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FINAL REPORT ON EXCAVATIONS, 1948

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A. E. TREGANZA AND A. BIERMAN

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INTRODUCTION

The year 1946 marked the discovery of the Tank Site by Robert F. Heizer and Edwin M. Lemert. Their work was synthesized in a paper entitled "Observations on Archaeological Sites in Topanga Canyon, California" (Heizer and Lemert, 1947). Here, so far as the small sample from test pits and surface collections permitted, they briefly defined the Topanga Culture, described the artifacts related to it, and indicated its possible cultural associations. Heizer and the senior author of the present paper were convinced that the Tank Site could fruitfully be further examined in the light of large-scale excavation. This was considered necessary to determine more closely the context of the Topanga artifacts, and the nature of the occupation here expressed. The answers to these two problems should contribute importantly to our understanding of the archaeology of southern California.

In the spring of 1947 R. L. Beals, of the University of California, Los Angeles, and R. F. Heizer, of the University of California, Berkeley, agreed to sent a joint party into the field the following summer. This coöperation between the two institutions marked a new step in furthering the progress of archaeological research in California, and gave students an opportunity to participate in active field research. In June, 1947, the senior author, assisted by Miss Consuelo Malamud, a graduate student at UCLA, initiated excavation at the Tank Site. Undergraduate and graduate students from both campuses of the university as well as from San Francisco State College acted as volunteer workers. The results of this investigation have appeared under the title, "The Topanga Culture: First Season's Excavation of the Tank Site, 1947" (Treganza and Malamud, 1950).

The activities of the first season should have brought to light a fairly representative sample from the site, but time imposed certain limitations, and much of what was uncovered only added to the list of problems. Further, the Tank Site as a unit was, presumably, known with some certainty, but there was little comparative material in which to frame the results. Therefore, three major lines of evidence remained to be investigated: (1) Additional excavation was necessary to verify the possible stratigraphy noted and to fill out the burial data and certify the typology established on the basis of the finds to date. Moreover, the Tank Site had demonstrated itself to be a deposit of unusual interest and importance; whatever added knowledge could be gained from it would be valuable. (2) LAn-2, just west of the Tank Site, required more intensive examination. From surface collections and test pits it was apparent that this site afforded clues to the interpretation and extension of the stratigraphy noted at the Tank Site, and it might represent a cultural development heretofore undescribed for the area. (3) A survey of the canyon should be undertaken so that the Topanga Culture could be viewed beyond its narrowly known confines. The problem was to gain an estimate of the number of lithic sites within the canyon drainage, and the points of similarity and difference between these and the Tank Site.

With the above three problems in mind, archaeological investigations were renewed in Topanga Canyon on the same coöperative basis as the previous year. We are indebted to the following students, drawn from the three state institutions mentioned above, for volunteering their time and energies in behalf of the project: Richard Bachenheimer, Alan Beals, Hal Eberhart, Robert Farrell, David Frederickson, William King, Harland Kinsey, Joseph Kreisler, Donald Lathrap, Albert Mohr, Arnold Pilling, and Barbara Wyman. The authors acted, respectively, as field director and assistant field director. Agnes Bierman and Albert Mohr are responsible for most of the field photography, mapping, and surveying.

The general conclusions reached in 1947 were not substantially altered by the additional excavation. Nor did it help to solve all the dubious aspects of the Topanga Culture. As might be expected, it led, rather, to the formulation of further questions. However, new specimens and more complete data add fullness to this report, and it is hoped these will increase its utility for comparative studies.

With respect to physiographic location and archaeological assemblage, the Tank Site does not conform to other sites previously known for the general environs. Comparisons with the earliest horizon yet recognized to the north, the Oak Grove of the Santa Barbara region (Rogers, D. B., 1929), seem to offer the most satisfactory parallels as related to mortuary practices and milling activities; however, inasmuch as the Oak Grove Culture is not characterized as having a well-defined flake and core industry we are forced through necessity to seek further comparative data as expressed in the cultural inventory of the San Dieguito complex in the extreme southern coastal area of southern California and among the remains from the region of ancient Lake Mohave in the eastern desert. It is both interesting and a problematical that here at Topanga we find in a single cultural complex an almost complete record of all the recognized cultural elements typifying early man in southern California. In addition to this early-man complex there remains a residue of material which appears to be best associated with cultural traits characteristic of a "middle" time position. Such middle cultures can be tentatively identified with Point Dume, the lower levels of Malaga Cove, the Little Sycamore, the Hunting

Culture of Santa Barbara, the Pinto-gypsum of the desert, and the La Jolla phases of San Diego although the latter are at present poorly defined. At the Tank Site (LAn-1) these traits, which are of "middle" position, have been named Topanga Phase II, and significantly enough they are confined to the upper 18 inches of the deposit. Site LAn-2, excavated this season, proved to be almost exclusively Phase II from top to bottom. Since these two sites occupy almost contiguous positions and with the distribution of cultural elements being such as it is, the suggested cultural stratigraphy observed in 1947 seems to be fairly well confirmed.

In addition to the economic and subsistence aspects we now know something concerning the socioreligious patterns as practiced at the Tank Site. Disposal of the dead is expressed in three forms: (1) primary inhumation in the flesh; (2) partial reburials under metates; and (3) fractional burials with interment of leg bones only. This variation in a single site is of interest. Formality appears present only in the first form; here all the bodies were fully extended with the heads orientated toward the south. Other than manos and metates, mortuary offerings were rare. In only one instance (Treganza and Malamud, 1950, burial 3) did we find what could be called a positive artifact association, that of a chert blade and a quartz crystal.

Artifacts of apparent nonutilitarian usage leave us with the convenient, but not to satisfactory, classification of "ceremonial." It is only through inference that we can assume functional use in ceremonies of such objects as cog stones and a variety of stone disks. Since the spindle-shaped charm stone and the stone cogs and disks appear to be nearly mutually exclusive of one another in their distribution between central and southern California, it is not improbable that the latter constitute the "charmstones" of the south.

Too frequently typological construct and metric measurements lead to sterility of interpretation divorced of any humanistic concept. At one time the Tank Site was occupied by a living culture and to some degree the occupants must have participated in activities other than those surrounding a fulfillment of a food economy. To this point it is difficult to explain large lithic concentrations consisting of unworked stone, broken metates and manos, core tools, and occasional sections of human long bones. Such occurrences are too large and too frequent to have resulted from mere chance, and for this reason we have given them the term "features." The material content of these aggregations suggests refuse dumps of worn out and broken implements, but if so they would collectively have occupied a considerable part of the central living area. Conceivably their central location could suggest some ceremonial involving the concept of a "shrine." That these features could represent some manifestation of the "Annual Mourning Ceremony" seems most dubious. Irrespective of the probability that the Mourning Ceremony is ancient in southern California the differences in cultural inventory and time between the Tank Site and the early and historic phases of the Gabrielino are such that it would be wishful thinking to imply any historical connection.

Earlier the Topanga Culture as depicted by the Tank Site has been characterized as largely constituting a seed-gathering economy. This characterization rests upon the presence of a large number of manos and metates as opposed to the decided rarity of projectile points and the near absence of mammal bone in the site deposit. Some what of a problem is the high ratio of core and flake tools. In American archaeology it has been popular to assume that flaked lithic assemblages automatically imply a hunting and skin-dressing economy. Possibly this assumption represents an Old World hangover with its overemphasis upon faunal associations merely because of their tangible nature as opposed to the lack of preservation of organic plant remains. In the light of all evidence, the situation at the Tank Site strongly suggests the possibility of alternative interpretations up to the point where we might consider a dual usage, or if the data permit, emphasize either a plant or animal economy.

During the first season's excavations it was our belief that the area excavated at the Tank Site was, so far as we knew, undisturbed, and any conclusions reached rested upon that basis. It is significant to note that during this season, as a result of our regional survey, we contacted a man named Trujillo, a resident of Topanga Canyon for some sixty years, and from him we gained considerable information pertaining to the Tank Site and the Topanga Culture in general. Mr. Trujillo informed us that it was his practice for some years before 1920 to plant a small hay crop over the area we were presently excavating, and prior to the first planting he had removed numerous oaks and pointed out a now dead, native black walnut that was alive during his earlier days of cultivation. Mr. Trujillo was fully aware that this was an archaeological site and told us he was forced to move many metates and large stones away from the area under cultivation. This action on his part may account in some measure for the somewhat reduced number of large stones in the very upper levels of the site (0 to 8 inches). As the habitation deposit occupies the very top of a knoll, the frequent plowing must have increased surface erosion to some degree.

Unknown to us earlier were two springs near the Tank Site which possibly had some bearing on the original selection of this local. It was through Mr. Trujillo that these springs and several additional Topanga Culture sites were found. Mr. Trujillo, in his own way, had come to recognize these metate- and mano-bearing sites to be old and contrasted, as he says, "with the sites down along the creek where the soil is soft and dark with some sea shell and where mortars occur and the burials are all folded up." Such characteristics are typical of sites occurring in the protohistoric and historic period.

Probably most significant of this season's work was the partial excavation of LAn-2 located on the same ridge and about 350 yards below the Tank Site. Through our efforts here we were able to confirm the suspected stratigraphy in the Tank Site and, at least partly, define Phase II of the Topanga Culture. Of greatest contrast is the appearance of flexed burials and the exclusive occurrence of light projectile points. Although core and flake tools are still present, a definite shift occurs in the material from which they are made and the tools themselves do not dominate the cultural inventory.

From the Tank Site the artifact yield per cubic foot almost doubled that of the 1947 season. From the removal of approximately 2,496 cubic feet of mound we obtained 5,895 typable artifacts (all specimens and original data for 1947-1948 are now deposited in the Museum of Anthropology, University of California, Berkeley) or on the average of 2.3 artifacts per cubic foot of dirt removed. Compared to other California mounds, this figure is exceptionally high. Only in the Sacramento Valley among Late Horizon sites where baked clay objects were manufactured as a substitute for stone do figures run correspondingly as high, and even here one has to consider a single class of artifacts rather than a full range as expressed in the Tank Site. One explanation for the great increase for this season is that most of our excavations were conducted in the shallow part of the site (0 to 8 inches) where the bulk of the artifacts occurred.

REVIEW OF EARLIER WORK AT THE TANK SITE

Concerted excavation at the Tank Site was first carried on from June 19 to August 5, 1947. The immediate aim was to explore as fully as time permitted the nature and extent of the deposit. In the main, interest revolved on cutting long trenches, test pitting, and expanding in favorable areas. The compact nature of the soil and the heavy artifact yield retarded clearing. Nevertheless, some 5,000 cubic feet of mound earth was removed which bore an artifact content of one finished implement to every 1.5 cubic feet.

Within the limitations imposed by archaeological conditions, the excavation made possible certain inferences regarding the over-all pattern and associated complexes derived from an open site typified by crude percussion-flaked core tools and basic milling implements. The chipped stone has been compared to that described for the San Dieguito and Lake Mohave cultures. It includes a somewhat ill-defined variety of scraper planes, scrapers, choppers, projectile points, and large blades. Our Topanga series of scrapers and planes was numerically large enough and exemplified a sufficient degree of internal variation to warrant a breakdown into descriptive categories or types. Ground- and pecked-stone pieces consisted mainly of manos and metates. Here too, quantity and diversity allowed a reduction to types. The cultural validity and developmental implications of the typology presented are limited although some such considerations were discussed. Specimens represented only sparingly, as was true with a number of forms of flaked tools, and especially mortars, pestles, cogged stones, disks, and ornaments, have been described individually. For additional details and for information not included here the reader is referred to the earlier published report (Treganza and Malamud, 1950).

On the basis of eight burials, all in poor condition, two modes of interment were recognized: primary inhumation and reburial. Difficult to characterize concisely are the various manifestations defined as features. They include unusual aggregates of stone and/or implements, hearths, or any circumstance that appeared atypical of the relatively homogeneous midden deposit as it was understood in 1947.

A physical analysis of the mound mass and its contents indicates a considerable degree of antiquity for the occupation represented. The midden material is extremely compact, and there is a suggested development of a soil profile. With the exception of fragmentary, occasional bits of shell, charcoal, bone, and a trace of ashaltum, all organic substances have long since disappeared from the site. What little mammal bone remained was almost inevitably in a poor state of preservation, generally fragmentary, and considerably decomposed. Marine shell, crushed and friable, was encountered in occasional pockets in the lower limits of the deposit and under inverted metates. This shell probably represents evidence of the occasional use of shellfish as a dietary item. No shell artifacts were found below 6 inches and all shell refuse was found below 48 inches. The few artifacts as were found in the upper levels were only in a fair state of preservation and can probably be assigned to Phase II occupation.

As our primary interest was in the Tank Site, and our time limited, archaeological reconnaissance in the vicinity was necessarily curtailed. Four lesser sites yielding core tools, and manos were noted along the small tributary system on which the Tank Site is located. One of these, LAn-2, was test-pitted. An additional site, LAn-6, typified by "Topanga-like" artifacts, was recorded on the western periphery of the San Fernando Valley just over the divide from Topanga Canyon.

LOCATION AND DESCRIPTION OF SITES

The prefix and numbers used in this paper to designate archaeological deposits will follow the system now being used by the University of California Archaeological Survey. All data on sites are filed in the central office of the Survey, Department of Anthropology, University of California, Berkeley. In this paper, LAn stands for Los Angeles County.

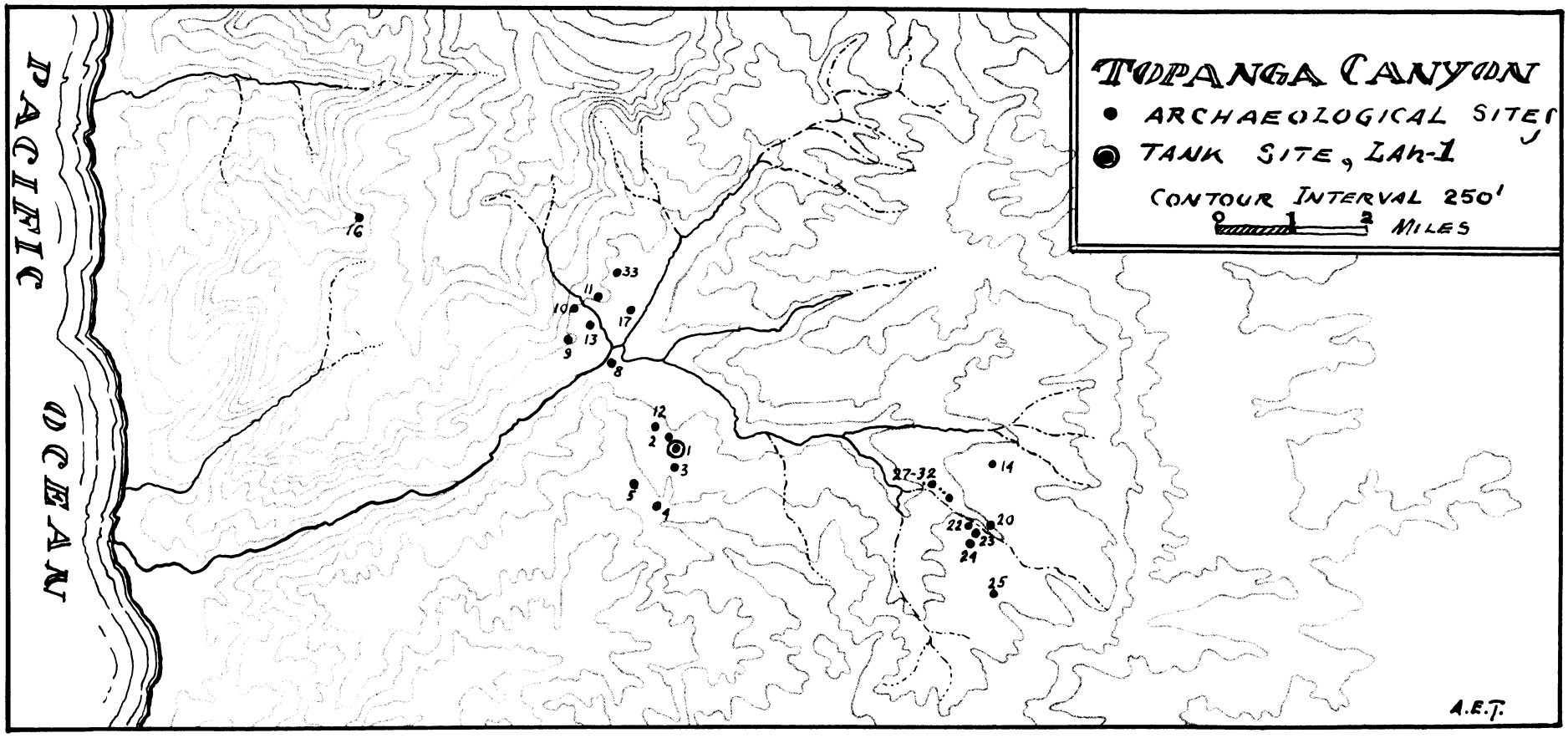
LAn-1 (Tank Site).—Our type locality, the Tank Site, occupies a well-drained knoll high up on the eastern side of Topanga Canyon (elevation 1,214 feet) some 4 miles inland from the Pacific Coast. The tract of land upon which the site lies is known locally as the "92 acres" (See Treganza and Malamud, 1950; and maps 1 and 2).

LAn-2 (map 3).—This site lies on the "92 acres," about 350 yards west-southwest of the Tank Site, on the same ridge but at a lower elevation. At this point the ridge narrows almost to a hogback about 75 feet wide, terminating in a small knoll. There were signs of occupation for a distance of 300 feet along the ridge. The exact limits could not be determined since the vegetation had been bulldozed off earlier and the deposit had been dragged. Excavation at this site established the basis of Topanga Culture Phase 11.

LAn-3.—This site is located on the Trippet Ranch just within the city limits of Los Angeles. It occupies the same ridge as the Tank Site but lies at a higher elevation and some 450 yards to the east. The western edge of the site and the nearby canyon are covered with live oaks, sage, and manzanita. Most of the surface has been disturbed, for the land was formerly planted to grain. The limits of habitation are marked by compact light-brown soil, which discolors slightly the yellow surrounding earth. There is no perceptible rise in contour. Artifacts typical of the Tank Site were observed weathered out of the occupation surface. The former living area was estimated about a hundred square yards. The deposit appeared only a few inches deep; however, this was probably a village site, though occupied only for a short time. An abundance of tarweed, restricted to the deposit area, might well be considered a vegetation association.

LAn-4.—This site is located in the saddle of of ridge which separates the Topanga Canyon drainage from that of the Santa Ynez Canyon, about one-half mile east-southeast of the Tank Site. The saddle is well covered with live oaks and manzanita. The habitation deposit is marked by a slight discoloration of the soil and yielded a few manos like those of the Tank Site. At best, the site was probably just a temporary camping spot.

LAn-5.—As at LAn-4, the evidence of occupation, consisting of typical manos, was found in a small saddle of a ridge directly across the ravine from, and about


TOPANGA CANYON
ARCHAEOLOGICAL SITES
TANK SITE, LAn-1
CONTOUR INTERVAL 250'
0 1 2 MILES
PACIFIC OCEAN
A.E.T.
16
33
11
10
17
13
9
8
12
2
1
3
5
4
27-32
14
22
20
23
24
25

one-half mile south of, the Tank Site. Large live oaks are the predominant vegetation. No extensive habitation area was noted, though the evidence might well have been hidden under leaf mould.

LAn-6.—This site is of interest since it may indicate an occurrence of the Topanga Culture in the San Fernando Valley. The deposit is located on the periphery of a citrus grove in the eastern foothills of the valley, near Girard. Cultural associations consisted of Topanga-like scrapers and choppers composed of a tough, light-colored rhyolite. There were no signs of occupation. It is not improbable that this was a quarry site; an outcrop of rhyolite is close at hand. However, no quantities of reject refuse were noted; nor did any core or flake tools composed of rhyolite occur in the Tank Site series to suggest trade or contact between the two sites.

The two San Fernando Valley sites, the Big Tahunga and Porter Ranch sites, reported on by Mr. Edwin Walker (Walker, 1936, 1945) of the Southwest Museum, appear to have no relation to LAn-6 or bearing on the problem of the Topanga Culture.

LAn-8.—Topanga Post Office and a number of smaller buildings now stand directly on this site, though parts of it are still evident where it extends south to the highway. Except in the dry summer, water is available in the creek just across the road and there are two springs less than half a mile to the west.

The low mound has been badly cut through by latter-day road and building operations, thus an area of only about 200 square feet remains uncovered. Even here the surface has been considerably disturbed, but, at the same time, a large number of artifacts have been exposed and are to be found scattered over the dark, friable midden soil, interspersed with rejects and shell fragments. The artifacts noted consist of general core tools and a possible mano fragment. One shell disk bead (diameter, 3 mm.; thickness, 1 mm.; diameter of perforation, 1 mm.; unidentifiable shell) was collected.

LAn-9.—Located on a small rocky knoll, formed by a spur descending from the range on the west side of the canyon, the site is .5 (unless specified, all mileages noted are in air miles) of a mile northwest of LAn-8 and .3 of a mile due south of the ranch house of R. Kiewit. Water is available at a spring, .25 of a mile northwest, rising from the bed of an intermittent creek that drains into Topanga Creek.

In appearance the site is very different from LAn-8. The mound soil has been consolidated to a near-clay, so that it varies only from the surrounding clayey soil in being somewhat darker. It extends over an area of 100 square feet, but few artifacts are evident on the surface. Those collected consist of 8 single-edged scraper planes and 1 bifacial chopper. Of the planes, 2 were additionally utilized as choppers on the edge opposite that which had been worked. All artifacts were basalt with the exception of 2 quartzite planes. Patination was evident on all the basalt specimens, though not as heavy as on similar implements from a number of the other sites.

LAn-10.—This site is situated on the adjoining ridge, only .13 of a mile northwest of LAn-9 and is correspondingly closer to the spring, which from here is due north. Both in physiographic location and appearance the two sites are very similar.

The area covered by mound soil stretches along the ridge some 250 feet and is 70 feet wide. But the soil is compact and consolidated and only slightly dark. A portion of the site area has been somewhat disturbed by the construction of a milk house, stockyard, and fences. Artifacts picked up from the surface consist of manos, choppers, scraper planes, and hammerstones. Of the manos, 5 are bifacial—3 with parallel wear surfaces, 2 wedge-shaped in cross section—and of these, 2 are trifacial, with the two sides that form the keeled back meeting at right angles. In cross section, all the used areas are only slightly convex. Most show considerable wear and good shoulder development, display pecking on their grinding surfaces, and all but 2 granitic specimens are of sandstone. A single monofacial chopper of basalt is well battered along its edge. Out of 7 single-edged planes, 2 have been secondarily worked and used as choppers on an edge other than that developed on the periphery of the plane, and 6 are basalt and 1 is quartzite. One small, flat scraper has two localized adjacent concavities struck from its margin and is also of basalt. Of the 3 core hammerstones, 2 are basalt and 1 is quartzite. Considerable chemical alteration is obvious on even the flaked surfaces.

LAn-11.—Located in the vineyard of the Kiewit Ranch, this site is less than .2 of a mile west of north from LAn-10. The spring already mentioned is immediately to the east, and another, on the property of S. Barton, is .3 of a mile north-northeast.

