

Discussion

The combined faunal remains listed in Tables 46 and 46A are very nearly identical to those recorded by Curtis (1959, p. 151). Several small mammals: the California badger, kangaroo rat, wood rat and meadow mouse have been added in our present listing, but all or most of these may have been represented in the Miscellaneous Rodentia and other small unidentified mammal remains of the earlier report. The albatross and crow are additions to the list of birds. The only fish remains identified in the past were those of shark, white sea bass and sheephead. The identification of over a dozen different kinds of fish remains for this report adds significant data on the eating habits of the original inhabitants of the site.

The major quantity--in number of individual pieces--in nearly every level of T25 and as observed in other pits, consisted of deer bones. These were fractured, splintered and often broken into small fragments. Very few were charred or burnt. By weight there were often more sea mammal remains per level; the individual pieces were usually larger than those of deer.

Small land mammals were not numerous; many of the genera listed in Table 46 were represented by one or two individual bones or teeth. Rodent remains were the most common of all. In Trench M a number were seen that appeared quite fresh and well articulated, especially those of the gopher.

Note the remains of the Guadalupe fur seal, once common in southern California waters, but practically extinct since the 19th century when indiscriminate sealers exterminated it. The sea otter, once also common, was brought to near extinction along the California coast during the early days of the exploitation, exploration and settlement of California, especially by the Russians. It is now making a comeback under government protection (Ingles 1954, pp. 108, 137).

The fish remains in all pits were represented mainly by vertebrae. Bird bones were rare throughout; the most common forms observed were long wing bones.

The intrusive femur and distal epiphysis of a young cow or calf were found at 6 inches below the surface in T25. Its weight and presence were not incorporated into the Tables.

The faunal remains in excavation unit T25 are probably only partially representative of other areas of this excavation due to the presence of the

house floor. The floor occupied most of the 30-36" level and no bone was found directly upon or incorporated within the compacted area. This should be considered when evaluating the faunal remains from T25 as more or less typical of the midden in that area. Many of the tables show the great concentration of cultural material in that particular level.

The use of the gross divisions in Table 47 is justified on the basis of the difficulty in identifying much of the bone to species. However, these divisions are offered in hope that they will indicate some measure for assessing food preferences and offer some data which can be related to the tool types necessary for the acquisition of these protein resources.

Many of the by-products of the mammals, birds and fishes, no doubt used by the inhabitants, no longer remain due to their perishable nature. However, there is still some evidence of the use of bone to fashion tools and ornaments.

The inventory of the 59 bone artifacts recovered shows that 10 are made of deer cannon bone, 3 of antler, 26 of various medium-sized unidentifiable mammal bone, 3 of land mammal ribs, 4 of fish vertebrae, 6 of bird bone and one sting ray spine. No identifiable sea mammal bone artifacts were found, but there may have been several among those objects ground down and polished so that it was impossible to ascertain if they were made of land or sea mammal. All in all, various deer bones seemed to have served in making a majority of the awls, punches and other small and simple tools.

From this present sample of faunal remains it is possible to realize that many and diverse resources were exploited by the site's aboriginals from the very beginning. While shellfish remained the major source of food (as evidenced by the ubiquitous mussel fragments in the midden), land and sea mammals, birds and fish were used to augment the shellfish diet. Deer, sea mammals and rabbits offered the major mammalian food sources.

It might be mentioned parenthetically that on sterile base in pit T25, where all the bone was collected, the following mammal and bird remains were found: the astragalus of a deer, the phalanx of a sea otter, the ulna of a Guadalupe fur seal, one fragment of a loon's beak and the femur of a crow.

The human toe bone found at 12-18" and the two finger bones at 30-36" recovered in T25 were disassociated from any known burial and were possibly dragged there by rodents.

SUMMARY

The excavations in 1962 disclosed a number of unexpected situations and offered new data for consideration in re-evaluating the site known as IAN-52. When the 1959 report was written, it had been assumed that the shellmound and its artifacts represented the debris of a relatively short-term occupation over a fairly large village site that had a cemetery at one end. No stratigraphy had been noted by the field workers and all were convinced of the homogeneous nature of the deposit.

That part of the midden east of the burial area or cemetery was shallow, with a maximum depth of deposit of 36". The major efforts were concentrated in the cemetery. There, a maximum of 52" and an average depth of 40" was found, but the whole area was thoroughly disturbed--both by the original occupants and present-day relic-hunters.

Dating of the site was postulated on the basis of traits diagnostic of the proto-historic and historic period for the Chumash. The consensus was that occupation began early in the Christian era and lasted until about 1800-1830 A.D.

The test excavation in 1960 offered the first clues as to the possibility of a longer occupation period and possible cultural stratigraphy. A depth of over 50" was reached in the 3 test pits. A shell lens from 16-24" seemed to show an effective stratigraphic cultural barrier: within and above it lay the major part of the small lithic industry, the worked bone, modified shell and polished stone; below the shell lens lay the bulk of the rudely chipped cobble core tools, most of which had never been reported from the site before.

Evidence of a prepared platform core-prismatic blade industry was also found. A survey of the area uncovered a surface bead-making station about a quarter mile from the site. Here a small complex of bladelet tools in direct association with Olivella shells and beads in various degrees of finish attested to specialization in the use of these tools.

However, in 1960 few grinding tools were recovered in the small area excavated, and no burials or features were recorded. No historic materials were found as were reported in 1959 from the excavations of the ASA and UCLA. In other words, the picture appeared more complex than had been suggested by the earlier excavations.

This latest excavation, in what appeared to be an undisturbed area of the site, showed more complications. The midden deposit and artifacts continued to 54" in one trench and at least to 60" in the other--where sterile base was determined at 72". No shell lens or other visible cultural stratigraphic feature was present. Burials, hearths and rock features were found in both trenches. No evidence of the platform core-prismatic blade industry was apparent. Shell disk beads were comparatively rare for the volume of midden dug, and none were found as grave associations. The individual burial pattern itself was certainly different from that of the mass disturbed graves reported from the cemetery at the western end of the site.

While many of the artifact types remained constant from excavation to excavation, the text tables show that the quantities and percentages of many were at considerable variance. In 1962 heavy core tools were found in respectable number in the lower levels of the trenches; the smaller, bifacially chipped stone tools were congregated, on the whole, in the upper levels. Ornaments, fishhooks, worked bone and polished stone showed a concentration in the upper levels as well, but were recovered in the greatest quantity from 6-36". No non-aboriginal material was found except for the obviously late intrusive metal and shotgun shell.

The table to follow will attempt to show the similarities and differences encountered in the three excavation periods. Note that in table 49 "cemetery" will refer to that area at the western end of the site where the mass disturbed graves were found by the Heye Foundation, the ASA and the UCLA field crews. "Village" refers to that portion of the site east and apart from the cemetery. The excavations done by the author and assistants were considered to have been totally in what had been called the "village" part of the site.

In Table 49 under each report date where the depth concentration is recorded, the first number in parenthesis will represent the number of specimens in that concentrated area; the second number represents the total number of specimens recorded.

From the following table it can be postulated that IAN-52 does not represent a village site occupied over the total area simultaneously. The data from the latest excavation indicate that the site was probably first occupied at the eastern end. There, occupation continued for a considerable length of time--enough for 6 feet of midden to accumulate in some areas.

TABLE 49

Comparison of Data from the Different Excavations at LAN-52

Data	1959	1961	1963
Depth to sterile base	36" aver. (village) 40" aver. (cemetery) 52" max. (cemetery)	53" max.	54" max. (Trench M) 72" max. (Trench T)
Cubic yards excavated	60 (UCLA, cemetery) 60 (ASA, cemetery) 15 (ASA, village)	6.5	43+
Stratigraphy	None reported	Heavy shell lens between 16"-24"	None
Burial complex	Separate cemetery, Mass disturbed graves, Plank-lined graves, Flexed bodies, Grave goods: many shell ornaments and tools, Trade beads.	No burials uncovered	1 primary loose flex with no grave goods; 1 partial with several unmodified shells; 1 disturbed with a few flat unmodified cobbles.
Other	Fire-broken rocks, Asphaltum with basketry impression.	None	2 hearths, 2 rock features, 1 ash lens, 1 house floor.
Artifact Concentrations			
<u>Small Chipped Stone</u>			
Proj. pts. and blades	0-36" (87/106)	0-36" (10/11)	0-30" (79/81)
Drills	0-36" (137/150)	0-12" (11/11)	0-30" (50/54)
Scrapers	0-24" (22/25)	0-36" (14/14)	6-36" (67/76)
Microtools	--	0-48" (12/15)	--

TABLE 49, Cont.

