

pendicular south-facing surface.

The rock art at Boulder Complex 2 consists of three separate design panels (south, northeast, and northwest) executed on the relatively smooth and regular inner faces of massive exfoliated slabs and their complimentary surfaces on the parent boulders. These large slabs lean against the boulders, forming shelters within which the elements are located. The south panel set consists of 115 pits and 4 groove petroglyphs with 92 pits and 2 grooves on the boulder panel (Figure 12e), 11 pits and 2 grooves on the slab panel (Figure 12a), and the remaining 12 pits scattered among several smaller boulders within the shelter. At the northeast panel set, 44 pits are present on the boulder panel (Figure 12b), and 5 pits and 14 pictograph elements appear on the slab panel. The northwest panel set includes 12 pits and 4 pictograph elements on the boulder panel (Figure 12c), 4 pits and 6 pictograph elements on the slab panel, as well as 12 pits that occur on the surfaces of other boulders lying inside the alcove.

Sampling Procedure

The Dead Dog site was the first site tested during salvage work at Perris Reservoir. This choice was dictated by the fact that initial plans called for the grading of a major access road across the site and over the hills into the reservoir area proper. It was not until after the archeological fieldwork was completed that construction plans were changed and the road location moved elsewhere.

Work began with an attempt to assess the diversity and extent of the cultural deposits. This was accomplished by dividing the site into four quadrants (cf. A-D, Figure 17) and collecting all refuse found on the surface in these areas.

The location of the excavations was limited by the terms of the salvage agreement to those areas of the site likely to be damaged by construction of the road. The initial excavation unit (Unit 1) was placed in Locus A, approximately 2 m northwest of Boulder Complex 1, where bedrock metates, mortars, and rock art gave evidence of prehistoric activity. Subsequently, two more exploratory units (Units 2 and 3) were dug just north and east of Unit 1. When these units failed to reveal either dense occupational debris or significant cultural features, three additional units (Units 4-6) were excavated within Boulder Complex 1 itself. Following the completion of this work, excavation was initiated in Locus B, about 70 m west of the first excavations. Ultimately, four units were dug in this second area. These were numbered 7

through 10.

In all, 24.5 m³ of earth were excavated with shovel and/or trowel and passed through one-quarter-inch mesh screen. The mean depth of the excavation units was 67 cm; however, three of the units (2, 4, and 6) reached a maximum depth of only 30 cm. When these units are removed from calculations, the average depth of the others becomes 85 cm.

Stratigraphy

Evidence of the physical stratigraphy at the Dead Dog site was derived from the excavations and from an inspection of the soil profiles exposed in the stream channel. Four stratigraphic units were recognized (Figure 18). From bottom to top, these units are:

Unit I: Light tan and yellow sandy clay (Munsell color 2.5Y 5/2 to 2.5Y 3/2). This unit is slightly compacted, massive, and unbedded. It appeared in all excavations and was exposed in the stream cut. Its horizontal limits are unknown, but it probably caps subsurface bedrock across the site. Only a few artifacts were recovered from this unit, and these probably owe their presence to rodent disturbance.

Unit II: Dark brown sandy clay (Munsell color 10YR 3/5 to 10YR 3/2). This is the midden deposit. It is unbedded, massive, somewhat less compact than the underlying tan and yellow sandy clays. Its thickness varies from 40 to 50 cm. It is horizontally discontinuous over an area approximately 150 x 200 m near the apex of the alluvial fan.

Unit III: Light brown sandy loam (Munsell color 2.5Y 4.5/5). This is a layer of relatively coarse, uncompacted sands, about 15 to 20 cm thick. Some internal stratification was noted, probably the result of slope wash. Artifacts were occasionally encountered, but as in the case of Unit I, their presence is fortuitous, probably the result of rodent disturbance or plowing.

Unit IV: Organic layer. This deposit is restricted to Locus A. It is a layer of decomposing organic material about 5 cm in thickness, which extends over a rectangular area about 25 x 50 m. The organic material appears in the form of elongate lumps or casts, resembling dung. This fact, coupled with the presence of sheep shears and other historic artifacts, indicates that the deposit marks the former location of an enclosure for sheep and/or other livestock.

All of these strata, with the exception of Unit IV, were deposited by alluviation. The absence of buried channel deposits or other erosional features suggests that much of the deposition occurred as a result of slope wash. Certainly there is no indication in the sampled portions of the site of the channel cutting so characteristic of the deposits at the Peppertree, Oleander Tank, and Charles Mott sites. It is interesting to note that more than 15 cm of sediments have been laid down on the surface of the site since the termination of the aboriginal occupation, an interval of probably no more than 150 years. If this rate of deposition is characteristic of similar settings elsewhere in the Perris-San Jacinto area, it suggests that sites substantially older than those at Perris may be deeply buried and that they will be difficult to identify in the course of surface surveys.

Subsurface Features

Features encountered in the excavations at the Dead Dog site fall into four categories: earth ovens, hearths, cobble scatters, and burials.

Earth Ovens

Two such features were found at the Dead Dog site. One was located at a depth of 60 cm in Excavation Units 7 and 9. It was hemispherical in form and measured 80 cm in diameter and 10 cm in depth. It was lined with nearly 50 fire-blackened cobbles, ranging in size from 10 to 14 cm (Figure 18), and was highly oxidized. Also, a large amount of charcoal was present in the feature matrix. This fill was screened and subsequently treated by water separation. Forty-four bone fragments were recovered, representing the remains of at least two jackrabbits and one cottontail. A number of seeds were also found, including some identified as juniper, amaranth, goosefoot, sunflower, and bentgrass.

The second earth oven pit was encountered in Excavation Unit 5 at a depth of 20 cm. It was similar in form to the first, but somewhat larger, measuring about 1 m in diameter and 30 cm in depth. The sides and bottom were lined with about 40 cobbles. Large quantities of bone and charcoal were noted in the fill. This soil has not yet been subjected to water separation, so that a detailed list of the faunal and floral contents cannot be presented here.