This site has much in common with LAn-9 and LAn-10. The sloping knoll on which the site is situated is part of the ridge that forms the north bank of the intermittent creek. The leeched, indurated soil is hardly recognizable as occupational deposit, but the fact that it forms a site is obvious from its slightly darker coloring and the scattered surface artifacts and reject material. These are thinly strewn over an area of 200 feet by 100 feet, and are found to a depth of 2 feet in the bank resulting from a road cut at the base of the site.

The 10 single-edged planes that come from the surface range from large to small, 9 of which are basalt and 1 a pink mudstone. A single massive double-ended plane of basalt is much battered on its worked edges, which are flaked back on their upper side. Battering is also in evidence along the flaked edge of 4 bifacial choppers, 3 of which are basalt and 1 quartzite. Out of 4 basalt flake scrapers, one has been much used; and of 4 core hammerstones, 2 are basalt, 1 is quartzite, and 1 is mudstone. Manos were represented by 3 bifacial types, the grinding surfaces of 2 being parallel, and 1 meeting at an angle to effect a wedge-shaped cross section. All are well-shouldered, 1 displaying a pecked depression on a single wear surface; 2 are of sandstone, 1 of which is carbonized; and the third is of an igneous rock. Again, on all the basalt specimens the patination is very marked.

LAn-12.—The largest site yet found in the canyon is on the property of Mr. Miller on the road to the Trippet Ranch, .25 of a mile southeast of the Tank Site across an intermittent creek. It was noted that in the creek bed, just downstream from the Miller residence, pools of water, which, according to Mr. Trujillo were spring fed, an exceptionally dry summer season.

The site extends from the ridge where the house is located into the knoll west of the orchard, covering an area of 400 by 300 feet to a depth of at least 30 inches. Artifacts are plentiful on the ploughed and cultivated surface, and the highly indurated mound soil is dark and clayey. Where the deposit has been cut by recent developments, little worked stone is found in the banks; and a 5-foot square pit netted only one fragment of a ground slate pendant, though the deposit extended below the 30 inches to which the excavation proceeded. From the walls of the pit it could be noted that some soil profile had already developed.

Tools from the surface included general core tools,

manos, and metates. A basin metate had been reported; and a fragment of one, of sandstone and shaped on its outer surface, was found. Of 9 manos and mano fragments, 5 are bifacial and relatively thin and 4, monofacial. All but 2 of the monofacial artifacts are sandstone, these being of a granitic rock. In cross section the majority of grinding surfaces are unusually convex, especially as they reach the edge and roll partly up the side. A single basalt pestle fragment was obtained. Scraper planes are well represented by 10 with a U-shaped edge development, some well-battered along the worked margin; and 25 single-edged planes, some of which are very large and most displaying flaking back on their edges, generally on the upper surface of the used edge. Four of quartzite and 1 of felsite porphyry are single-edged, the remainder are basalt. The 4 side scrapers are thin flakes, 2 of basalt, 2 of chert. The 3 choppers are of basalt, 1 having served additional use as a hammerstone, and the 4 hammerstones are basalt cores. Patination is noticeable on all, and smoothed flake scars are not uncommon.

LAn-13.—Six bedrock mortars were found here in a sandstone outcrop of the south bank of the creek, 200 feet upstream from the Kiewit Ranch. As the area is covered by a relatively dense oak grove, the fact that no artifacts were found on the surface in the vicinity may be due in part to the thick fall of dead leaves. However, the soil here beneath the leaf mold is no different from that of the region as a whole, being of a light-colored clayey consistency.

LAn-14.—Three-tenths of a mile northeast of Mineral Springs is a basalt quarry and possible habitation site. The spring water is potable and affords the nearest available water source. Over an area of 100 by 75 feet, surrounding the basalt outcrop, the sandy soil is somewhat darker. Whether this is owing to the decomposition of organic refuse strewn about a habitation site or merely to rock weathering, or in part to both, was indeterminable. The only evidence of former activity are several percussion bulbs and a number of specimens displaying a small amount of regular chipping, which suggest crude scrapers. All of these pieces, moreover, have undergone considerable patination so that they are now quite yellowed even on their flaked surfaces. In general appearance and degree of patination the artifacts from this site show marked resemblance to those from San Fernando, LAn-6, just over the divide.

Four-tenths of a mile to the south, .2 of a mile southwest of the home of M. Biencourt, an isolated chopper was picked from the surface of a spur ridge leading to Garrapata Creek. It is a large bifacial tool, battered on the slightly fashioned working edge, of basalt and patinated. No further indication of aboriginal habitation could be discovered in the near vicinity. Lithic tools and rejects, however, were found on the slope just southeast of the Biencourt residence, apparently weathering from a higher source. Investigation at the time was not feasible, however, and further investigation has not as yet been possible.

LAn-16.—Now almost completely destroyed or disturbed by bulldozing and animals, this site is centered in the chicken run of the W. R. Hamilton Ranch, some 3 miles up the Fernwood-Pacific Road, 1.7 air miles southwest of Topanga Post Office. It sits on a somewhat more level shelf of an otherwise steep slope, the east bank of a ravine from which a permanent spring emanates 12 miles from the site. Over an area 60 feet in diameter, dark friable mound soil is still in evidence, though artifacts are now scarce. Three deep bedrock mortars, and some seven smaller, have been worn into a sandstone outcrop toward the upper end of the site, and a single pestle, and scraper plane of quartzite, came from the surface.

LAn-17.—LAn-17 surrounds the spring on the Barton School property to an indeterminable extent. Recent building and cultivation have obliterated or disturbed considerable portions of the old habitation site; however, from what remains, it appears very similar to LAn-8, .3 of a mile southeast. Artifacts lie on the surface of the dark, friable midden deposit, which contrasts with the surrounding light clayey coil, though the discoloration may have been intensified to some extent by seepage and decay of organic matter derived from the heavy oak grove. The artifacts noted consist of a shallow basin metate, manos, only a few general core tools, and a bedrock mortar in a boulder, some 300 feet from the spring.

LA-21 and LAn-21.—Located on a level shelf adjacent to the west bank of Garapata Creek, the site is .72 of a mile east-northeast of Mineral Springs. The upper half is separated from the lower by a 4-foot sandstone face that divides the site midway between the bank and its upper extremity. In all, an area of 50 feet by 75 feet is covered with dark, friable, sandy midden deposit to an undetermined depth, which contrasts with the surrounding light, brown-colored sand. Surface finds included only some scrapers, and a quartz core hammerstone, along with a few cores and more concentrated chert flakes; by far in the majority were head-fractured, carbonized rock fragments. A shallow 10-foot test trench again yielded only fired, fractured rock.

A number of springs are located in this vicinity, all, at present, permanent and potable. Two are within a quarter of a mile, one upstream and one downstream. Two others are within a three-quarter mile radius, one upstream on the old Santa Maria Ranch, and the other at Mineral Springs, to the west across a low range.

LAn-23.—This site is on the east side of Garrapata Creek located in a small cave near the top of a large sandstone outcrop. The habitation deposit consists of loose, ashy dark soil charged with clam and abalone shells, and mammal and bird bones. Artifacts recovered were typical of the late protohistoric period. This site was partly examined by R. F. Heizer in 1946 and called by him "Cave 1" (Heizer and Lemert, 1947, p. 238).

LAn-24.—This site is in the open adjacent to LAn-23. It consists of a refuse deposit some 75 square yards in area. Surface and subsurface artifacts resemble those of Topanga Phase II. This was Heizer's "Upper Site" (Heizer and Lemert, 1947, p. 238).

LAn-25.—A cave site, LAn-25 is .4 of a mile east of LAn-23 in the same sandstone ridge. It has a northwest exposure and is very near the top of the outcrop. A small opening leads into a circular room 15 feet in diameter; the walls and ceiling are somewhat smoke-blackened. However, the cave probably bore little habitation, for the floor deposit is hardly discolored and includes very little charcoal, only two flakes and no artifacts. Water is available at the Santa Maria spring a half a mile north, but the ascent to the cave is difficult because of the thick brush and sheer rock faces.

LAn-27.—This is one of a series of caves reported by W. King and D. Lathrop. They stretch along the north bank of Garrapata Creek for .25 of a mile on the property of M. Biencourt, just south of the owner's house, all with a more or less southerly exposure. Water is available from the spring in the creek bed a few hundred feet upstream and from Mineral Springs, less than a half a mile to the west. As none contain deposit of any depth, and the

majority are relatively low overhangs, these caves probably served only as temporary shelters.

LAn-27.—This is a high-roofed cave, 25 feet wide and 12 feet deep, with a maximum floor deposit of 12 inches. The slope in the front of the cave also bears dark, loose deposit, which appears to have a greater depth than that in the cave itself. Surface finds include a few scrapers, as well as some flakes and marine shell fragments.

LAn-28.—100 feet west of LAn-27, and slightly higher, is another cave, only 8 by 5 feet. The rock floor bears no artifacts, the only evidence of possible habitation being the intensely fire-blackened roof. As extensive brush fires are not uncommon in this region the blackening may well be the result of unintentional firing.

LAn-29.—This is the largest of the caves, 60 by 16 feet, and is 400 feet southwest of LAn-27 and somewhat lower. A thin erosional or aelian layer covers the surface of the deposit, which bears scrapers, marine shell fragments, and burnt bone; the interior of the cave is completely carbonized.

LAn-30.—Only 30 feet southwest of LAn-29 is another small cave, 20 by 10 feet, with fire-blackened walls and shallow deposit containing scrapers, marine shell, and flakes.

LAn-31.—This is a low circular cave with two entrances, some 80 feet southwest of LAn-30. The dark ashy deposit covers a floor 10 by 15 feet where pockets attain a maximum depth of 24 inches, and extends some 20 feet beyond the cave mouth. Aside from marine shell and flakes, it contained a few cores and scrapers.

LAn-32.—The last of the caves is 200 feet west of LAn-31 and slightly lower. Here a long shallow overhang leads to a dry circular room with blackened walls. The deposit covers an area 15 feet in diameter, is dark, ashy, and dry, and yielded a few scrapers, some cores, and a quantity of marine shell fragments.

LAn-33.—In a sandstone cliff overlooking the valley, 3 potholes have been used as bedrock mortars. They are .25 of a mile west-southwest of the spring on the Barton School property, and the same distance west-northwest of the spring on the Kiewit Ranch, surrounded on the west by oaks. Again, neither surface artifacts nor other habitation deposits are evident in the immediate vicinity.

SUMMARY OF SITES

On the basis of physiographic location, nature of deposit, artifact types, and the degree of implement patination, sites LAn-2, 3, 4, 5, 9, 10, 11, 12, 14, and 24 resemble the Tank Site and, therefore, could probably be classed as representative of one of the phase developments of the Topanga Culture. Sites LAn-8, 20, 21, 22, 23, 27, 28, 29, 30, 31, and 32, because of the friable, dark soil, presence of steatite, quantities of mammal bone and mollusk shell, or associated bedrock mortars, have been classed as late protohistoric sites and are not considered within the scope of this paper. Several sites, e.g., LAn-17, were of dubious mixed origin and would require more extensive examination to determine their cultural affinities. Where omissions in the numbering occur, e.g., 7, it is because sites were reported for an area and later failed to materialize as much.

FIELD TECHNIQUES

Our major purpose in continuing field work at the Tank Site was to establish with greater certainty the relationships between the diverse artifact types and classes, and other manifestations, already recognized. In the hope that the general region in which burials had been located in 1947 would continue to be productive in this respect, we expanded from there in all directions, especially toward the center of the mound. Digging in the deeper northwestern part of the site was furthered with the intent of verifying the suggested stratigraphy and acquiring, possibly, a deep undisturbed burial in better condition than those from the upper soil horizons.

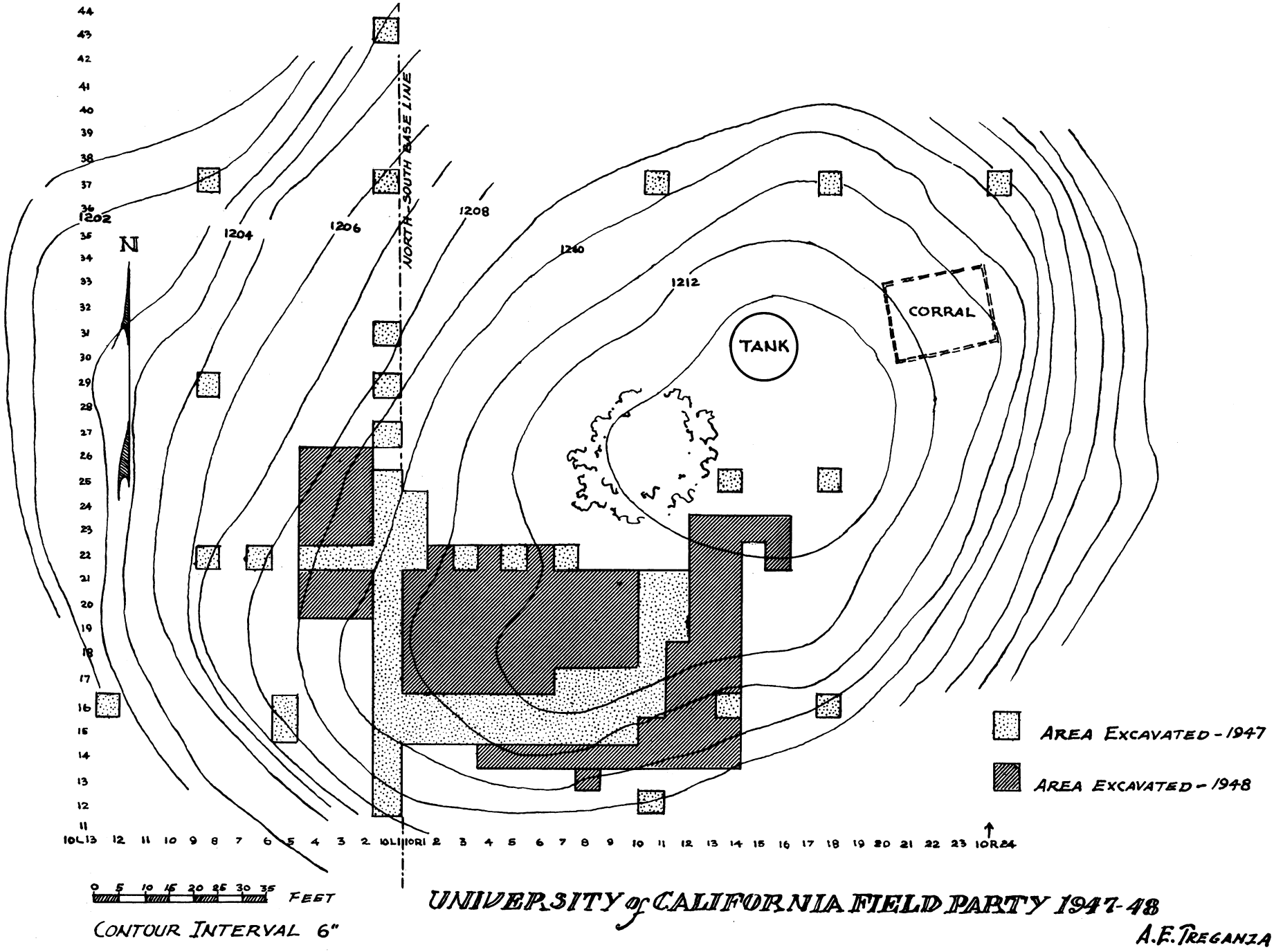
The procedure of excavation and notation was essentially unaltered from that previously employed. A grid of coördinates had already been established with reference to permanent data. Burials and features were again entered on standard University of California archaeological forms. A slight change, however, was made in the method of recording and cataloguing field data.

Originally a data sheet had been completed for each 6-inch interval of a 5-foot grid section, on which artifacts were plotted in exact horizontal location. In working up the material it became clear that the specific spatial distribution of isolated implements lacked patterning. It was therefore considered adequate, when returning to the field, to designate provenience by excavation unit and level only. In addition, the method of cataloguing was simplified and so organized that 90 per cent of the tabulation of data could be completed in the field. This was possible because the specimens derived from the 1947 field work had already been classified and constituted a sample on which expectations could reasonably be based.

The procedure followed was to strip each 5-foot section in 6-inch levels, and to sack together all the artifacts from one such test unit. At the end of the day the level bags were taken to camp where the artifacts were washed, labeled, and tabulated. All items were marked in India ink according to section number and level interval, e.g., 15R10-1, a specimen from the 0- to 6-inch level of the pit; 15R10-2 would indicate the 6- to 12-inch level, etc. A tabulation sheet was kept for each excavation unit. This sheet listed the most frequently occuring types or categories, allowing for the notation of rare forms, and was ruled vertically to indicate depth intervals. Artifacts were entered according to type, or category, and level, and then packed for transport. Atypical specimens or those to be used for illustration were set aside for separate shipment and more intensive examination.

This system had many advantages. Records were readily kept up to date, problems that suggested themselves as excavation progressed could be more closely defined and investigated, and artifacts could be expeditiously and finally cleared from the work area. The data sheets served as a field catalogue and covered the groundwork of the final statistical compilation. The number assigned each specimen referred not only to its catalogue entry but also its provenience.

In 1947 we could not anticipate what might be found, nor could we establish immediately the significance of what we did encounter. Thus it has been our policy to



Map 2. Tank Site LAn-1

save all worked stone and ship it back to the Museum of Anthropology at Berkeley for study. During the second season, however, we felt a little more discrimination was warranted in order to save the museum valuable storage space. Therefore, the bulk of the hammerstones and a number of complete, and all fragmentary, manos, metates, and scrapers were tabulated and piled into pit 21R4 before backfilling.

FEATURES

Since the Tank Site showed promise of being an unusual and important deposit, considerable care was observed during both seasons of excavation to isolate and expose any concentration of lithic remains which appeared to be in any way atypical of the average mound martix. As a result, numerous associations of stones, such as mano caches, highly weathered inverted metates, and massive piles of rejected cores, broken manos and metates, and plain cobbles, were set apart from the rest of the site and given the term "feature." In some instances these features possess obvious meaning, as was true of the mano caches and the inverted metates, but in other instances the purpose remains unknown. If nothing else, this technique of isolating features as excavation progressed provided an adequate view of the internal structure of a village, a type of information largely lacking in southern California archaeology.

The features described below represent a continuation of the series reported for 1947.

Feature 14 (pl. 19, b).—Cache of 4 manos. The placement of these specimens precludes a chance affinity; they were closely grouped and each was standing more or less on end. No other artifacts were found in association.

Feature 15 (pl. 19, d).—Owing to its areal extent, feature 15 is somewhat difficult to define. The complex of stone by which it is characterized has been arbitrarily broken down for descriptive convenience. There is no way of knowing whether the entire complex exemplifies a single unit or if in the course of time it merely developed from a single point of departure.

Feature 15a.—This was 10 by 10 feet with an average depth of 4 to 8 inches. Four inverted metates, additional metate fragments, manos, core tools, and a single fragment of a slate pendant. In the southeast portion were 12 symmetrical stream cobbles of different sizes. This latter aggregation is of interest. The almost perfect symmetry of the stones suggests selection, and the physiographic location of the Tank Site implies such stones must have been transported to it. None shows any evidence of utilitarian use, and in the light of present knowledge the existence and function of such objects cannot be explained.

Feature 15b.—Badly weathered, fragmentary metates; altered "lumps" of sandstone; manos; and core tools. Three small pestles were found near association.

Feature 15c.—Inverted, killed, sandstone metate; sandstone slab; and core tools. Burial 11 was in close proximity, but owing to its badly disturbed condition, no positive association could be made with the feature.

Feature 15d.—Metates; altered sandstone blocks; core tools; manos; and fragments of human leg bones.

Feature 16.—Disintegrated, pitted metate and fragments of 2 other metates; mano fragments; core tools; unworked stone; and unidentifiable fragments of human bone.

Feature 17.—Characterized by a number of symmetrically water-worn cobbles. Contrasts with other features wherein metates, manos, cores, and irregular, unutilized stones predominate. Fragmentary metates, manos, and core tools were also present, as were 2 segments of human femora.

Feature 18.—Badly weathered, inverted, deep-basin metate in near association to symmetrical sandstone cobble containing a ground depression. The latter may represent the initial stage of mortar manufacture, though the smoothness and regularity of the depression surface somewhat invalidates the idea.

Feature 19.—Metates (deep basin, shallow basin, and slab); mano fragments; scraper planes; core hammerstones; and fragments of human femora and tibiae. The deep-basin metate was right side up, in contrast to the usual inversion.

Feature 20.—Deep-basin metate with associated metate fragments; carbon-smudged blocks of disintegrated sandstone core tools; and sections of human femora.

Feature 21 (pl. 18, b).—Large, shallow-basin metate and fragments of 2 others; 2 large, reworked, granite boulders; 3 blocks of highly decomposed sandstone; core tools; mano; and fragments of human femur.

Feature 22 (pl. 20, b).—Deep-basin metate; 2 slab metates and 3 metate fragments; chunks of altered sandstone; core tools; and a large, chert blade.

Feature 23 (pl. 20, d).—This feature constituted by far the largest single concentration of stone, being about 8 feet in diameter. In addition to quantities of unworked pieces of granite and sandstone, the following artifacts were noted: 53 metate fragments (31 deep basin, 13 shallow basin, and 9 slab), 15 manos, 11 scraper planes, 4 side scrapers, 5 bifaced chopper, and 2 abrading stones.

Feature 24 (pl. 18, d).—Large, decomposed fragments of fired sandstone (18 x 12 x 11 inches); 2 metate fragments; core tools; and fragments of human long bones.

Feature 25 (pl. 19, a).—Cache of 6 manos.

Feature 26 (pl. 20, a).—One slab metate; metate fragments; manos; core tools; and limonite pigment.

Feature 27.—Killed, inverted, deep-basin metate; slab metate; 2 scraper planes; 1 mano; 6 core hammerstones; 1 cobble hammerstone; 1 bifaced chopper; fossil mammal bone; and fragments of human bones.

Feature 28 (pl. 20, c).—Killed, inverted, shallow-basin metate; fragments of 2 slab metates; 1 shallow-basin type; 4 mano fragments; and 2 core hammerstones. This feature is of interest due to its very shallow depth (4 inches to top of metate). No disturbance could be detected, indicating either that when Mr. Trujillo plowed the site (1920) his plow was drawing less than 4 inches or the deposit has undergone some degradation since the time of his activity.

Feature 29.—Inverted, deep-basin metate; hammerstone; granules of red ocher; and fragments of human long bones.

Feature 30.—Single, inverted, shallow-basin metate.

Feature 31.—Inverted, deep-basin metate; 9 complete manos and 3 fragments; 2 scraper planes; 6 core hammerstones; 7 chunks of altered sandstone; and fragments of human leg bones.

Feature 32.—Fragments of highly altered metates and 3 chunks of burned sandstone. Unknowingly, a section of this feature was moved during our 1947 operations.

BURIALS

The number of burials recovered was disappointing in view of the previous summer's find. In 1947 our efforts had been confined to digging a wide L-shaped trench peripheral to the central section of the site, from which six fully extended burials were removed, as well as a disturbed burial and reburial. Considering this a favorable sample, we anticipated the central region at least to be as productive. It proved, on the contrary, to be almost lacking in burials. The few interments we did expose came, again, from the peripheral sectors. This peripheral occurrence of burials suggests the possibility of marginal cemeteries rather than burial plots in the central living area, a feature often characteristic of later cultures.

