,000 years short of Treganza's estimate for LAn-2. The question now arises: are the fire pits intrusive? Certainly such a possibility must not be overlooked, but, on the other hand, there appears to be no evidence favoring intrusion. There are no apparent soil changes or other signs of disturbance on the surface of the site which might indicate a late intrusive feature below. The whole site, including the fire-pit areas, is capped by a layer 6 or 7 inches thick of leached, light-brown midden, indicating that no major disturbance has taken place since the leaching process began. Finally, there are no artifacts that can be recognized as belonging to an intrusive group. Even if such artifacts were present, they might be difficult to distinguish from the older materials, as we really have no idea what constituted the material culture of the aborigines in the Los Angeles area 2,500 years ago—unless, of course, the LAn-2 assemblage is an example.

Until substantial opposing evidence is found at other sites, the average date of 2550 ± 150 B.P. must stand as the most accurate chronological placement of LAn-2. Considerable midden had to accumulate before there was enough soil to permit the construction of earth ovens. Therefore, these roasting pits and their carbon dates do not represent the earliest occupation of LAn-2, but probably coincide with its later history. As a conservative estimate, 1000 B.C. is suggested for the establishment of the site. Perhaps it was inhabited for 700 years.

CULTURAL RECONSTRUCTION

The inhabitants of LAn-2, like most simple hunters and gatherers, left relatively few nonperishable remains for the archaeologist to find and use in reconstructing their way of life. Much of their energy was expended in making a living from the various wild plants and animals in their environment. It is this aspect of their culture—the food quest—which we know most about from studying the material remains at LAn-2.

The small size of LAn-2 must have limited the population to a few nuclear families, perhaps totaling ten to twenty individuals. These people probably obtained fresh water from two springs near the Tank Site (Treganza and Bierman, 1958, p. 46).

The fact that there is relatively little evidence of hunting at LAn-2 suggests that it was occupied for the primary purpose of obtaining wild plant foods which begin to be available in this area in April. Table 11 lists the usable wild plants on the site and in the immediate vicinity. It seems likely that the flora of Topanga Canyon was much the same 2,500 years ago as it is today. Evidence from the La Brea tar pits indicates that some of the plants now growing on or near the site were extant in the Los Angeles area during the Pleistocene, and have not changed since then (Frost, 1927, pp. 82, 84).

Yucca may have been the most important food collected by the inhabitants of LAn-2; indeed, an abundance of this plant in the area could well have been a determining factor in the establishment of the site. Not only was yucca valuable to the Indians as a source of fiber and an immediately edible food, but, properly prepared, the heads of the plant could be stored and eaten during periods when food was scarce. The fire pits at LAn-2 were probably earth ovens used for the purpose of roasting the heads and possibly the stalks of yucca. Similar stone-lined pits, known ethnographically as earth ovens, were built, at least in southern California, exclusively for cooking yucca and mescal (Barrows, 1900, pp. 58-59; Kroeber, 1925, p. 695; Sparkman, 1908, p. 195).

Although we cannot be sure of conditions 2,500 years ago, there is certainly enough yucca in the immediate vicinity of LAn-2 today to support a small population for several weeks. On June 13, 1962, fifteen flowering Yucca whipplei stalks were counted within a radius of less than half a mile from LAn-2 (map 2). The count undoubtedly would have been higher were it not for the areas modified by modern cultivation, brush clearing, housing, roads, and reservoir excavation. According to Fred Hicks, who has studied extensively the ecological aspects of Yuman culture (Hicks, 1963), one stalk of Yucca whipplei will furnish a hearty meal for eight to ten people (personal communication, 1962). On this basis, fifteen individuals eating one good meal of yucca a day could remain at LAn-2 for one week. If the radius of exploitation is extended to two miles and other plant foods and some animals are added to the yucca diet, it should be possible to sustain fifteen individuals at LAn-2 for at least two months. The quantity of grinding tools at the site indicates that, in addition to yucca, seeds and other plant foods were indeed heavily exploited. By September most of these foods were no longer available, although acorns could be gathered in the fall, provided the technique of leaching them was known.

The oak distribution today (map 2) points up the fact that acorns would add substantially to a subsistence economy. If acorns were gathered by the Indians 2,500 years ago—and we have no way of proving this—LAn-2 could well have been a central base for economic activity much of the year. Without the benefit of acorns, however, it seems unlikely that the plants harvested during the summer months provided enough food to sustain the people at the site for more than two or three months of every year. The minor occurrences of shell and sea-mammal bone in the midden strongly suggest that the LAn-2 people came inland from the coast, bringing some seafood with them. They lived for several weeks or months at LAn-2, gathering the different kinds of wild plants as these became available, and then returned to the seashore to resume a partly, if not primarily, marine economy. A similar seasonal pattern is arguable for the larger and older Tank Site, where bits of shell are reported from the earliest and latest levels of occupation (Treganza and Bierman, 1958, p. 47).

A few stone pendants and incised stones are the only objects that reflect the simple aesthetic achievements of the LAn-2 people. Red ocher, however, was probably employed to decorate tools, ornaments, and individuals, especially for ritual purposes.

Extensive trade in raw materials, finished objects, or food was not noted, although nine projectile points and a scraper are made of an impure grainy obsidian believed to have come originally from Grimes Canyon in Ventura County.

Little concerning social organization or magico-religious practices can be derived from the archaeological remains at the site. The basic socioeconomic unit was probably the nuclear family. The several families living on the site may or may not have been kin, but undoubtedly functioned as a cooperative economic unit. Thus the yucca gathered by each family was roasted together in one communally built earth oven. After roasting, the yucca may have been distributed equally among the members of the group; or, more likely, each family marked its own plants