These features are at once both containing and heating facilities. As such they were probably used to heat, roast, or parch foodstuffs. A sharp

increase in faunal remains in levels above these features and a marked decrease in the levels directly below them may indicate that they were used for cooking meat. Faunal remains from one suggest that cottontail and jackrabbit were among the species involved. In addition, a small number of seeds recovered from this same feature may reflect the use of these facilities for seed parching. Agave roasting can probably be discounted since pits used for this purpose are considerably larger (Castetter, Bell, and Grove, 1938), and because agave was not sufficiently common in the area during the time period postulated for most of the occupation. (See Bettinger, "Environment and Ethnography," in this publication; see also Kowta, 1969.) Among the Luiseño, cottontails and jackrabbits were cooked in roasting pits or earth ovens similar to those at the Dead Dog site (Drucker, 1937; Sparkman, 1908: 198).

Radiocarbon analysis of charcoal from the fill of the earth oven first described yielded an age of less than 150 radiocarbon years (UCLA-1819). When corrected for secular variations (Suess, 1970) this date is consistent with expectations based on UCLA-1816 (215±60 radiocarbon years: AD 1735) and UCLA-1818 (210±60 radiocarbon years: AD 1740) from the Peppertree and Charles Mott sites, respectively. Both of the latter mark the climax of periods of intensive occupation.

Hearths

Only one example was encountered at Dead Dog. It was located in Excavation Unit 9 at a depth of 60 cm, directly adjacent to the first earth oven described above (Figure 18). It consisted of a group of six cobbles, 10-15 cm in diameter, arranged in a rough circle 30 cm across. The center was marked by a dense concentration of charcoal. The feature is rudely constructed and could best serve as a heating facility if the material being treated required no containment. It is suggested that this implies the heating of stones (for heat transfer as in stone boiling) or materials already contained in ceramic vessels. Both practices are documented ethnographically among the Luiseño (Drucker, 1937). McCown (1955: 7-8) notes two distinct types of aboriginal cooking facilities at the site of Temecu nearly 100 km to the south of Perris Reservoir. One consisted of three rocks used to prop a vessel during the process of stone boiling. The other was a small rock-ringed fireplace upon which a pottery vessel could be directly heated. The hearth at Dead Dog is similar to this latter type of feature and was probably used in the same

manner. Hearths of this size could also produce coals for use in seed parching (Drucker, 1937; Harrington, 1934: 30).

Cobble Scatters

These are arrangements of ten or more small-to-medium-sized cobbles that occur on a common surface. The cobbles are often blackened and fractured by exposure to fire. Scatters may include mano and metate fragments. Four of these features were found, located as follows:

Excavation unit	Depth in cm
1	20-30
8	50-60
8	70-80
10	80-90

Unlike hearths or earth ovens, cobble scatters are not associated with primary evidence of fire such as charcoal. Their dispersed character indicates that they are not the focal point of a localized activity area as would be the case with a hearth. Aboriginally, stone cobbles served a wide variety of purposes including heat transferers, heat conservers (as in roasting pits), and props for round-bottomed ceramic vessels. These scatters, therefore, probably represent aggregations of such cobbles, both used and unused, which were kept on hand for use in these activities.

Burials

The Dead Dog site derives its name from a canid skeleton which was found lying between two large boulders at a depth of 20 cm below the surface in Excavation Unit 4, Locus A. This feature probably postdates the aboriginal occupation of the site, since it lies stratigraphically above four bedrock features — three metates and one mortar — and is associated with at least one historic artifact, an unfired .22 cartridge. Although no evidence of an artificial pit was noted during the excavation of Unit 4, the articulated condition of the skeleton would appear to indicate that this is an intentional burial. If this is indeed the case, the feature may be related to the sheep corral also noted in Locus A, since dogs are commonly employed in the herding and containing of sheep.

Artifacts and Ecofacts

Artifacts are divided into six classes: flaked stone, ground stone, ceramics, worked bone,

worked shell, and historic objects. Although the sections below deal with both general descriptions and distributions of the artifacts, the reader is referred to the papers that deal specifically with each artifact class. Tables 8 through 11 summarize the horizontal and vertical distributions of all artifacts encountered at the Dead Dog site.

Flaked Stone

These artifacts fall into seven categories: projectile points, scraper planes, end scrapers, knives, perforators, hammerstones and cores.

Projectile Points

Fourteen of 15 complete or nearly complete projectile points were classified as Cottonwood Triangular. The remaining specimen was aberrant and could not be assigned to a recognized category. In addition, five artifacts identified as projectile points were too fragmentary to permit classification. On the basis of differential lateral and basal edge treatment, the Cottonwood Triangular type is divided into four varieties, three of which are present in the sample from Dead Dog. Eight pieces were identified as Cottonwood Triangular concave base. Five of these are quartz, two are chert, and one is aphanitic ultrabasic (Plate 15b, u, y). Cottonwood Triangular straight-base and narrow-blade varieties were represented by three specimens each (Plate 16j, l, o, s). All six were manufactured from quartz. The unclassified point, a small leaf-shaped specimen with shallow side notches, is made of chalcedony (Plate 16x). All 15 projectile points recovered from buried deposits were located in the four excavation units (7-10) in Locus B. Surface collections yielded five pieces, all within Locus A. The implications of these and other distributions are discussed below.

Scraper Planes

Five scraper planes were found. Three of these are classified as Type IIA after Johnson (1966: 6) (Plate 17b). One of these is a banded, medium-grained quartzite, another is a fine-grained grano-diorite porphyry, and the third is made of fine-grained igneous rock. All Type IIA scraper planes were found on the surface, one in Locus A and two in Locus B. The unclassified scraper planes (Plate 18b, c) are long and relatively narrow with a sharp natural bevel along one lateral margin that served as the working edge. Both exhibit use-wear and intentional retouch and were manufactured

from fine-grained metamorphic rock. These specimens were recovered from buried deposits, one in Unit 5 of Locus A and the other in Unit 8 of Locus B.

End Scrapers (Plate 19i)

Two end scrapers were recovered, both made of fine-grained gabbro. They have expanding distal edges that are steeply retouched and display use-wear. Both were found on the surface of Locus C.