Comparisons of Data from the Different Excavations at LAN-52

Artifact Concentrations	1959	1961	1963
<u>Large Chipped Stone</u>			
Hammerstones	0-36" (8/10)	24-36" (8/8)	18-54" (25/25)
Choppers	--	24-36" (4/4)	12-48" (12/12)
Scraper planes	--	12-48" (6/6)	12-48" (28/30)
Cobble scrapers	24-48" (6/9)	24-48" (4/4)	12-54" (20/21)
Flake knives	--	0-48" (5/5)	12-48" (24/26)
<u>Pecked and Ground Stone</u>			
Milling stones	0-36" (3/3)	--	12-54" (7/7)
Manos	0-48" (10/11)	24-36" (1/1)	42-54" (6/6)
Festles	0-36" (19/21)	12-36" (3/4)	12-48" (11/13)
Bowls and/or mortar	0-36" (20/21)	12-24" (2/2)	6-54" (7/7)
<u>Polished Stone</u>			
Ornaments	0-24" (14/21)	0-24" (6/7)	6-24" (12/16)
Tools + Misc.	0-24" (27/40)	0-24" (4/4)	6-36" (12/14)
<u>Worked Shell</u>			
Beads	0-36" (4477/4701)	0-24" (56/75)	6-42" (259/275)
Ornaments	0-36" (25/28)	--	6-42" (16/17)
Fishhooks	0-36" (81/90)	0-24" (10/13)	0-36" (20/22)
<u>Worked Bone</u>			
Tools	0-36" (88/95)	0-30" (16/19)	0-30" (35/43)
Ornaments	0-24" (37/45)	--	0-36" (11/13)
<u>Non-Aboriginal</u>			
Trade beads	0-36" (207/216)	--	--
Glass + crockery	0-36" (41/41)	--	--
Metal tools	0-12" (2/2)	--	--
Intrusive metal	0-48" (7/10)	--	0-18" (5/6)

It is also assumed that occupation at the eastern end terminated before the arrival of the Spanish as no historic materials from that period or trade beads were recovered. The implications are either that the site was abandoned and later reoccupied further west, or, for some reason, the inhabitants gradually moved westward toward the canyon, and relocated there.

However, in no area across the length and width of the bluff is there any break in occupation debris. The surface everywhere shows ample evidence of occupation with the black, greasy soil thoroughly impregnated with broken mussel shells. Without digging, it is, therefore, impossible to ascertain at which point one might begin to find evidence of the later occupation with its trade beads and 18th century Mission Period artifacts.

The small area tested in 1960 seems to fall somewhere between the proposed earlier occupation and the latest occupation reported in 1959. It had considerably greater depth than the "village" area dug further west on the bluff, and at the time of excavation, the shell lens seemed to offer a suggestion of cultural stratigraphy with two relatively dissimilar complexes above and below the shell lens itself.

The distribution patterns of the lithic material in the several occupation areas is more than a little puzzling in some respects. The occurrence of small and fairly well-made chipped stone tools in the upper levels of all areas was not altogether unexpected. However, the presence of a considerable number of crude, percussion-flaked core tools in the last two excavations poses a problem since in the past it had been conjectured that we were dealing with a late contact site.

In the latest excavation of 1962 there was a total of 368 flaked stone artifacts. Of this number, 117, or over 31% are large cobble core or cobble flake tools.

In many respects these tools resemble those from very early sites such as the Pank Site (Treganza and Malamud 1947 and Treganza and Bierman 1955), Zuma Creek (Beck 1955), and the Little Sycamore Shellmound (Wallace et al. 1956). Similarities are also seen with artifacts from sites described in "Early Gathering Complexes of Western San Diego County" (Warren, Irwin and Ludey 1961), and with the heavy lithic assemblage at the Glen Annie site, SBA 142 (Cwen and Curtis [eds.], 1963).

On the other hand the known late Canaliño sites seldom have reported more than a bare scattering of scraper planes, heavy cobble flake scrapers,

massive choppers and unmodified cobble flake knives. The Goleta Site: SBA-60, whose lithic complex is described in great detail by Kowta (1961), is a prime example. Wallace (1955) does not include flake and core tools in his Late Horizon Cultural Complexes. A heavy chipped core and flake assemblage is conspicuous by its absence from the excavations of the 1950's at Arroyo Sequit. Its presence in the 1960 and 1962 excavations does not imply that we are dealing with an Early Milling Stone Horizon occupation, but rather that we probably have a continuation of an early trait into later times or that we are dealing with a situation of cultural lag--especially when compared with the climax of the Canaliño in the Santa Barbara area.

In the small chipped stone assemblage the projectile points in the present collection are a motley group at best. Singularly few well-made points were recovered; proportionately they only constitute a small minority compared with those of fair or even poor workmanship. Later in time, at the western end of the site, more symmetrical forms with regular edge pressure retouch occurred. This opinion is based not only on the data in the 1959 report but knowledge of the many well-made, small projectile points from the burial end of the site, which are in the hands of private collectors and relic-hunters. It may be added too, that finely fashioned, slender drills are also missing from the present collection. Altogether, the lithic material appears more rude than that collected by the earlier excavators and collectors.

Although no microtools such as drills made from small prepared platform cores were recovered in the 1950's, their absence from the record may only indicate lack of recognition of these very small tools. Their presence at Dos Pueblos (Harrison n.d.), SBA-60 (Kowta 1961), the Soule Park site (Susia 1962), the bead-making station near LAN-52 (Curtis 1961b) and the test excavation at LAN-52 in 1960 (Curtis 1961b) is a good indication of the possibility that they were, in fact, overlooked or unrecognized during the excavations of the 1950's. However, no such bladelet tools or their parent cores were found in 1962; the small, well-made disk beads, of the type most probably perforated by microdrills, were also not found in any number.

While the total quantity of grinding tools is small in all excavations, the percentages may be significant. In 1959, the milling stone-mano complex comprised 25% and the mortar-pestle 75% of the total grinding tools. Hammerstones and other resharpening tools were not common. The latest excavation shows 40% for the milling stone-mano complex as opposed to 60% for the

mortars (or bowls) and pestles. Cobble hammerstones, suitable for resharpening grinding tools, were also recovered in relatively greater quantity. Treganza's comments (1958, p. 73) on the possible use of scraper planes for resharpening grinding tools may also be considered in this context.

A comparison of polished stone objects shows that the later occupants also made far greater use of steatite for ornaments, bowls, and arrow-shaft straighteners. These artifacts may be considered together with the presence of 110 asphaltum plugs and the remnants of juniper (Juniperus californica Carrière), suitable for multiplank boats. With the tomol or tomolo the Chumash were well prepared to travel to Catalina Island to trade for the steatite. From the area occupied by the earlier inhabitants the excavation yielded only 6 certain small asphaltum plugs and no wood was recovered. It is possible that the construction of boats and the use of plank-lining for graves had not yet reached the peak it did later in time.

The 1959 report also shows that shell ornamentation had reached a high point for the site. While in no manner were these ornaments as diverse or sophisticated as those from other Chumash sites in the Santa Barbara areas or the Islands, they were, none the less, similar. The large percentage of small, well-made Olivella disk beads was no doubt used for inlay work as well as for grave goods and they constituted 75% of the total of Olivella disk beads.

From the present collection of 293 shell ornaments, the 173 Olivella disk beads constitute 59%, the 98 spire-lopped shells (Olivella and Conus combined) 33%, and the 13 abalone ornaments a mere 4%. No clamshell ornaments, mussel disk beads or the columella tubes, found at the western end of the site, were in evidence in 1962. It would appear, therefore, that shell ornamentation was less refined, not as numerous in kind, and not part of the burial complex.

The presence of an atlatl spur at the 6-12" level is interesting in light of the recent discovery of two similar objects at a Morro Bay site (Clemmer 1962). However, these latter two specimens were recovered from the 48-54" levels. Kroeber (1953) comments on the use of the spear-thrower by the Chumash. However, there is no record of the exact provenience, associations or depth of the single specimen he discusses. Several projectile points from the present collection might be considered suitable for atlatl dart points.

The exploitation of the areal resources appears to have been similar in all areas to the degree that mussel remains constitute the major food debris. However, relative to the proportions of cubic yards of midden processed, hunting--as evidenced by the faunal remains, projectile points, scrapers, flake knives and possibly scraper planes--was of greater importance during the earlier occupation. Fishing, on the other hand--as related to the quantities of fishhooks, drills, gorges, and barbs--was of greater importance to the inhabitants at the western end of the site, later in time.

There is no way of determining if the earlier group or groups used the cemetery for burials, as well as the village proper for individual interments. However, among the many tools taken from the mass graves, no heavy cobble tools were reported, and in the three burials uncovered in 1962 no quantities of grave goods were directly associated with the skeletal material.

In reviewing all of the above, the author now feels that the eastern area, with what appears to be the earliest occupation so far examined, probably extended back in time to the first period of the Canalino and perhaps even back into the terminal phase of what Rogers (1929) called the Hunting Culture and Olson (1951) the Intermediate Mainland Period.

The following are offered as the main traits for this assumption:

1. The depth of midden deposit--a known 6 feet in some areas;
2. The rude finish of most of the small lithic industry;
3. The importance of hunting as interpreted by the faunal remains, atlatl spur, and the cobble tools suitable for butchering meat and processing hides;
4. The near balance of the mano-milling stone and mortar-pestle industries;
5. The relative lesser quantity of shell fishhooks and bone tools for fishing;
6. The relative paucity of shell and bone ornamentation;
7. The lack of grave goods;
8. No trade items even at the surface.