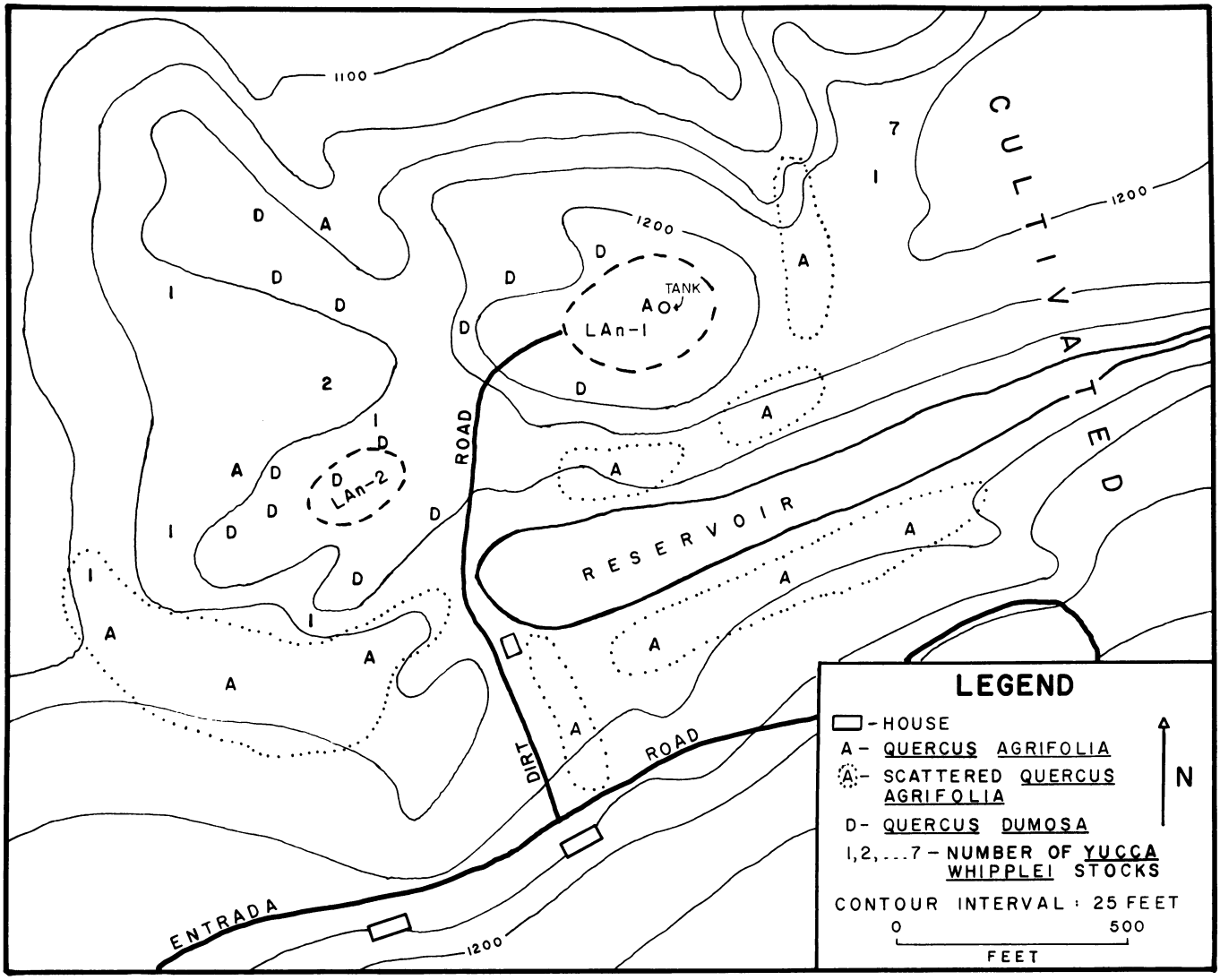
TABLE 11

Usable Wild Plants in Vicinity of LAn-2

Plant	Reported use	Source
Occurring on site:		
1. Adenostema fasciculatum	Medical use of bark, leaves	Stuhr, 1933, p. 117
2. Arctostaphylos (manzanita)	Berries, seeds eaten; medical use of leaves; source of dye	Barrows, 1900, p. 64 Stuhr, 1933, p. 57 Romero, 1954, pp. 70-71
3. Salvia apiana (white sage)	Seeds eaten	Medsger, 1947, p. 127
4. Quercus dumosa (scrub oak)	Acorns leached and eaten	Barrows, 1900, p. 62 Kroeber, 1925, p. 649 Wolf, 1945
5. Rhus laurina (laurel sumac)	Seeds provided drink	Stuhr, 1933, p. 14
6. Rhus ovata (sugar-bush)	Drink from seeds; flower eaten; medicinal tea from leaves	Barrows, 1900, p. 66 Medsger, 1947, p. 231 Stuhr, 1933, p. 14
7. Trichostema lanatum (romero)	Medicinal herb	Romero, 1954, p. 48 Stuhr, 1933, p. 78
Occurring within mile of site		
8. Salvia columbariae (chia)	Seeds eaten, made into drink; remedied fevers and served as poultice for gunshot wounds	Barrows, 1900, p. 64 Medsger, 1947, p. 126 Romero, 1954, p. 254 Stuhr, 1933, p. 77 Woodward, 1949
9. Quercus agrifolia (coast live oak)	Acorn eaten; galls have medicinal value	Romero, 1954, p. 57 Wolf, 1945, p. 35
10. Rhus trilobata (squawbush)	Branchlets useful in basketmaking; berries eaten or made into beverage; stems prepared to aid coughs and lung troubles; a tonic made for loss of appetite	Barrows, 1900, p. 64 Jepson, 1951, p. 608 Kroeber, 1925, p. 695 Medsger, 1947, p. 213 Romero, 1954, pp. 63, 70 Stuhr, 1933, p. 15
11. Ceanothus (mountain lilac)	Soap	Stuhr, 1933, p. 116
12. Nicotiana (tobacco)	Smoked and chewed	Barrows, 1900, p. 74 Jepson, 1951, pp. 888-889 Stuhr, 1933, p. 131
13. Brodiaea capitata (blue dicks)	Corm eaten and made into shampoo	Jepson, 1951, p. 223 Medsger, 1947, p. 197 Romero, 1954, p. 40 Stuhr, 1933, p. 85
14. Calochortus (mariposa lily)	Corm eaten	Medsger, 1947, p. 178 Stuhr, 1933, p. 85 Woodward, 1949
15. Sambucus glauca (blue elderberry)	Berries cooked into sauce; bark and flowers used medicinally	Barrows, 1900, p. 64 Kroeber, 1925, p. 695 Medsger, 1947, p. 84 Stuhr, 1933, p. 25
16. Yucca whipplei	Pods and flowers boiled and eaten; stalks roasted and eaten immediately or stored; leaves made into fiber and pods used in bleaching	Barrows, 1900, pp. 59, 66 Romero, 1954, p. 58
17. Erigonum fasciculatum var. foliolosum (wild buckwheat)	Leaves made into drink to relieve stomach and head pains; eyewash made from flowers	Stuhr, 1933, p. 105

before roasting, thereby keeping the ones they had gathered (Spier, 1928, p. 106; Gifford, 1936, p. 259; Gifford, 1932, p. 206).

The site yielded no evidence of political or religious leaders. None of the burials indicated a person of high importance; all were flexed and interred with no apparent orientation. Grave goods were absent, but stone cairns were placed over two of the burials, one holding a child. Two quartz crystals recovered from the general debris were the only objects of probably ritual significance, and these could have been owned by ordinary individuals. The function or functions of the unusual incised stones is not known.



Map 2. Distribution of oak and yucca in vicinity of LAn-2

CULTURAL RELATIONSHIPS

The Topanga complex has been widely compared with such cultural assemblages as San Dieguito and La Jolla to the south, Oak Grove to the north, and Cochise far to the east. It will be necessary later to relate LAn-2 in a general way to some of these complexes, as they pertain to the Milling Stone Horizon of southern California, but the immediate task is to compare LAn-2 with those sites for which we have good quantitative data and which are geographically near enough to Topanga Canyon to increase the possibility of direct cultural ties.

RELATION TO LOCAL EXCAVATED SITES

LAn-1

The Tank Site is situated just 165 yards east of LAn-2 and contains, in general, the same artifact assemblage. Proportionately, the Tank Site has more manos and milling stones but fewer core tools (i.e., hammers, choppers, scraper planes), projectile points, and pestles.

TABLE 12

Chronology of Important Archaeological Complexes in Southern California

Date		Santa Barbara		Los Angeles		San Diego	
B.P.	A.D./B.C.						
		Late	Canaliño	Late	Arroyo Sequit Malaga Cove 4	Late	San Luis Rey I
1000	1000 A.D.						
	↑	Intermediate	Hunting	Inter-mediate	Malaga Cove 3 Ven-2 ?		?
2000	0						
	↓				Topanga III (2440-2700 ± 150)		
3000	1000 B.C.	Milling Stone	Oak Grove	Milling Stone	Parker Mesa (3000 ± 100)	Milling Stone	La Jolla (7300-3900 ± 200)
4000	2000				Little Sycamore		
5000	3000				Zuma Creek (4950 ± 200)		
6000	4000				Topanga II Malaga Cove 2 LAn-111 Malaga Cove 1 ? (6510 ± 200)		
7000	5000		?				
8000	6000			Early	Topanga I	Early	San Dieguito

In addition to their many similarities, there are important differences between these sites which clearly indicate that, although they may have been inhabited contemporaneously for a while, LAn-2 continued to be occupied long after the Tank Site was permanently abandoned. Thus, flexed and rock-cairn burials, stone-lined earth ovens, and stones with incised grid designs, which are distinctive of LAn-2, are not recognized in the Tank Site, which has several different forms of burial, no earth ovens, and no stones displaying grid designs. These differences seem to be significant enough to permit some revision of Phases I and II and the addition of a new phase to the Topanga complex. Based on our present evidence, the major characteristics of the three phases are as follows:

Phase I.—Some manos, milling stones, and percussion-flaked core tools which increase in frequency near the end of the phase; large, leaf-shaped, percussion-flaked blades and points; reburial of long bones, generally under inverted milling stone. Type site: LAn- below 18 inches.

Phase II.—Abundance of manos, milling stones, and core tools; mortar and pestle introduced but not abundant; large blades mostly replaced by smaller pressure-flaked points which increase in frequency; miscellaneous shaped and incised stones; stone features, many with associated human bone fragments; reburial continues along with the introduction now of extended burials, heads pointing south. Type site: LAn-1, 0-18 inches.

Phase III.—Manos, milling stones, and core tools continue in abundance; some increase of mortars, pestles, and pressure-flaked projectile points; a wider variety of point types; stone features continue; introduction of stone-lined earth ovens; small stones with definite incised grid pattern; and flexed burials, some under rock cairns. Type site: LAn-2.

It is important to note that the types within each major artifact class continue from one phase to the next. For the most part core tools and seed-grinding implements are the same in all three phases, although plainly made pestles, which first occur during Phase II, may show some embellishment by Phase III times (Treganza and Bierman, 1958, pl. 24, d). Likewise, projectile points change little from Phase II to Phase III. Of the twenty-four classifiable points recovered from LAn-2, only five—flaring sides, small stem, basal notched, concave base, and convex base—are not known for Phase II.

Dating of the Topanga complex and its postulated phases still remains tentative and largely speculative. A few carbon dates for LAn-2, however, and three other Milling Stone Horizon sites on the coast establish some basis for estimation (table 12). The five carbon 14 dates for LAn-2 range from 2440 B.P. to 2700 B.P. If we extend these dates a few hundred years in each direction, we may conservatively place Phase III as beginning about 3,000 years ago, and perhaps lasting until the beginning of the Christian era. Parker Mesa, a Topanga complex site located at the mouth of Topanga Canyon, has a carbon 14 date of 3000 ± 100 B.P., but it is difficult to place it in any of the Topanga phases because it lacks the distinguishing characteristics of any one phase. Zuma Creek, a coastal shell midden in Los Angeles County, has a carbon 14 date of 4950 ± 200 B.P. from its lower level (Flint and Deevey, 1960, p. 211). As the artifact assemblage and burial patterns at this site are very similar to those assigned to Phase II of the Tank Site, we may assume some cultural and temporal relationship between these sites, and estimate the beginning of Phase II to be between 5,000 and 6,000 years ago. A single carbon date of 6510 ± 200 is reported to be equatable with level 1 of the Malaga Cove Site (Flint and Deevey, 1960, p. 201). The next higher occupation level (level 2) contains remains of the Phase II type, suggesting that Phase II is no more than 6,000 years old at the most. For Phase I we have no comparative data with dates in the Los Angeles area, and can only suggest that it evolved into Phase II about 5,000 years ago, after a duration of at least 1,000 years.

Parker Mesa (King, 1962)

This site lies on a high terrace at the mouth of Topanga Canyon. The number of milling stones, manos, and crude core tools recovered easily places the site within the Topanga complex. One carbon 14 date of 3000 ± 100 B.P. (UCLA-275) from its lowest level indicates an occupation just prior to or contemporaneous with that at LAn-2. Unfortunately, Parker Mesa lacks the diagnostic traits that would allow us to place it within one of the phases of the Topanga complex. There are no burials, no incised stones, no mortars and pestles, no identifiable projectile points, and only one chert knife, possibly water-rolled. A single chert crescent (King, 1962, fig. 14, a) is the same general type as the fragment from LAn-2 (pl. 9, y); and, in a more subjective way, the overall craftsmanship of the Parker Mesa tools approaches the crudeness noted for LAn-2. As a whole, however, the artifactual materials excavated at Parker Mesa would fit easily into any of the Topanga phases.

LAn-111 (Rozaire, 1960)

The Encino Site, or LAn-111, is located northeast of LAn-2 in the San Fernando Valley and is immediately recognizable as belonging to the Topanga complex by the similar types of artifacts and lithic materials used. It contrasts markedly with LAn-2, however, in the following ways: (1) 80 percent of the 415 artifacts recovered were found on the surface, suggesting erosional activity at the site over a very long period of time; (2) seed-grinding implements were more abundant than core tools; (3) there were only two pressure-flaked projectile point fragments; (4) mortars and pestles were completely lacking; (5) one reburial was found; (6) there were no stone features. Most of these are characteristic of the Tank Site and of late Phase I of the Topanga complex.

Porter Ranch Site, San Fernando Valley (Walker, 1951)

This unusual "ceremonial site" definitely belongs to the Milling Stone Horizon. Although one reburial and accumulations of unworked stone with "killed" milling stones show parallels with the Tank Site, the complete absence of core tools and the fact that milling stones outnumber manos by a ratio of 28 to 1 discourage comparison with the Topanga sites.

Little Sycamore (Wallace et al., 1956)

Little Sycamore is a coastal shell mound about 25 air miles northwest of LAn-2. Like the Topanga sites, it contains stone features and an abundance of grinding tools and percussion-flaked core implements, although the latter are proportionately less evident. Pestles occur at the same low frequency as at LAn-2, but in general are more crudely manufactured. Projectile points, for the most part, resemble Topanga Phase II types and are noticeably less abundant and less varied than those from LAn-2. Five flexed burials and 10 reburials show similarity to the burial patterns at both LAn-2 and the Tank Site. No extended skeletons were found. Milling stones covered six of the reburials and two flexed burials. One reburial was under a rock cairn; another was covered by a stone slab.