Knives

Three different types of knives, each represented by a single specimen, were identified. A triangular chert biface (Plate 19a) was located in Unit 8, Locus B, and an irregular biface, also made of chert (Plate 19c), was located on the surface in the same locus. A large flake of fine-grained gabbro, which served as a cutting tool (Plate 19e), was recovered in Unit 7, again in Locus B.

TABLE 8
DISTRIBUTION OF ARTIFACTS ON GROUND SURFACE, DEAD DOG SITE

Category	Number	Locus A	Locus B	Locus C	Locus D
Flaked Stone					
Projectile points					
Cottonwood Triangular, concave base	4	4	--	--	--
Cottonwood Triangular, straight base	1	1	--	--	--
Scraper planes					
Type IIA	3	1	2	--	--
Scraper					
Endscraper	2	--	--	2	--
Knife					
Irregular bifacial	1	--	1	--	--
Hammerstones	2	1	--	1	--
Core	1	--	--	1	--
Ground Stone					
Manos					
Type IIA	2	--	--	2	--
Type IIB-1	3	--	1	2	--
Unclassified fragments	38	4	5	29	--
Metates					
Slab	1	--	--	--	1
Basin	1	--	--	1	--
Unclassified fragments	1	--	--	1	--
Pestles					
Type II (non-food processing)	1	--	1	--	--
Ceramics					
Vessel sherds					
Tizon Brown Ware	11	2	6	2	1
Lower Colorado Buff	7	3	4	--	--
Pipe					
Fragment	1	--	1	--	--
Historic Items	10	9	--	1	--
Total	90	25	21	42	2

TABLE 9
DISTRIBUTION OF ARTIFACTS IN LOCUS A, DEAD DOG SITE

Category	Number	Sur- face	Depth in cm									
			0- 10	10- 20	20- 30	30- 40	40- 50	50- 60	60- 70	70- 80	80- 90	
Flaked Stone												
Projectile points												
Cottonwood Triangular, concave base	4	4	--	--	--	--	--	--	--	--	--	--
Cottonwood Triangular, straight base	1	1	--	--	--	--	--	--	--	--	--	--
Scraper planes												
Type IIA	1	1	--	--	--	--	--	--	--	--	--	--
Unclassified	1	--	--	--	--	--	--	1	--	--	--	--
Perforator	1	--	--	--	--	1	--	--	--	--	--	--
Hammerstones	4	1	--	--	1	1	--	1	--	--	--	--
Core	1	--	--	--	--	--	--	1	--	--	--	--
Ground Stone												
Manos												
Type IIA	2	--	--	--	--	--	--	1	--	--	--	1
Unclassified fragments	23	4	3	4	9	--	3	--	--	--	--	--
Metates												
Basin	1	--	--	--	--	--	--	1	--	--	--	--
Unclassified fragment	1	--	--	--	1	--	--	--	--	--	--	--
Ceramics												
Vessel sherds												
Tizon Brown Ware	7	2	3	2	--	--	--	--	--	--	--	--
Lower Colorado Buff	4	3	1	--	--	--	--	--	--	--	--	--
Worked Bone												
Awl fragments	1	--	--	--	1	--	--	--	--	--	--	--
Unclassified worked bone fragments	6	--	--	--	2	1	1	2	--	--	--	--
Historic Items	91	9	69	5	6	1	--	--	--	1	--	--
Total	149	25	76	11	20	4	4	7	--	1	1	--

Perforators (Plate 19m)

A single chert implement, triangular in outline, with a blunt tip and deep, concave lateral edges, was classified as a perforator. It was recovered in Unit 1, Locus A.

Hammerstones

Six large cobbles with battered edges were identified as hammerstones. Five of them appear to be exhausted cores. Of these five, three are made of a porphyry of unknown composition, one is fine-grained gabbro, and one is metamorphosed sandy siltstone. Four core-hammerstones were found in Locus A, one in Unit 1, two in Unit 5, and one on the surface. A single specimen came

from Unit 8, Locus B. The hammerstone that did not appear to be a reused core was located on the surface in Locus C.

Cores

Four artifacts that served as cores were recovered. Two are fine-grained gabbro, one is flint, and one is grano-diorite. They were found in sub-surface deposits in Unit 5, Locus A; in Units 7 and 8, Locus B; and on the surface in Locus C.

Ground Stone

These tools are the most common implements at the Dead Dog site. The class includes manos, metates, and pestles.

**TABLE 10
DISTRIBUTION OF ARTIFACTS IN LOCUS B, DEAD DOG SITE**

Category	Number	Sur- face	Depth in cm												
			0- 10	10- 20	20- 30	30- 40	40- 50	50- 60	60- 70	70- 80	80- 90	90- 100	100- 110	110- 120	120- 130
Flaked Stone															
Projectile points															
Cottonwood Triangular, concave base	4	--	1	1	--	--	--	1	--	1	--	--	--	--	--
Cottonwood Triangular, straight base	2	--	--	--	2	--	--	--	--	--	--	--	--	--	--
Cottonwood Triangular, narrow blade	3	--	--	--	--	1	1	1	--	--	--	--	--	--	--
Unclassified	1	--	--	--	--	--	--	--	1	--	--	--	--	--	--
Unclassified fragments	5	--	--	--	--	1	--	1	2	--	--	1	--	--	--
Scraper planes															
Type IIA	2	2	--	--	--	--	--	--	--	--	--	--	--	--	--
Unclassified	1	--	--	--	--	--	--	--	--	1	--	--	--	--	--
Knives															
Triangular bifacial	1	--	--	--	--	--	1	--	--	--	--	--	--	--	--
Irregular bifacial	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--
Flake	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--
Cores															
	2	--	--	--	--	--	--	2	--	--	--	--	--	--	--
Hammerstone															
	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--
Ground Stone															
Manos															
Type IIA	1	--	--	--	--	--	--	1	--	--	--	--	--	--	--
Type IIB-1	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--
Unclassified fragments	11	5	--	1	--	1	1	1	--	2	--	--	--	--	--
Metates															
Basin	1	--	--	--	--	--	--	--	--	--	--	--	--	1	--
Unclassified fragments	2	--	--	--	1	--	--	--	--	--	--	1	--	--	--
Pestles															
Type II (non-food processing)	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--
Ceramics															
Vessel sherds															
Tizon Brown Ware	32	6	3	5	6	2	6	2	1	1	--	--	--	--	--
Lower Colorado Buff	8	4	1	--	--	1	1	--	1	--	--	--	--	--	--
Pipes															
Fragments	2	1	--	--	--	--	--	1	--	--	--	--	--	--	--
Worked Shell															
Perforated <i>Argopecten</i> valve	1	--	--	--	--	--	--	1	--	--	--	--	--	--	--
Worked Bone															
Awl fragments	2	--	1	--	--	--	--	--	1	--	--	--	--	--	--
Unclassified fragment	1	--	--	--	--	--	--	--	1	--	--	--	--	--	--
Historic Items															
	10	--	7	--	--	--	--	1	2	--	--	--	--	--	--
Total	97	21	15	7	9	6	10	12	9	5	--	2	--	1	--