A possible beginning of occupation of ca. 2-5000 B.P. may be postulated. Any attempt to assign a more definite date would be merely guesswork, as so little is known of this particular period in southern California prehistory.

The indications are also that as time went on there was some cultural change. The artifacts recovered from the upper levels more nearly equate with those from the western end of the site. Maximim occupation, as evidenced by the number of artifacts per cubic yard of midden dug, appears to have built up in that period represented by the 12-54" levels. From 12" to surface a gradual diminution occurs. The termination of occupation would have its upper limit prior to the early 16th century.

On the other hand, it is considered that the western end of the site represents a later occupation, and its traits may be summarized as follows:

1. The shallow depth of deposit (3 feet in the village);
2. A more refined small lithic industry which probably included the prepared platform core-prismatic blade assemblage with bladelet tools, especially microdrills suitable for making holes in small disk beads;
3. The lack of cobble core and cobble flake tools;
4. An increase in fishing activities with the greater quantity of fishhooks and bone fishing tools;
5. The greater percentage of mortars and pestles as opposed to milling stones and manos;
6. The proliferation of shell ornaments and an increase in polished stone objects;
7. The greater use of boats, and with them the presence of more objects of steatite and serpentine;
8. Grave goods in quantity and diversity;
9. Trade beads and other historic materials.

This configuration now leads one to consider that the occupation here began later than had been originally considered. The author would now suggest that it may have begun well into the Christian era--possibly as late as ca. 1000 A.D.

In any attempt to reconstruct the history of occupation at LAN-52, it is paramount to keep a number of problems in mind. How representative of the total picture of LAN-52 do we now have? After all, all the excavations have been small, spotty, selective in area and dissimilar in approach. The site is large and its potential has barely been tapped. No complete evaluation of the total site can be made even now with the additional data from this excavation. What may be found in other areas is still in question.

There is some evidence in the the literature of horizontal cultural stratigraphy on large open sites. Walker (1951, p. 116), in discussing the Big Tajunga site writes:

"It seemed evident that the northern end was the oldest part of the Big Tujunga site. Here the human bones found had not been cremated, but are believed to have been reburials--token burials, so to speak, possibly to identify the recipients of gifts. All bowls were broken into small fragments and showed evidence of fire. The projectile points were of the old type of spear or atlatl. A short distance from the northern end of the site were found the fragments of the Arizona Hohokam pottery bowl referred to. South of this deposit came the radical change to cremated bones placed in soapstone bowls, and the appearance of arrowheads. It is believed that the deposits were placed in holes in the ground commencing early in the northern part of the site and continuing southward during the course of several centuries."

Littlewood (1960, p. 136) commenting on some problems in "An Analysis of Skeletal Material from the Zuma Creek Site (LAN-174) says that differences in burial position and degree of mineralization of the bones "casts some doubt on the contemporaneity of his (Peck's) finds with the rest of the series treated in this report" (work done by a UCLA field class). The burials reported by Peck (1955) were inland of the UCLA burials by 25 to 100 feet.

A request for information on similar problems in assessing homogeneity of sites brought this response from David A. Fredrickson, who has done considerable salvage archeology in northern and central California. He writes:

"At site Lak-261 (Fredrickson 1961) near the town of Lower Lake in Lake County, a combination of horizontal and vertical cultural stratigraphy was encountered. The area of the site which seemed the richest in terms of surface indications (e.g., slight mounding, darker soil, a large number of surface artifacts, and a higher concentration of other cultural material) yielded cultural material to a depth of approximately five feet before sterile base was reached. Two components, one comparable to the Late Horizon and one comparable to the Middle Horizon of the Central California chronological sequence, were identified. At the periphery of the site, to the north, where surface indication of cultural occupation was slight, insufficient material was recovered to allow separation of these two components, but a third component was identified, comparable to the Borax Lake Complex (cf. Meighan 1955:26ff), beginning at a depth of approximately five feet and extending to a depth of eight feet at which point sterile base was reached. If the excavations had been limited to the site area which appeared richest in terms of surface indications, the important borax lake component would not have been found."

"At site CCo-308 (Fredrickson 1963) in the town of Alamo in Contra Costa County, excavation of a 30 foot deep channel for the realignment of San Ramon Creek revealed a unique case of combined vertical and horizontal stratigraphy. Briefly, three superimposed stratigraphic levels could be distinguished in the profile of the channel excavation, extending from the

surface to a depth as great as 19 feet. The uppermost level has been identified as an early Phase 1 component of the Late Horizon; the two lower levels appear to represent two periods of occupation during the Middle Horizon, with early Middle Horizon represented by the deepest component.

The direct overlap of the three levels, however, took in only a small part of the area of each level. If excavations had been carried out on the basis of surface indications only, the deepest level would have been found only by chance, as only the eastern periphery of the upper stratum overlapped the deepest stratum. The second level, extending slightly further to the west, furnished a greater opportunity for discovery. At no point, however, did the richest concentration of surface material rest above either the second or third level. The fact that an extensive profile was available allowed locating the archeological excavation at a point which samples all three levels."

No doubt a more extensive search of the literature might reveal other situations which might be comparable to those described above. As far as LAN-52 is concerned, only a large-scaled, well-integrated excavation utilizing as many different field and laboratory techniques as are feasible will help resolve the problems which remain. The site should be sampled more thoroughly in all its areas; it is the last of the available large shell middens on the coast in that area.

A valuable project for future excavators at LAN-52 would be the collecting of all unmodified bone from enough excavation units to procure a more representative sample. The universe represented by pit T25 from the present excavation can only indicate the potential data which might be acquired. With such data the relative dependence upon hunting and fishing as compared with shellfish and wild vegetal food gathering can be more accurately determined.

The charcoal collected from the several levels including that from a hearth, from sterile base in one trench and from other areas would certainly give valuable information in dating if radio carbon processing could be made available. The author sincerely hopes that such dates will be possible in the near future.

The theoretical problems that could be resolved by additional excavation and dates include those relating to differential activities on a large site, the evidences of horizontal as well as vertical cultural stratigraphy, the causes for differing exploitative maneuverings on the part of the occupants, and the transitional period covered--one so little explored and so little understood in southern California archeology.

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EXPLANATION OF PLATES

- Plate 1. a. View of public beach, Highway 101 and Park Headquarters from Trench M area.
b. Trench M before backfilling--from west to east.
c. Trench T before backfilling--from east to west.

Plate 2. a. Projectile points:

Top row, left group of three, Type 1;
Top row, right group of four, Type 2;
Center row, left group of two, Type 3;
Center row, right group of three, Type 4;
Bottom row, left group of four, Type 5;
Bottom row, single point at right, Type 6.
(Length of Type 2 projectile point in top row, extreme right is 3.5 cm.)

b. Spear points:

Top row, Types 8,9, and 10, from left to right.
(Length of spear point top row, extreme left, is 6.9 cm.)

Blade fragments:

Center row, median fragments;
Bottom row, basal fragments.

c. Drills:

Top row, small stubby;
Second row, medium stubby;
Third row, large stubby;
Bottom row, two at left, flake drills; center, quartz crystal drill; two at right, bi-pointed drills.
(The drill in the top row at extreme right is 3.0 cm. long.)

d. Cobble tools:

Top row, scraper planes;
Center row, hammerstones;
Bottom row, choppers.
(The scraper plane in the center of the top row is 13.5 by 8.0 by 6.3 cm.)

Plate 3. a. Cobble tools:

Top row, flake scrapers;
Center row, pecking stones (or picks);
Bottom row, unmodified cobble flake knives.
(The pecking stone, center row, extreme left, is 8.6 by 6.6 by 2.8 cm.)

b. Pecked and ground stone:

Top row, miniature grinding stones;
Center row, anvil stones;
Bottom row, miniature paint mortar.
(The small grinding slab, top row, extreme left, is 19.3 by 13.0 by 6.3 cm.)

Plate 3. c. Pestles:

Top row, shouldered conical forms;
Bottom row, unshouldered conical forms.
(The length of the center pestle in the top row is 17.8 cm., maximum diameter 5.9 cm.)

- d. "Killed" bowl of sandstone from Feature #2.
(The bowl is 24.0 cm. in diameter at the top, 15.0 cm. high.)

Plate 4. a. Polished stone:

Top row, large disk ornaments;
Second row, from left to right, slate pencil-like object, effigy-like object of slate, steatite pendant;
Third row, tubular steatite beads;
Bottom row, slate punch-like objects.
(The longest punch-like object in the bottom row is 4.2 cm.)

- b. Spatulate slate object.
(12.8 by 10.3 by 2.3 cm.)

c. Bluff Site artifacts:

One deep basin and two slab milling stones.
(The deep basin milling stone is 47.0 by 39.3 by 10.2 cm.)

d. Bluff Site artifacts:

One "killed" deep basin, 2 other deep basin milling stones and one mano.
(The deep basin milling stone with the mano in it is 45.5 by 30.5 by 11.1 cm.)

Plate 5. Worked Shell:

- a. Clamshell scraper;
b. Polished and cut shell object;
c. Limpet rings;
d.-g. Abalone ornaments;
h. Incised abalone ornament;
i. Drilled abalone blank;
j.-l. Fishhook shanks.
(All drawings are life-size.)