It is evident from the above comparisons that Little Sycamore is most like Topanga Phase II, with the flexed burials suggesting some overlap into Phase III. Thus the site is tentatively dated as being between 2,500 and 5,000 years old. Distance from Topanga, plus the absence of extended burials and slight variations in burial patterns, indicates that Little Sycamore was not inhabited by people from LAn-2 or the Tank Site. These factors do not, of course, eliminate the possibility that groups from the two areas may have had some contact with each other.

Zuma Mesa (Ruby, 1961) and Zuma Creek (Peck, 1955)

These two coastal shell middens are situated on adjacent terraces near Point Dume, approximately 15 air miles northwest of the Topanga Canyon sites. Both yielded the same cultural materials and probably were occupied contemporaneously. Here, as at all Milling Stone Horizon sites, the most important seed-grinding utensils were the mano and the milling stone. No pestles and only one stone bowl were reported from the Zuma Creek Site; Zuma Mesa yielded two conical pestles from the surface. A total of thirteen flat boulders with shallow mortar-like depressions were recovered from both sites, but this type is not known for the Topanga complex. It is assumed that these implements were used with pestles to grind plant foods, and may represent a transition from the mano and milling stone to the mortar and pestle. Core tools were abundant, though proportionately less evident than at LAn-2 and the Tank Site. The variety and frequency of projectile points is most similar to Topanga Phase II, although lozenge and side-notched types are not present. Large blades, mostly percussion-flaked, occurred throughout the midden at Zuma Creek, again indicating a closer relationship to the Tank Site than to LAn-2. It is unfortunate

that none of these blades were made of the fine-grained basalt so characteristic of the Topanga sites, thereby providing evidence of some early contact between the two areas.

Several stone features were exposed, two of them associated with burials. To date only the Zuma Creek Site has yielded human remains. Peck reports seven burials, and work by Ascher in 1957 produced nine more (Littlewood, 1960). Of the total, four were reburials, one under a milling stone; seven were extended with heads pointing in a southerly direction, as at the Tank Site; one was flexed under a milling stone with three convex base projectile points in association. The type of disposal for the remaining four interments could not be determined from the available evidence; however, two of these appear to be similar to the unusual fractional burials reported for the Tank Site.

On the basis of burial patterns alone, it would appear that the Zuma sites were contemporaneous with the Phase II levels of the Tank Site, and had been largely abandoned by Phase III times. A higher proportion of large blades as opposed to projectile points, and the low frequency of mortars and pestles, also support a Phase II rather than a Phase III date for these coastal sites. It is clear that the Topanga sites show closer similarities with the Point Dume middens than with Little Sycamore; yet there is no concrete evidence to support a seasonal occupation of both Zuma and Topanga by the same population. It seems likely that the Topanga people, if indeed they were spending part of the year at the coast, would be more likely to go to the mouth of Topanga Canyon, which is only a few miles away, rather than travel up the coast all the way to Point Dume.

Malaga Cove (Walker, 1951)

The important stratified site at Malaga Cove near Palos Verdes should be mentioned here, even though it lacks sufficient quantitative data for useful comparisons. It is a coastal midden approximately 40 miles south of Topanga Canyon. Level 2, some 30 feet below the surface of the site, contained materials belonging to the Milling Stone Horizon, that is, abundant manos, some milling stones, one small mortar and pestle, reburials, and rock cairns. A carbon 14 date of 6510 $\pm$ 200 B.P. is recorded from shell equatable with the next level below (level 1), which is notable for its complete lack of seed-grinding utensils.

None of the sites reviewed above appear to be as late in time as LAn-2. True, a few of them do show some overlap into the Phase III period, but most of their material remains compare more favorably with Phase II of the Tank Site. Perhaps Little Sycamore, with its relatively high frequency of flexed burials, was inhabited contemporaneously with LAn-2 longer than any of the others.

RELATION TO SOUTHERN CALIFORNIA PREHISTORY

Turning now from the comparison of local archaeological sites, it is necessary to relate LAn-2 to the broader cultural and chronological framework of southern California prehistory. Wallace (1955) has suggested four cultural horizons for the coastal region of this area, which extends from Point Conception to the Mexican border (and probably beyond). Horizon I includes possible finds of early man, as well as the crude-blade industry of the San Dieguito people of San Diego County (Rogers, 1939, 1945). According to recent estimates, this complex is at least 8,000 years old (Warren and True, 1961, p. 261). Horizon II is characterized by early milling stone assemblages such as Oak Grove in the Santa Barbara region (Rogers, 1929), the La Jollan assemblages in San Diego (Rogers, 1939, 1945), and the Topanga complex of the Los Angeles area. Any site with an abundance of manos and milling stones would be included here. Carbon dates for this horizon range from about 7500 B.P. for La Jolla to about 2500 B.P. for Topanga Phase III. The third horizon, termed Intermediate by Wallace, is characterized by increased hunting activities and a shift in grinding utensils from manos and milling stones to mortars and pestles. Examples include the Hunting Culture of Santa Barbara (Rogers, 1929; Orr, 1943, 1952), possibly Ven-2 (Wallace, 1955) near the Little Sycamore site, and level 3 at Malaga Cove (Walker, 1951). This horizon is poorly defined in the Los Angeles area, and is unknown in the San Diego region. It may date from between 500 B.C. and A.D. 1000. Horizon IV extends from A.D. 1000 to the historic period. This Late Prehistoric Horizon may be recognized by an abundance of very small stemless projectile points suggesting the increased use of the bow and arrow, pottery in the San Diego region, and in general an elaboration and proliferation of kinds of artifacts. Seed gathering as well as hunting was important, so that use of the mortar and pestle continued, although San Diego still favored the mano and milling stone to some extent. The Canaliño people of Santa Barbara (Rogers, 1929; Orr, 1943, 1952) developed the most elaborate culture of this period. Arroyo Sequit (Curtis, 1959) and Malaga Cove level 4 are good examples of this late horizon in Los Angeles County; San Luis Rey I (Meighan, 1954) is one of the late complexes in the San Diego region.

It is clear from the above resume that LAn-2 represents the end of the Milling Stone Horizon in the vicinity of Los Angeles. Although a notable number of projectile points, mortars, and pestles from the site reflect a tendency toward the Intermediate Horizon, the high proportion of manos, milling stones, and core tools indicates that the site did not fully reach the state of development defined by Wallace. Perhaps it would be best to characterize LAn-2 as transitional between the Milling Stone and Intermediate Horizons.

The discussion so far has not included the position of the Channel Islands in relation to the Milling Stone Horizon. Several of these islands were occupied at least 5,000 years ago, and there are some carbon 14 dates in excess of 10,000 years B.P. for Santa Rosa Island (Orr, 1962). The archaeological evidence indicates that from the beginning the prehistoric inhabitants of the Channel Islands practiced a maritime economy. As abundant and varied vegetation was not available, the sea had to furnish most of their subsistence. Undoubtedly there was trade with the mainland, especially in later periods, but the ecological isolation of the islanders prevented them from developing or even following to a significant degree the seed-gathering habits of their continental neighbors. Conceivably, then, there never was, nor ever could be, a Milling Stone Horizon on these islands. Orr (1952, p. 224) states that the Oak Grove Culture never reached the northern islands. In the south, however, McKusick and Warren (1959, p. 137) postulate a milling stone complex for San Clemente Island, based upon the recovery of five stone grinding slabs and four manos from one small site. The basin type of milling stone characteristic of the mainland

is lacking as are other diagnostic traits of the Milling Stone Horizon. This complex is not known for any of the other Channel Islands, and its cultural importance and chronological placement need further verification. We must conclude that, at the present time, there are no island sites that can easily be related to the Milling Stone Horizon. This may be owing wholly or in part to environmental differences between the mainland and the islands.

Geographically, the Topanga complex is roughly centered between the Oak Grove Culture of the Santa Barbara area to the north and the La Jollan assemblages to the south, around San Diego. As might be expected, Topanga shares distinctive traits with each, especially in relation to burial patterns and percussion-flaked tools. Extended burials, heads oriented south, are known for Oak Grove and Topanga II, but do not occur in the La Jollan sites. Instead, flexed burials are the exclusive pattern in San Diego, where they have been dated by carbon 14 as early as 6,700 years ago (Moriarity, Shumway, and Warren, 1959, p. 198). Flexed inhumation is not dated until Topanga III times in the Los Angeles area, and is not reported for Oak Grove. The practice of reburial is common around Los Angeles, but has not been documented for Milling Stone Horizon sites in other parts of southern California. Finally, crude percussion-flaked tools are characteristic of Topanga and La Jolla, but appear to be lacking for Oak Grove.

These broad areal similarities and differences suggest problems of trait origins and culture contacts which are beyond the scope of this report, and probably will require much more excavation and comparison before adequate solutions to them are found.

SUMMARY AND CONCLUSIONS

Site LAn-2 was inhabited about 1000 B.C. by a small group of hunters and gatherers. They may have come inland from the coast to exploit wild plant foods during the spring and summer months and then returned to the seashore, or they may have lived at the site all year. At any rate, small bits of shell and sea-mammal bone indicate some contact with the Pacific Ocean 5 miles away. That the principal food resources of these people were plants and seeds is demonstrated by an abundance of seed-grinding utensils (manos and milling stones) and three uniquely constructed stone-lined fire pits, presumably used for roasting yucca. Tools were fashioned mainly from a local fine-grained basalt and sandstone. Pressure flaking is apparent on most of the projectile points, but direct percussion techniques were employed for the manufacture of hammerstones, choppers, and scraper planes. Analysis of the flaking and battering of these latter tools has demonstrated that most of them were not planing tools, but rather served a variety of cutting, scraping, and chopping functions; some may even have been prepared platform cores for the production of blades. All the burials from the site were flexed with no apparent orientation and no grave offerings; two, however, were covered by rock cairns. A few stone pendants and shaped stones with simple incised designs represent the only articles suggestive of leisure activity.

Charcoal from the fire pits yielded five radiocarbon dates ranging from 2440 $\pm$ 200 B.P. to 2700 $\pm$ 150 B.P. These, the latest dates belonging to the Milling Stone Horizon, extend its duration in southern California to 5,000 years. Table 12 indicates that this horizon was replaced by Intermediate Horizon cultures, first in the Santa Barbara region, somewhat later in Los Angeles, and perhaps not at all in San Diego where the La Jolla complex may have lasted until the Late Horizon. That LAn-2 represents a population that continued in the milling stone tradition long after the rest of the Los Angeles area had adapted to a hunting or Intermediate way of life is a possibility that should be considered. Meighan has a date of 3880 $\pm$ 250 B.P. for the Little Harbor Site on Santa Catalina Island (1959, pp. 384-386); and dates of 3980 $\pm$ 100 B.P. and 3300 $\pm$ 100 B.P. are recorded from two burial sites on San Nicolas Island (Reinman and Townsend, 1960, pp. 1-115; Reinman, personal communication). These sites are placed in the Intermediate Horizon, and Meighan implies that the Milling Stone Horizon generally ended sometime around 4000 B.P. He may be right, but as yet there are no mainland sites in Los Angeles or Ventura County which have dates to support his belief. In addition, ecological differences, discussed earlier, inhibit a comparison between island middens and milling stone sites on the mainland. Until we find and date hunting cultures in Los Angeles County, we cannot assume that early Intermediate manifestations on the offshore islands imply similar and contemporaneous developments along the coast of California.