Manos

Seventy-one manos and mano fragments were found, of which eight could be assigned to the categories defined by Robarchek (this publication). Five of these are Type IIA, including two found on the surface in Locus C and those from buried deposits in Units 2 and 5 in Locus A and Unit 10 in Locus B. There were three Type IIB-1 manos, all from the surface of the site, two in Locus C and one in Locus B. Considering both complete and fragmentary specimens, manos were most commonly encountered in Locus C, where 33 were found. Locus A produced a total of 25, while Locus B yielded 13. None was found in Locus D.

Metates

Eight metates were found, including four fragmentary specimens and four that could be assigned to the categories recognized by Robarchek. Of the latter, three were basin shaped, and one was a slab metate. Distribution frequencies ranged from three in Locus B to one in Locus D.

Pestles

One Type II (non-food processing) pestle was found on the surface in Locus B.

Ceramics

A total of 54 sherds, including 42 of Tizon Brown and 12 of Lower Colorado Buff, was recovered. Tizon Brown was the most common in Locus B, where a total of 32 sherds was found in surface and subsurface deposits. Only seven sherds were found in Locus A, two in Locus C, and one in Locus D. Lower Colorado Buff was represented by eight sherds in Locus B and four in Locus A.

The high frequency of Tizon Brown sherds with burned or soot-coated exteriors indicates that vessels of this ware were used for cooking. On the other hand, buff sherds exhibit no exterior carbon layer or other evidences of fire, and it is inferred that these containers functioned as storage vessels for foodstuffs and/or water.

Two pipe fragments were recovered. A small section from a thin pipe wall was recovered in Unit 9, Locus B. The other is a fragment of a perforated ventral flange from which the pipe could have been suspended on a cord. This piece was found on the surface of Locus B.

Worked Bone and Shell

Nine pieces of worked bone were noted, two of which are classified as awl fragments. Seven other bone splinters probably represent awl fragments but were too incomplete to permit conclusive identification. All examples were from subsurface deposits distributed among Units 1 and 5 of Locus A and Units 8 and 9 in Locus B (Tables 9 and 10).

The single worked shell artifact recovered at the Dead Dog site was found in Unit 9, Locus B, at a depth of 60 cm below the present ground surface, on the living floor and adjacent to the radiocarbon-dated earth oven. It is a large right valve of *Argopecten circularis aquisulcatus* with a hole punched from the inside (Plate 20a). This may be one-half of a rattle made by cementing two such valves on a shaft and placing pebbles in the central cavity thus formed.

Historic Objects

Included among the 102 historic objects recovered are 58 square iron nails; 24 cartridges, shells and slugs; 8 glass fragments; and 12 miscellaneous items. These artifacts were distributed as follows: Unit 1 (3), Unit 3 (1), Unit 4 (3), Unit 5 (72, including 50 square nails), Unit 6 (3), and surface (9) in Locus A; Unit 8 (8) in Locus B; and surface (1), Locus C. The disproportionate number of nails found in Unit 5, Locus A, may represent a historic building, a corral gate, or a refuse pit. Any one of these features might be associated with the sheep corral located in Locus A.

Debitage

The distribution of the 514 pieces of debitage recovered from buried deposits in Loci A and B is summarized in Table 11. In order to compare the relative frequency of debitage between units, the average number of flakes per 0.4 m³ of dirt (the equivalent of one 10 cm level in a 2 x 2 m excavation unit) was calculated (Table 11). The ratio of debitage to flaked stone tools from buried deposits is 514 to 27 or 19 to 1. Wilmsen (1970: 65) has noted that debitage/tool ratios of 25-19 to 1 are common at sites where tool production was an important activity.

Faunal Remains

A total of 2,213 whole and fragmentary bones was recovered. Their distribution is indicated

in Table 11. Table 26 shows the species breakdown of the fauna and also indicates that jackrabbits and cottontails were the most important animals consistently taken.

Floral Remains

Carbonized plant remains were separated from the fill of the earth oven in Unit 7. Thirty-six specimens were recovered, of which 19 were identified. Juniper berries and nut shell fragments were represented by seven specimens, as were grasses (including bentgrass, cf. *Agrostis*). Goosefoot, amaranth, and sunflower seeds make up the balance (Gardner, McCoy, and Brown, this publication).

Distributions

Assessments of the duration of occupation and of functional differences between loci at the Dead Dog site are based on the vertical and horizontal distributions of artifacts (Tables 8 through 11). These arguments are presented in the sections below. Statistical tests employed to measure the significance of certain distributions include Fischer Exact (Fisher, 1934), Mann-Whitney U (Mann and Whitney, 1947), X² test for two independent samples (assuming chi-square distribution), and a one-sample runs test (Siegel, 1956). In each case the tests were one tailed (i.e., directional), and a probability level of .05 was considered significant.