More apparent from the field notes than in the course of excavation was the repeated occurrence of fragmented sets of long bones still in semiarticulated position. (See features 15d, 15c, 16, 17, 19, 20, 24, 27, 29, and 31.) The nonarticulated epiphesial extremities were generally lacking. In some instances sections of both femora and tibiae occurred in articulated position; in others, just a pair of tibiae or femora, or a single femur or tibia were left. Burial 1 (Treganza and Malamud, 1950, p. 134; pl. 15, a) constitutes a good example of the condition to which we just referred. Earlier, on the basis of merely this isolated example, we assumed it to be simply the remains of a disturbed extended burial. However, the frequent recurrence of the phenomenon this season suggests a distinct and intentional burial pattern. Often, the segmented long bones were encountered in conjunction with those features composed of a concentration of large unworked stone and metate fragments. Some problem exists as to what happened to the rest of the skeleton. At no time during excavation did we uncover scattered skull fragments or teeth, and fragmentary arm bones or other skeletal parts were rare. The bulk of the dissociated bone consisted of tibiae or femora. Until otherwise indicated, therefore, we are led to assume that the manifeatation results from some form of sectional body disposal, though its ramifications remain unknown and precisely comparable situations are unreported in terms of a consistant pattern.

The data from the two seasons' work thus demonstrate three methods for disposal of the dead: (1) primary inhumation in the flesh, the disposition of the corpse being extended, either prone or supine, with head oriented southerly; (2) reburial, involving only incomplete skeletal remains, primarily segments of long bones, and covered by a metate, which is generally inverted; (3) fractional burial, with interment of leg bones only. The latter is a tentative form, and should it in reality have existed we are unable to explain such a unique custom that would have involved body dissection. The nature of the finds, however, suggests burial of the dismembered lower extremities and not merely a reburial, hence probably representing a form of primary inhumation.

Burial 9*

Location: section 22L2.
Depth: 50 in.
Type: fractional burial.
Condition: fair.
Position: indeterminable.
Sex: indeterminable.
Remarks: Partial burial consisting of sections of leg bones. Owing to the depth, preservation of the existing bone was good. Unfortunately, because of a cave-in of the unconsolidated earth of last year's fill, a photograph was impossible.
Artifacts in association: larger part of deep-basin metate. In contrast to other metates associated with reburials, this specimen was not inverted.

Burial 10
(Pl. 17, e)

Location: section 16R11.
Depth: 24 in.
Type: fractional burial.
Condition: poor.
Position: ?
Sex: ?
Remarks: Double burial involving only the leg bones. In one burial the greater part of both femora was present. The original burial position could have been either flexed or extended, i.e., if the corpse has been interred in toto in the first place. In the second burial most of the two

Table 1

Burials LAn-1

Burial data	Burial number											
	1	2	3	4	5	6	7	8	9	10	11	12
Depth from surface (inches)	12	19	18	19	13	7	6	30	50	24	12	26
Primary inhumation	...	x	x	x	x	x	...	...	...	...	?	?
Reburial	...	...	...	...	...	...	x	x	x	...	?	?
Fractional burial	x	...	...	...	...	...	...	...	...	x	...	...
Extended on ventral side	...	...	...	x	...	...	...	...	...	...	...	...
Flexed	...	...	...	...	...	...	...	...	...	?	...	...
Head oriented	...	s	ssw	s	s	s	...	...	...	...	...	...
Artifacts associated	...	...	x	x	x	x	x	x	x	...	...	...

*Burials 1-8 described in Treganza and Malamud, 1950, pp. 134-135.

tibiae and parts of both femora remained, their position strongly suggesting flexure. It is impossible to say to what extent the burials were disturbed, or what happened to the rest of the bodies.

Artifacts in association: none.

Burial 11
(Pl. 18, a)

Location: section 15R13.
Depth: 12 in.
Type: partial reburial or disturbed primary burial.
Condition: poor.
Position: indeterminable.
Sex: indeterminable.
Remarks: Fragments of long bones, mandible, and maxilla present. Position of mandible and maxialla among the leg bones suggests either a former disturbance of a primary inhumation or a secondary burial.

Artifacts in association: possible feature 15C and a cogged stone found about 18 inches away.

Burial 12

Location: section 17R7.
Depth: 26 in.
Type: indeterminable.
Condition: poor.
Position: indeterminable.
Sex: indeterminable.
Remarks: Bone disintegration and what seemed to have been disturbance obviated taking adequate information.

Artifacts in association: none.

DESCRIPTION OF ARTIFACTS

To avoid repetition of description, only those types or groups of specimens not covered in the earlier report will be fully discussed here. Such categories as have already been isolated and defined will be treated in summary fashion. For complete descriptive data, the 1947 account of the Topanga Culture should be consulted. The total tabulations of the major groups of artifacts derived from both season's excavations will be presented in this paper.

The artifacts from LAn-2 constitute a problem of their own and will be described in a later section of this paper covering the excavation of that site.

FLAKED TOOLS

With few exceptions, the additional flaked tools represent roughly the same sample as already revealed. Concave scrapers, thumbnail scrapers, a crescentic stone,

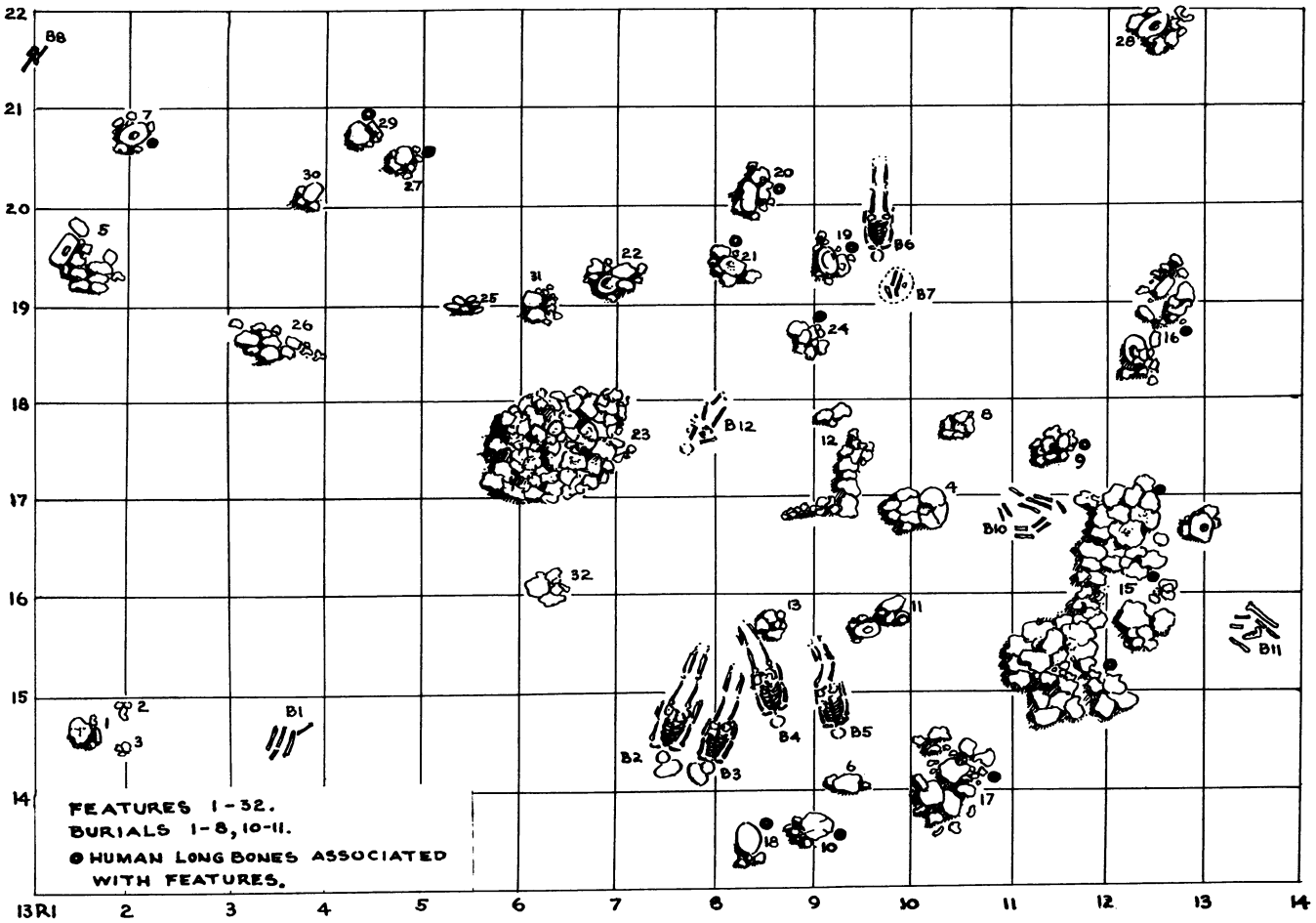


Figure 1. Location of Features and Burials

and new projectile point types make up the adjunct to the typology. The frequencies for most of the groups of flaked tools are reasonably higher than was heretofore indicated. This is probably the result of the more extensive excavations carried out in the areas of greatest artifact concentration.

Scraper Planes

Numerically, scraper planes as an entire class constitute the largest single stylized group of artifacts from the Tank Site. Some forms display a marked perfection in flaking technique, and are comparable to illustrated specimens from the San Dieguito industry (M. J. Rogers, 1929; 1939, pl. 8, i-j) on the southern California coast and in the Lake Mohave Culture (Campbell et al., pls. XXVI, XXVII) in the eastern desert. The majority, however, exhibit only generalized characteristics with considerable latitude in external form suggesting that their manufacture required little precision on the part of the maker, and probably, also, they served essentially as an all-purpose tool. The nature of the wear on much-used specimens indicated hard usage, such as would result from repeated contact on an unyielding surface.

Figure 2 illustrates "ideal" scraper-plane types and the following description is a brief summary of the recognized forms. (For photographs, see Treganza and Malamud, 1950, pls. 17-19.)

Type IA

Round to oval in outline, flat base chipped about the entire perimeter. Top surface flaked to a near symmetrical dome shape.

Type IB

Like IA, except that the upper surface rises to a peak or ridge somewhat off-center.

Type IC

Like IA, but higher and with more latitude in form. Flakes are struck from the perimeter at a steep angle so that on most specimens height exceeds diameter.

Type IIA

Form is variable, but tends toward subrectangular. About three-quarters of the basal margin evidences flaking, the remaining portion consists of an unretouched straight edge caused by the removal of a large primary flake.

Type IIB

Like IIA, except that the worked edges display a marked degree of secondary flaking or resharpening, to the point where sections of the steepened sides are notably undercut.

Type III

Distinct from other forms in that they are shaped from angular rocks on which two separate working faces have been developed. In other respects the specimens in this category fall essentially into the IIA class.

Table 2

Frequency of Scraper Planes by Depth

Type	Depth (in in.)										Total
	0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-48	48-54	54-60	
IA	22	21	16	9	6	4	1	1	...	...	80
IB	11	6	5	8	3	2	1	...	...	...	36
IC	34	52	28	17	14	7	2	1	...	...	155
IIA	356	472	385	187	88	43	23	12	2	2	1,570
IIB	12	7	10	4	1	...	...	2	...	...	36
III	29	43	21	17	7	9	3	1	1	...	131
Total by level	464	601	465	242	119	65	30	17	3	2	2,008

Scrapers

Side scrapers (fig. 3, d-e).—Ovoid to angular, with convex working edges. Frequently with scalloped working edges.

Straight-edge scrapers or knives (fig. 3, f).—Irregular forms with a single straight, monofacial retouched margin along one side.

Ovoid or discoidal scrapers (fig. 3, a).—Made from large flat flakes, often showing a percussion bulb on one surface, and worked to a near-symmetrical form. Chipping may extend over the whole of one or both faces.

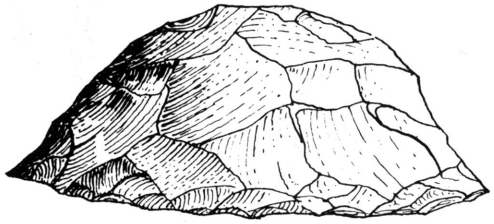
End scrapers (Treganza and Malamud, 1950, pl. 20, k-l).—Subrectangular in outline with one of the narrow ends flaked back to a low angle.

Snub-nosed scrapers (ibid., pl. 20, f-g).—Like end scrapers with the exception that the flakes have been removed from the retouched end at a much steeper angle, producing a blunter but stronger working edge.

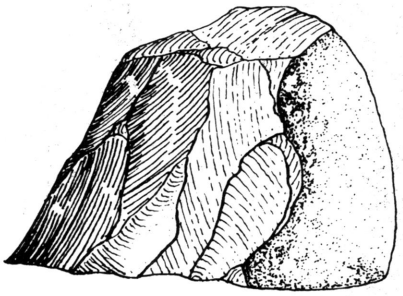
Cobble scrapers (ibid., pl. 20, c).—Made from a split cobble showing wear along the sharp curved margin. Only slight retouching.

Flake scrapers or knives (fig. 3, g).—Thin flakes monofacially flaked along portions of their peripheries.

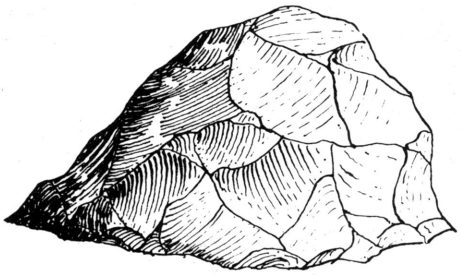
Concave scrapers (fig. 3, c).—These are neither common nor are they clearly stylized. They total only nine, all acquired during the second season. Though none are alike, they characteristically display a shallow localized concavity along one edge. In some instances the margin of the concavity shows signs of notable abrasion. Small chips have been sprung from the base of the concavity probably through use. Sizes range from 6 to 10 cm. in diameter with the depressions varying from .5 to 2 cm. Seven specimens were of basalt and



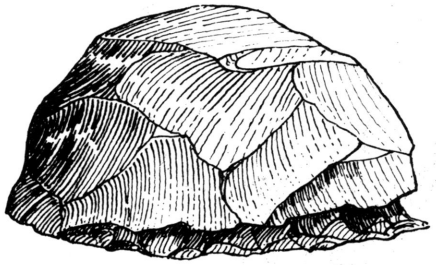
IA



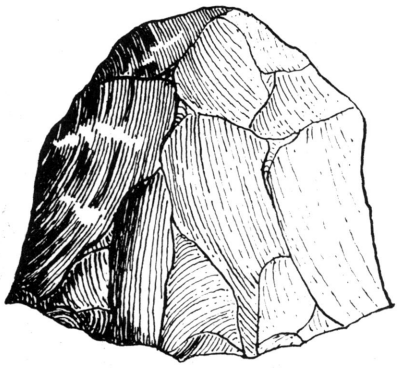
IIA



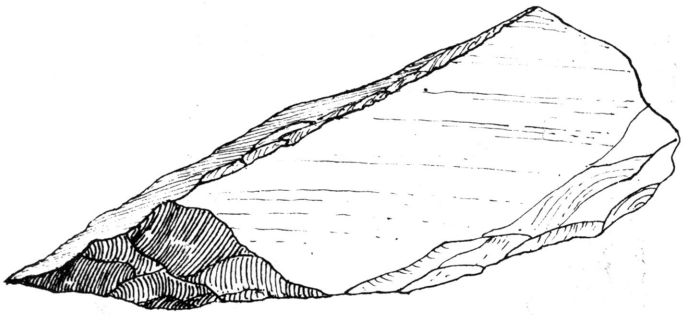
IB



IIB



IC



III

Figure 2. Scraper Plane Types

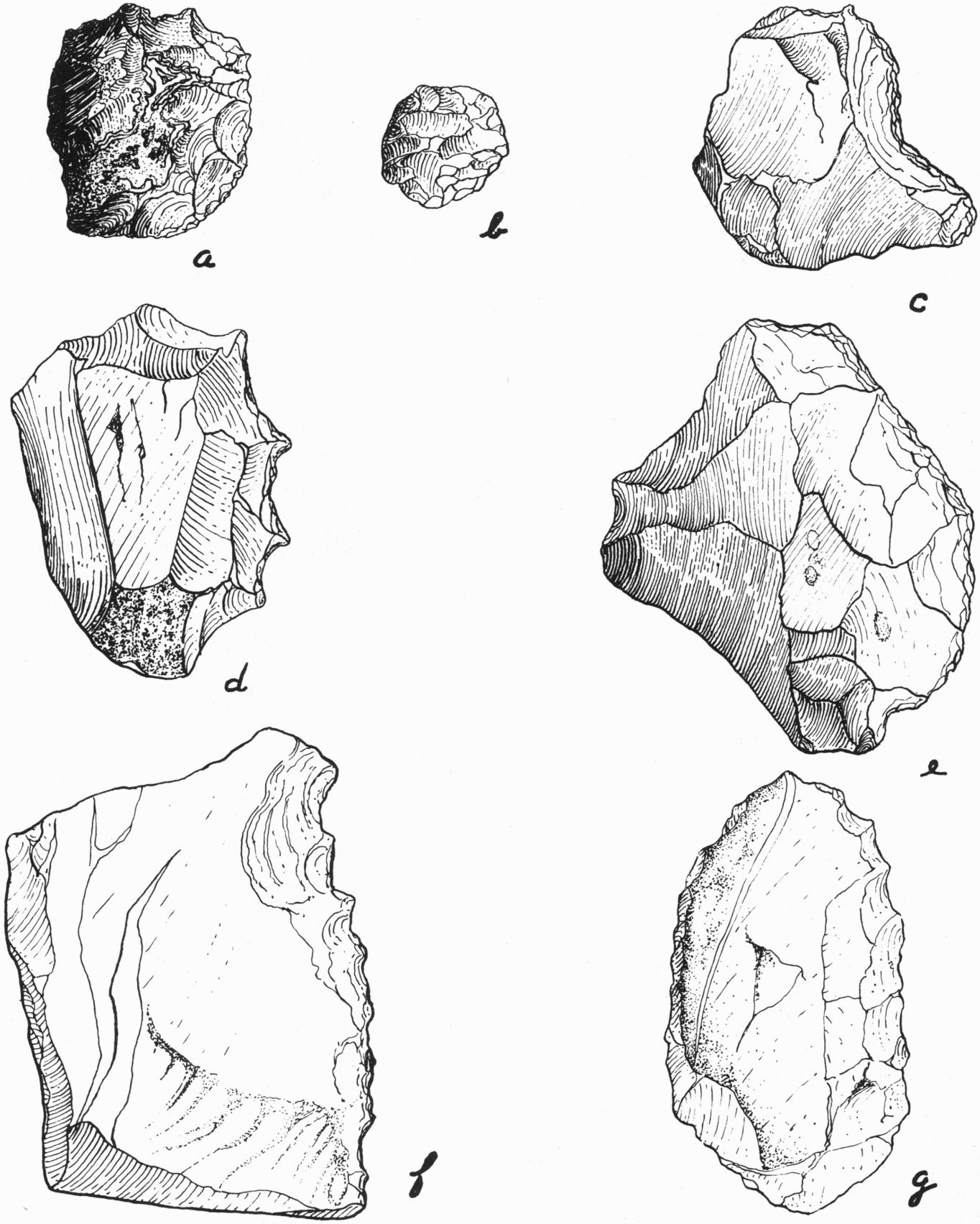


Figure 3. Scraper Types

one each of chert and porphyry.

One specimen appears to have served a dual function as a tool. A portion of one edge is concave and the remainder convex, as on a typical side scraper. Both working margins display considerable wear.

Examples illustrated by Rogers (1939, pl. 8, h, k) for the desert Playa industry differ in that they are consistently subrectangular, elongated, and have a broader concave scraping edge along each of two sides.

Thumbnail scrapers (fig. 3, b).—Only a single specimen falls in this category. It is roughly circular in outline, thin, lenticular in cross section, and flaked on both surfaces. The example made of a dark-brown chert is 2 cm. in diameter and 4 mm. thick. The lone occurrence of this type of tool would seem to indicate a lack of emphasis on light delicate work. Implements of this nature are usually best associated with cultures of later origin.

Choppers

Unifaced choppers or heavy duty scrapers.—These are produced from large cores of basalt or from a split cobble and exhibit flaking only on one face. (Treganza and Malamud, 1950, pl. 20, d-e).

Bifaced choppers.—These are large cores bifacially flaked along an edge to effect a sharp, sinuous margin that may extend around the entire periphery or only a portion of it (ibid., pl. 20, a-b).

Crescentic Stone or "Amulet"

This class is represented by but a half of a single specimen obtained during the second season (pl. 21, m). Though this specimen varies somewhat from illustrated examples there seems to be little doubt as to its general classification. The function of these implements remains open to question, and varient forms appear to have considerable latitude in time and areal distribution in western United States. Similar forms may be noted for the Lake Mohave Culture and the San Dieguito-Playa industry (Campbell et al., 1937, pl. XXXVIII, a-c; M. J. Rogers, 1939, pl. 8, a-c).

Drill or Reamer
(Pl. 23, d-e)

Two very similar pieces make up the addition to this class. Both are elongated, tapering sections of rose quartzite on which the margins have been retouched and the tip of each is notably abraded. The large ends show no evidence of preparation for hafting, so presumably they were used as a hand reamer or drill. The lengths are 6 cm. and 10 cm.

Hand Pick

The two new specimens, roughly triangular in outline, resemble the single piece recovered in 1947. On both, the working end tapers to a heavy, well-formed point, whereas the opposite end is bulbous and fits comfortably into the palm of the hand. Lengths are 9.8 cm. and 13 cm., respectively, with basalt and quartzite as materials.

Projectile Points

Since projectile points as a general class have proved to be the best criteria for establishing the stratigraphic differences whereby Topanga Phase I and Phase II may be distinguished, and because projectile points, to some measure, provide useful comparative data, it seems advisable to illustrate all the complete and near-complete specimens collected during both seasons.

With additional information some modification has been made over last seasons presentation. Here are included two groups of projectile points, each of which is associated with a definite phase of the Topanga Culture. Phase I is characterized by large blades and large points, most of which are composed of a highly patinated basalt and have been manufactured through the percussion or rough pressure-flaking technique (pl. 21, a-l). Phase II is characterized by small projectile points of the "dart" class which in material range through slightly patinated basalt, glassy basalt, obsidian, chalcedony, and chert. All have been finished in a rough to medium pressure technique (pl. 22, c-u). Totally absent in either phase is the light, thin, finely pressure-flaked "arrow point" of the historic or protohistoric periods.