Results of the excavations at LAn-2 in 1957 suggest a slight revision of Phases I and II of the Topanga complex and the addition of a new phase. If we consider the complex as a whole, we see a very slow change in tool types and burial patterns over its 5,000-year history. Phase I begins in the lower levels of the Tank Site, perhaps 7,000 or 8,000 years ago, with a few manos, milling stones, crude core tools, and large percussion-flaked blades. Although the evidence for it is scarce, reburial under milling stones may have been the favored form of interment, especially near the end of the phase. By Phase II times there is an abundance of manos, milling stones, and percussion-made tools. The mortar and pestle are introduced, and slowly increase in number. Large and small pressure-flaked points also make their first appearance during this phase, and begin to replace the crude blades. Stone features of several types and with unknown functions are characteristic. Reburial continues along with the introduction of extended burials, heads oriented in a southerly direction. Approximately 3,000 years ago flexed burials replace extended burials, and signify the beginning of Phase III. The same tool assemblage noted for Phase II carries over, but there are a few more mortars and pestles at this time, in addition to a wider variety of projectile points. Stone cairns still occur, but now we recognize a new kind of feature—rock-lined earth ovens. Small stones with incised cross-hatched designs are a final indicator of Topanga III. This last phase is postulated on the basis of excavations at LAn-2, which represents without doubt a late manifestation of the Topanga complex.

BIBLIOGRAPHY

Barrows, David P.
1900. The Ethno-botany of the Coahuila Indians of Southern California. Chicago: University of Chicago Press.

Collier, Donald, Alfred E. Hudson, and Arlo Ford
1942. Archaeology of the Upper Columbia Region. University of Washington Publications in Anthropology, 9(1):1-178. Seattle.

Curtis, Freddie
1959. Arroyo Sequit. Archaeological Survey Association of Southern California, paper no. 4. Los Angeles.

Drucker, Philip
1937. The Tolowa and Their Southwest Oregon Kin. University of California Publications in American Archaeology and Ethnology, 36(4):221-300. Berkeley.

Fenenga, Franklin
1953. The Weights of Chipped Stone Points: A Clue to Their Functions. Southwestern Journal of Anthropology, 9(3):309-323. Albuquerque.

Flint, R. F., and Edward S. Deevey
1960. Radiocarbon Supplement. American Journal of Science, vol. 2. New Haven.

Foster, George M.
1944. A Summary of Yuki Culture. Anthropological Records, 5(3). Berkeley: University of California Press.

Frost, Fred H.
1927. The Pleistocene Flora of Rancho La Brea. University of California Publications in Botany, 14:73-98. Berkeley.

Gifford, E. W.
1932. The Southeastern Yavapai. University of California Publications in American Archaeology and Ethnology, 29(3). Berkeley.
1936. Northeastern and Western Yavapai. University of California Publications in American Archaeology and Ethnology. 34(4). Berkeley.

Greenwood, R. S.
1959. Early Dwellers in Topanga Canyon. Archaeology, 12(4). New York.

Harrington, M. R.
1957. A Pinto Site at Little Lake, California. Southwest Museum Papers, no. 17. Los Angeles.

Heizer, R. F., and E. M. Lemert
1947. Observations on Archaeological Sites in Topanga Canyon, California. University of California Publications in American Archaeology and Ethnology, 44(2):237-258. Berkeley.

Hicks, Frederic
1963. Ecological Aspects of Aboriginal Culture in the Western Yuman Area. Unpublished Ph.D. dissertation. University of California, Los Angeles.

Jepson, Willis Linn
1951. A Manual of the Flowering Plants of California. Berkeley and Los Angeles: University of California Press.

King, Chester D.
1962. Excavations at Parker Mesa (LAn-215). UCLA Archaeological Survey, Annual Report, 1961-62, pp. 91-155. Los Angeles.

Kroeber, A. L.
1925. Handbook of California Indians. Bureau of American Ethnology, Bulletin 78. Washington.

Littlewood, R. A.
1960. An Analysis of Skeletal Material from the Zuma Creek Site. UCLA Archaeological Survey, Annual Report, 1959-60, pp. 135-154. Los Angeles.

McCown, B. E.
1955. Temeku: A Page from the History of the Luiseño Indians. Archaeological Survey Association of Southern California, paper no. 3. Los Angeles.

McKusick, M. B., and C. N. Warren
1959. Introduction to San Clemente Island Archaeology. UCLA Archaeological Survey, Annual Report, 1958-59, pp. 107-181. Los Angeles.

Medsger, Oliver P.
1947. Edible Wild Plants. New York: Macmillan.

Meighan, C. W.
1953. The Coville Rock Shelter, Inyo County, California. Anthropological Records, 12(5). Berkeley: University of California Press.
1954. A Late Complex in Southern California Prehistory. Southwestern Journal of Anthropology, 10:215-227. Albuquerque.
1955. Archaeology of the North Coast Ranges, California. Archaeological Survey, no. 30. Berkeley: University of California Press.
1959. The Little Harbor Site, Catalina Island: An Example of Ecological Interpretation in Archaeology. American Antiquity, 24(4), part 1:383-405. Salt Lake City.

Meigs, Peveril
1939. The Kiliwa Indians of Lower California. Ibero-Americana, vol. 15. Berkeley.

Moriarity, J. B., G. Shumway, and C. N. Warren
1959. Scripps Estates Site I: A Preliminary Report on an Early Site on the San Diego Coast. UCLA Archaeological Survey, Annual Report, 1958-59, pp. 185-216. Los Angeles.

Olson, Ronald L.
1936. The Quenault Indians. University of Washington Publications in Anthropology, 6(1):1-190. Seattle.

Orr, P. C.
1943. Archaeology of Mescalitan Island and the Customs of the Canaliño. Occasional Papers, Santa Barbara Museum of Natural History, no. 5. Santa Barbara.

1952. Review of Santa Barbara Channel Archaeology. Southwestern Journal of Anthropology, 8:211-226. Albuquerque.
1962. Observations on New Radiocarbon Dates from the California Channel Islands. Western Speleological Institute, Observations, no. 8. Santa Barbara.

Peck, S. L.
1955. An Archaeological Report on the Excavation of a Prehistoric Site at Zuma Creek, Los Angeles County, California. Archaeological Survey Association of Southern California, paper no. 2. Los Angeles.

Ray, Verne F.
1932. The Sanpoil and Nespelem: Salishan Peoples of Northeastern Washington. University of Washington Publications in Anthropology, vol. 5. Seattle.

Reinman, F. M., and Sam-Joe Townsend
1960. Six Burial Sites on San Nicolas Island. UCLA Archaeological Survey, Annual Report, 1959-60, pp. 1-134. Los Angeles.

Reinman, Fred M.
1961. Archaeological Investigations at Whale Rock Reservoir, Cayucos, California. State of California, Department of Natural Resources, Division of Beaches and Parks, Interpretive Services Section.

Rogers, D. B.
1929. Prehistoric Man of the Santa Barbara Coast. Santa Barbara Museum of Natural History. Santa Barbara.

Rogers, M. J.
1939. Early Lithic Industries of the Tower Basin of the Colorado River and Adjacent Desert Areas. San Diego Museum Papers, no. 3. San Diego.
1945. An Outline of Yuman Prehistory. Southwestern Journal of Anthropology, 1(2):157-198. Albuquerque.

Romero, J. B.
1954. The Botanical Lore of the California Indians. New York: Vantage Press.

Rozaire, C. E.
1960. The Archaeology at Encino, California. UCLA Archaeological Survey, Annual Report, 1959-60, pp. 307-330. Los Angeles.

Ruby, J. W.
1961. Excavations at Zuma Mesa. UCLA Archaeological Survey, Annual Report, 1960-61, pp. 190-232. Los Angeles.

Sparkman, Philip Stedman
1908. The Culture of the Luiseño Indians. University of California Publications in American Archaeology and Ethnology, 8(4). Berkeley.

Spier, Leslie
1928. Havasupai Ethnography. American Museum of Natural History Anthropological Papers, vol. 29, part 3. New York.

Spier, Leslie, and Edward Sapir
1930. Wishram Ethnography. University of Washington Publications in Anthropology, 3(3):151-300. Seattle.

Stuhr, Ernest T.
1933. Manual of Pacific Coast Drug Plants. Lancaster, Pennsylvania: Science Press Printing Co.

Treganza, A. E., and A. Bierman
1958. The Topanga Culture: Final Report on Excavations, 1948. Anthropological Records, 20(2). Berkeley: University of California Press.

Treganza, A. E., and C. G. Malamud
1950. The Topanga Culture: First Season's Excavation of the Tank Site, 1947. Anthropological Records, 12(4). Berkeley: University of California Press.

Walker, Edwin F.
1936. Obsidian Used by Prehistoric Californians. Masterkey, vol. 10, p. 15. Southwest Museum. Los Angeles.
1951. Five Prehistoric Archaeological Sites in Los Angeles County, California. Publications of the Frederick Webb Hodge Anniversary Publication Fund, Vol. VI. Los Angeles.

Wallace, W. J.
1955. A Suggested Chronology for Southern California Coastal Archaeology. Southwestern Journal of Anthropology, 11(3):214-230. Albuquerque.

Wallace, W. J., et al.
1956. The Little Sycamore Shellmound, Ventura County, California. Contributions to California Archaeology, no. 2. Archaeological Research Associates. Los Angeles.

Warren, C. N., and D. L. True
1961. The San Dieguito Complex and Its Place in California Prehistory. UCLA Archaeological Survey, Annual Report, 1960-61, pp. 246-338. Los Angeles.

Wolf, Carl B.
1945. California Wild Tree Crops. Rancho Santa Ana Botanic Garden, Anaheim, California.

Woodward, Arthur
1949. Indian Foodstuffs of Los Angeles County. Los Angeles County Museum, Leaflet Series, History, no. 1. Los Angeles.