Plate 6. Worked bone:

- a.-b. Awls
c. Resharpened awl;
d. Punch;
e. Fine tips;
f. Gorge;
g. Flaker;
h. Atlatl spur;
i. Harpoon barb;
j. Mammal bone tube;
k. Bird bone bead;
l. Whistle fragment;
m. Fish vertebra bead.
(All drawings are life-size.)

Plate 7. a. Feature #1 with shallow basin sandstone milling stone, core scraper and scraper plane;

- b. Feature #2 with "killed" sandstone bowl or mortar;
c. Burial #1, loosely flexed young adult (?);
d. Feature #6, house floor, showing gopher-riddled surface.

Plate 8. Stratigraphic record of the south wall of excavation unit T25 showing the location of Feature #6, the house floor.

EXPLANATION OF MAP

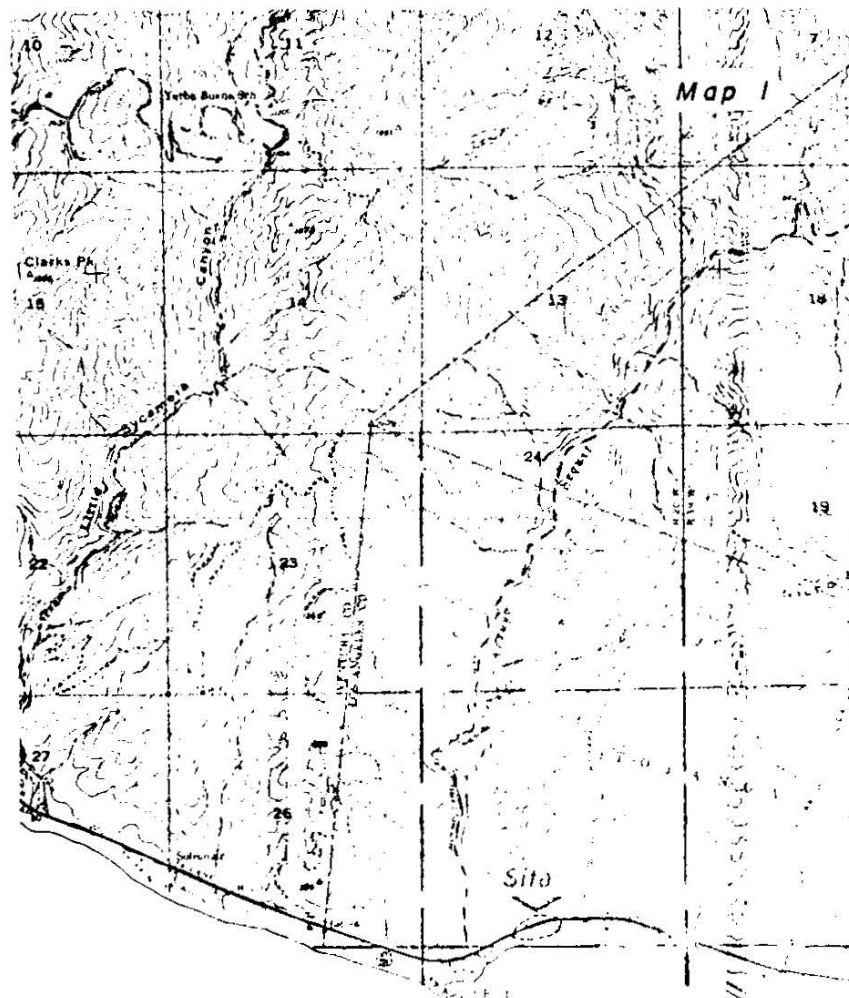
Map 1. Topographic map of the Arroyo Sequit shellmound area. The total site is outlined at the bottom, just right of center.

EXPLANATION OF FIGURES

Figure 1. Contour map of 1An-52 with excavated areas indicated.

Figure 2. Trenches dug in 1962.

Figure 3. Phosphate Sample Map with excavated areas.



THE BUREAU OF LAND MANAGEMENT
CALIFORNIA
MINUTE TERRITORY TOPOGRAPHIC

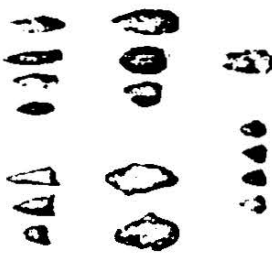
Plate 2



a.



b.



c.



d.

Plate 1



a.



c.