In addition to the physical and technological differences between the projectile points of Phase I and Phase II there remains important stratigraphic differences that are clearly shown in table 4. The large blades and points of Phase I are primarily confined to the lower levels of the site with the deepest occurrence at the 54-to-60-inch level and a maximum occurrence in the 12-to-18-inch level. Almost a complete reversal of this may be observed in the distribution of Phase II points. Here the

Table 3

Frequency of Flaked Artifacts by Depth

Type	Depth (in in.)										Total
	0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-48	48-54	54-60	
Side scrapers	178	129	73	37	12	5	7	3	2	1	447
Straight-edge knives	75	42	42	19	12	3	...	2	1	...	196
Ovate scrapers	9	10	5	8	1	1	1	...	...	...	35
End scrapers	11	14	10	8	2	4	...	...	...	...	49
Snub-nose scrapers	8	15	6	1	2	...	...	...	...	...	32
Flake scrapers	25	20	14	8	2	1	3	...	...	...	73
Cobble scrapers	2	1	3	...	1	1	...	...	...	...	8
Concave scrapers	3	3	2	1	...	...	...	...	...	...	9
Thumbnail scrapers	1	...	...	...	...	...	...	...	...	...	1
Unifaced choppers	48	56	33	27	12	3	3	3	...	...	185
Bifaced choppers	152	117	113	49	14	7	6	5	1	...	464
Core hammerstones	339	422	429	154	93	17	18	9	5	1	1,478
Total by level	851	829	730	312	151	42	38	22	9	2	2,986

maximum occurrence is in the 0-to-6-inch level and none occurred below the 18-to-24-inch level. That some degree of overlap is present can be expected, assuming our interpretation of the erosional history of the Tank Site is correct (Treganza and Malamud, 1950, p. 131). In any stratified site, unless the cultural levels are separated by a sterile layer of some thickness some degree of cultural mixing may be anticipated. Previously unknown to us was the fact that Mr. Trujillo had plowed the site in earlier days and this, plus rodent activities, could have brought about considerable mixing in the upper 12 inches of the deposit. Though less digging was done in the Phase II site LAn-2, it is significant to note that only the small pressure-flaked projectile points were present. In form and material they resemble in near exactness the material from the 0-to-12-inch level of the Tank Site (pl. 23, f -m).

Two specimens, a large blade and large point (pl. 22, a, b), have tentatively been assigned to Phase II though there may be some doubt as to their cultural provenience. The blade, composed of a dark-brown chert, shows considerable pressure-flaking skill as evidenced by the serrations along both margins. The large point composed of obsidian lacks refinement in flaking but shows little or no evidence of surface alteration (patination). Also, both these types are of not uncommon occurrence in the coastal shell middens that can be assigned to periods of less antiquity than the Tank Site.

Assigned to Phase I are three heavy points which, because of their nature, stand in contrast to the typical patinated basalt specimens; yet thier association in the site deposit is such that they must be considered along with other projectile points as belonging to the Phase I period. Plate 21, l, illustrates a dark-brown chert blade with a concave base which was flaked either by controlled percussion or a rough-pressure technique. This specimen was found in direct association with an extended burial of the Phase I type (Treganza and Malamud, 1950, pl. 15, f; pl. 21, i), and hence has been assigned to this period. Though its presence appears out of character with the heavy basalt examples, this association is not necessarily unique, for almost an identical example may be noted for the Lake Mohave Culture (Campbell et al., 1937, pl. XLIV, e; pl. XLV, d). A second specimen composed of a white chert and having a broad angular stem base finds no other parallels in the Topanga area (pl. 21, k), yet it too occurs in the Lake Mohave area where such forms are classed as a Silver Lake type (ibid., pl. XLII, d). The third specimen is composed of a thin piece of laminated chert, leaf-shaped in form, and displays only slight marginal flaking in its original shaping. This example was recovered at a depth of 60 inches and marks the greatest depth of any projectile point recovered from the Tank Site.

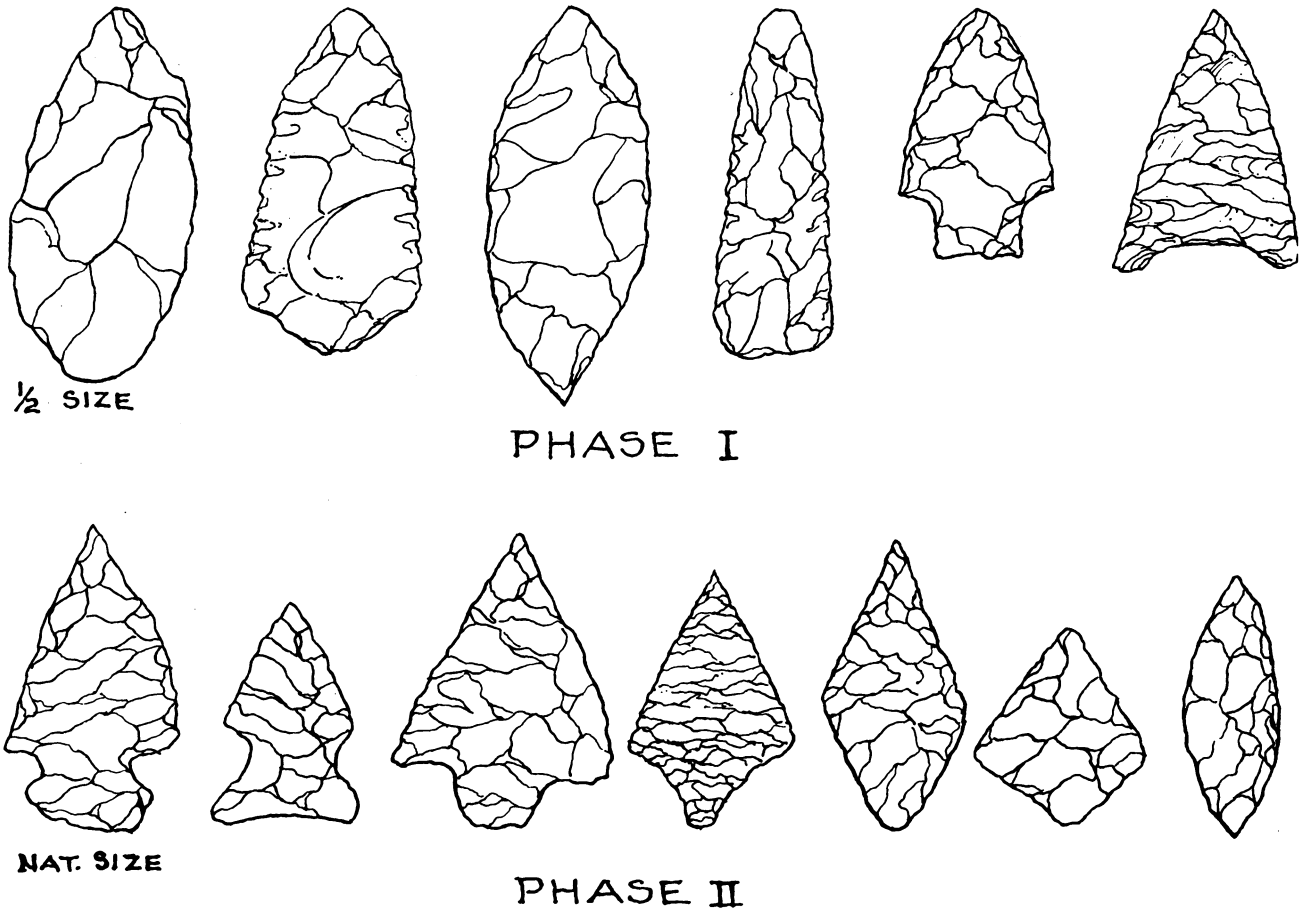


Figure 4. Projectile Points

Table 4

Projectile Points

Points	Occurrence by depth (in in.)										Total
	0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-48	48-54	54-60	
					Phase II						
Side-notched	...	3	...	...	...	...	...	...	...	...	3
Contracting stem	3	4	2	...	...	...	...	...	...	...	9
Lozenge	9	3	2	...	...	...	...	...	...	...	14
Fragments	26	14	5	1	...	...	...	...	...	...	46
Total	38	24	9	1	0	0	0	0	0	0	72
Blades and large points											
					Phase I						
Blades	...	3	6	1	1	1	...	1	1	...	14
Large points	2	4	2	...	...	1	...	1	1	1	12
Total	2	7	8	1	1	2	0	2	2	1	26

Small "Dart" Points

Side-notched points (pl. 22, c, d, e).—A single example differs in some degree with specimens recovered last season. It is smaller, having a length of 3 cm. and with a slightly concave base. Though this is a surface specimen composed of obsidian, the surface has been so highly patinated that it bears little resemblance to its parent material (pl. 22, d).

Contracting-stem points (pl. 22, f, g, j, k).—This type has some latitude in respect to the shape of the stem and some refinement probably could be made. Some specimens have well-defined shoulders and are with stems which contract to a sharp point (pl. 22, g, k), being reminiscent of points associated with the Hunting and Canalino cultures of the Santa Barbara coast. In other instances shoulders are less well-defined, or the stems terminate in more rounded bases. The lengths range from 2.7 cm. to 4.2 cm. The materials include basalt, chert, chalcedony, and obsidian.

Lozenge points (pl. 22, h, i, l-u).—Numerically this group constitutes the largest class of the small projectile points. Were a larger series present, some refinement of types might be attempted. Of the fourteen specimens, some tend toward diamond shapes, whereas others border small leaf or stem forms. Lengths range from 2.5 cm. to 4.1 cm. Materials used are obsidian, basalt, chert, and quartz.

Large Blades and Large Points

The large blades and points collected this season show some variation over those of last year, both in finishing technique, form, and material. Frequently, for lack of established terminology, it is difficult to distinguish between what might be termed a chipped knife, leaf-shaped blade, or a coarsely made projectile point. We attempt only a rough breakdown between blades and large points, either of which if hafted could serve the purpose of a knife. All specimens are illustrated and may be judged by the observer.

Described below are only those additional specimens collected this year. For full details the 1950 report should be consulted.

Large blades (pl. 21, a-g).—

1. This specimen comes from a depth of 48 to 54 inches, marking the deepest level from which any blade was taken. Though it shows an old break, enough remains to offer a computed length. The form is leaf-shaped and probably pointed at both ends. Computed length, 9.2 cm.; width, 4.6 cm.; thickness, 1.2 cm. Material is basalt (pl. 21, b).
2. Basal half of what was probably a leaf-shaped blade. Incomplete length, 4.5 cm.; width, 5.4 cm.; and 1.4 cm. thick. Material is basalt (pl. 21, c).
3. Larger half of a basalt blade, showing some attempt to reshape the broken margin. Incomplete length, 7 cm.; width, 4.5 cm.; and 1.5 cm. thick (pl. 21, a).
4. This chert specimen exhibits the best flaking technique of any large blades from the Tank Site. Compared with the patinated basalt examples, considerable contrast exists. Typologically this specimen is similar to forms typical of the Hunting Culture of the Santa Barbara coast. Because of its shallow position (6-12 inches), lack of patination, and flaking technique, we have assigned it to Phase II of Topanga. The form is a willow leaf with slightly serrated edges. Length, 14.9 cm.; width, 3.4 cm.; and 1.5 cm. long. Material is a dark-brown chert (pl. 22, a).

Large points (pl. 21, h-l; pl. 22, b).—

1. This specimen, like the blade above, also deviates to some degree from other large points. It is composed of an unaltered obsidian and comes from the 0-to-6-inch level of the deposit. Because of its shallow depth and contrastive nature, it has been assigned to Phase II. The form is leaf-shaped, being more pointed at one end. Length, 7 cm.; width, 3 cm.; and 1.3 cm. thick (pl. 22, b).
2. Specimen made from a thin piece of banded,

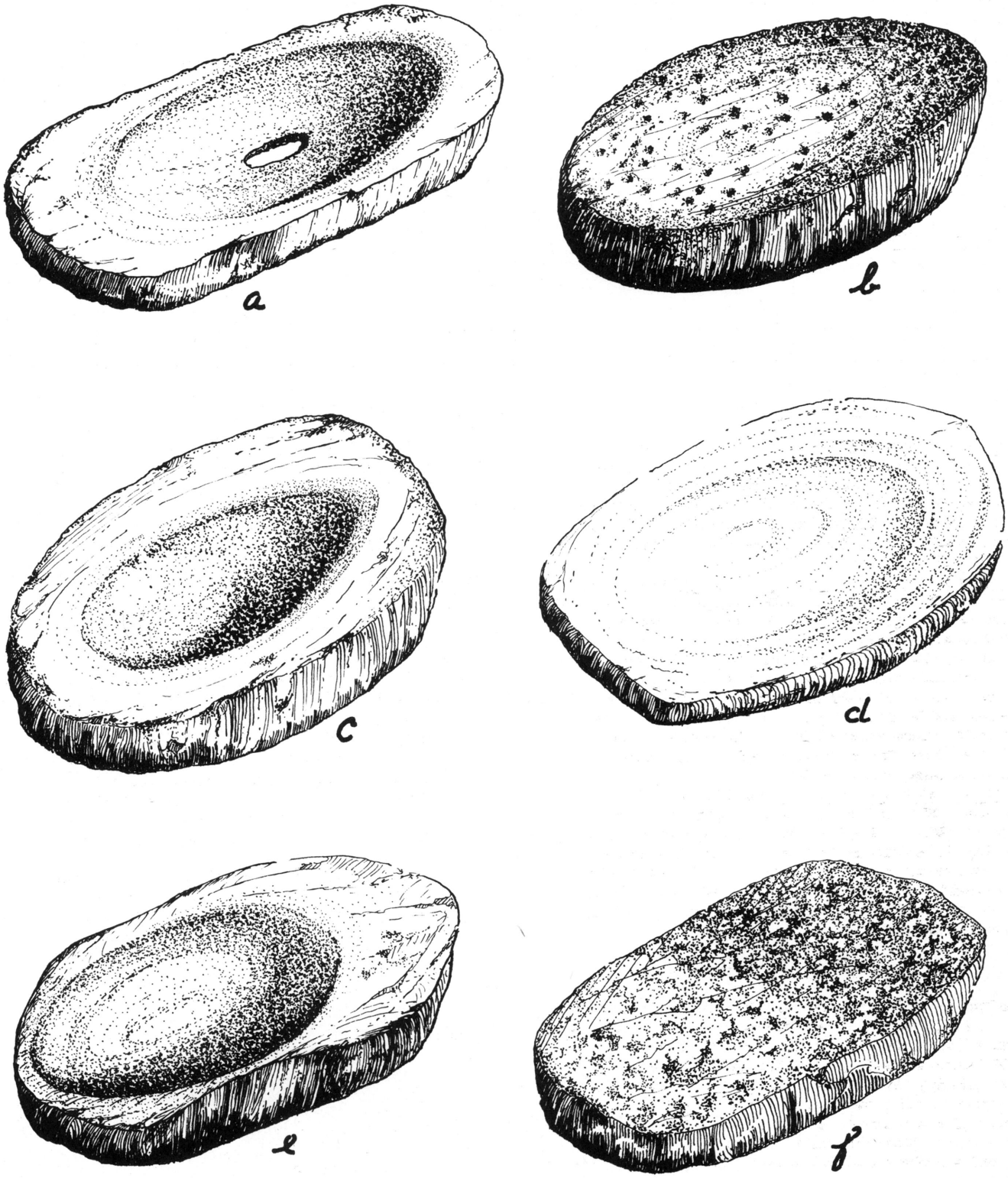


Figure 5. Metate Types

TREGANZA

laminated chert. Shaping was done merely by marginal flaking, as the original surface shows no working. Coming from a depth of 60 inches, this marks the greatest depth of any large point. Length, 5.4 cm.; width, 2.8 cm.; and 5 cm. thick (pl. 21, j).

3. Basal fragment of a large blade. This broad, angular base is a unique occurrence for the Tank Site, though some parallels may be noted in Lake Mohave specimens. This single piece possesses sharp, angular shoulders that terminate in a broad, flat, angular base. The material is a white chert (pl. 21, k).

GROUND OR PECKED STONE

Manos and Metates

As heretofore, manos far outnumber metates in the deposit. An explanation of this inequitable representation of milling stones has already been discussed in some detail (Treganza and Malamud, 1950; p. 140), viz., that the more rapid wear of the nether stone periodically called for manos of somewhat varying shapes to conform to the changing contour of the metate throughout its serviceable life. Proof to substantiate this thesis is lacking, but it appears to be a reasonable possibility. Also, the practice of pecking manos to increase the effectiveness of their grinding surfaces must have resulted in considerable breakage, as judged by the large number of fragments.

Of 2,556 manos and 329 metates, whole and fragmentary, 962 and 79 respectively, were classifiable. The descriptive categories derived from the 1947 data proved adequate in defining the limits of variability and patterning displayed by our recent acquisitions. Some pieces exhibit technological refinement of types earlier described.

Metates

Metates are of three types, called here deep basin, shallow basin, and flat slab. As was true last season, the material is predominantly sandstone for all three forms.

Type I, deep basin (fig. 5, a, c, e).—These are the most abundant. Fifteen complete specimens and seventeen fragments were recovered. In both form and size there exists a close parallel between this type and those associated with the Oak Grove Culture of the Santa Barbara area.

Type II, shallow basin (fig. 5, b, d; pl. 18, c right).—This type is represented by fifteen complete and eleven fragments.

Type III, slab (fig. 5, f; pl. 18, c).—Like type II, the slab metate is less common, being known only through eleven complete and ten fragmentary specimens.

The distribution of metates through the deposit was not as random as that of manos. Many of the complete specimens occur among features or with burials. Fragments were encountered throughout the excavation, but were most highly concentrated in features consisting of large aggregates of stone. No depth table has been presented for metates, as it is assumed that the mano distribution reflects a more complete picture for these related tools; however, the deep-basin form seems to occur at the greatest depth.

Manos

Manos and mano fragments were so common in the occupational debris that their association in features or with burials had little or no significance. With the exception of scraper planes they were the most frequent artifact group encountered. Their depth distribution (table 5) suggests several noteable points. The highest frequency occurs in the 6-to-12-inch level, being represented by some 349 examples. From 0-to-36-inches there are 960 specimens but from 36-to-54-inches there are only 2 examples. This would seem to indicate then that the early history of the Tank Site was characterized mainly by a flake-and-core industry with the mano-metate complex being exhibited only lightly at first and then gaining considerable importance toward the latter periods. of Phase I. Excavations at LAn-2 would also indicate that the trait began to wane toward Phase II and was gradually replaced by a mortar-pestle complex, which continues to be characteristic on into historic times.

Manos have been typed largely on the basis of the number of faces that exhibit wear, the nature of the worked or worn surfaces, and the general form. Some eight types have been recognized.

Table 5

Mano Types

Types	Occurrence by depth (in in.)									Total
	0-6	6-12	12-18	18-24	24-30	30-36	36-42	42-48	48-54	
IA	28	25	17	10	1	...	...	...	1	82
IB	12	26	12	8	2	...	...	...	...	60
IC	10	13	10	6	3	...	...	...	...	42
IIA	31	51	19	9	4	2	...	...	...	116
IIB	54	106	76	31	11	2	...	...	...	280
IIC	82	89	68	31	10	3	1	...	...	285
IID	13	15	11	4	2	2	...	...	...	47
III	9	24	16	2	...	...	...	...	...	51
Total . . .	239	349	229	101	33	9	1	0	1	962
						Fragments not typable				1,556
										2,518

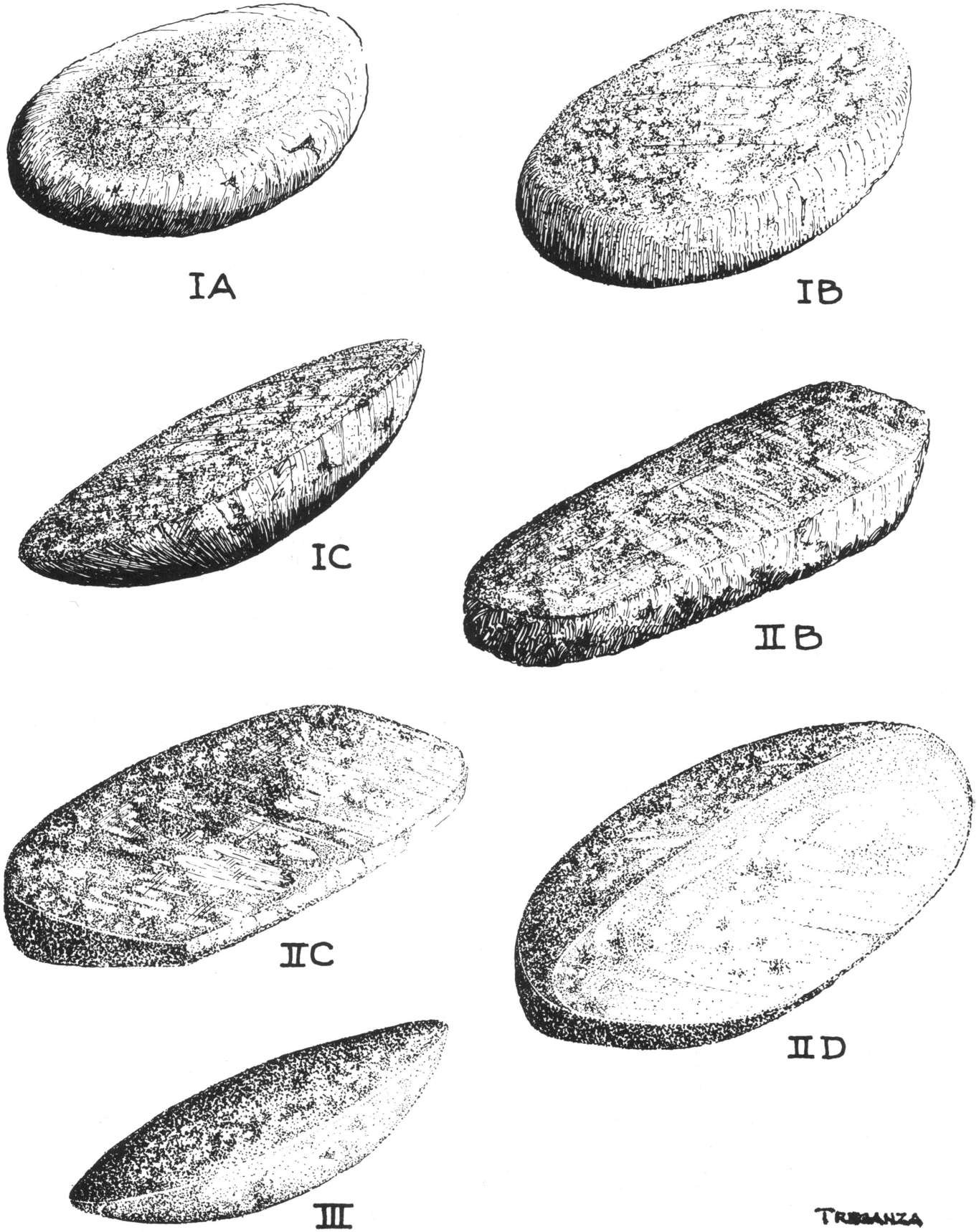


Figure 6. Mano Types

I. Unifaced
   IA. Natural cobbles with wear on one surface. Cobbles range from symmetrical to irregular in shape: circular to ovoid in outline.
   IB. Extended form of type IA, showing excessive wear. Forms all tend toward symmetry.
   IC. Elongated "sugar-loaf" in cross section. Entire back surface completely smoothed.

II. Bifaced
   IIA. Natural cobbles with wear on two surfaces. Symmetrical forms range from oblate spheroids to ovoid disks, others are symmetrical. In cross section wear surfaces are parallel to lenticular. Grades into type IIB.
   IIB. Same as IIA, but forms are elongated (length always much greater than the breadth).
   IIC. Wedge-shaped, ovoid to elongate cobbles. Angle between wear surfaces ranges from 5 degrees to 45 degrees.
   IID. Same as type IIC, but one surface is keeled as a result of superimposed wear pattern.