Vertical Distributions

For the most part, the vertical distribution of artifacts varies directly with the character of the midden layer. That is, artifacts are relatively less

common in the extreme upper and lower portions of this stratum, where it is mixed with sterile soil formations, than near its center, where it is not. In both Loci A and B artifacts of ground stone, flaked stone (not including projectile points), and worked bone exhibit no patterned distribution but occur throughout the deposits. This was determined by applying a "runs test" in which arbitrary levels containing one or more artifacts of a given type were scored as "hits," and those lacking such artifacts were scored as "misses." The total number of "runs" of hits and misses was calculated and in all cases showed that the observed vertical distributions of artifact types within these classes were random. However, it was noted that while projectile points (other than fragments) and ceramics occur throughout the deposit in Locus B, they are confined to the upper portion of the midden in Locus A. The sample from Locus A is small (five points and six sherds), and the trend may be due to sampling error.

Alternatively, these artifacts may have been included in soil redeposited in Locus A during the construction of a road across Locus B, where sherds and points are relatively more common. It is significant in this respect that all these specimens occur either on the surface or in the first 10 cm of excavation, except in Unit 4, where an intrusive post-aboriginal occupation feature has been noted. A comparison between Locus B and the surface and first 10 cm of Locus A based on the number of points and sherds in each such that

	Surface and 0-10 cm		Total	
	Locus A	Locus B		
Points	5	15	20	
Sherds	9	40	49	
Total	14	55	69	df=1

TABLE 11
DISTRIBUTION OF DEBITAGE AND BONE WASTE IN
LOCI A AND B, DEAD DOG SITE

	Total	Locus A Excavation units						Locus B Excavation units			
		1	2	3	4	5	6	7	8	9	10
Debitage											
Raw total	514	55	6	11	6	154	--	110	93	30	49
Average/0.4m ³ excavated	6.9	6.1	2.0	6.3	2.0	22.0	--	8.0	9.3	8.4	4.9
Bones and Fragments											
Raw total	2213	42	3	1	5	377	1	895	195	445	185
Average/0.4m ³ excavated	30.4	15.7	1.0	0.6	1.6	53.8	1.0	66.0	19.5	127.0	18.5

yielded an χ^2 value of .32 with a concomitant probability of between .70 and .50. In other words, the upper portions of Locus A and the entire deposit of Locus B are statistically indistinguishable. In view of this, surface disturbance rather than sampling error is probably the cause of the observed distribution of points and sherds in Locus A.

On the basis of radiocarbon dates, stratigraphy, and time-sensitive artifacts, it has been argued elsewhere (Bettinger, "Dating the Perris Reservoir Assemblages," in this publication) that the Perris locale was occupied during two distinct periods, "early" and "late." Traits belonging to the early period include Elko Eared points and basin milling stones. Time markers from the late period are Tizon Brown Ware and Lower Colorado Buff Ware sherds, lipped *Olivella* beads, and projectile points of the Desert Side-notched type and of the Cottonwood series. At Dead Dog only one artifact, a deeply buried milling stone, could be reliably assigned to the early period. The remainder of the time-sensitive artifacts and most of the other pieces not identified as time markers belonged to the late period. Therefore, for all intents and purposes, the collection from the Dead Dog site is considered a late period assemblage.

In summary, the overall picture of vertical distributions is one that is notable for its lack of change. The stability of both artifact types and categories would seem to imply that the Dead Dog site was consistently inhabited for only a short time during the late period, and that during this period activities carried out at this site remained basically the same.

Horizontal Distributions

Reconstructions of localized activity areas within the site are based on an assessment of variation in the horizontal distributions of features and artifacts. This endeavor is hampered in part by the nature of the excavated sample. Although surface collections were made in all loci, only Loci A and B were tested for subsurface deposits. In both cases the dispersion of excavation units is such that large portions of the midden were neglected, so that certain cultural features may have been consistently missed. These and other considerations detailed below render any conclusions made on the basis of distribution data now on hand tentative at best. In general, the following discussion will focus on Loci A and B since samples from these areas are relatively well controlled. The activities performed

in Loci C and D are briefly considered at the end of the section.

Only one living floor was recognized at the Dead Dog site. It was exposed in Units 7 and 9 (Figure 18), where an earth oven and a hearth were found resting on a common surface in the level 50 to 60 cm below the present ground surface. A perforated *Argopecten* valve and an unclassified projectile point were also noted *in situ* on this floor. As noted above, both the earth oven and the hearth are associated with cooking activities, so this floor probably represents part of an area of food preparation. The presence of large quantities of bone and several sherds from both cooking and storage vessels supports this hypothesis, although none of these was recovered in primary association with either feature or with the occupation surface. Intact features were present in several other units at Dead Dog, but these were located in discontinuous excavation units and could not be stratigraphically linked with any degree of confidence.

Before entering into a detailed comparison of the assemblages from Loci A and B, a brief review of the artifact and feature distributions is in order. The figures cited below represent *totals from all units and the surface* within a particular locus. The underlying assumption here is that the portions of the deposits at Dead Dog considered in this paper were occupied for a short period of time, during which activities and their locations remained relatively stable. The chronology provided by the projectile points and ceramic sherds tends to substantiate the temporal aspect of this proposition. (See Bettinger, "Dating the Perris Reservoir Assemblages," in this publication.)

Considering only Loci A and B for the present, eight categories of artifacts and features are sufficiently represented to warrant consideration: projectile points, knives, hammerstones, manos, sherds, bone awls and fragments, cooking features (including earth ovens, hearths, and cobble scatters), and bedrock facilities. Their distribution is as follows:

	Locus A	Locus B	Total
Projectile points	5	15	20
Knives		3	3
Hammerstones	4	1	5
Manos (including fragments)	25	13	38
Sherds	11	40	51
Bone awls and fragments	7	2	9
Cooking features	2	5	7
Bedrock features	21	—	21
Total	75	79	154

The directional distribution exhibited by each of the categories tabulated above suggests that different sets of activities were performed in Loci A and B. The disparities between these areas are best understood in terms of the permanent and non-portable features they contain, since the location of these items often determines the distribution of functionally related tools as well as the presence of subsidiary activities. Thus Locus A is distinguished by bedrock seed-milling surfaces and manos. In this instance, hammerstones may have served to roughen milling surfaces. On the other hand, the features and artifacts in Locus B, including earth ovens, a hearth, cobble scatters, and sherds from both cooking and storage vessels, are all linked to the preparation of food for immediate consumption. Placing seed-milling tools and features into one group and cooking items into another provides us with the following contingency table for Loci A and B:

	Locus A	Locus B	Total
Seed-milling items	50	14	64
Cooking items	13	45	58
Total	63	59	122

The χ^2 value for this distribution is 37.1 (Siegel, 1956: 107) with a probability of $p \leq .001$, a highly significant result. In this case, the dimensions of sex and economic mode do not account for the location of activities since both seed grinding and cooking are female-oriented "extractive" tasks (Murdock, 1949: 213; Binford and Binford, 1969).