Plate 4

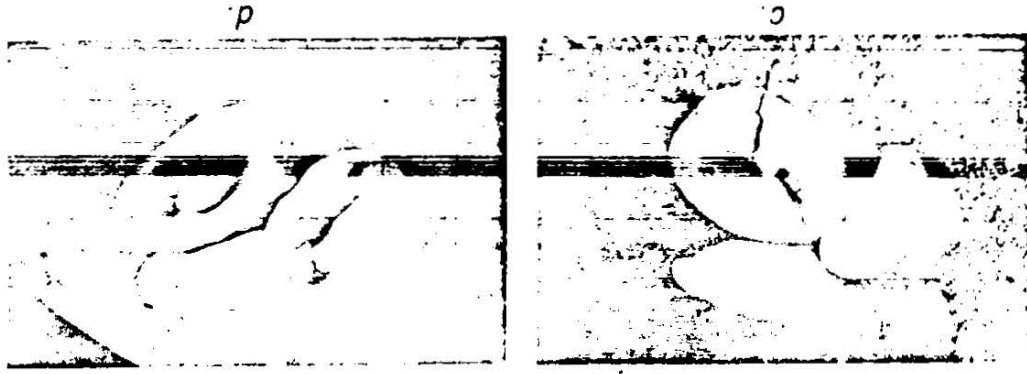


Plate 3

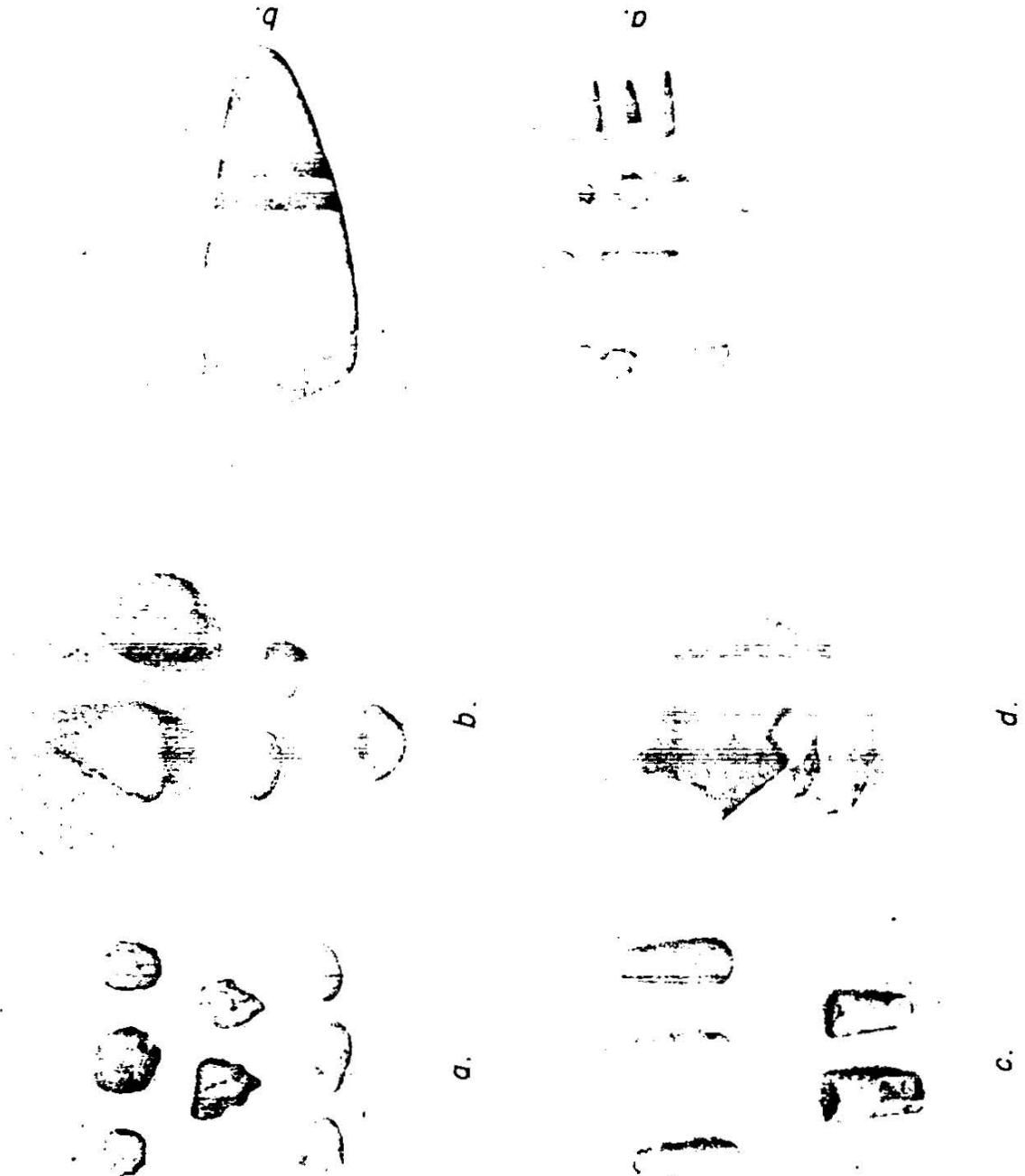


Plate 5

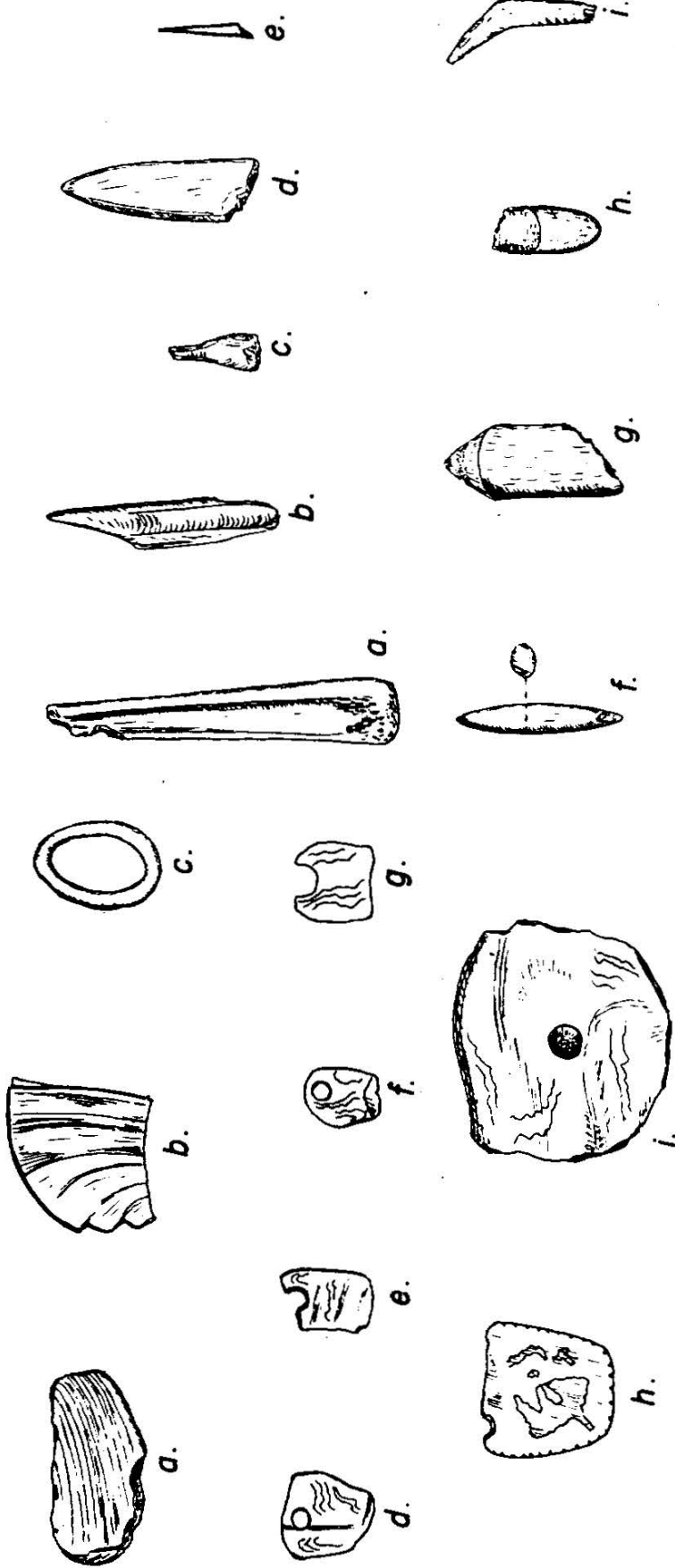


Plate 6

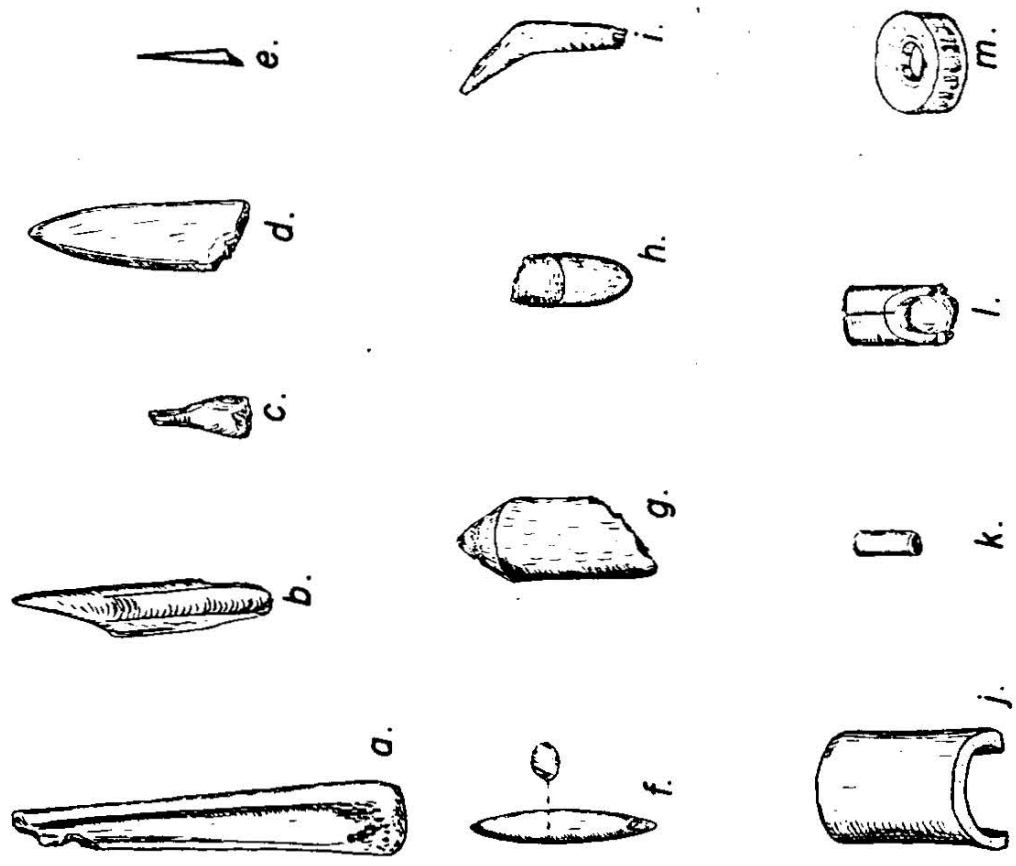


Plate 7

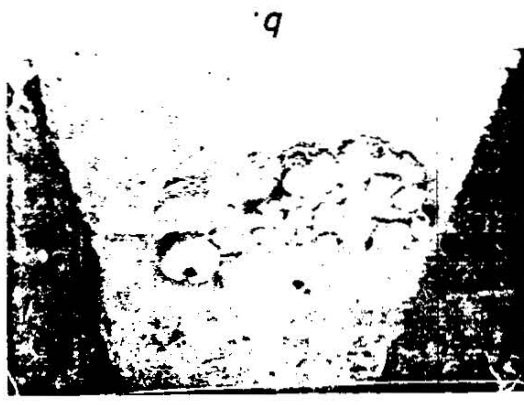
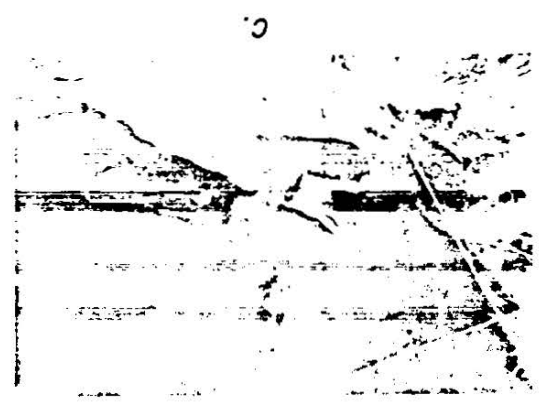
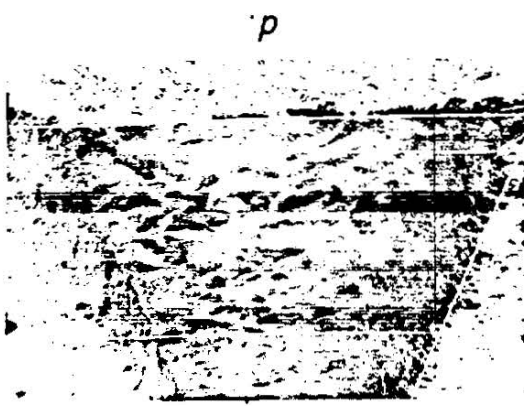
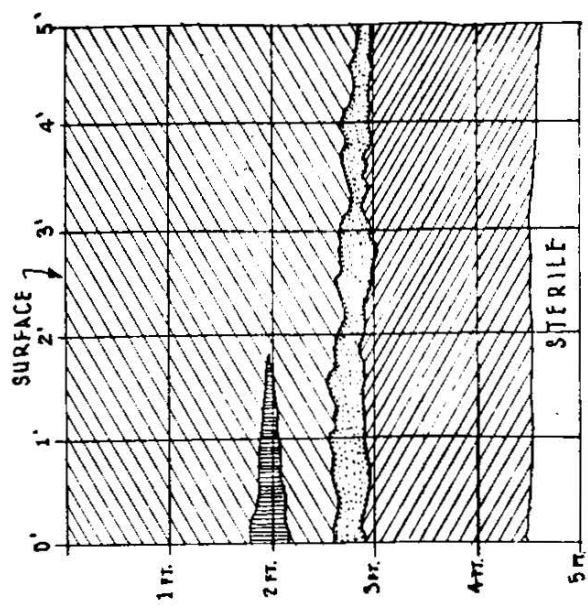
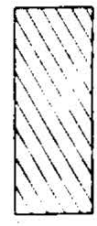