III. Trifaced
   III. Long, narrow, triangular cross section.

Mortars

Newly acquired mortars are represented but by three fragmentary pieces. Only one is of sufficient size to suggest an outer diameter of approximately 12 inches, and all three appear to be of the cobble type similar to the complete specimen collected in 1947 (Treganza and Malamud 1950, pl. 24, a). Considering the area excavated and the very small number of both mortars and pestles that were recovered, it would be safe to assume this complex was of little significance in the history of the Tank Site. Their function was probably concerned primarily with something other that the food economy, such as grinding pigments or functioning in some specific capacity. Wooden mortars and pestles can not be totally excluded, but the great preponderance of manos and metates would probably preclude any serious assumption that mortars and pestles ever played any important roll at the Tank Site.

Included in feature 18 was a spherical cobble 8 inches in diameter, marked by a well-defined, shallow, circular depression. Its surface bears the marks of shaping by pecking and some rubbing; the depression is well-smoothed, as if worn down by constant use. We can not say whether the piece is completed, as such; or whether, possibly, it represents a small mortar in an arrested state of manufacture.

Pestles

Five complete pestles were recovered, providing a total of nine for the two seasons. The specimens this year differ from those already known in being more stylized, i.e., four are almost perfectly cylindrical and show wear at both ends. All are made of sandstone and have gently rounded pounding surfaces. Specimens 1, 2, and 4, as listed below, were found in a single cache.

1. Shaped over-all by pecking, forming a slightly tapered cylinder, somewhat bulbed at either extremity. Both ends evidence use. This example, by far the largest recovered from the Tank Site, compares in many respects to pestles associated with later cultures of the coast and interior. Length, 31.5 cm.; average diameter, 6.9 cm. (pl. 24, a).

2. Entirely shaped by pecking and grinding. Two opposite sides somewhat flattened by abrasion as if used as a mano on a slab metate, and resulting in a somewhat flattened cylinder form. Both ends used. Length, 13.5 cm.; average diameter, 6.8 cm. (pl. 24, c).

3. Similar to specimen 2, though more nearly circular in cross section and surface shows no grinding. Length 16.5 cm.; average diameter, 7 cm.

4. Completely worked by pecking and grinding. Cylindrical form distorted by slight tapering and dorsoventral flattening. Used at both ends. Length, 15.2 cm.; average diameter, 6.5 cm.

5. This specimen is composed of a highly weathered sandstone so that the surface treatment is no longer discernable. Shaped to a truncated conoid and apparently used only on the larger end. Length, 18.5 cm.; greatest diameter, 8.5 cm.

These five specimens were localized in the southeast sector of the deposit, and non occurred deeper than the 12-to-18-inch level. Numerous Phase II projectile points came from this same general area of the site and therefore there is some inclination to assign these specimens to a late position in the Phase I with the probability that they are Phase II.

Abrading Stones

Two broad classes of abrading stones have been differentiated on the basis of form and inferred function (Treganza and Malamud 1950, p. 147):

I. Those that could be held in the hand and rubbed against some article being finished. These have smoothed, even-abrading surfaces that are gently concave to convex. They are clearly distinguishable from manos by their reduced average proportions, and the near consistent lack of pecking as a sharpening measure. That this latter characteristic does not hold without exception seems to be due simply to the fact that some of the abrading stones appear to be reused manos.
   One of the examples in the above category, originally a broken bifaced mano, has small, half-inch deep depressions at either end. These evidently served as finger-holds, for they effect a good grip on the tool.
II. Those that, though quite varied in size, bear one or more grooves on their faces. The furrows vary in breadth and depth and appear to be a function, essentially, of the amount and kind of wear to which the artifact was subjected.
   Many of these specimens, especially those with narrow, V-shaped longitudinal grooves, would be classed as awl sharpeners had they occurred in sites of later origin. However, bone awls or pointed, worked bone in any form is absent in the Tank Site. It would suggest, then, that this class of abrading stones were involved in conjunction with wood working, the tangible evidence having been lost to us.

Cog Stones

Cog stones, because of their unique forms and restricted distribution, may be useful as diagnostic elements for future comparative studies. As yet we know little about their function or cultural associations in the rest of southern California. Their temporal position appears to be a middle one, as none occur in positive

association with late or historic sites, and conversly, none have been reported for Lake Mohave, coastal San Dieguito, or Oak Grove. The Tank Site specimens represent the earliest known occurrence, and even here their exact position as to Phase I or Phase II is not fully known. Most of our specimens occur in the top levels (0-18 inches), though a single example was found as deep as 32 inches (pl. 23, b).

We have suggested cog stones in southern California may constitute the counterpart of the spindle charm stones of central California with the south boundary of the Chumash marking the near southern limit of the spindle forms. Material out of which cog stones have been made is of some interest. The Tank Site specimens range through volcanic tuff, siliceous sinter, escoriated basalt, to a fine-grained basalt. From other areas the same materials are present plus sandstone, granite, and granodiorite. Steatite, one of the most easily worked stones, appears to be absent. Obviously the hardness and type of stone were of little importance. The appearance of the finished product likewise varied. Some specimens are a product of perfection, others of the roughest sort. Perforated specimens might suggest hafting, but few are of this type.

The suggestion of a ceremonial usage of cog stones is not solely lacking in evidence. In 1936-1937, under the Works Progress Administration, Mr. J. W. Winterbourne excavated two sites in Orange County known as the Banning Site and the Norris Site. The following are excerpts from a letter dated April 13, 1939, to Edwin F. Walker from J. W. Winterbourne (we are indebted to Mr. H. Eberhart for providing this data from his manuscript on cog stones):

"I am enclosing some data on cog stones that one of the clerks gathered from the field notes. . . . We have noticed several peculiarities regarding this cogged discoidal. First, that the Banning Estate Site seems to have produced as many of these stones as all the other sites where they are found combined; second, that the stones in most cases are found in the clay completely below the camp debris; third, that rarely have they been found in association with other artifacts except the discoidal; fourth, that they seem never to have served a utilitarian purpose as they are not pitted or polished and rarely broken; fifth, if broken, in almost every case the Indians attempted to mend them with asphalt; sixth, that the material used in their manufacture is with few exceptions a vesicular basalt which is found in outcrops in the San Joaquin Hills and at various points in the Santa Ana Mountains; seventh, that the number of cogs or depressions may vary three to twenty-five or thirty-eight, that the stone may be perforated near the center of the planes or it may not be, but that usually there is a depression near the center of both obverse and reverse planes."

The following excerpts are from the same letter and contain more detailed information regarding archaeological occurrences: "A decomposed burial was uncovered four feet east of a cog stone and at the same depth. . . . Three fine specimens were found close together under four oblong slabs of fossilized limestone, a pectin shell and a blue piece of granite. . . . A cog stone was uncovered twenty-five inches below the surface, 19 inches northeast by north from a large metate, in plot #10-b. Upon further investigation, the metate proved to be resting on the stones of a fireplace from which a few broken human bones protruded. Twelve inches north of the fireplace . . . a mano was found with the cog stone."

The above excerpts were from the Banning Site. The following are from the Norris Site: "Three cog stones, #39, #40, #41, were found at a depth of 39 inches. These cog stones rested in the clay on edge. Flat surfaces parallel to each other. These cog stones were found close to a fireplace about two feet square and also close to a burial . . . two cog stones were uncovered. These cog stones were one on top of the other and rested on the clay which underlies the kitchen midden. A cog stone was found in test hole #14 at a depth of 3-1/2 feet, 8 inches below the bottom of the excavations in a pit. Ablaone shell covered the top of the cog stone . . . three cog stones one on top of the other. . . . This is the first fragment of a cog stone ever encountered in our excavation. We found a few with cogs or pieces broken from them but the Indians generally made an attempt to mend them. This would seem to indicate a ceremonial rather than a practical use."

These instances serve to indicate such objects were held in high esteem at least for the two sites mentioned. None of the Tank Site specimens was patched nor did any two occur in the same immediate area; however, parallels exist in the forms, materials, the near association of metates, and at least two burial forms. Also, we recognize no utilitarian role in which these curious objects could have functioned.

Last season's cog stones were all fragmentary. This year three complete specimens were found.

1. Beveled disk, biconically drilled. The specimen is indented at even intervals, resembling somewhat a perforated metal tapered gear or a fish vertebra. Height, 3.8 cm.; diameter at base, 8.8 cm. Material a fine-grained basalt (pl. 23, a).
2. Slightly beveled disk. The periphery is grooved at even intervals producing a cog effect. Both the flat surfaces are slightly pitted at the center of the disk. Height, 4.7 cm.; average diameter, 8.5 cm. Material a rough escoriated basalt (pl. 23, c).
3. Slightly beveled disk like the above specimen only more refined and with more grooves. Slightly pitted on both surfaces. Grooves appear to have first been made by a sawing technique and then later smoothed down. Height, 3 cm.; average diameter, 7.3 cm. Material is volcanic tuff (pl. 23, b).

Stone Disks

Discoids, like cogged stones, do not appear to have been utility items. That there may be some relationship between these two groups in a functional complex is attested by their direct association in the Banning Site as reported by Winterbourne. Eventually they may prove to be as important as cog stones in terms of cultural time-markers, though at present little is known concerning their distribution.

Stone disks have been divided into two gross categories: (I) those with flat to convex faces; (II) those on which one or both faces are concave. In either group the sides may be beveled or straight (for illustrations, cf. Treganza and Malamud 1950, pl. 24, c, d, f, i).

The three specimens recovered this season fall into the first group. All are characterized by flat faces and all are made of sandstone.

1. Sides beveled with the lower or larger face battered about the entire periphery. Height, 4 cm.; diameter, 6.5 cm. to 9 cm.
2. Fragmentary specimen with straight sides and slight central depression on one face. Height, 4.2

cm.; diameter, 7.7 cm.
3. Fragmentary specimen with vertical sides. Height, 3 cm.; diameter undetermined.

A barrel-shaped object of sandstone was recovered which, if it is a finished product, should not be classed here as a stone disk. However, there is some possibility that it represents a discoid in the initial stages of manufacture, and as such it is without parallel in the collection. Height, 6 cm.; diameter 5.9 cm. at ends; 6.8 cm. at middle.

There is no reason to assume that any of our specimens are in any way related to the so-called "bowling" stones reported for southern California in late prehistoric or historic times.

Rubbing Stones

This class includes small flat cobbles, showing abrasive wear on one or both faces. They may be distinguished from manos by their reduced size though many appear to look like "little" manos. None shows any shaping other than through continued wear from use.

A minority of these pieces, thirty-four, are distinguished by the development of a small centralized pit on one or both smoothed faces. In some instances there is a single pit on one surface and two on the other. Many of these pitted examples have been battered on their peripheral edges, suggesting they were either reused rubbing stones or they served a dual function of both smoothing and pecking. We are hesitant to call them "pitted hammerstones" since many are made from a soft sandstone and would be ill adapted to this function. It is of some interest to note that this general type of stone implement occurs in central and northern California throughout most of the entire cultural history of the more advanced industries. It has been suggested that such an artifact may have been used as an "acorn anvil" or in some way related to the preparation of the acorn in the hulling process. Should this prove to be correct, then one might expect it to be an ancient element in native California.

For future comparative work it may prove advantageous to make further subdivisions by differentiating between pitted and non-pitted forms. We have made no attempt to do so at the present time.

Core Hammerstones

Some investigators tend to place core hammerstones in a class with flaked tools, but in the present paper they are classed as an artifact of pecked stone. It is the great quantity of their occurrence which appears significant, rather than how they are classed.

Hammerstones may be conceived as having two quite distinct functions: (1) those whose function is primarily to remove a large flake through the percussion method, such as the production of a core itself or a rough blade, and (2) those hammerstones having sharp or semisharp projections used to reduce to some desired shape rocks of a nonconcoidal nature, such as pecking down the surface humps on a mortar or pestle in order to develop symmetry; or the function may not necessarily be one of shaping but merely to periodically rough up a grinding surface on a metate or mano. There naturally remains the possibility that once a specimen of the latter type had lost all of its sharp projections it could then assume the role of the first type and continue as a useful tool (Treganza and Valdivia, 1955, p. 20).

One problem of classification arises when we combine the process of manufacture and the concept of use. If we assume a rough piece of source material was purposely flaked down to produce a core to be used solely as a hammerstone, the artifact by definition becomes a flaked tool. However, at this point it bears no resemblance to a hammerstone, but looks more like a chopper or just a plain core and frequently may be classed as such. Once this core is used as a percussion instrument and has its sharp margins battered back, it begins to take on the characteristics of a hammerstone or a used core tool. If battering continues, the final result is an angular nodule whose irregular, worn margins mark the former presence of sharp bifacial flake edges. A well-worn core hammerstone is also a worn-out specimen, at least in the light of its original function.

Of the 1,478 specimens from the Tank Site it is our opinion that their resultant form is derived through means of their own function—that of pecking. That such an implement was much in demand is evidenced by the pecked surfaces of numerous grinding tools. We doubt seriously if hammerstones of this type were manufactured as such, but rather we assume any suitable core, rejected scraper plane, or chopper could have served as a starting point, and an over-all examination of our specimens supports such a thesis.

Emergent is the correlation of core hammerstones and the presence of manos and metates. Noteably both these grinding elements are rare in the coastal San Dieguito and in the Lake Mohave area but do occur among the Shoshonean and Yuman groups who occupied the areas corresponding to these ancient lithic cultures.

Cobble Hammerstones

Cobble hammerstones tend to be oval or egg-shaped and exhibit abrasion on one or both ends. None exceeds fist size, and many are slightly smaller. A number evidence additional use as a rubbing stone.

A varient of this form is slightly thinner and contains small bifacial depressions that have been pecked into the more flattened sides and presumably served as finger grips.

Slate Pendants

To date, worked slate was represented only by three nonperforated, lozenge-shaped specimens, one of which displays a faint, crude rectilinear design. The second season's activity produced no comparable examples, though it added six pieces to the collection. These can be broken down into three descriptive categories:

1. Four examples, none over 2 mm. in thickness, too fragmentary to warrent reconstruction. Judging by the striations on their surfaces and edges, they were shaped by grinding. On each, one end tapers to a blunt point.
2. A lozenge-shaped specimen containing three broken-out peripheral biconical drilled holes. Average length, 6 cm.; average width, 4.5 cm.; 3 mm. thick.
3. A single trapezoidal specimen with no perforation or abrasive marks, but shaped at its narrow end by chipping. Length, 12 cm.; width, 6 cm.; 3 mm. thick.

Miscellaneous Artifacts

Here, as in the first report, are included objects that constitute part of the total cultural inventory, but as

small or unassociated occurrences, they require individual descriptions.

Objects of Stone

1. A smooth, symmetric piece of fine-grained sandstone that, though incomplete, is recognizably spindle-shaped. In all probability it is a fragment of pseudomorphic belemnite cast, but appears to be analagous to the spindle-shaped charm stones of the Santa Barbara Hunting Culture or to those of central California or to the single specimen recovered at the Little Sycamore Site in Ventura County (Wallace, 1954, fig. 38B, p. 114; pl. 24e).

2. Six clusters of quartz crystals, apparently segments of geodes, were recovered. Whether collected as a curiosity or whether they functioned as would a single large crystal for purposes of anamatistic power, as in central California, can only be conjectured. In 1947 a very small, terminated crystal was found in direct burial association, so there remains the possibility that at least single specimens had some ceremonial significance.

3. Spheroidal cobbles of varying sizes were encountered, especially in association with features. None appears to have been artificially shaped either by pecking or grinding, and hence we assume they represent highly selected specimens collected from the numerous conglomerate exposures found in Topanga Canyon. Circumstances surrounding their occurrence offer no clue as to their possible use.

4. Half of a biconically drilled chlorite-schist bead, 1.5 cm. long, and about 1 cm. in diameter. Both ends appear to be roughly serrated, but this feature may be accidental. That the bead was at one time worn on a string appears evident from the high luster at the juncture of the two conical drill holes.

5. A perforated tip of a fossil shark tooth, on which the enamel is largely lacking.

BONE IMPLEMENTS

It can be said with certainty that bone tools in any form were not characteristic of the Tank Site in either Phase I or Phase II.

From both season's work were recovered a single fragment of a bone awl, a small section of polished bone containing a light drill pit, and the tip ends of six antler-tine flakers. The antler specimens all occurred in the 0- to 12-inch level and probably should be assigned to Phase II since their distribution would coincide with the pressure-flaked projectile points.

This near-complete lack of bone artifacts is a pronounced contrast with later coastal and interior sites. In part it can be suggested that wooden objects were manufactured at the Tank Site as a substitute for bone.

OTHER REMAINS

Unworked Bone and Shell

The nonhuman bone recovered consisted primarily of highly fragmented cannon bones, none of which lent itself to positive identification. The total bulk of such refuse was surprisingly low. We can make no claim that mammal bone has disintegrated and disappeared in the course of time, for human bone, though by no means well preserved, was relatively abundant in small pieces (see features).

As has been pointed out, this scarcity of faunal remains lends support to the thesis that at least large game animals did not serve as significant staples. Smaller, lighter bones of rodents were even more rare, and even these could have been postoccupation, since burrowing mammals were present when we excavated. Only two pieces of bird bone were noted and both of these were under an inverted metate.

In the deeper part of the deposit (below 12 inches) identifiable shell remains were absent. Occasional small flecks of calcareous residue might suggest the former presence of highly altered shell remains, but as yet we lack a microscopic analysis to confirm this. In the extreme upper limits (0-6 inches) a few obvious shell fragments were collected, but even here such occurrences were rare.

Fossil Remains

Previously mentioned were a possible belemnite cast, which may have served as a charm stone, and a perforated shark's tooth, probably used as a pendant. Last season we observed numerous remains of some unidentified fossil vertebrate and several marine shells.

Whether these remains indicate merely the former presence of an aboriginal fossil collector, or whether they played some functional role, will never be known to us. A large fossil fish vertebra is known to have constituted part of a Yokuts rainmaker shaman's kit (records of the University of California Archaeological Survey), and fossil horse teeth occur with historic Wintu burials (Treganza, 1954), but the temporal separation between these two historic groups and the Topanga Culture is too great to offer any likely suggestions.

Pigments

Numerous mineral pigment sticks and granules indicate the considerable use of such items, but other than the occurrence of hematite in moderate to light form with some burials, little is known of possible additional uses. As for body paint or surface decoration on perishable material, the evidence of such use would not be preserved.

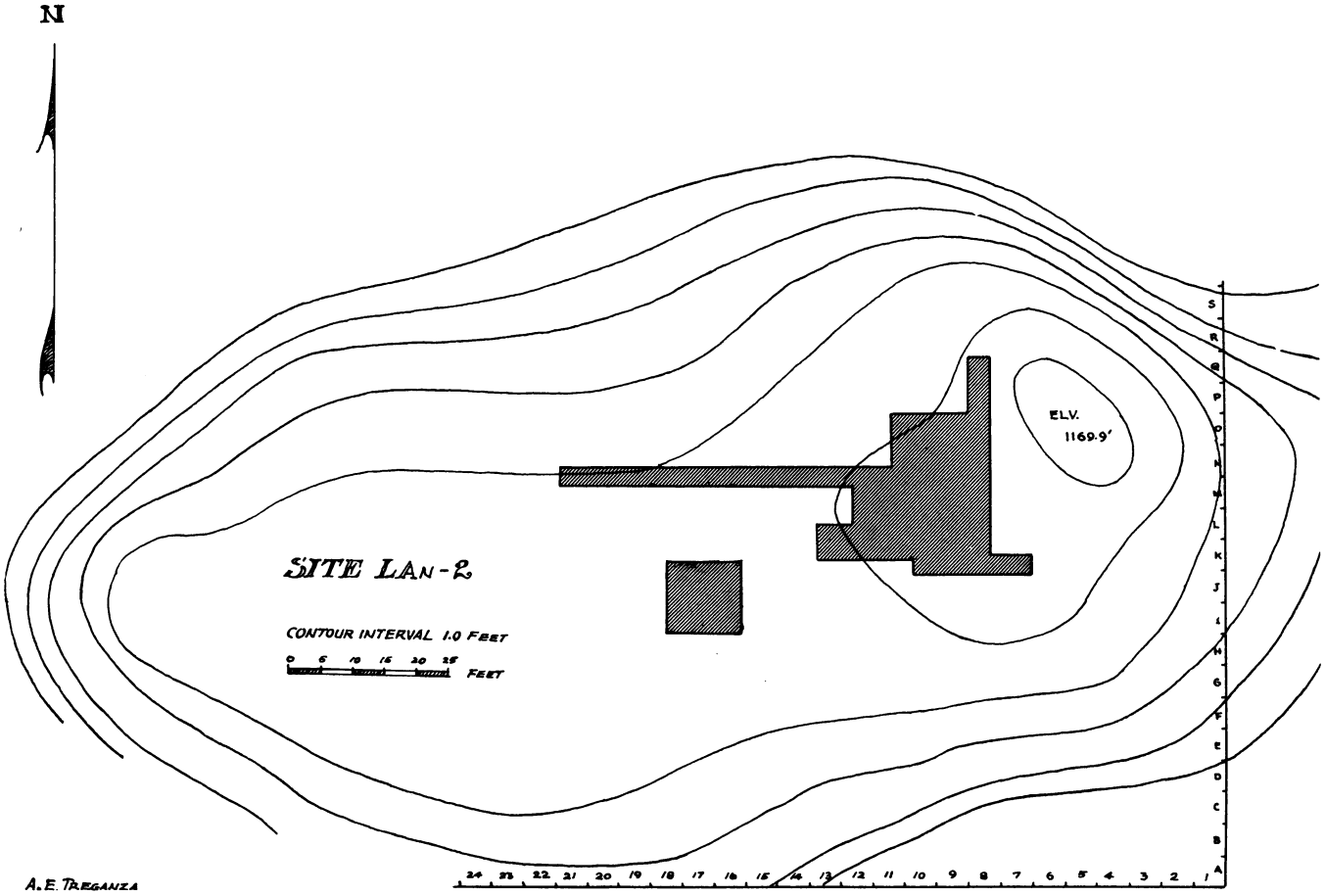
None of the pigment sticks was formed as a result of molding ground materials into a paddy or brick, as is sometimes noted for California, but rather, a good grade of mineral was originally selected, and, as pigment was desired, it was ground from this parent source. Gradually, either long angular or rounded forms resulted. Of these sticks of pigment 13 were hematite, showing a color range from brick red to brown; 33 were limonite, ranging from pale yellow to a rich orange yellow. Occasionally sticks of a pink mudstone occurred.

EXCAVATION OF SITE LAn-2

This site occupies the same ridge as does the Tank Site approximately 350 yards west-northwest of the latter at an estimated 150 feet lower elevation. The ridge narrows down to a slight saddle, providing a semi-knoll upon which the occupational debris has collected (Treganza and Malamud, 1950, pl. 14, a, c). For purposes of fire control the area had previously been bulldozed, obliterating the exact limits of the deposit. Mound soil appears to extend 110 feet east-west and 70 feet north-south, and is 36 inches at its deepest point, some 15 feet southwest of the center of the site. The midden thins out on the periphery more rapidly toward the west than to the east. The deposit is loose, dark, and sandy. No extensive ash lenses were observed, and charcoal, though it appeared in small pieces, was not common. Surrounding the depositional area, the markedly yellow sandy clay stands out in definite contrast. The submound base is the same as the surrounding soils only slightly darker from the downward leeching of organic material from the midden. Directly above the site and to the northeast, a light-yellow sandstone outcrop has been exposed to weathering for a considerable period of time.