The three remaining tool categories — bone awls, knives, and projectile points — are not directly associated with either seed milling or cooking; however, their distribution is highly localized. The Fisher Exact test indicated that the probability of such differential concentrations under random conditions was .0033 based on the contingency table below:

	Locus A	Locus B	Total
Projectile points	5	15	20
Bone awls and worked bone fragments	7	2	9
Total	12	17	29

While the significantly larger number of bone awls suggests such activities as the production of

coiled basketry in Locus A (Kroeber, 1932), the projectile points recovered in Locus B probably represent cached, lost, or discarded items of hunting paraphernalia rather than tools actually in use in that area. On the other hand, some points from the Perris locality exhibit use-wear patterns usually associated with butchering, and it is likely that along with the knives, some of the points found in Locus B served as tools of meat preparation. (See also Wilke, "Flaked Stone Artifacts," in this publication.)

In general, the features and artifacts present in Locus B reflect a range of both male and female-oriented activities consistent with what would be expected in a household unit. These include the storage and repair of hunting gear and the storage and preparation of foodstuffs. Locus A is a work area in which the tasks revolve around the preparation of seeds and the probable production of coiled basketry.

The distribution of bone between Loci A and B follows the pattern noted above. When units from Loci A (denoted by "A") and B (denoted by "B") are arranged in rank order on the basis of their relative frequencies of bone and bone fragments (cf. Table 11), the resulting array has a U-value of 2 and hence a probability of .019 (Mann and Whitney, 1947; Siegel, 1956).

Rank order of units according to bone frequencies:

B B A B B A A A A

Therefore, we conclude that in accord with expectations based on the presence of butchering tools and meat-roasting pits, units in Locus B contain relatively larger amounts of bone than those in Locus A.

In contrast, chipping waste is not differentially distributed. A rank order of excavation units based on frequency of debitage has a Mann-Whitney U-value of 6 and a probability of .129, which is not small enough to be considered significant.

Rank order of units according to chipping waste:

A B B B A A B A A A

When the distribution of bone is compared to that of chippage, the results indicate that while high frequencies of bone are usually accompanied by large numbers of flakes, the reverse is not true. The test is accomplished by dividing excavation units according to the relative frequencies of bone

rather than by locus. The first five in the bone rank order (denoted by "X") are compared to the second five (denoted by "Y") in terms of their rank order of debitage frequency. The resulting array is highly significant, with a U of 2 and a probability of .016.

Ordering of units according to chipping waste:

where X = a rank of 1-5 in bone rank order, and
where Y = a rank of 6-10 in bone rank order

X X X X Y Y X Y Y Y

Reversing the process so that the first five units in the debitage rank order are compared to the second five *in terms of the bone rank order* yields this array with a U of 5 and a nonsignificant probability of .075.

Ordering of units according to bone frequency:

where X = a rank of 1-5 in debitage rank order, and
where Y = a rank of 6-10 in debitage rank order

X X X X Y Y Y Y Y X

It would appear, therefore, that while meat preparation in Locus B is highly associated with debitage, probably as a result of resharpening butchering tools, chipping waste in Locus A reflects a different activity. Since projectile points, both complete and fragmentary, are absent for the most part from Locus A, chipping waste in this area is not a by-product of their manufacture. Alternatively, the preparation of plant materials, especially willow (*Salix* spp.) for use in foundations for coiled baskets requires that they be scraped (Steward, 1933: 270). The debitage present in Locus A in all likelihood represents both tools and

resharpening flakes associated with this step of basketry manufacture.