Plate 8



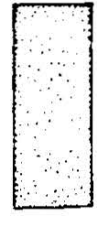
SOUTH WALL OF UNIT T-25



BLACK FRIABLE SHELL MIDDEN.



ORANGE-YELLOW SANDY SOIL.



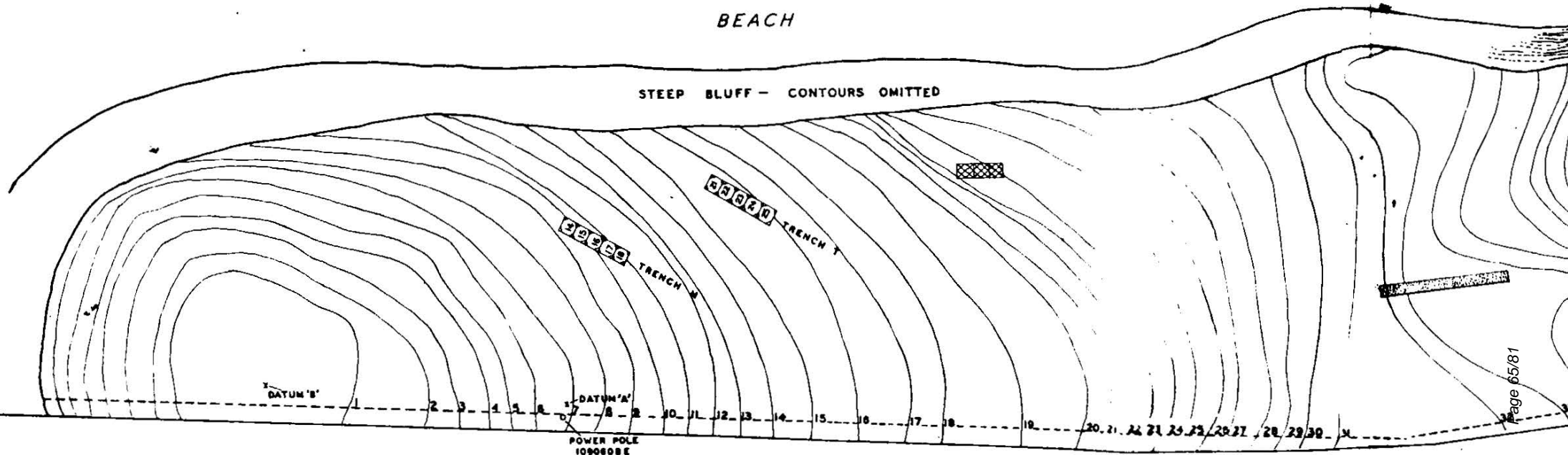
SOPHER-RIDDEN, COMPACTED MOUSE FLOOR. (FEATURE #6)



HARD, COMPACTED, DARK MIDDEN WITH VERY LITTLE SHELL OR ROCK.

BEACH

STEEP BLUFF - CONTOURS OMITTED










ARROYO SEQUIT

4 LA_N 52

HIGHWAY 101 Alt.

CONTOUR INTERVAL 1 FT
0' 10' 20'
SCALE

LEGEND:

-  EXCAVATED - 1962
-  EXCAVATED - 1960
-  EXCAVATED - 1954
-  EXCAVATED 1951
-  RELIC HUNTER HOLES
-  PITS LAID OUT BUT NOT EXCAVATED
-  FENCE LINE