PLATES

EXPLANATION OF PLATES

Plate 1

Site LAn-2. a. Looking southwest from the Tank Site (foreground). LAn-2 is at center of ridge (arrow). b. General view of mapping and beginning excavation. View southwest. c. Feature 1. Note part of feature 2 in upper left corner of picture. d. Feature 1 subsoil pit containing three boulders in situ.

Plate 2

Features 2, 4, and 5. a. Feature 2 assemblage of milling stones, manos, and unmodified rocks. b. Feature 4 assemblage of unmodified rocks. c. Feature 5 fire pit partly cut away to expose subsoil pit. d. Feature 5 subsoil pit. Boulders not in situ.

Plate 3

Features 6, 7, and 8, and soil profile. a. Feature 6. Possible fire pit. b. Feature 7. Assemblage of unmodified rocks. c. Feature 8 fire pit. d. Soil profile, north wall of pit N9. Height of wall: 19 inches. A level line passes just below center of profile.

Plate 4

Burials 5, 6, and 7. a. Burial 5. b. Burial 6. c. Rock cairn covering Burial 7. d. Burial 7 after removal of cairn.

Plate 5

Scraper planes, top and side views. a. Type IA. b. Type IB. c. Type IIA. d. Type IIB. e. Type IIC. f. Type IID. g. Type III. Arrows indicate the two worked edges and the direction of flaking. Length of d, 9.5 cm; rest to scale.

Plate 6

Scrapers, choppers, and hammerstones. a. Side scraper. b. End scraper. c. Multiedged scraper. d. Discoidal scraper. e and f. Semiovoid scrapers. g. Thumbnail scraper. h. Miscellaneous scraper. i. Unifaced chopper. j. Bifaced chopper. k. Unifaced-bifaced chopper. l and m. Core hammerstones. n and o. Cobble hammerstones. p. Multifaced core. Length of i, 11.5 cm; rest to scale.

Plate 7

Milling stones. a. Repaired basin milling stone from feature 2; length, 43.8 cm. b. Basin milling stone; length 19.0 cm.

Plate 8

Manos and miscellaneous ground stone objects. a. Type IIA mano from feature 2. b. Type IIB mano. c. Type I mano. d. Type IIC mano fragment. e. Type III mano fragment. f. Abrading stone. g. Pitted rubbing stone. Length of b, 15.6 cm; a, c, d, e, f, and g, same scale. h, i, j, and k. Shaped stones. Length of i, 8.2 cm; h, j, and k, same scale.

Plate 9

Blades, projectile points, gravers, and crescent. a, b, and c. Large knife blade fragments; c may be a base fragment. d and e. Gravers. Arrows indicate points from which spalls have been struck. f, g, h, i, j, and k. Large leaf-shaped points. l. Large flaring sides point. m and n. Large contracting stem points. o. Large small-stem point. p. Large basal-notched point. q. Concave-base point. r. Small lozenge-shaped point. s. Small leaf-shaped point. t. Small contracting stem point. u. Small side-notched point. v. Crescent fragment. Length of a, 7.9 cm; others to scale.

Plate 10

Incised stones, pendants, and quartz crystals. a, b, c, d, and d'. Incised stones. Two sides shown for a and c; d' is a scale drawing of the design on d. e and f. Quartz crystals. g and h. Stone pendants. Length of a, 8.9 cm; rest to scale.

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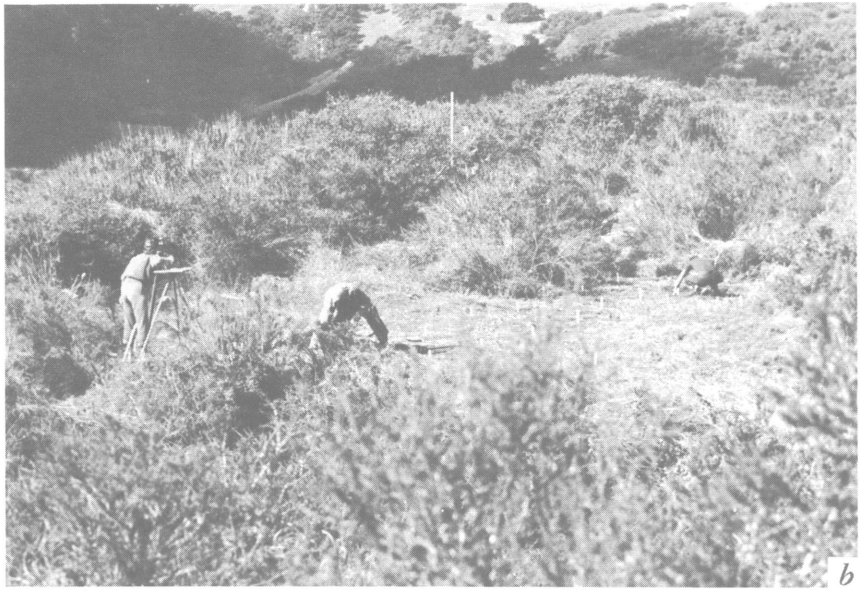

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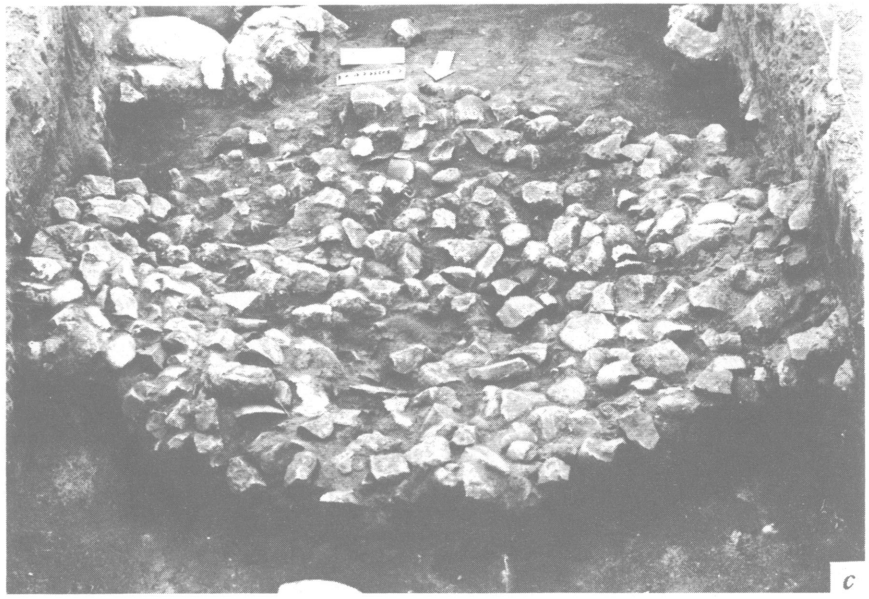

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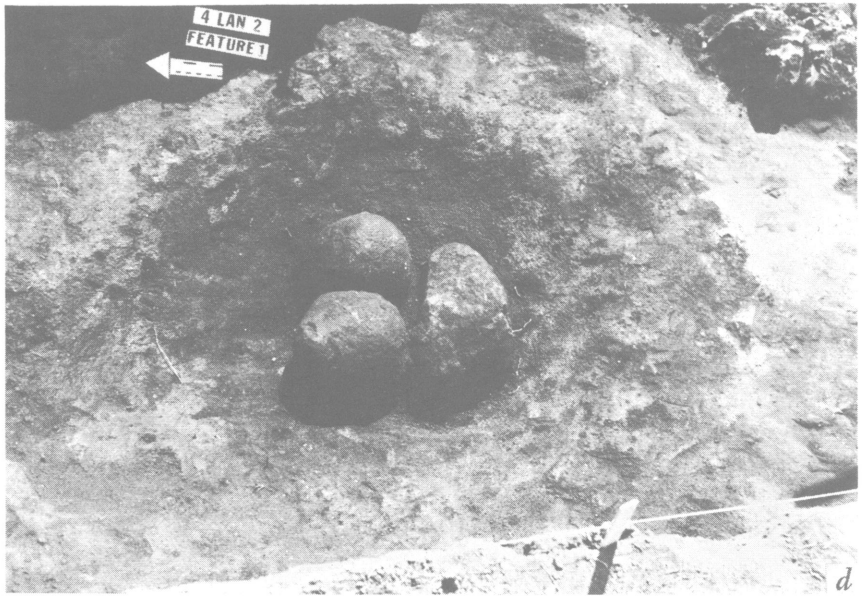

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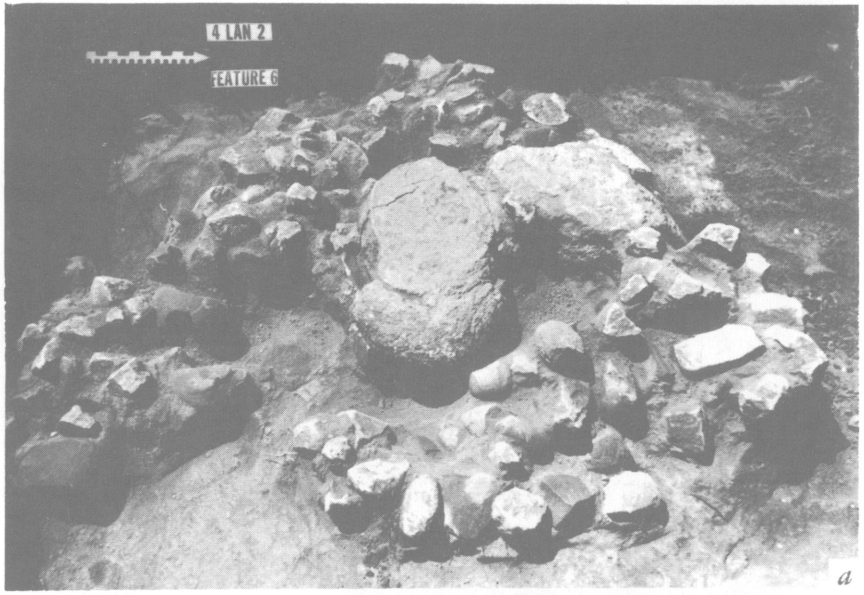