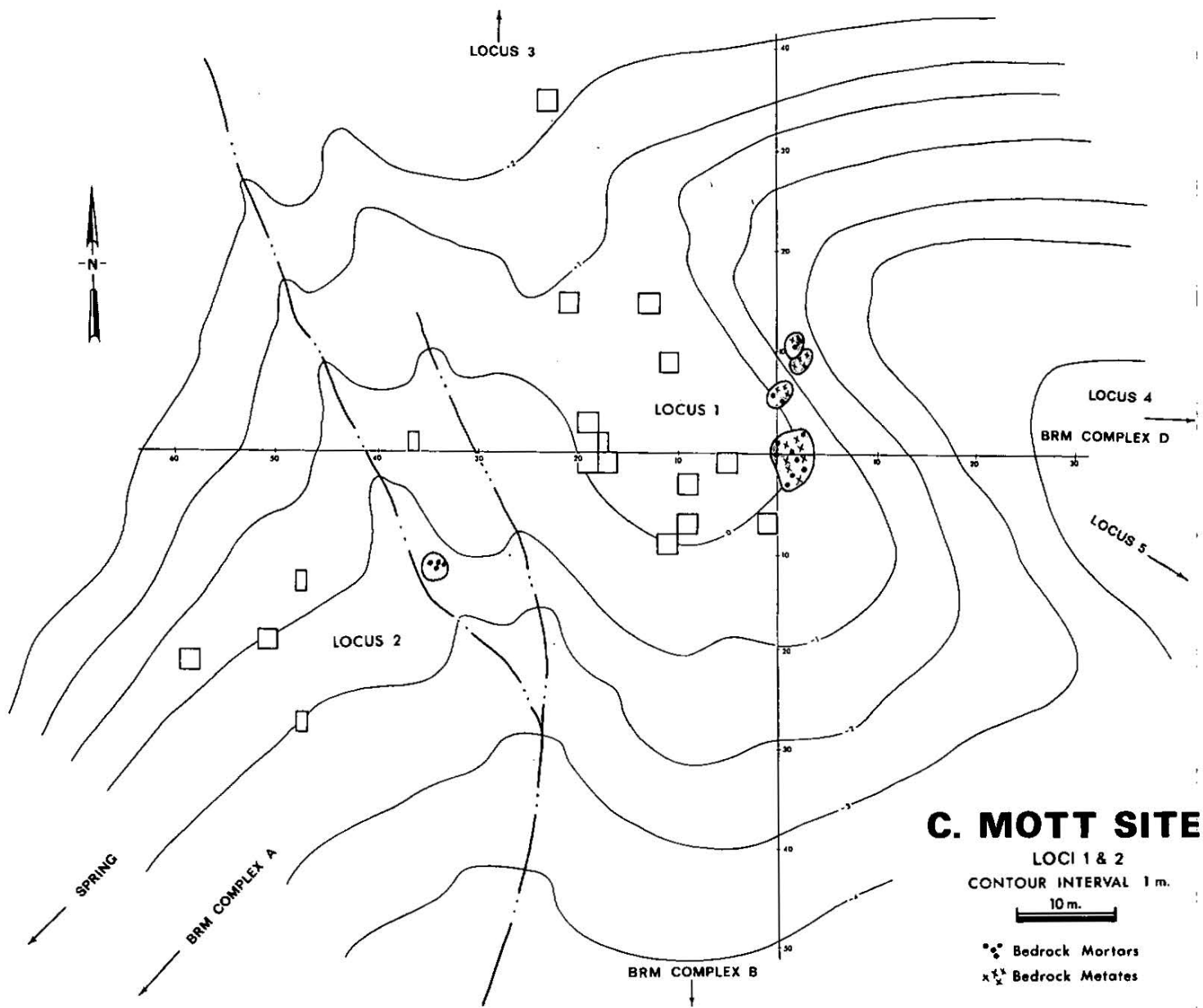
Conclusion

Based on the evidence provided by time-sensitive artifacts, the Dead Dog site was consistently inhabited for a short period of time, perhaps only 200 years. The size of the occupant population is undetermined, but the restricted horizontal distribution of the midden would suggest an estimate of about 30 individuals.

The results of analysis of floral remains found in one of the earth ovens point to occupation sometime between midsummer and fall. Subsistence was based on seeds and fruits of oak and hollyleaf cherry, as well as on products of the hunt, especially hares and rabbits.

Within the site, two activity areas are noted. One is a household area in Locus B, which is characterized by both male and female-oriented tasks. The other is an exclusively female work area in Locus A reconstructed as the location of activities related to both seed milling and basketry manufacture. The range of artifact types in Locus C (Table 8), including ceramics and end scrapers, may represent one or more household areas similar to that in Locus B; however, surface collection by casual visitors has seriously skewed their original distribution.

Despite the fact that all activities represented at Dead Dog could have been accomplished individually, some female-oriented tasks were apparently done by groups in localized work areas; this may reflect a strong corporate association between females. If this is true, some of the pictographs and petroglyphs in Loci A and D may be related to the initiation of girls to status as adult females, since *rites de passage* often arise as expressions of solidarity among economically vital and sexually defined social subgroups (Young, 1962).



C. MOTT SITE

LOCI 1 & 2
 CONTOUR INTERVAL 1 m.
 10 m.

- Bedrock Mortars
- ××× Bedrock Metates

Figure 19. Map of loci 1 and 2, Charles Mott site.

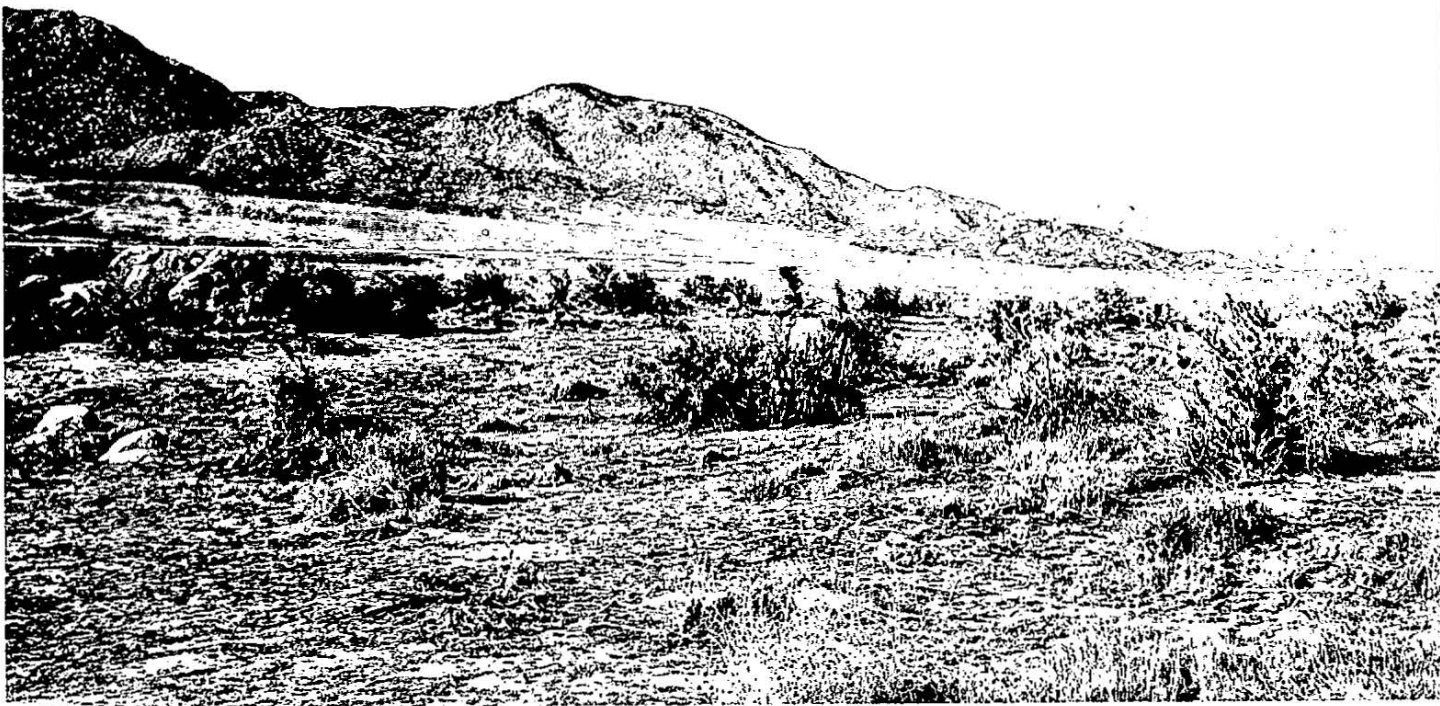


Plate 12. Location of the Charles Mott site (4-Riv-464). View to the north from a distance of 1.5 km. The site is located at the base of the hills just above center.