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FIG. 1

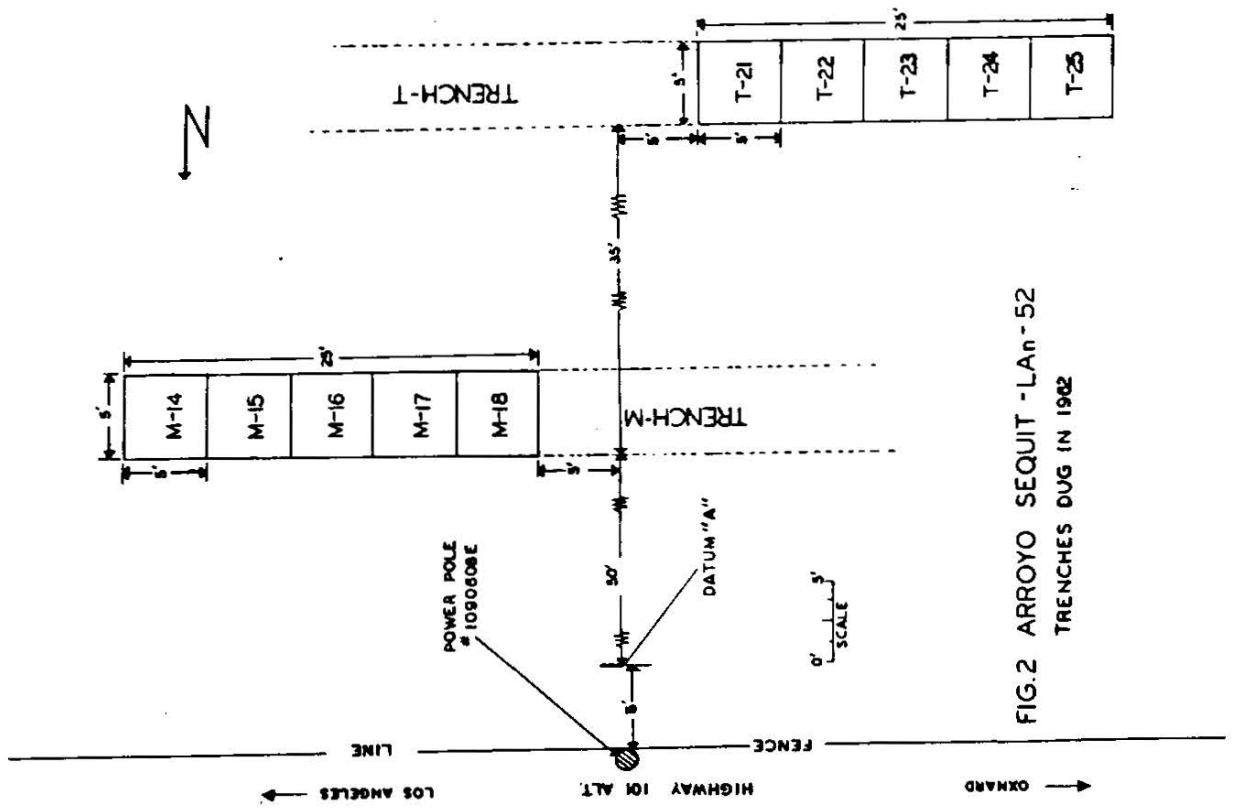


FIG.2 ARROYO SEQUIT - LAN-52
TRENCHES DUG IN 1982

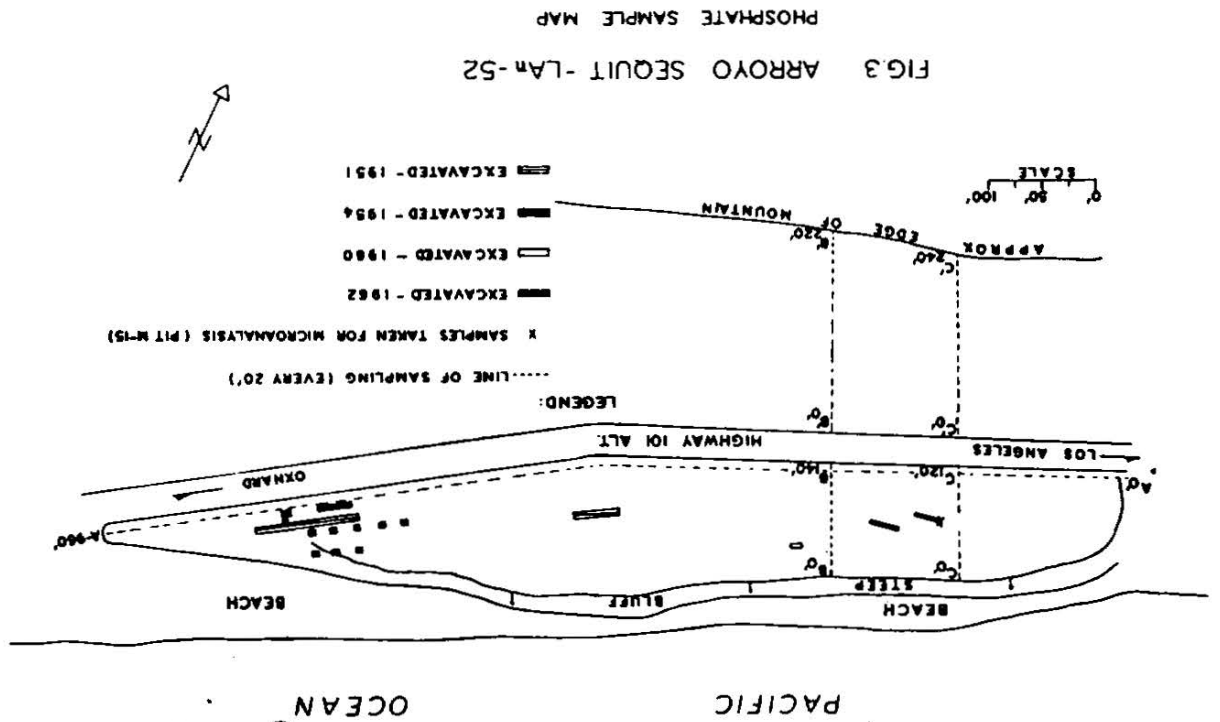
APPENDIX

FISH REMAINS FROM ARROYO SEQUIT SHELLMOUND (LAn-52),
LOS ANGELES COUNTY, CALIFORNIA

by

W. I. FOLLETT

-113-



INTRODUCTION

It has been my privilege to examine the fish remains collected by Mrs. Freddie Curtis at the Arroyo Sequit Shellmound (LAN-52), an archeological site on the east side of Arroyo Sequit, in extreme western Los Angeles County, California.

This site is on a large bluff that rises gradually from the creek bed at the mouth of Arroyo Sequit to an elevation of nearly 75 feet, and is on the south side of the present U. S. Highway 101. Occupancy of the site is tentatively dated between approximately 1000 B.C. and 1500 A.D.

This discussion of the fish remains constitutes an appendix to the detailed report on the site and its archeology by Mrs. Curtis.

FISHES REPRESENTED

21 different species

The collection comprises 459 fish remains. Most are incomplete or fragmentary; the centrum is the only element of the elasmobranch vertebra that has persisted. Of these remains, 128 are here identified, at least to genus; the rest are too fragmentary for satisfactory identification. Approximately 19 species, referable to 14 families, are represented as follows:

FISH REMAINS, BY SPECIES AND SKELETAL ELEMENT

Family LAMNIDAE -- Mackerel Sharks

Lamna ditropis Hubbs and Follett -- salmon shark

Tooth: 3 (2 complete, 1 incomplete); Plate 1A.

Isurus oxyrinchus Rafinesque -- mako

Tooth: 4 (1 complete, 3 fragments).

Family CARCHARHINIDAE -- Requiem Sharks

Triakis semifasciata Girard -- leopard shark

Centrum: 24 (10 complete, 14 incomplete). The identification to genus and species is questionable.

Family SQUATINIDAE -- Angel Sharks

Squatina californica Ayres -- Pacific angel shark

Centrum: 2 (1 complete, 1 incomplete).

Family RHINOBATIDAE -- Guitarfishes

Rhinobatos productus (Ayres) -- shovelnose guitarfish

Centrum: 3 (1 complete, 2 incomplete).

Family MYLIOBATIDAE -- Eagle Rays

Myliobatis californica Gill -- bat stingray

Tooth segment: 1, incomplete.

Centrum: 1, complete.

Family SERRANIDAE -- Basses

Paralabrax clathratus (Girard) -- kelp bass

Quadrate (left): 1, incomplete.

Maxillary (right): 1, incomplete.

The identification to species is questionable.

Family SPHYRAENIDAE -- Barracudas

Sphyaena argentea Girard -- Pacific barracuda

Quadrate (right): 2, incomplete; the larger from a fish about 40 inches long.

Metapterygoid (left): 1, incomplete.

Articular (left): 1, incomplete.

Articular (right): 1, incomplete.

Vertebra: 6, incomplete; approximately the 2nd, 3rd, and 4th precaudals are recognizable; the 3rd precaudal, 11.3 mm. in horizontal diameter (Plate 1B), is from a fish about 34 inches in total length and about .5 pounds in weight.

Family CARANGIDAE -- Jacks

Seriola dorsalis (Gill) -- yellowtail

Vertebra: 3, incomplete; the 1st and 2nd and approximately the 10th precaudals; the largest is from a fish about 32 inches in total length and perhaps 12 pounds in weight.

Family SCOMBRIDAE -- Mackerels

Scomber japonicus diego Ayres -- Pacific mackerel

Dentary (left): 2, incomplete.

Vertebra: 21, incomplete; the 1st and approximately the 2nd, 3rd, 5th, 7th, 8th, and 9th precaudals and approximately the 8th, 10th, 11th, and 12th caudals are recognizable. Two are partly charred.

Sarda lineolata (Girard) -- California bonito

Dentary (right): 1, incomplete.

Vertebra: 5, incomplete; approximately the 11th, 14th, and 16th precaudals and approximately the 13th caudal are recognizable.

Thunnus thynnus (Linnaeus) -- bluefin tuna

Vertebra: 3, incomplete; the largest, 21 mm. in horizontal diameter, is recognizable as approximately the 4th caudal, from a fish weighing perhaps 50 pounds.

Thunnus alalunga (Bonnaterre) -- albacore

Vertebra: 17, incomplete; approximately the 5th, 11th, and 14th precaudals and approximately the 2nd, 15th and 17th caudals are recognizable.

Family POMACENTRIDAE -- Damselfishes

Chromis punctipinnis (Cooper) -- blacksmith

Vertebra: 1, incomplete; approximately the 4th caudal, 2.3 mm. in horizontal diameter, from a fish about 6 inches long; Plate 1G.

Family LABRIDAE -- Wrasses

Pimelometopon pulchrum (Ayres) -- California sheephead

Dentary (right): 1 fragment.

Pharyngeal: 12 (4 incomplete, 8 fragments); Plate 1D.

Vertebra: 3, incomplete; approximately the 3rd, 6th, and 14th caudals.

Family SCORPAENIDAE -- Rockfishes

Sebastes paucispinis (Ayres) -- bocaccio

Hyomandibular (right): 1, incomplete. The identification to species is questionable.

Sebastes goodei Eigenmann and Eigenmann -- chilipepper

Dentary (left): 1, incomplete.

Dentary (right): 1, incomplete.

Sebastes sp. -- rockfish

Frontal (right): 1 fragment.

Hyomandibular (left): 1, incomplete.

Hyomandibular (right): 1 incomplete.

Family BATRACHOIDIDAE -- Toadfishes

Porichthys myriaster Hubbs and Schultz -- slim midshipman

Vertebra: 1, incomplete; approximately the 9th precaudal. The identification to species is questionable.

Family CLINIDAE -- Klipfishes

Heterostichus rostratus Girard -- giant kelpfish

Dentary (right): 1, incomplete.

FISH REMAINS, BY LEVELS

In the following list of fish remains by levels, it is noteworthy that the largest amount of material and the largest number of species were obtained at depths of 18 to 30 inches.

0-6". Isurus oxyrinchus: Tooth.

Squatina californica: Centrum.

Paralabrax clathratus: Quadrate (left).

Unidentified fragments: 6.

6-12". Lamna ditropis: Tooth.

Triakis semifasciata: Centrum (2).

Paralabrax clathratus: Maxillary (right).

Scomber japonicus diego: Vertebra (3).

Thunnus alalunga: Vertebra (2).

Pimelometopon pulchrum: Pharyngeal (6); Plate 1D.

Sebastes goodei: Dentary (2).

Sebastodes sp.: Hyomandibular (left).

Unidentified fragments: 43.

12-18". Lamna ditropis: Tooth (2); Plate 1A.

Isurus oxyrinchus: Tooth.

Triakis semifasciata: Centrum (4).

Rhinobatos productus: Centrum.

Myliobatis californica: Tooth segment.

Sphyræna argentea: Quadrate (right); metapterygoid (left); vertebra (ca. 2nd precaudal).

Scomber japonicus diego: Vertebra (2; 1st and ca. 9th precaudal).

Pimelometopon pulchrum: Pharyngeal (2).

Heterostichus rostratus: Dentary (right).

Unidentified fragments: 25.

18-24". Isurus oxyrinchus: Tooth (2).

Triakis semifasciata: Centrum (3).

Sphyræna argentea: Quadrate (right); articular (2; left, right); vertebra (precaudal).

Scomber japonicus diego: Dentary (left); vertebra (8; including ca. 5th, 8th, and 9th precaudal and ca. 12th caudal).