Exploratory excavation was initiated in the form of a 12- by 3-foot test trench in 1947. Continuing in the summer of 1948, it was found that more thorough excavation would be warranted. A 5-foot coördinate system was then superimposed on the partial excavated area (see map 3).

At the conclusion of the 1947 season there was reason to feel that the Tank Site was stratified, though at that time without further data, or a means of checking with another site, the evidence was not fully convincing. However, in 1948 additional work on the Tank Site plus a limited amount of excavation on the LAn-2 provided the necessary information not only to show a definite cultural change in respect to some elements within the Tank Site, but also that the Topanga Culture as it has been defined underwent considerable change as it continued on into later times. These changes as exhibited in LAn-2 consist primarily in a shift in the method of disposal of the dead from extended burials to a flexed position, a change in burial orientation favoring north, elaboration in pestle types, absence of large crude blades, projectile points that are small and correspond with the types in upper level of the Tank Site, and a shift in material and variety of core and flake tools. It is upon these differences that Topanga Phase II rests.



Map 3. Site LAn-2

DISPOSAL OF THE DEAD

The method of disposal of the dead contrasts sharply with that of the Tank Site. Of the four burials exposed, two were loose-flexed (pl. 17, c-d), a third, tight-flexed on the back (pl. 17, a-b), and the fourth, though incomplete, likewise suggested a flexed position. The use of a rock cairn is shared by a single burial from the Tank Site, though in the case of the former (burial 6), the cairn composed of manos and metates and other rocks surrounded the burial; here the rocks lay directly over the burial. Like the Tank Site, associated artifacts were rare. The only occurrence was a single metate associated with the cairn in burial 4.

The condition of the bones was poor. Though more complete than the remains from the Tank Site, the skeletal material was fragile and difficult to expose, possibly due to the loose sandy mound matrix.

Burial 5 from the Tank Site possessed a slight flexure of the knees and the dual burial 10 possibly suggests flexure. Both of these burials come from the shallow area of the Tank Site and may suggest a parallel.

In other coastal sites, the burial pattern found at LAn-2 finds comparable practices (Rogers, D. B., 1929; Rogers M. J., 1945; Walker, 1936; Peck, 1955; Wallace, 1954.

Table 6

Burial Data on Site LAn-2

Burial data	Burial number			
	1	2	3	4
Depth from surface (in.) . . .	21	13	15	26
Primary inhumation	x	x	x	x
Loose flex on side	x	x	x	...
Tight flex on side.	...	...	...	...
Tight flex on back	...	...	...	x
Head pointed	NE	WSW	N	N
Artifacts associated	...	...	...	x

DESCRIPTION OF ARTIFACTS

FLAKED TOOLS

The assemblage of flaked core tools recovered from LAn-2 represents in part a continuation of the lithic patterns as described for the Tank Site. Such modifications as have been noted, plus other cultural changes, constitute the basis for assuming this site follows the Tank Site in an uninterrupted temporal sequence. This assumption is further backed by stratigraphic evidence provided by projectile points (table 4).

Some core tools are also found in LAn-2 but do not occur either in the total quantity, quality, or number of types as found in the Tank Site. Many of the specimens exhibit a lesser degree of patination, though there are some that are heavily patinated. Considering the great quantity of tools in the Tank Site and its close proximity, it may be that the more weathered tools were borrowed from the Tank Site. The majority of the core tools were so poorly manufactured that at times definite tool types were difficult to recognize. Basalt still appears to predominate as a source material, but quartzite appears to have been of more common usage, expecially in the making of certain scraper types.

Table 7

Flaked Tools and Materials from Site LAn-2

Tools	Basalt	Quartzite	Total
Scraper plane IA	5	2	7
Scraper plane IIA.	57	5	62
Scraper plane III	9	3	12
Side scrapers.	7	3	10
Straight-edge knives or scrapers . . .	5	10	15
End scrapers	5	0	5
Snub-nosed scrapers . . .	5	0	5
Concave scrapers	4	0	4
Unifaced choppers	0	2	2
Bifaced choppers	9	3	12
Core hammerstones . . .	60	3	63

Inasmuch as the tool types are the same as those set up for the Tank Site, there is little need to redescribe them. The frequencies are listed in table 6. The depths ranged from surface to 36 inches, but the distribution of artifacts appeared to be homogenous, hence the depth has no significance.

Projectile Points

Nothing from LAn-2 approached the large crude blades and points characteristic of the lower levels of the Tank Site (LAn-1). Contrarily, the material matches the small points that are typical of the upper levels of the Tank Site (0-12 inches), and finds, in addition, parallel in the later coastal cultures of the Santa Barbara region. All of the specimens are pressure flaked and composed of either chert or obsidian. The eight typable points represent too small a series, and the deposit is too shallow to show any stratigraphic differences within the site.

Lozenge points (pl. 23, i-l).—Of the four specimens recovered, one appears to have accidentally had a large flake removed from one side and then undergone secondary chipping, producing a resemblance to a single side-notched type. Their representative lengths are 4.0, 3.6, 3.5, and 2.9 cm.

Side-notched points (pl. 23, g-h).—These two specimens differ from those of the Tank Site in that the base tends to be more concave rather than convex. Only one of the Tank Site specimens showed a slight concavity. These specimens differ somewhat from the side-notched concave points that are typical of the protohistoric and historic period in that they are broad across the base and proportionately short. Their lengths are 3.5 and 2.5 cm.

Contracting-stem points (pl. 23, f).—This single speci- is larger than those of the Tank Site and differs in that the sides tend to be convex near the tip, concave at the mid-section and base, terminating in well-defined tangs. Were it not for the well-defined tapering stem, the basal portion would be concave. Typologically this type finds a good parallel in D. B. Rogers' Hunting and Canalino specimens and a somewhat lesser similarity to the Gypsum Cave material. (An extended discussion of this type will be found in the conclusion.) Length, 7 cm.

Convex-base points (pl. 23, m).—This type is not represented in the Tank Site series and is known here only through a single incomplete specimen. It is a type not uncommon to the later coastal group. Reconstructed length, 3.5 cm.

Fragments of points.—Only two additional point fragments were recovered, neither of which are typable.

GROUND OR PECKED STONE

Ground or pecked stone, like that of chipped material, evidences a certain amount of continuity as compared to the Tank Site, but also changes slightly. The number of examples and types is considerably less, perhaps due in part to the proportional amount of digging done, though it is difficult to determine, as the Tank Site might well be classed as unusual in regard to its great quantity of implements. Where manos and metates were of frequent occurrence in the Tank Site, they become rare here. Though only two mortars and four pestles were found, it would indicate a considerable statistical increase over the Tank Site, especially when the amount of digging done in the two sites is compared. Slate pendants carry through as do stone disks. No cog stones were recovered though they appear to be an associate of the disks.

Metates

A slight shift may be noted in the types of metates. The shallow basin and the slab take precidence over the deep basin. As to material and form, no differences could be noted. The specimens from this site were not weathered so badly nor was the inverted position common. The number of each type recovered was as follows: shallow basin, 17; slab, 3; deep basin, 2; and 19 unidentifiable fragments.

Manos

Manos, like metates, were not too numerous nor varied in form. The finished specimens lack the perfection of the better made examples in the Tank Site. Considering the entire grinding comples, it is evident that the role played here was of less importance. This might be interpreted as indicative of a slight shift in the food economy. It is difficult to offer an explanation as to the direction or nature of such a shift, though there is some evidence suggesting greater emphasis was placed on hunting. By types, the following number of each was found: 4 mono-facial type 1A; 20 bifacial type IIB; 3 wedge-shaped type IIC; and 1 type III, with three worked faces.

The ratio of manos to metates is quite different here than at the Tank Site. Here the ratio is 1.5 metates to 1 mano. Little explanation can be offered to this reverse trend other than it represents a breakdown of an older pattern as a result of a shift toward the mortar-pestle complex.

Mortars

The evidence for mortars rests upon two incomplete specimens. A single rim fragment, composed of a fairly course sandstone, resembles the Tank Site specimen, but having a somewhat larger diameter (about 10 inches). The second specimen is too gragmentary to allow any reconstruction of size.

Pestles

Only four pestles were recovered. One, a complete specimen composed of a diabase, was shaped by pecking followed by grinding. The specimen is 14.6 cm. long, tapering from 3.5 cm. in diameter to 5 cm. at the distal end. A ridge forms a circular band about the handle, 3.1 cm. from the top, 1.6 cm. wide, and projects some 3 cm. The form has a phallic appearance (pl. 24, d).

A fragmentary specimen like the above type is too incomplete to afford much information. It is composed of a coarse sandstone and has been subjected to considerable oxidation from a fire.

Another fragmentary specimen 11.3 cm. long exhibited a well-defined convex pounding end. One side shows evidence of flattening by grinding, and in this respect it is like the cache of three small pestles from the Tank Site.

An implement, hardly worked but apparently complete, is an elongated cobble, nearly circular in cross section. The pounding end is convex, showing considerable wear. The length is 19.7 cm. with an average diameter of 8.5 cm.

Rubbing Stones

All of the seven specimens recovered were composed of flat cobbles, spherical to oval in form, and worn on both sides. Of these, two have a single concave surface and a single specimen was bipitted on both surfaces. Size of specimens averaged 7.85 by 7.1 by 2.8 cm.

Stone Disks

A single representative with beveled edges ranging in diameter from 7.4 cm. on one surface to 5.5 cm. on the other, and 3.6 cm. thick, was found. It is composed of a sandstone and is shaped by pecking and grinding, resulting in a somewhat uneven form. Similar specimens have been illustrated for the Tank Site (Treganza and Malamud, 1950, pl. 24, c, d, f, h).

Pendants

Pendants are known only in fragmentary or unfinished form, none of which resemble the types from the Tank Site. A single unfinished specimen, composed of slate, is subrectangular in outline with irregular wavy edges, the dimensions being 10 cm. long by 2 cm. wide by 5 cm. thick. On both surfaces of the smaller end biconical drill holes had been started. The entire surface shows evidence of irregular scratchy abrasive marks. A single specimen composed of laminated shale is incomplete and suggests merely a rectangular form. In addition, three steatite fragments appear to represent some form of pendant. If complete, all would probably have had a long tapering rectangular form. The thickness varies from 1 to 3 cm.

OTHER REMAINS

Shell and bone artifacts were absent; this may be partly due to the limited excavation. No evidence of textiles was detected.

Unworked Bone and Shell Remains

Like the Tank Site, both these elements were rare, especially shell, which is known only through two unidentifiable fragments. A few deer bones occurred, the lower mandible of a wild cat (Lynx rufus), and the canine and incisor teeth of either a fox or coyote. The preservation of mammal bone, like that of human, was very poor.

SUMMARY AND CONCLUSION

The final Topanga report remains primarily descriptive in order to make the data more useable for comparative purposes. Although this concluding report describes some new material, adds considerably to artifact frequencies, and defines Phase I and Phase II of the Topanga Culture, the basic conclusions reached earlier remain essentially unchanged, and the previous general conclusions need not be repeated here (Treganza and Malamud, 1950). This summary is the senior author's opinion and does not necessarily reflect the views of either of the coauthors of the Topanga reports.

An extended archaeological survey in upper Topanga Canyon and its main tributaries revealed ten additional habitation deposits comparable to the Tank Site, LAn-1. More recent excavations along the adjacent coast and in the interior valleys (Walker, 1951; Wallace, 1954; Peck, 1955) have produced artifacts comparable to both phases of the Topanga culture. Therefore, the Topanga Culture, as we have defined it here, is not limited to the Tank Site but contains local expression as well as relationships outside the immediate area.

The two phases of the Topanga Culture are derived primarily through differences in projectile points and burial customs. Phase I is characterized by large percussion-flaked blades and points (pl. 21) which occur in the Tank Site (LAn-1) from the surface to 60 inches in depth with the greatest frequency below 18 inches (see table 4), and no similar type points or blades have been found in LAn-2. Phase II projectile points are smaller, varied in type, and are pressure flaked (pls. 22, 23, f-m). These points are confined to the upper 18 inches of the Tank Site and are exclusive to LAn-2. There are three forms of interment in the Tank Site, all of which characterize Phase I: (1) primary inhumation, extended, prone or supine, head southerly; (2) reburial, segments of long bones only, generally under an inverted metate; and (3) fractional burial with interment of long bones only. By virtue of its deep occurrence the reburial is the most ancient in the Tank Site (Treganza and Malamud, 1950, p. 135, burial 8). Phase II burials are flexed, with no specific orientation, and occur both with and without rock cairns. These burials were all limited to LAn-2.

Since clear-cut stratigraphic evidence is lacking it is difficult to assign other classes of artifacts as being definitely associated with any one specific phase of the Topanga Culture. Some general statements can be made. The large quantity of basalt core tools, especially scraper planes, occur deep in the Tank Site and are far less common in LAn-2. Manos and metates bear out the same relationship; however, both these types of artifacts span the time gap from early occurrences to the historic period. It is only when one or both of these elements characterize or dominate a site, such as in LAn-1, that they have diagnostic or comparative value in so far as the Topanga Culture is concerned.

Cog stones, discoidals, and crescentic stones, or "amulets," are unique types of artifacts, and when found in the right association with other artifacts may prove to be valuable horizon indicators. Cog stones and discoidals occur most commonly along the interior margin of the southern California littoral, and, where documented, the mano and metate are also present. Crescentic stones, as an artifact type, have been most objectively associated with the San Dieguito of the San Diego coast and the San Dieguito-Playa (Lake Mohave) Culture of the eastern desert. However, the crescentic stone in its various forms expresses considerable latitude in time and space.

Certain elements in the Topanga Culture might be viewed as "index artifacts" when they occur as associates. To have comparative value it is the combination of traits which create the cultural pattern and not the isolates. Phase I is characterized by a combination of extended burial with the head south, reburial of long bones under metate, fractional burial, percussion-flaked projectile points and blades, dominance of flake and core tools, dominance of milling stones with wide variation in the hand stone (mano), crescentic stones, stone cogs, and stone discoidals. The latter two may occur late in this first phase. Phase II has flexed burials with no specific orientation, an occasional rock cairn in association, pressure-flaked projectile points constituting several types, and dominance of the cobble mortar and pestle as milling implements, though the latter may occur toward the end of Phase I.

Through lack of clear-cut stratigraphic evidence, all other artifacts described for the Tank Site will have to be considered either as late Phase I or early Phase II. Unless subsequent excavations at LAn-2 produce data of a nature different than that already described, this latter site should represent the type site for Phase II of the Topanga Culture.

Following the first published Topanga report, two village sites along the adjacent coast have been excavated, both of which share comparative traits with the two phases of Topanga Culture (Wallace, 1954, 1955; Peck, 1955). Both authors were handicapped in making comparisons, since this final report was not available. With future comparisons to be made, a clarification of some statements might be in order. Wallace (1955, Table I, p. 220) in presenting "milling stone horizon cultural assemblages" uses nine broad comparative categories for five different geographical areas in which each area is known by one or more excavation sites. The traits listed by Wallace under the heading of Topanga are those characteristic of Phase I with the possible exception of the mortar and pestle. "Few clam disk beads" are also listed. The only shell artifact found in the Tank Site was a single massive clam-disk bead which, because of its shallow occurrence (4 inches), is probably a Phase II artifact.

Peck (1955, p. 70), comparing Zuma Creek with Topanga, mentions the following as occurring at the Tank Site (LAn-1): ". . . hard calcareous mass at lower levels." Reference must be to the nonculturally altered sandstone base of the site, since the lowest portion of the cultural deposit, the C profile, is rather soft (Treganza and Malamud, 1950, p. 130). Peck notes burial markers as: "stone platforms, red ocher abundant, and flint tools." Large aggregates of stone were common in the Tank Site and are termed features, being composed of large quantities of boulders, whole and broken artifacts, and frequently a segment of human long bone (fig. 1). Frequently one or more metates occurred with burials. Red ocher was abundant in small granules throughout the site and appeared more frequently in the burial areas, but not to the extent as to class an interment as being a red-ocher burial in the traditional meaning or even as a burial marker. Flint tools consist of a single chert blade. Varied silicates occur as artifacts in the Tank Site but not as grave markers. Peck (1955, p. 70) also lists manos as occurring in pairs. Two was not characteristic for the Tank Site as mano caches occurred, numbering from two up to six (pl. 19, a, b).

It has been difficult to place the Topanga Culture in a

compatible time perspective with the other known early cultural assemblages of southern California. Topanga, between its two phases, has elements in part comparable to all of these earlier cultures but lacks a majority of artifacts common to any one. Paramount for an explanation is the "abnormal" quantity of lithic artifacts classed under the broad heading of core and flake tools which occur in the Tank Site. Most characteristic are scraper planes, choppers, and a variety of heavy-duty scrapers. Western archaeologists fail to share any common understanding as to what these artifacts mean in time and function. The many subvarieties into which these major classes have been divided suggest they are more the product of a too elaborate or overextended typology rather than varieties that have cultural significance. In part, the Topanga papers make the same error in attempting to describe objectively a large mass of data and at the same time devise some system whereby not only the Topanga artifacts but other materials could be made more meaningful in terms of cultural comparisons. Needed is a reëxamination of the entire concept of "core tools" in western North America. Earlier, few people recognized or reported such tools. Now the other extreme has the artifact versus the "naturifact" and the talk of culture in such loose terms as preblade industries.

Habitual thinking has perhaps contributed to the general idea that a lithic assemblage of core tools characterized by percussion flaking has come to represent both antiquity and a hunting- or skin-dressing economy. This may be true in instances where the physical and the biological evidence are sufficient to support such a claim.

The general antiquity of the Tank Site can be established on the grounds of physical evidence but the great quantity of core tools invites speculation to account for their occurrence in a nonhunting culture. Some 4,994 core tools were collected from the Tank Site of an estimated presence of 50,000. This figure is exceptionally high, compared to other southern California sites of assumed similar age. Greatest in amounts were scraper planes and core hammerstones. Curiously enough, none of the scraper planes, regardless of finish, shows any degree of wear of battering on the presumed working edge or polishing on the under surface as would be expected to occur with use. This is true of similar artifacts from the San Dieguito, La Jolla, and Lake Mohave cultures. Possibly as a fleshing tool no such wear would result, but evidence of skin dressing is lacking with so little mammal bone occuring in the site. A wood-working or plant-fiber economy likewise would hardly necessitate any great quantity or variety of tools. The large pulping plane used to remove mescal fiber from a leaf was rare even among the historic Dieguēno.

To account for the large number of "core tools" in the Tank Site, especially scraper planes, choppers, and core hammerstones, it is suggested these tools are actually crude implements used in the manufacture and maintainence of more refined implements directly associated with the mass production of the food economy, that is, the milling stones known as the mano and metate. The function of these primitive mills is to grind, necessitating a rough contact between the surface of the mano and the metate. When the surfaces are worn smooth, caking of meal (acorn) occurs on the polished faces, resulting in the reduced efficiency of the mill. Primitive peoples who have used the mano and metate solve this problem in one of two ways. In the Southwest and in Mexico volcanic scoriaceous or vessicular basalt is selected for either or both the hand stone and the grinding slab. As wear progresses new holes are constantly opened up on the surface of both the grinding tools and hence the mill constantly maintains full grinding efficiency and is self-sharpening. If granites, sandstones, or schist are used, as is often the case, then on frequent occasions the grinding surfaces have to be artificially pitted. To do this a core is made containing angular points and edges and sharp blows are struck on the faces of the mano and metate, removing small pitts (fig. 5, b, f; Treganza and Malamud, 1950, pl. 22, b, c, g). This latter technique of pecking or crumbling is the same as that used to shape or reduce a stone to a desired rough form preparatory to grinding as a finishing technique. It was discovered in our own experience in the manufacturing of stone artifacts (Treganza and Valdivia, 1955) that when a core hammerstone lost its sharp edges through battering it was of little use, and continued use of such a blunt hammerstone often broke the object being manufactured.

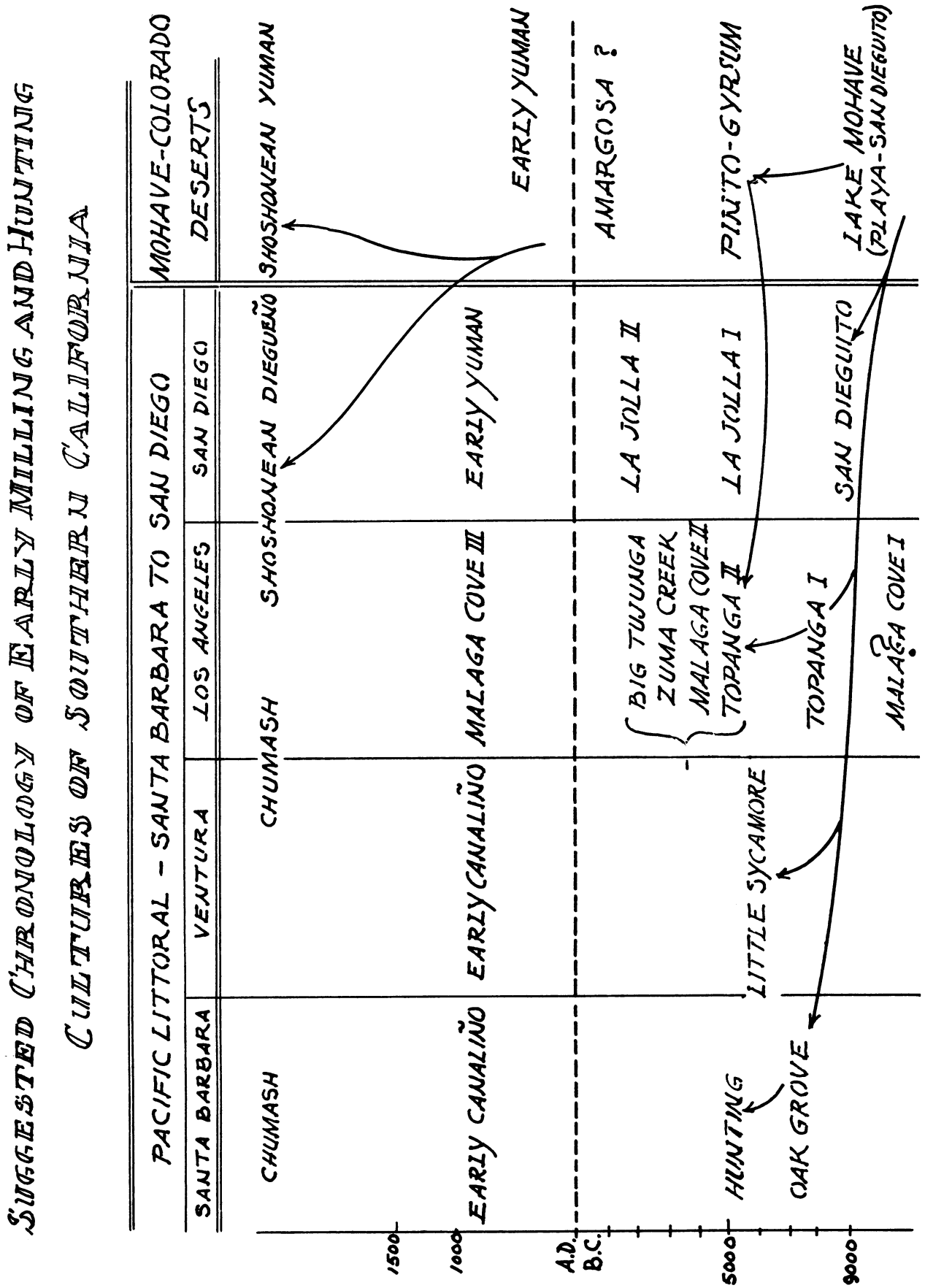
Where this pecking technique is used to sharpen manos and metates three end products result in terms of exhausted tools and become part of the camp refuse. Hammerstones occur as subangular nodules with battered blunt edges; manos, when they are worn too thin, usually break in the process of pitting, and the metate in time wears through or the bottom gets knocked out resulting in a "killed" artifact. What has earlier been referred to be many authors as the "ceremonial killing" of an artifact might also be viewed as the end product of function.