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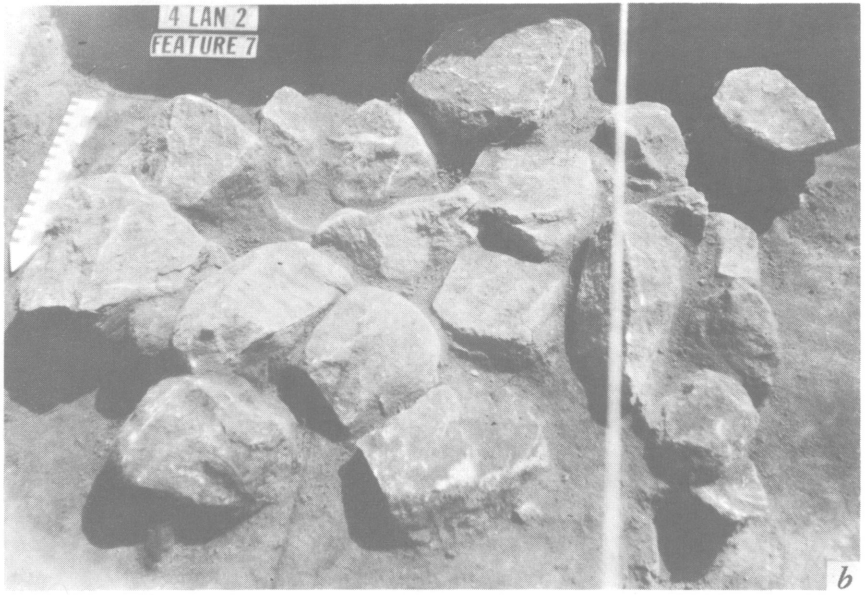

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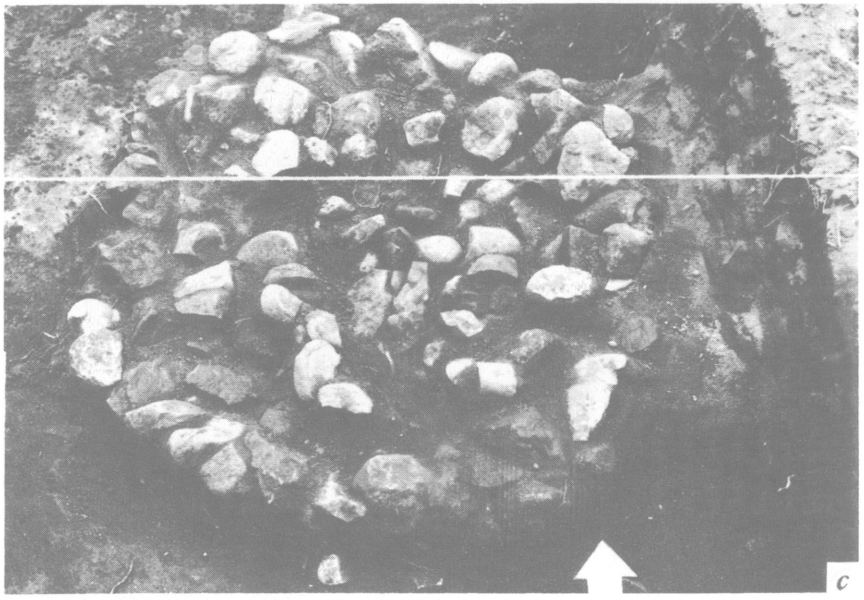

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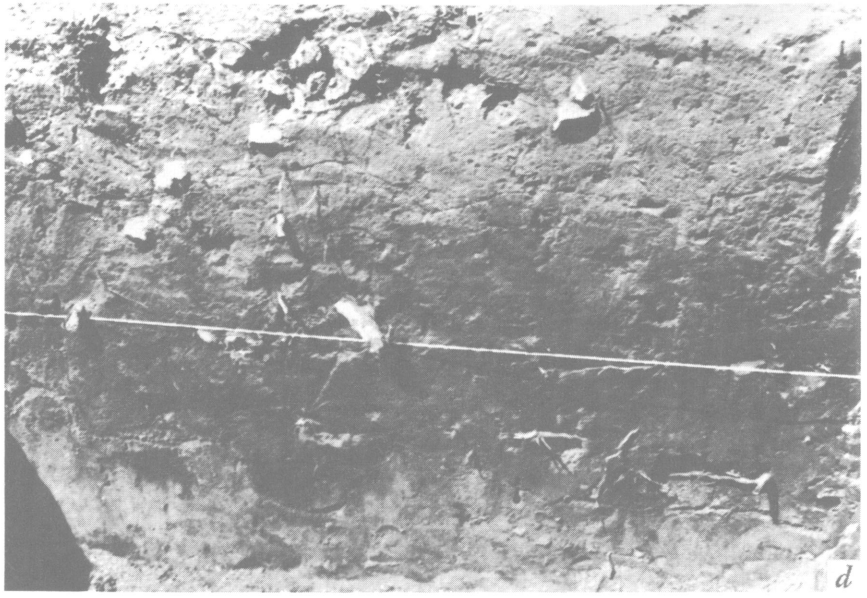

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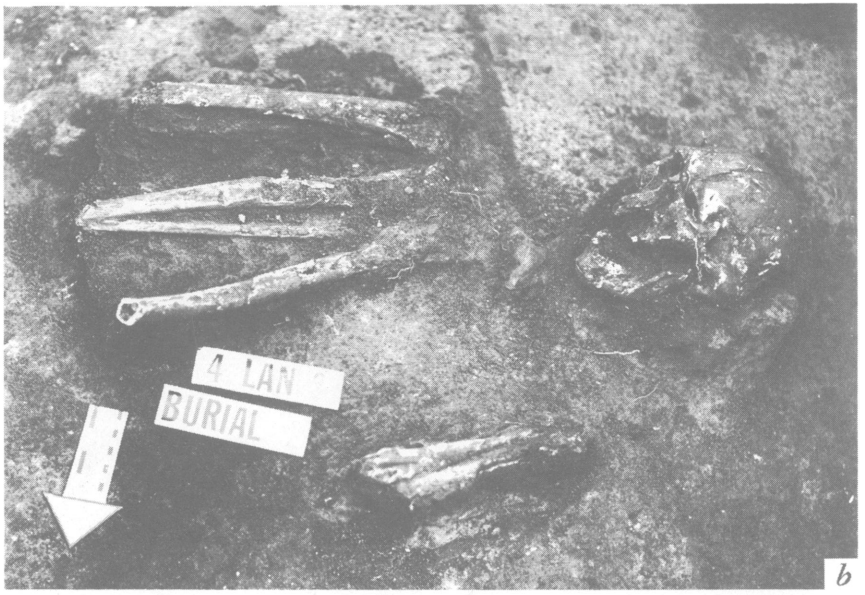

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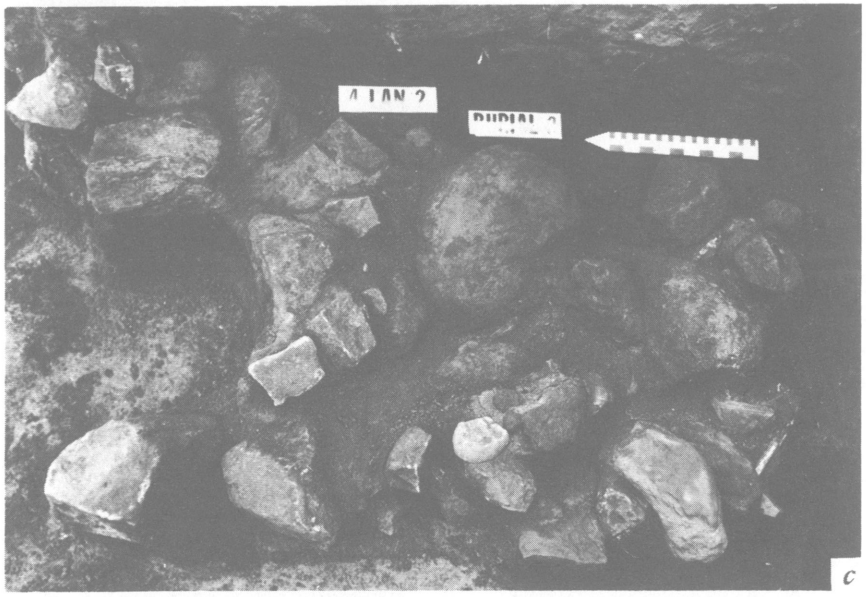

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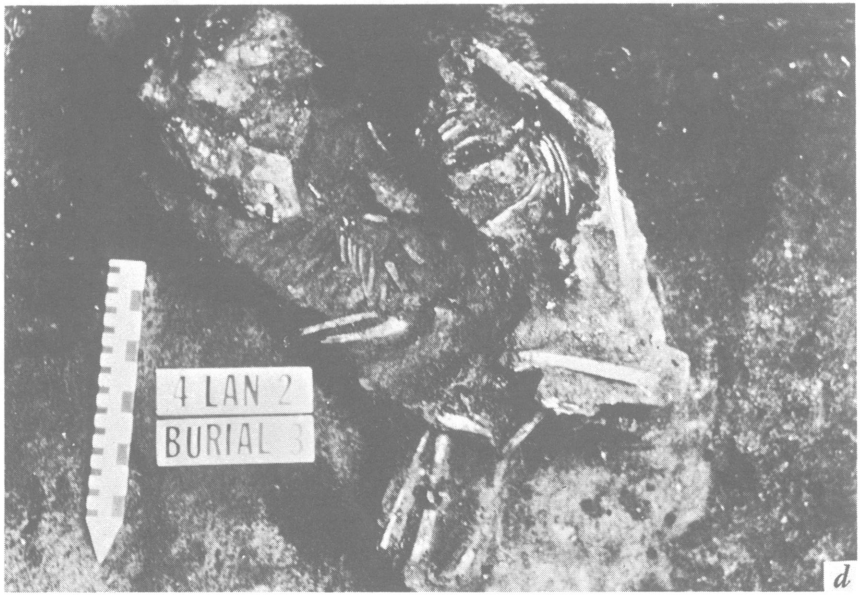

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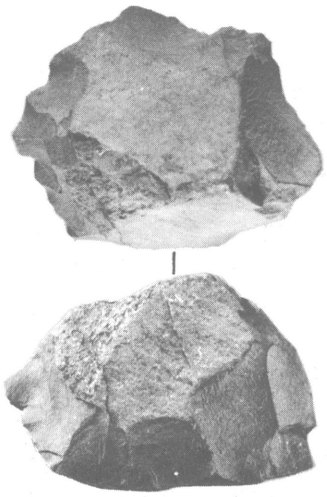

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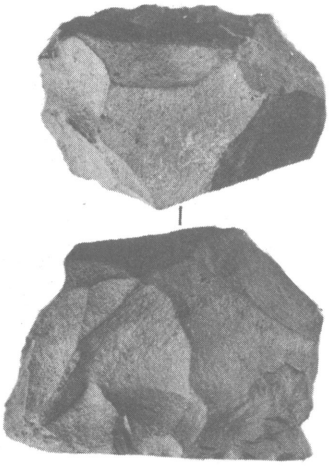