Sarda lineolata: Dentary (right); vertebra (3; ca. 11th and 14th precaudal and ca. 13th caudal).

Thunnus thynnus: Vertebra (ca. 4th caudal).

Thunnus alalunga: Vertebra (4; including ca. 14th precaudal and ca. 17th caudal).

Pimelometopon pulchrum: Pharyngeal (3).

Sebastodes sp.: Hyomandibular (right).

Unidentified fragments: 86.

24-30". Triakis semifasciata: Centrum (10).

Rhinobatos productus: Centrum (2).

Myliobatis californica: Centrum.

Sphyræna argentea: Vertebra (2).

Scomber japonicus diego: Dentary (left); vertebra (7; including ca. 2nd, 3rd, and 7th precaudal and ca. 8th and 10th caudal).

Sarda lineolata: Vertebra (ca. 16th precaudal).

Thunnus thynnus: Vertebra.

Thunnus alalunga: Vertebra (8; including ca. 14th precaudal and ca. 2nd, 15th, and 17th caudal).

Chromis punctipinnis: Vertebra (ca. 4th caudal); plate 1C.

Pimelometopon pulchrum: Dentary (right); pharyngeal; vertebra (ca. 6th caudal).

Sebastodes paucispinis: Hyomandibular (right).

Sebastodes sp.: Frontal (right).

Forichthys myriaster: Vertebra (ca. 9th precaudal).

Unidentified fragments: 122.

30-36". Triakis semifasciata: Centrum (3).

Squatina californica: Centrum.

Scomber japonicus diego: Vertebra (ca. 5th precaudal).

Sarda lineolata: Vertebra (ca. 11th precaudal).

Thunnus alalunga: Vertebra.

Pimelometopon pulchrum: Vertebra (ca. 3rd caudal).

Unidentified fragments: 12.

36-42". Triakis semifasciata: Centrum.

Sphyræna argentea: Vertebra (ca. 4th precaudal).

Seriola dorsalis: Vertebra (1st precaudal).

Thunnus thynnus: Vertebra.

Thunnus alalunga: Vertebra.

Pimelometopon pulchrum: Vertebra (ca. 14th caudal).

Unidentified fragments: 36.

42-48". Seriola dorsalis: Vertebra (2; 2nd and ca. 10th precaudal).

Thunnus alalunga: Vertebra (ca. 14th caudal).

Unidentified fragment: 1.

48"-sterile. Triakis semifasciata: Centrum.

Sphyræna argentea: Vertebra (3rd precaudal); plate 1B.

Unidentified fragments: 0.

DISCUSSION

All fishes represented in this collection (including the sharks, the guitarfish and the stingray) are edible. There are no unusually large examples of any species -- most are of average size. The remains of the salmon shark and the mako represent individuals weighing between 100 and 200 pounds; the largest bluefin-tuna vertebra is from a fish of perhaps 50 pounds. All other remains are from fishes of less than 20 pounds. The smallest individual represented is a blacksmith about 6 inches long.

Two species, Thunnus thynnus (bluefin tuna) and Thunnus alalunga (albacore), are pelagic. Adult Sebastodes paucispinis (bocaccio) and Sebastodes goodei (chilipepper) occur near the sea bottom in water too deep to be fished from the shore. The remains of these four species provide clear evidence of the use of a boat by the aboriginal fishermen.

Two other species, Lamna ditropis (salmon shark) and Isurus oxyrinchus (mako), are commonly regarded as pelagic, although they occasionally enter shallow water. It is much more probable that they were caught from a boat than from the shore.

Four species, Sphyræna argentea (Pacific barracuda), Seriola dorsalis (yellowtail), Scomber japonicus diego (Pacific mackerel), and Sarda lineolata (California bonito), are not strictly pelagic, but ordinarily occur offshore. They were probably taken most frequently from a boat, but may have been caught occasionally from the shore.

The remaining nine species, Triakis semifasciata (leopard shark), Squatina californica (Pacific angel shark), Rhinobatos productus (shovelnose guitarfish), Myliobatis californica (bat stingray), Paralabrax clathratus (kelp bass), Chromis punctipinnis (blacksmith), Pimelometopon pulchrum (California sheephead), Porichthys myriaster (slim midshipman), and Heterostichus rostratus (giant kelpfish), commonly enter very shallow water. It is quite as likely that the aborigines caught these species from the shore as from a boat.

Most of the species found at this site are discussed in a paper, now in press (Annual Report, Archaeological Survey, Department of Anthropology and Sociology, University of California, Los Angeles, 1962-1963, in which I have analyzed the fish remains obtained from the nearby Century Ranch Site (LAN-227), north of Malibu Canyon, Los Angeles County, California. The publica-

tions cited in the bibliography of that paper contain descriptions and figures of all the species found at the Arroyo Sequit Shellmound.

EXPLANATION OF ILLUSTRATIONS

- Plate 1. A. Lamna ditropis (salmon shark), tooth, extreme length 14.2 mm.; from a depth of 12-18"
- B. Sphyræna argentea (Pacific barracuda), vertebra (3rd pre-caudal), horizontal diameter 11.3 mm.; from a depth of 48"-sterile.
- C. Chromis punctipinnis (blacksmith), vertebra (ca. 4th caudal), horizontal diameter 2.3 mm.; from a depth of 24-50".
- D. Pimelometopon pulchrum (California sheephead), pharyngeal (lower), width 21 mm.; from a depth of 6-12".

Plate I



a.



b.

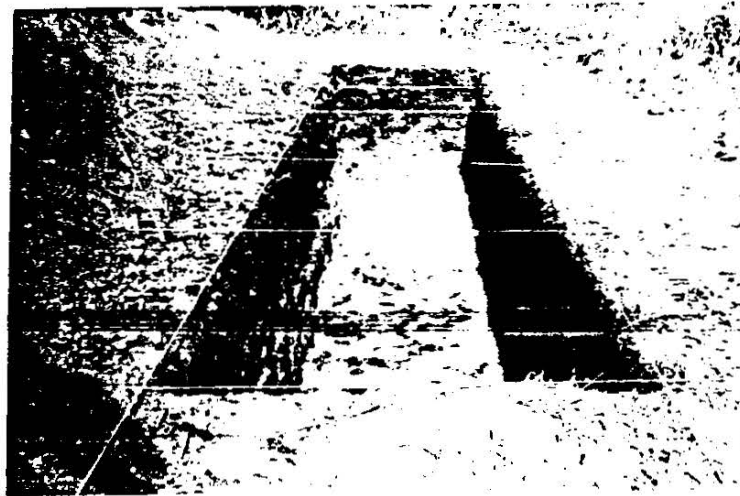




a.



b.



c.

SEQUENCE NOS. }
ONLY }
— DO NOT PRINT }
A

113

Reduce
(650%)

1.55



a.



b.



c.



d.

Reduce
69%

1.45



a.



b.



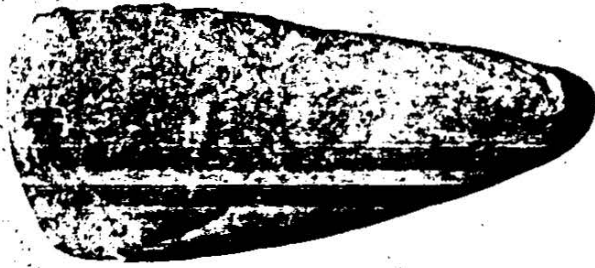
c.



d.

Reduce (67%)

135



b.



d.



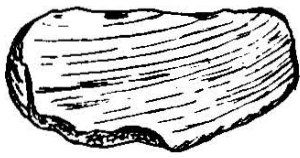
a.



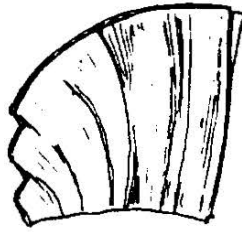
c.

116

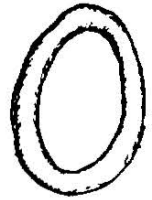
Red Hill
6890 7494
1155



a.



b.



c.



d.



e.



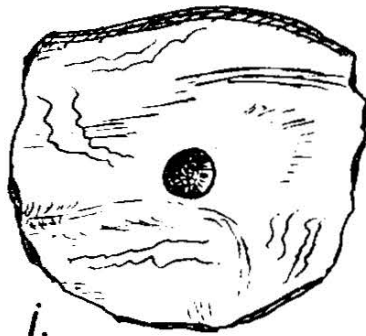
f.



g.



h.



i.



j.



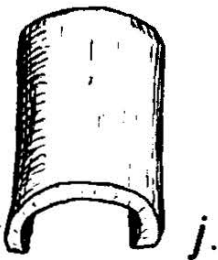
k.



l.

117

Reduce
(75%)



Reduce
76 5/10



b.



d.



a.



c.

1.00

119

Reduce (71.5/70)



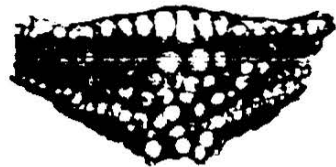
a.



b.



c.



d.

Reduce
75%

134

135 - 136
ARE BLANK

140