It is noted that Phase II site LAn-2 shows a sudden decline in core tools accompanied by a decline in manos and metates. Presumably the mortar becomes a replacement.

Recovered from approximately one-tenth of the Tank Site were 2,556 manos, 329 metates, both whole and broken, and 1,478 worn-out hammerstones. No clear breaking point could be established between an unused scraper plane, which is really a core with one or more flat bottoms, and a partly used hammerstone, or between just a plain core and a partly used hammerstone. Probably most of our scraper planes might be considered potential hammerstones. This being the case, the scraper plane may be just a "myth artifact" growing out of the literature and typologies rather than being an existing reality. This does not imply that all so-called core and flake tools or even some scraper planes should be considered in the same light. It merely points up the fact that Western terminology and typology might be reëxamined. One exception might be considered in the Type IA scraper planes (Treganza and Malamud, 1950, pl. 17, a), which, because of symmetry, flat base, marginal and all-over surface flaking, are similar to the classical forms of the San Dieguito Culture.

The possibility that this "abnormal" quantity of the core tools characterizing the early phase of Topanga can be related to a functional part of a seed-gathering economy relieves some difficulties in making cultural comparisons, and provides a more realistic approach. Why Topanga should have more core tools than other reported sites may also have an answer. Some early archaeologists failed to recognize core tools and naturally did not collect them. Sites immediate to the coast generally have a split marine-land economy, and though the metate and mano are present, the core tools used for purposes of pitting such artifacts are distributed more widely in a mound mass charged with shell refuse. Often, along the coast, beach cobbles and cobbles from marine conglomerate provide the only lithic source close at hand, and a resulting tool made from a cobble resembles more a

Table 8


SUGGESTED CHRONOLOGY OF EARLY MILLING AND HUNTING CULTURES OF SOUTHERN CALIFORNIA
PACIFIC LITTORAL - SANTA BARBARA TO SAN DIEGO
MOHAVE-COLORADO DESERTS
SANTA BARBARA
VENTURA
LOS ANGELES
SAN DIEGO
CHUMASH
EARLY CANALIÑO
HUNTING
OAK GROVE
CHUMASH
EARLY CANALIÑO
LITTLE SYCAMORE
MALAGA COVE III
SHOSHONEAN DIEGUEÑO
SHOSHONEAN YUMAN
EARLY YUMAN
EARLY YUMAN
BIG TUJUNGA
ZUMA CREEK
MALAGA COVE II
TOPANGA II
LA JOLLA II
AMARGOSA ?
TOPANGA I
LA JOLLA I
PINTO-GYRSUM
MALAGA COVE I
SAN DIEGUITO
LAKE MOHAVE (PLAYA-SAN DIEGUITO)
1500
1000
A.D.
B.C.
5000
9000

chopper or a "teshoa" flake. This is particularly true of metate-producing sites around Santa Barbara. The Tank Site is adjacent to a massive basalt outcrop from which angular core tools were manufactured. Thus, quarry refuse, and immediate lithic supply, and an economy demanding a great many pecking tools, plus erosional factors that might have concentrated artifacts in the course of time, can in part help explain the great quantity of core tools found at Topanga.

Since Carbon-14 dates are lacking, Topanga can receive only a relative position in a not too well understood southern California cultural sequence. Cultural placement therefore rests upon the recovered types of artifacts, the physical and chemical alterations of both mound mass and artifacts, and the physiographic location of the Topanga sites in terms of a paleogeographic environment. That two phases of the Topanga Culture exist is shown by stratigraphic evidence in the Tank Site with supporting evidence in the adjacent LAn-2 characterizing a Phase II period.

Recently a cultural chronology has been suggested for southern California coastal archaeology (Wallace, 1955, p. 227, table 3). Earlier a similar chronology was constructed (Treganza, 1950, table 8) which lacked recent data but was more comprehensive and included possible cross-cultural ties with the desert cultures of the southwestern part of the Great Basin.

Presented here is a modification and more limited view of the earlier chronological chart (table 8), differing from the chronology presented by Wallace mainly in the duration of time, and the inclusion of more recent data. Without knowledge of two phases of the Topanga Culture and without the aid of complete data, Wallace dates Topanga at about 2000 B.C. but not over 3000 B.C. Sites (or cultures) such as Oak Grove, Little Sycamore, Malaga Cove II, and La Jolla I are given a date between 0 B.C. and 3000 B.C. (average, 1500 B.C.). With more specific dating for the pheripheral areas, especially the central California Middle and Early Horizons, a date of 2000 B.C. for Topanga seems far too conservative to fit comfortably into any over-all generalized chronology for California. Likewise, if Phase I of Topanga is related, as is suggested, to the San Dieguito of San Diego County, and the latter is related to the ancient Lake Mohave (Playa) Culture of the eastern desert, then the acceptance of a date of a little over 3000 B.C. for these cultures would suggest the geologic dating for ancient Lake Mohave as too early or that coastal southern California has suffered a considerable cultural lag. It is doubted that either is the case.

Though claims have been made for Third Interglacial occupation of the southern California coast, convincing evidence is still lacking. The organized cultural activities of man first appear as a combination of shore-line and milling activities directed toward the collection and preparation of food. This simple ecological adaptation could have occupied considerable periods of time involving little or no cultural modification in the direction of technological change. It does not seem to conservative to date Phase I of Topanga between 4000 B.C. and 8000 B.C. and Phase II with some overlap from 2500 B.C. to 5000 B.C.

BIBLIOGRAPHY

Campbell, E. W., W. H. Campbell, E. Antevs, C. A. Amsden, J. A. Barbieri, and F. D. Bode
1937. The Archaeology of pleistocene Lake Mohave, SM-P No. 12.

Heizer, R. F., and E. M. Lemert
1947. Observations on Archaeological Sites in Topanga Canyon, California. UC-PAAE 44:237-258.

Peck, S. L.
1955. An Archaeological Report on the Excavation Of a Prehistoric Site of Zuma Creek, Los Angeles County, California. Archaeological Survey Assoc. of Southern Calif.

Rogers, D. B.
1929. Prehistoric Man of the Santa Barbara Coast. Santa Barbara Museum of Nat. Hist.

Rogers, M. J.
1929. The Stone Art of the San Dieguito Plateau. AA 31(3):454-467. Menasha.

1939. Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas. SDM-P No. 3. San Diego.

1945. An outline of Yuman Prehistory. SWJA 1(2):167-198.

Treganza, A. E.
1950. The Topanga Culture and Southern California Prehistory. Unpublished Ph. D. Dissertation. University of California.

1954. Salvage Archaeology in Nimbus and Redbank Reservoir Areas, Central California. UCAS No. 26.

Treganza, A. E., and E. G. Malamud
1950. The Topanga Culture: First Season's Excavation of the Tank Site. 1947. UCAR 12(4).

Treganza, A. E., and L. L. Valdivia
1955. The Manufacture of Pecked and Ground Stone Artifacts; A Controlled Study. UCAS (32):19-29.

Walker, E. F.
1936. A Ceremonial Site at Porter Ranch, San Fernando. SM-M 10:98-104.

1945. The Dig at Big Tujunga Wash. SM-M 19:188-193.

1951. Five Prehistoric Archaeological Sites in Los Angeles County, California. SM Vol. VI.

Wallace, W. J.
1945. The Little Sycamore Site and the Early Milling Stone Cultures of Southern California; A Ant XX(2):112-123.

1955. A Suggested Chronology for Southern California Coastal Archaeology. SWJA 11(3).

PLATES

EXPLANATION OF PLATES

Plate 17

Phase II burials from LAn-2. a. Burial 4 flexed on back with associated rock cairn. b. Burial 4 with cairn removed. c. Burial 1, flexed with associated rock. d. Burial flexed on left side. e. Burial 10, LAn-1, showing sets of leg bones from two individuals.

Plate 18

Burials, features, and artifacts from LAn-1. a. Burial 11, showing only long bones and mandible fragment. b. Feature 21, showing metate fragments and human long bone. c. Slab and shallow-basin metates. d. Feature 24, weathered metate fragments.

Plate 19

Features, LAn-1. a. Feature 25, a cache of six manos. b. Feature 14, a cache of four manos. c. Exposed features in central portion of site. d. Feature 15 and showing burial 10 in upper left.

Plate 20

Features, LAn-1. a. Feature 26, showing inverted metates, manos, and core tools. b. Feature 22, showing deep-basin metate that has been turned over, and manos, c. Feature 28, showing inverted "killed" metate, metate fragments, and manos. d. Feature 23, showing large concentration of metate fragments, core tools, manos, and fire-fractured stone.

Plate 21

Topanga Culture Phase I projectile points and blades from LAn-1. a-i. Patinated basalt specimens. j. Laminated chert. k-l. Chert. m. Crescent stone or "amulet."

Plate 22

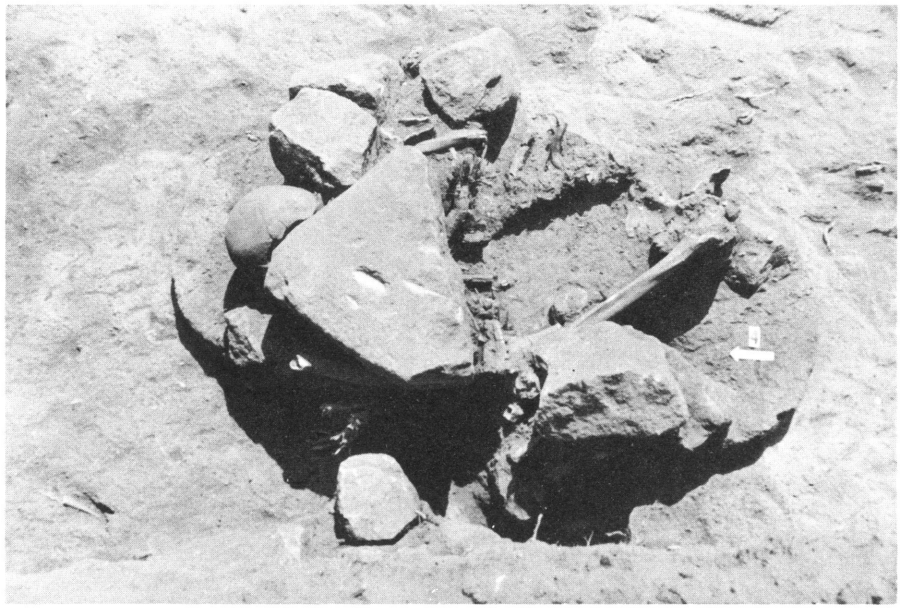
Topanga Culture Phase II knives and projectile points. a, b. Chert and obsidian knives. c-e. Side-notched points. f, g. Contracting-stem points. h, i. Lozenge points. j, k. Contracting-stem points. l-u. Lozenge points.

Plate 23

Cog stones, drills, and projectile points. a-c. Cog Stones. d-e. Quartzite hand reamers or drills. (Specimens a-e are from Tank Site, LAn-1.) f-m. Topanga Culture Phase II projectile points from LAn-2.

Plate 24

Pestles and charmstone (?) fragment. a-c. Pestles from LAn-1. d. Flanged pestle from LAn-2. e. Belmnite fossil fragment or charmstone from LAn-1.



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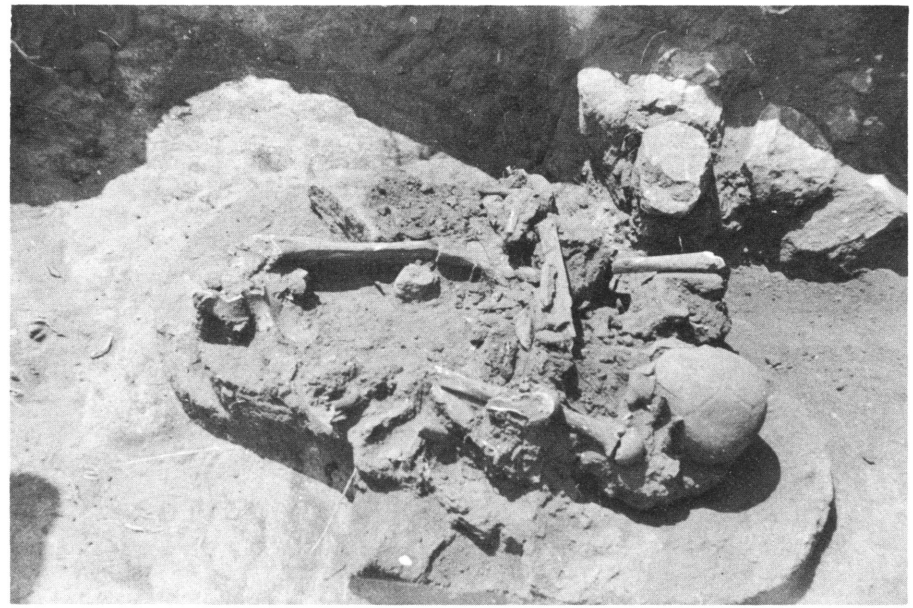

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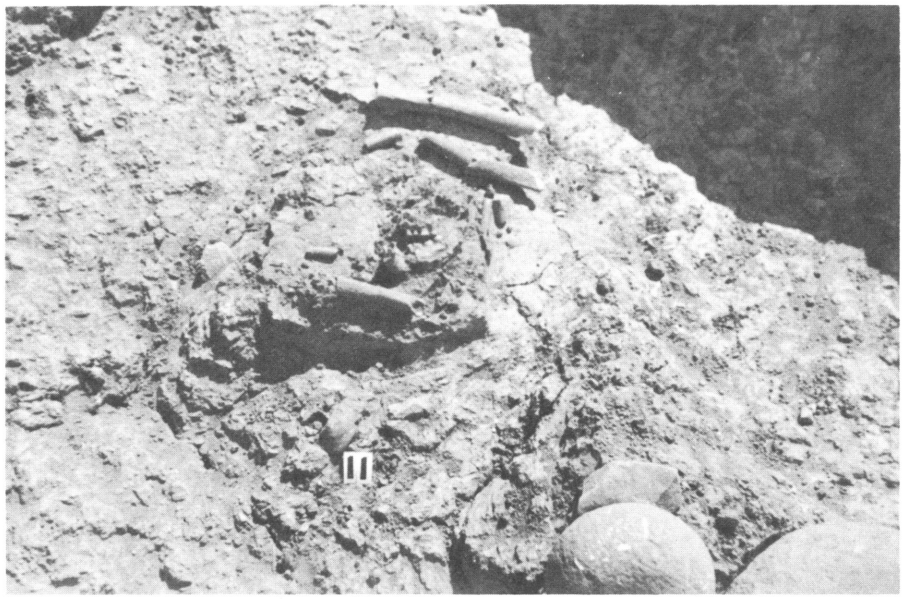
Plate 17. Phase II Burials from Site LAn-2



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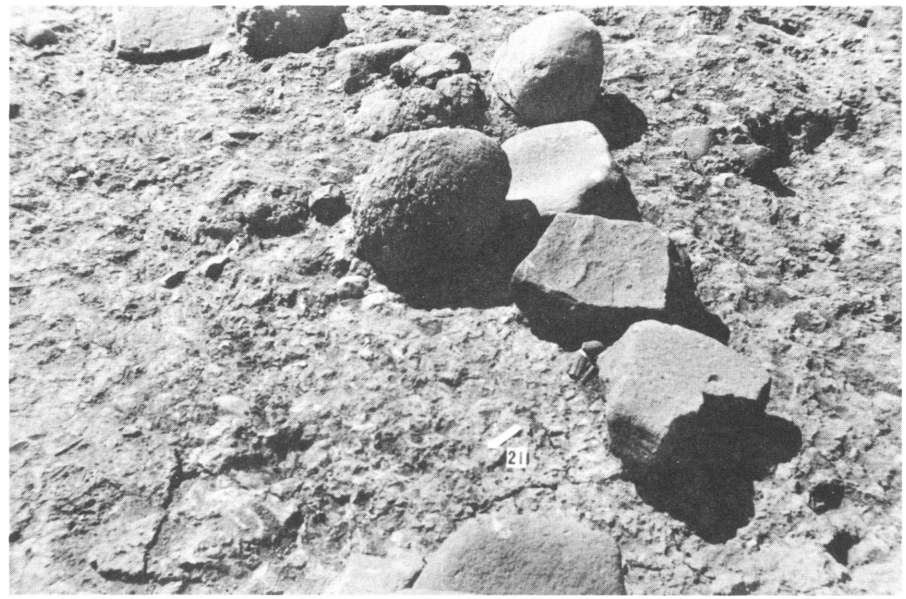

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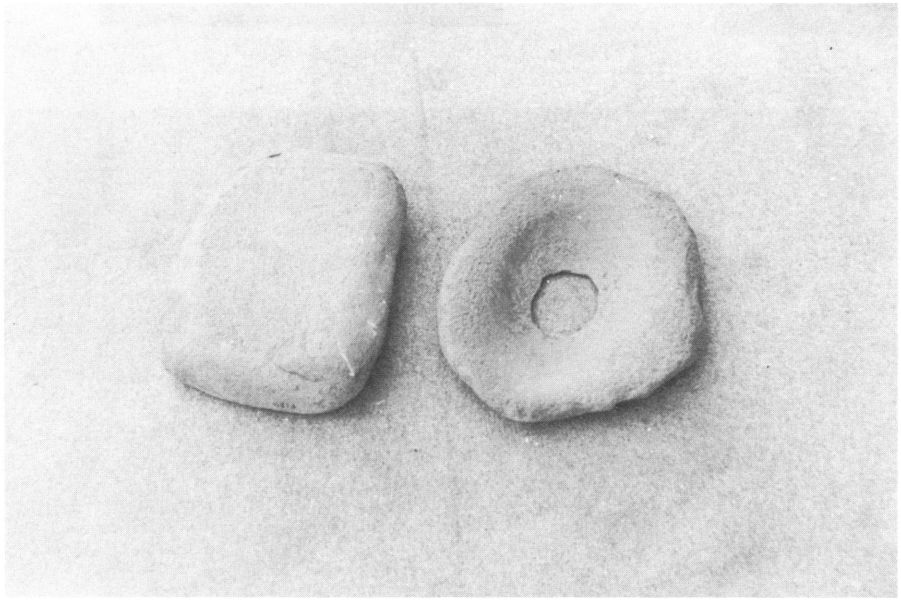

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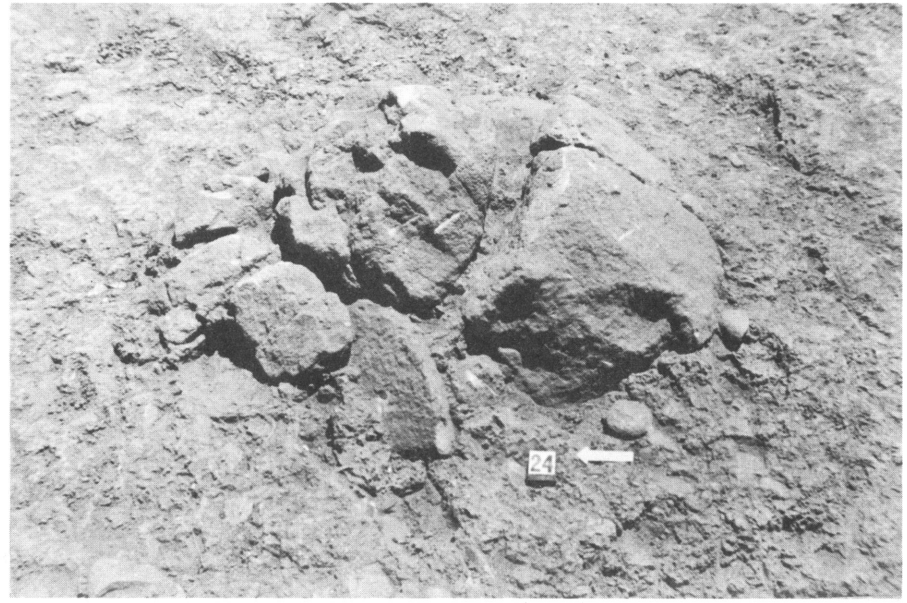

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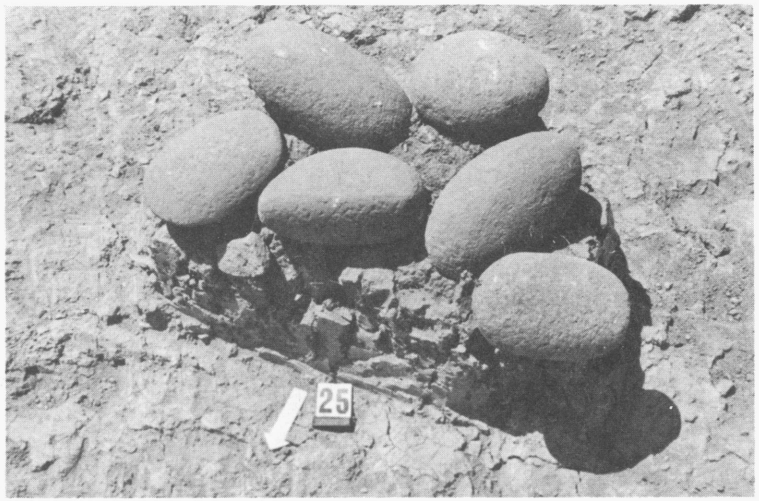
Plate 18. Burials, Features, and Artifacts from Site LAn-1



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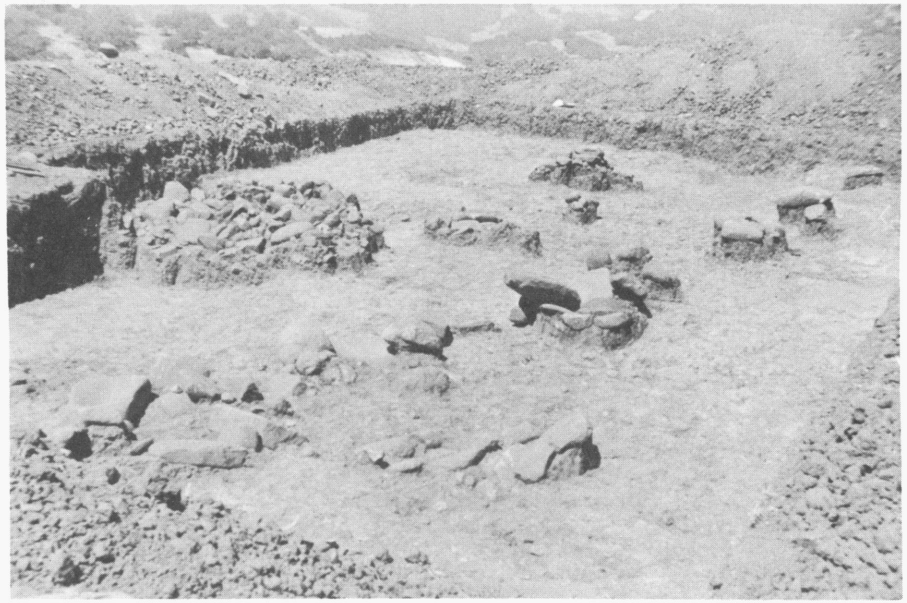