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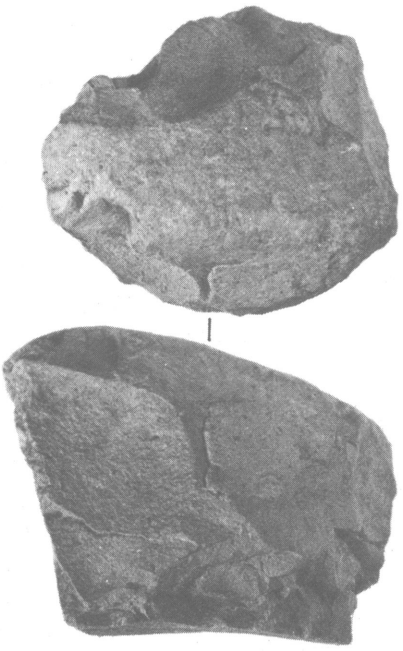

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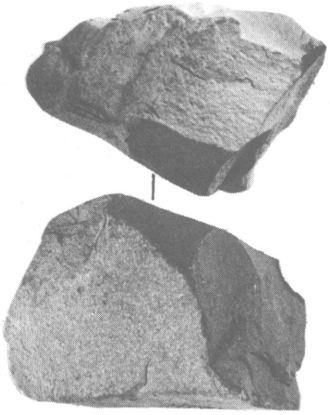

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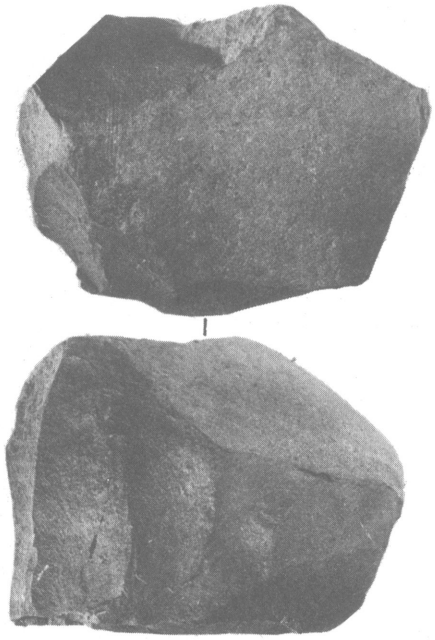

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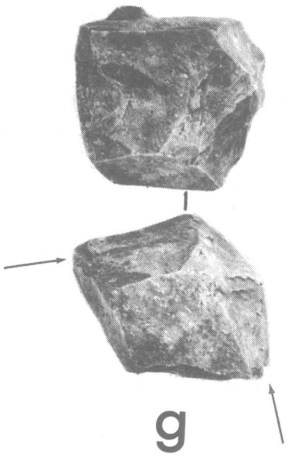

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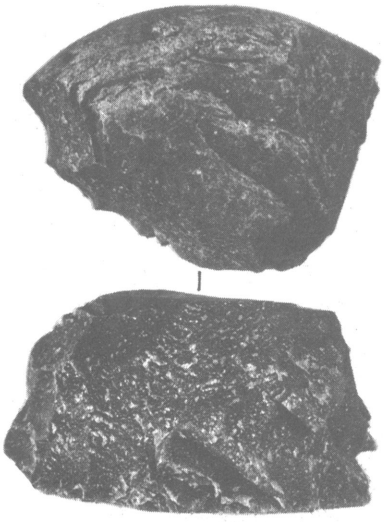