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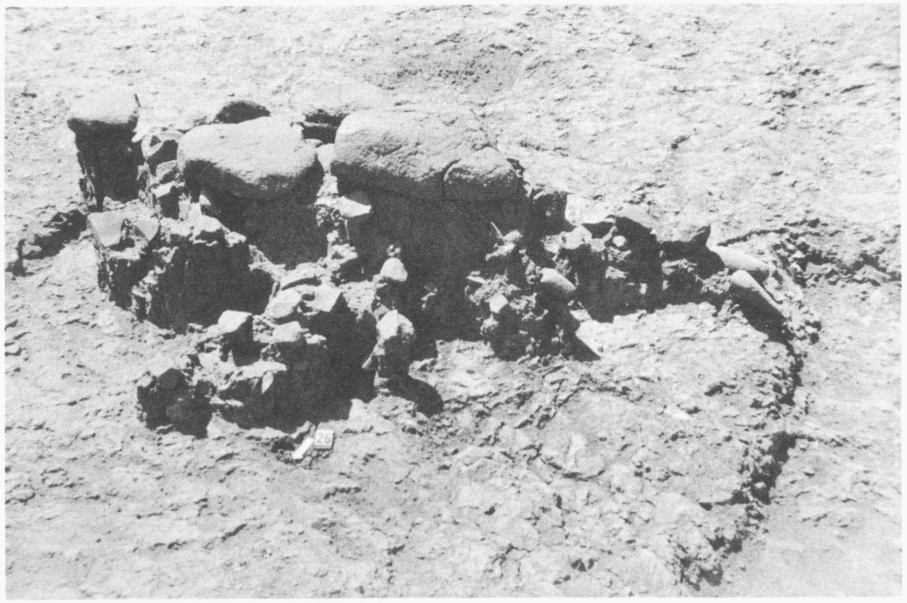
Plate 19. Features, LAn-1



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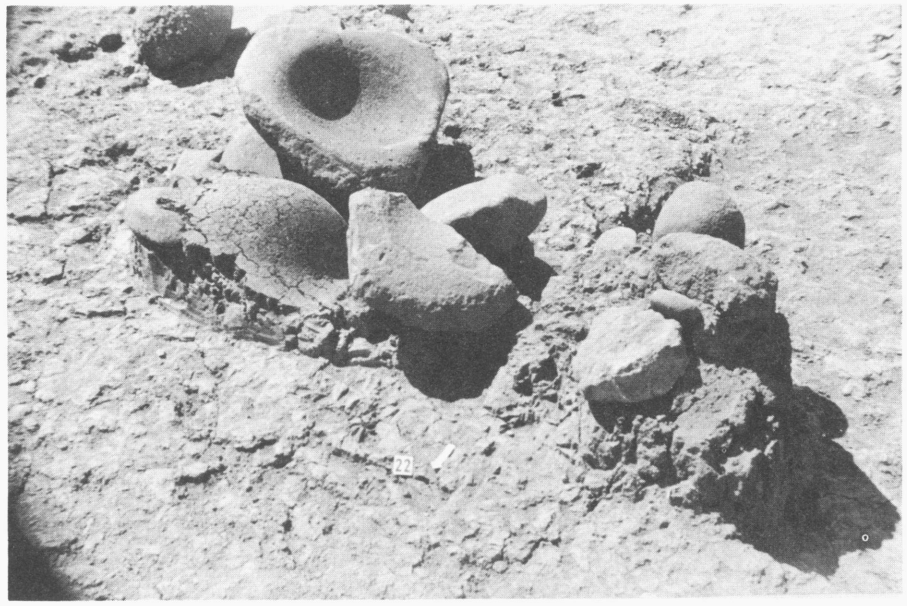

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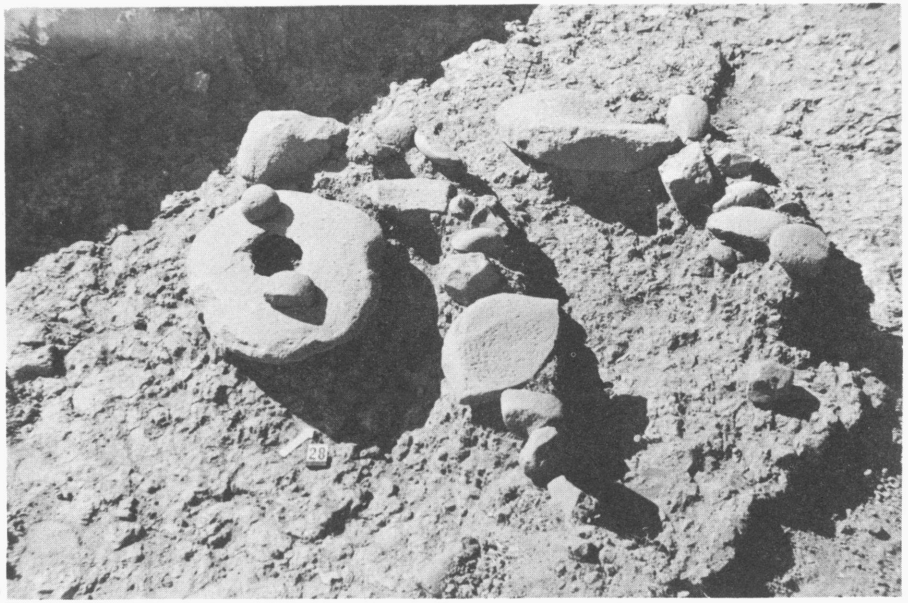

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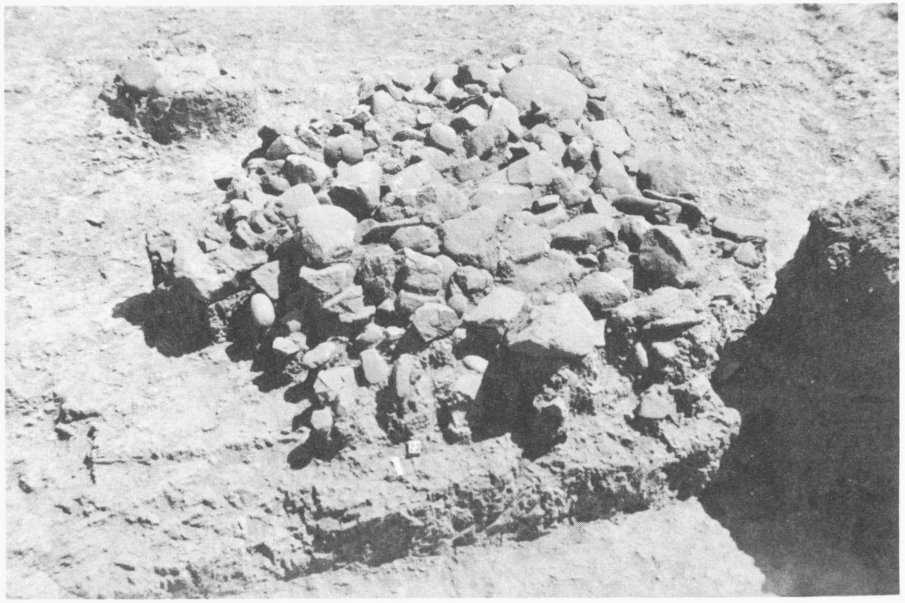

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Plate 20. Features, LAn-1

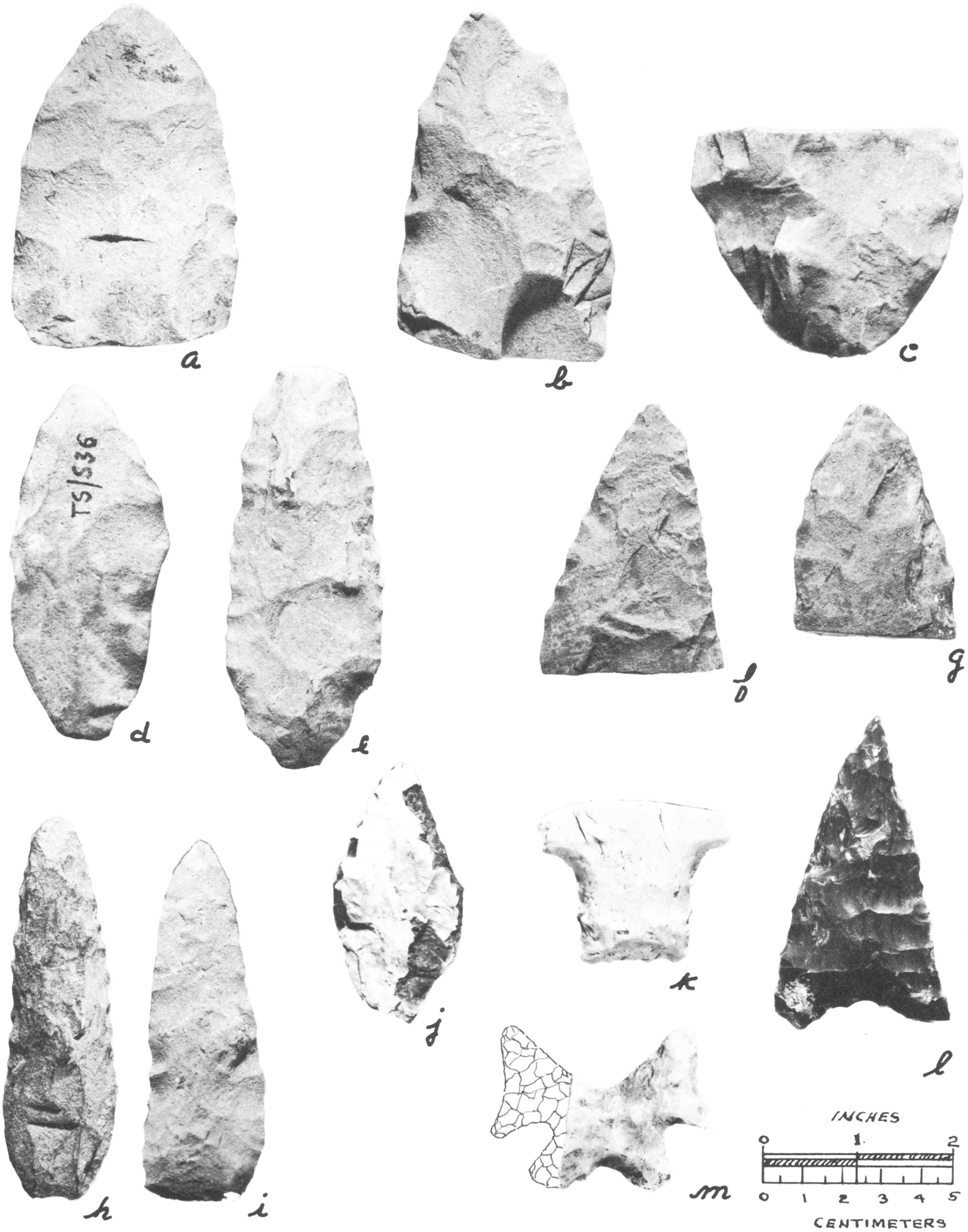


Plate 21. Topanga Culture Phase I Projectile Points and Blades from Site LAn-1

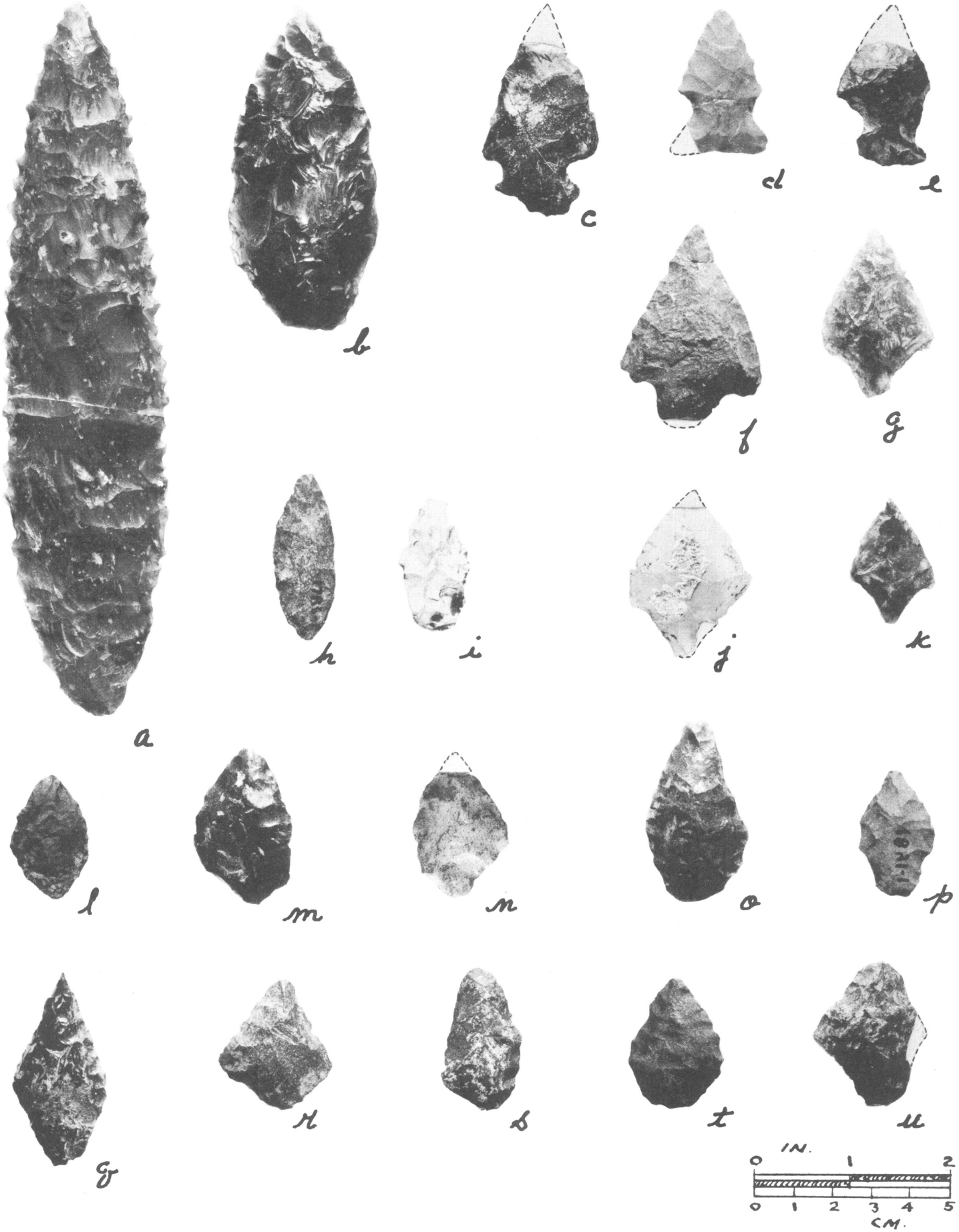


Plate 22. Topanga Culture Phase II Knives and Projectile Points

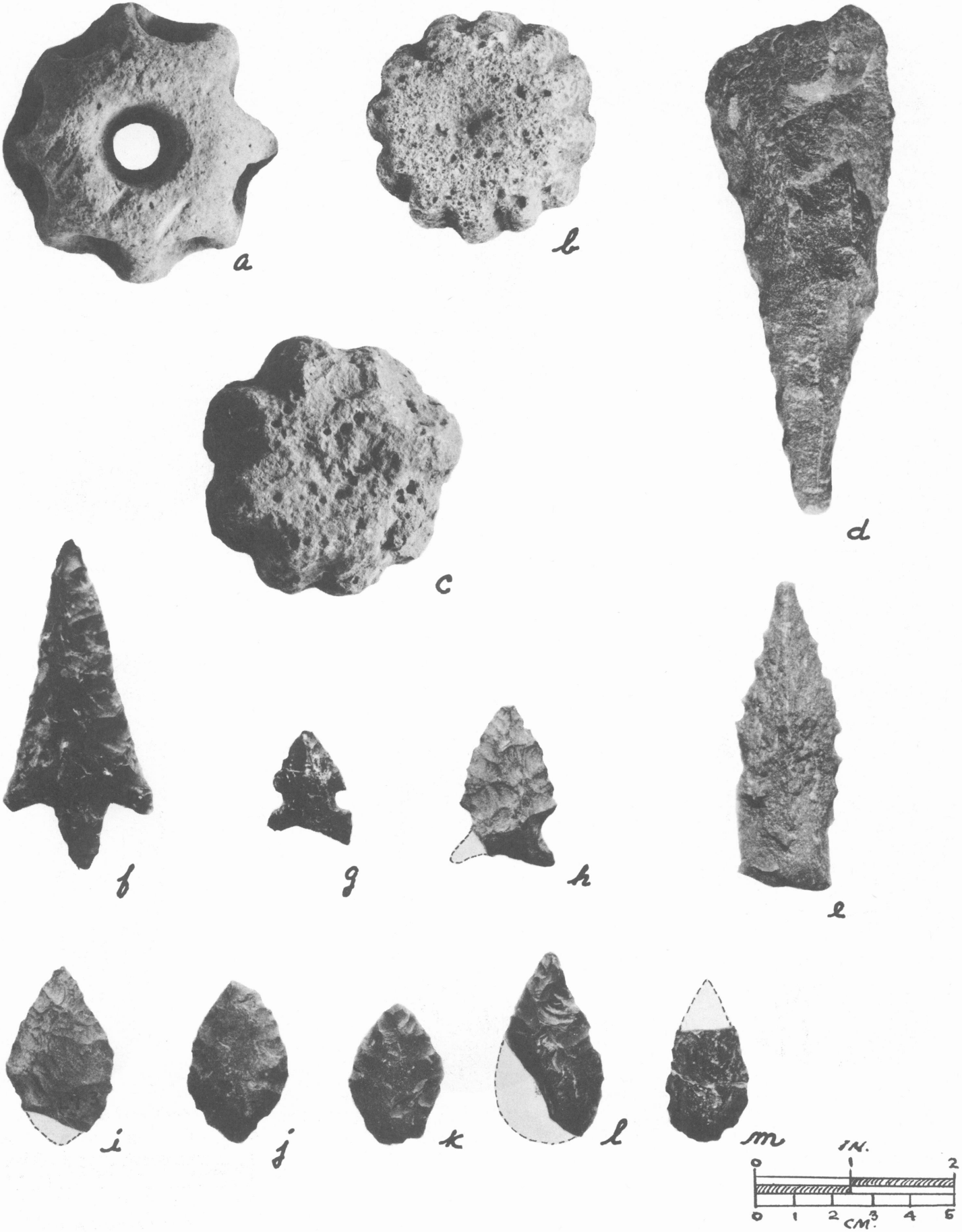
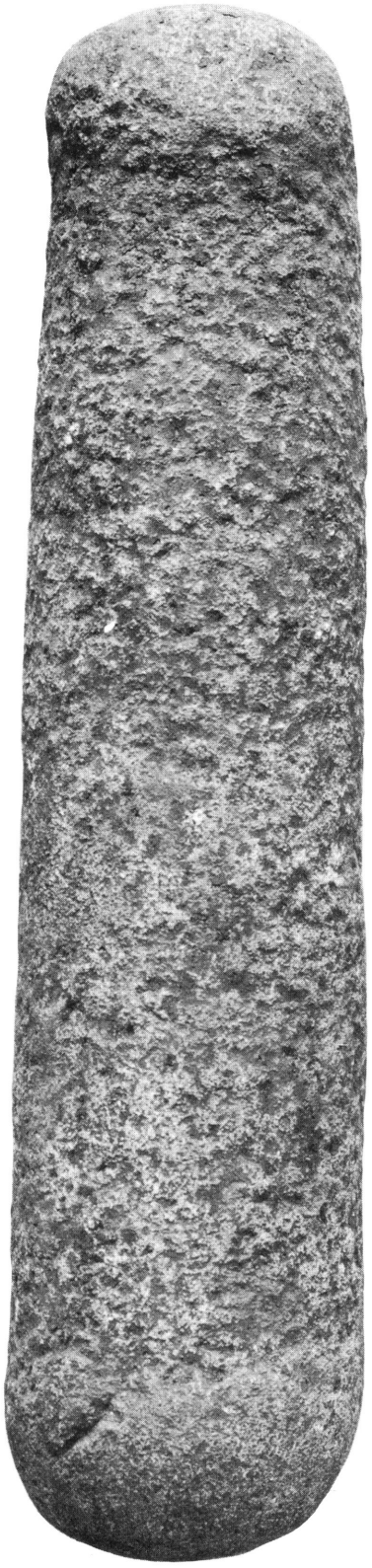


Plate 23. Cog Stones, Drills, and Projectile Points



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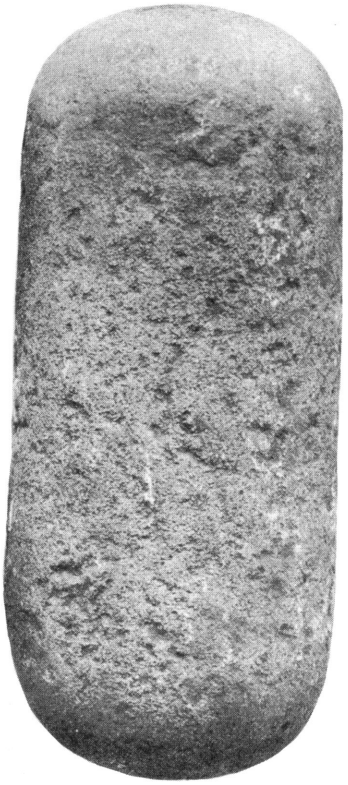

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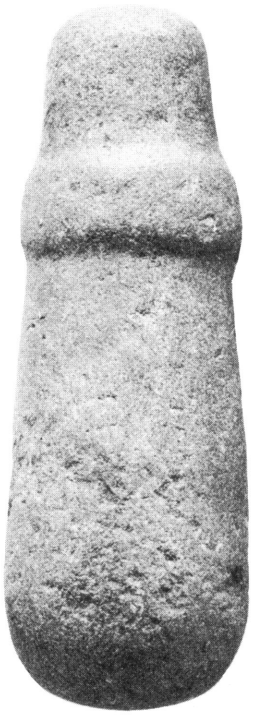

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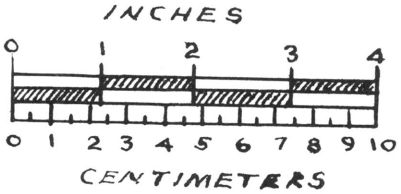

Plate 24. Pestles and Charmstone (?) Fragment