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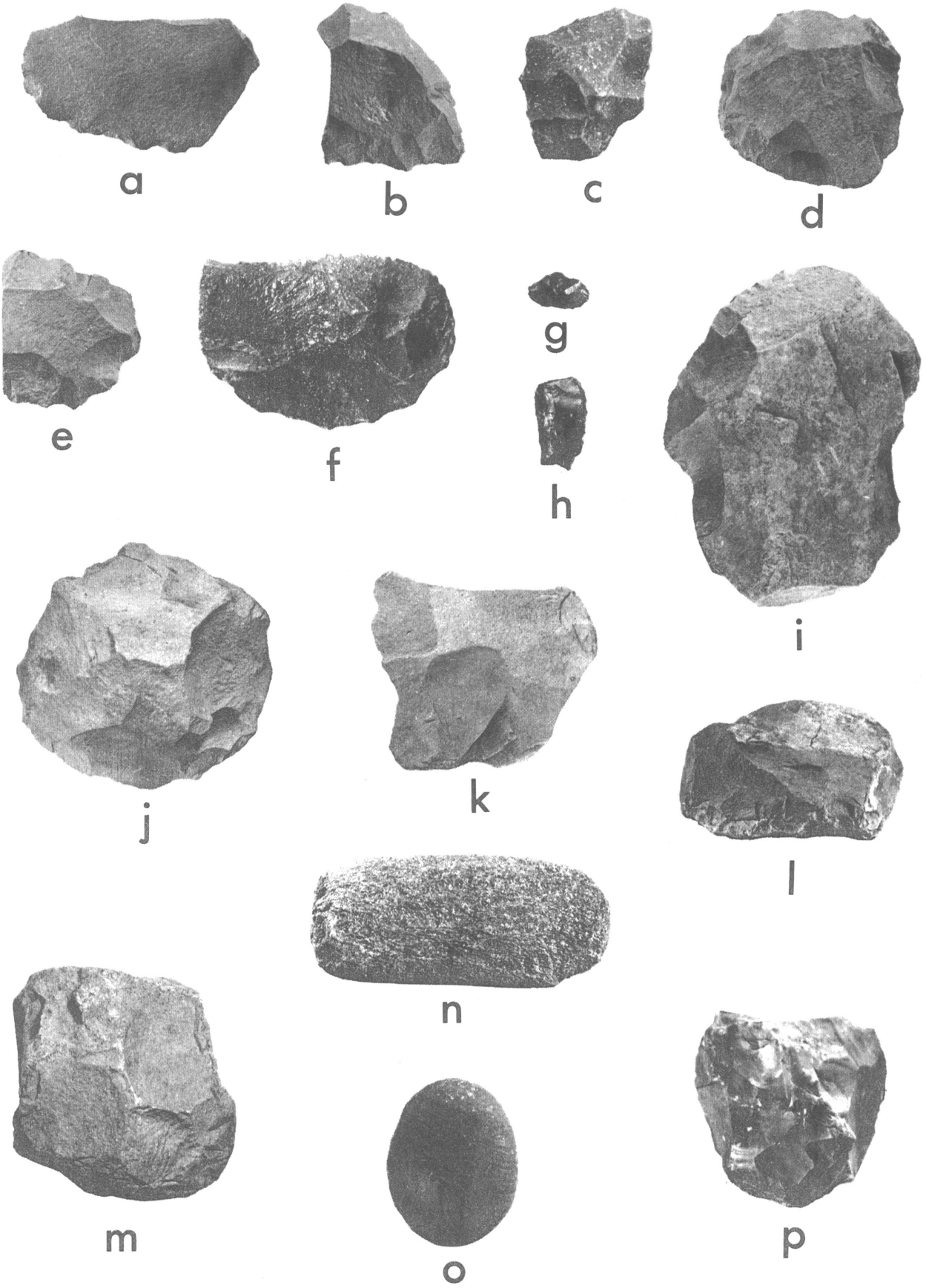
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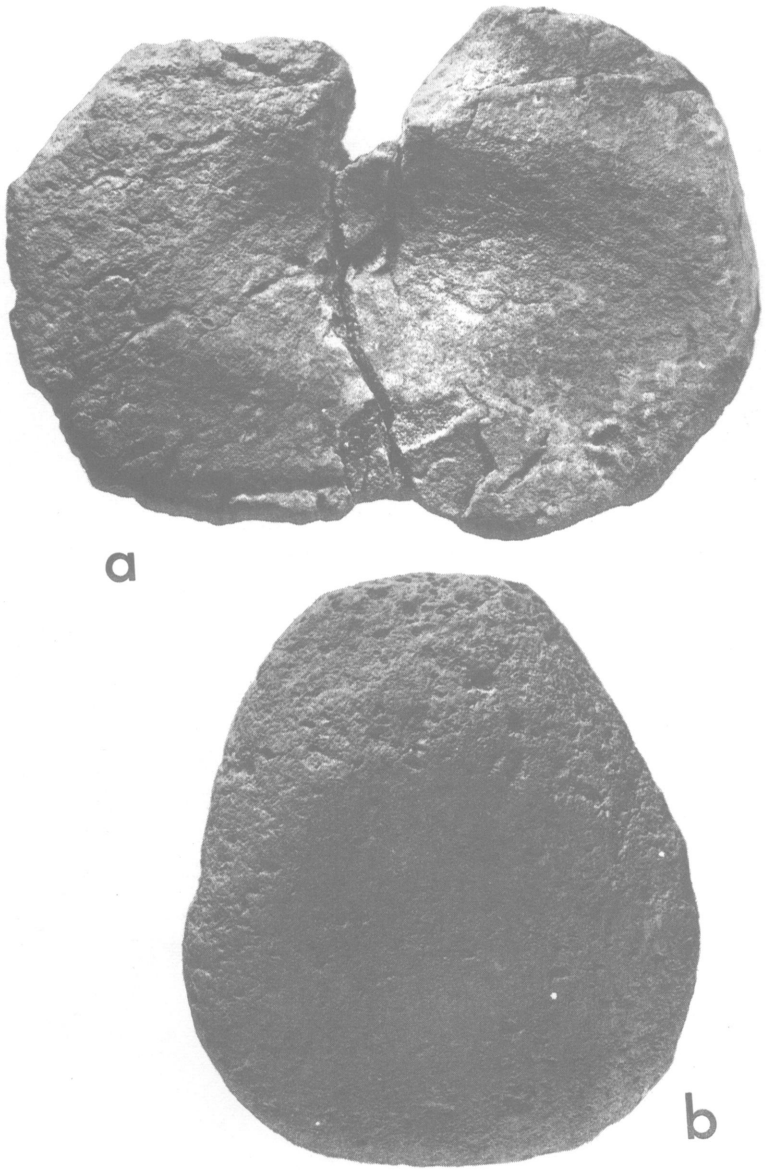
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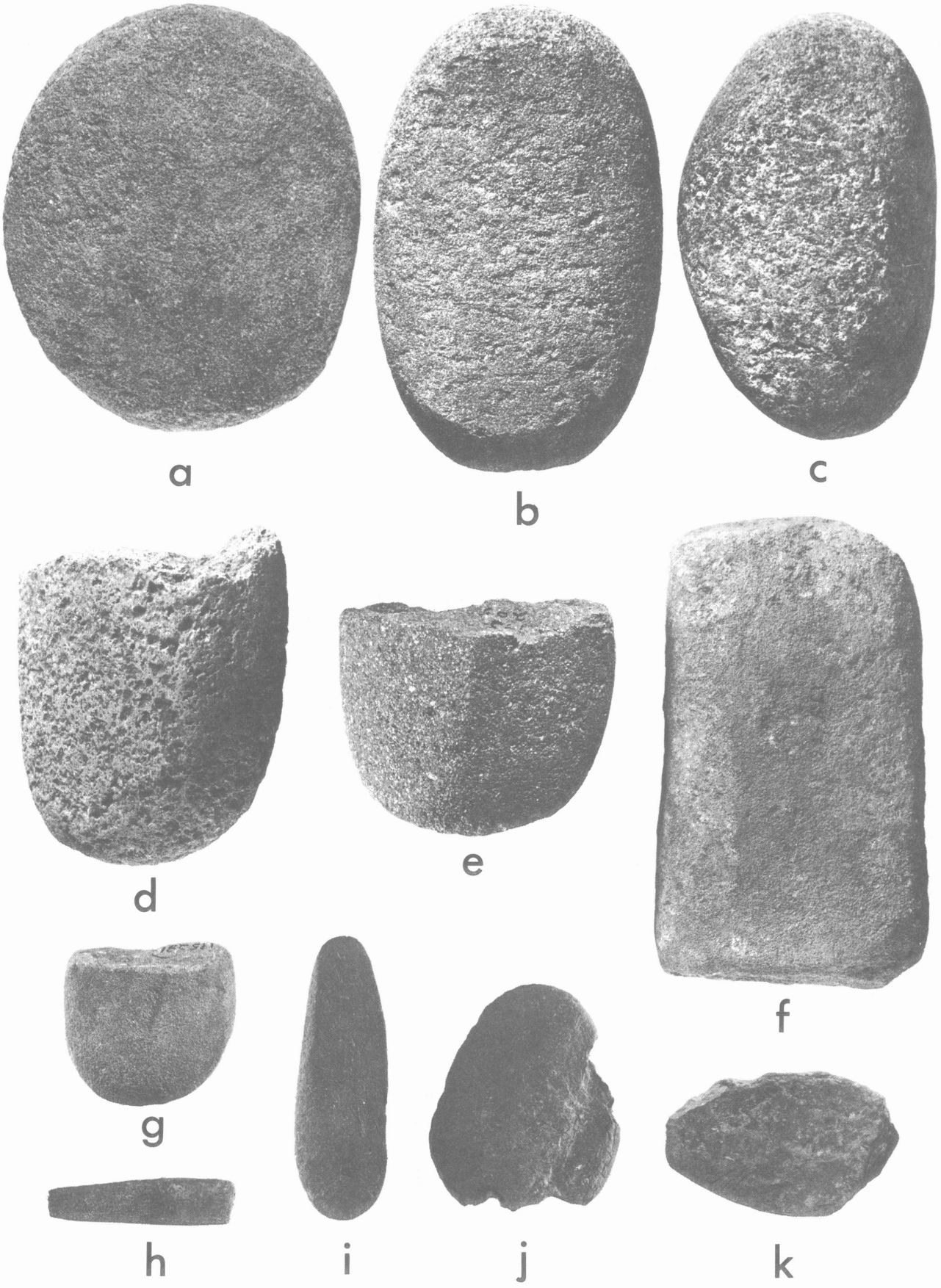
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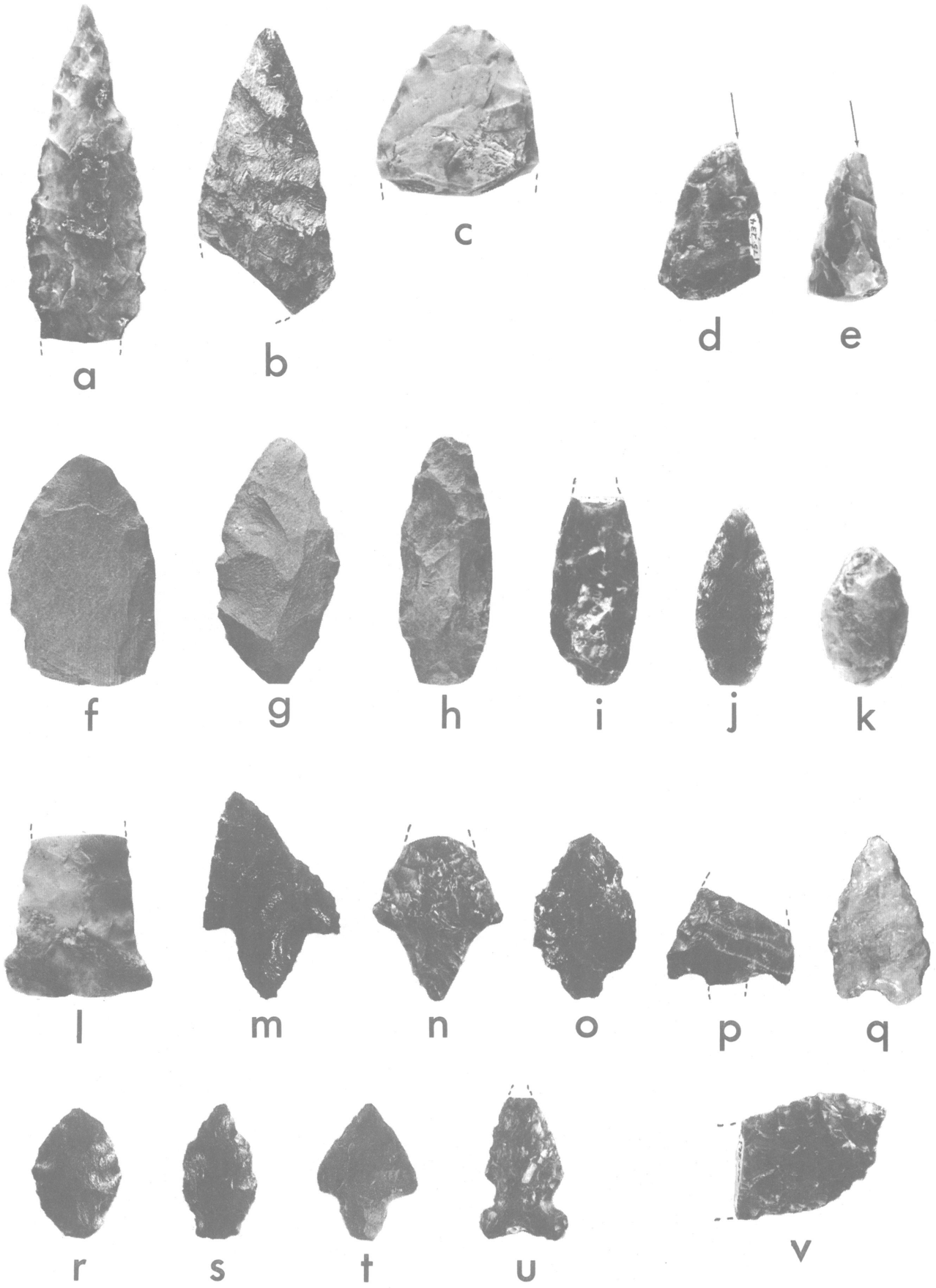
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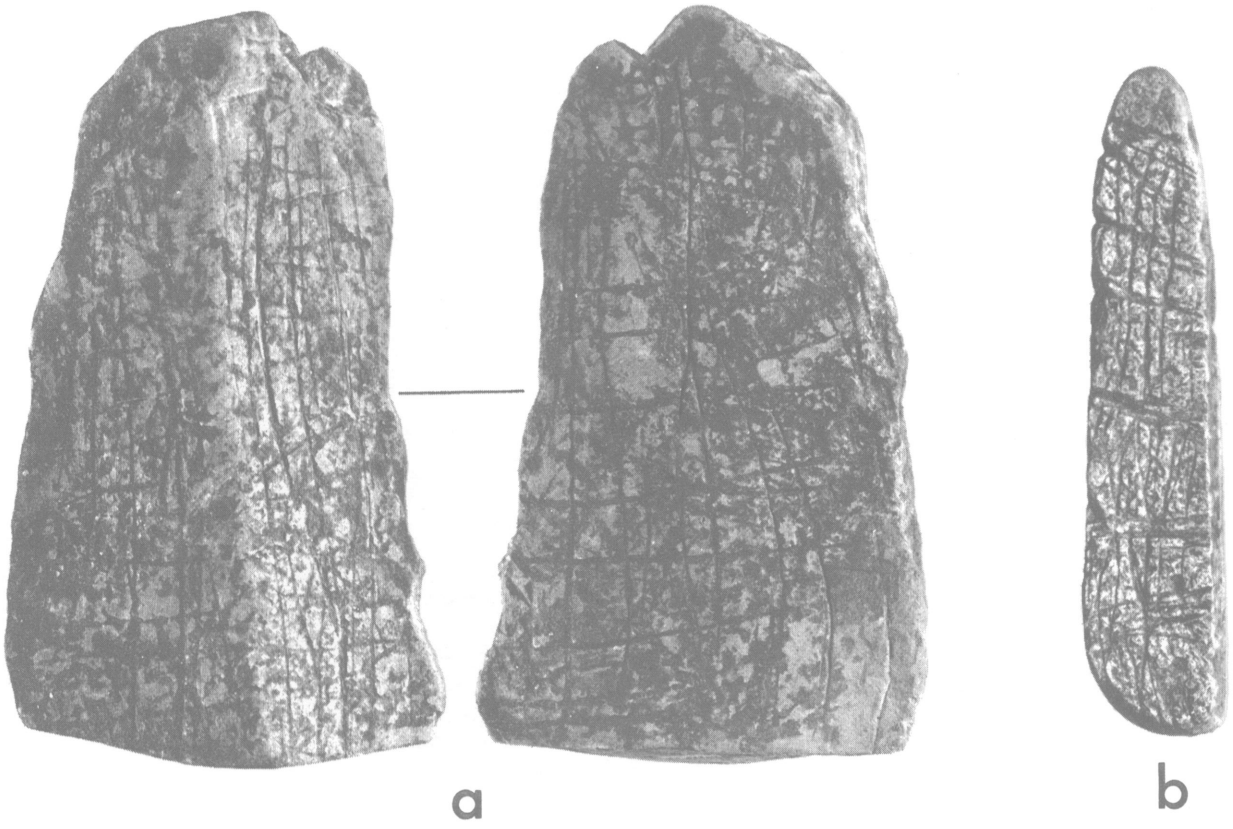
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