THE CHARLES MOTT SITE (4-Riv-464)

Clayton A. Robarchek

The Charles Mott site is located near the northeastern edge of the Perris Reservoir basin, nearly 1 km east-southeast of the summit of Mt. Russell. The site lies near the foot of the southern (inner) slope of the hills forming the northern edge of the basin, which it overlooks to the southwest (Figure 4; Plate 12). The hills to the north of the site descend to the floor of the basin in a series of terrace-like steps dissected by an arroyo, running north to south, which drains the upper slopes. It is on and around the two lowest terraces that the site is located (Plate 13).

The site is topographically varied and extensive, encompassing an area of more than 15 acres. Within this area are several distinct complexes of bedrock mortars and metates and associated midden deposits. For purposes of description and analysis the areas selected for study have been designated Loci 1, 2, 3, 4, and 5 (Figure 19; Plate 13).

The most extensive midden concentration is located on top of the first terrace above the basin. Designated Locus 1, the deposit measures about 40 m north to south by 30 m east to west. To the west of Locus 1, the previously noted arroyo dis-

sects the terrace to a depth of approximately 1 m. Between the western bank of this channel and the steep ridge that bounds the site on the west is a second midden concentration, designated Locus 2. North of Locus 1 and about 3 m higher lies a second terrace and midden deposit, designated Locus 3. From this point the terrain rises rapidly to the hills to the north and northwest. Isolated bedrock mortars and bedrock metates are scattered along the upper banks of the arroyo. East of Locus 1 the terrace drops steeply to a small valley or saddle running north to south. Another complex of bedrock features and associated midden deposits, designated Locus 4, is located here. On the eastern edge of Locus 4 rises a small hill approximately 25 m high. Near the summit are a number of bedrock metates, rock walls, and circles (see "Surface Features," below), and one pictograph. This area has been designated Locus 5.

In addition to the areas described, there are several smaller middens with associated bedrock features within the site, as well as numerous isolated bedrock mortars and bedrock metates and small rock shelters within a 400 m radius.

There are two springs on the site. At the base

of the ridge forming the western border of the site, approximately 30 m south of Locus 2, a spring feeds a small pool located in a cluster of large boulders. This spring is active throughout the year and supports a heavy growth of vegetation, including sunflowers (*Helianthus* sp.) and willow (*Salix* sp.). The former location of a second spring is marked by a clump of desert willows and sunflowers on the western edge of Locus 4. This spring now merely moistens the ground surface but informants familiar with the area report that it has disappeared only within the last two decades. In the 1920s this spring provided sufficient water for a farmhouse, livestock, vegetable gardens, and fruit trees. Virtually all evidences of this former habitation have now disappeared.

Outside the basin and a few kilometers to the southeast is the former shoreline of Lake San Jacinto. Now drained, this lake was an extensive and permanent body of water in aboriginal times (cf. Bolton, 1930 [II]: 345).

The site borders on two biotic communities - a coastal sage scrub community, which includes the site itself as well as the hills to the north, east, and west; and a grassland community in the basin to the southwest. Small chaparral communities are located on the upper north slope of Mt. Russell

and across the proposed reservoir basin on the upper northwest slopes of the Bernasconi Hills. Both oak (*Quercus* spp.) and hollyleaf cherry (*Prunus ilicifolia*) are represented in these locations, although neither is found on the site itself.

The Deposits

The midden deposits are discontinuous and scattered over the site, varying in extent from a few square meters to several hundred square meters and in depth from a few centimeters to nearly 2 meters.

As previously noted, Locus 1 is situated on top of the first terrace above the basin. This terrace is composed of granite bedrock covered with a thin mantle of alluvium. The bedrock is dome shaped, sloping in all directions from a high point at the eastern edge of Locus 1, where it breaks through the alluvium as an outcrop dotted with bedrock mortars and metates. The ground surface also slopes toward the west and south but at a lesser rate, so that the depth of the deposit becomes

Plate 13. Aerial view of the Charles Mott site. Loci are those discussed in the text. (Photo courtesy of Jack Lambie.)



greater as one moves outward from the high point. The deposit is a dark gray, fine-grained alluvium containing a considerable quantity of chipping waste, fragmented bone, charcoal, and decomposing granite. It is uncompacted and internally undifferentiated (i.e., not physically stratified). It varies in depth from 20 to 50 cm, averaging about 35 cm. Rodent disturbance is extensive, with burrows evident throughout the deposit and even in the decomposing surface of the bedrock. The artifact-bearing deposit in Locus 2 extended to a depth of 190 cm and within this deposit two distinct stratigraphic units could be recognized.

Stratum I: (lower) a fossil arroyo channel, sandy and light brown in color. This stratum, encountered at a depth of 60 cm in Unit 22S/58W and 120 cm in Units 20S/50W, 14S/48W, and 28S/48W, yielded only a few scattered flakes and ground stone fragments, a small amount of bone refuse, and one slate flake knife.

Stratum II: (upper) a dark gray alluvium containing a considerable quantity of flaking waste, fragmented bone, finely divided charcoal and somewhat more sand than the deposit in Locus 1. This uncompacted, internally undifferentiated upper stratum yielded most of the artifacts recovered from Locus 2.

Locus 3 contained two well-defined strata. Above 75 cm the deposit is essentially the same dark gray, fine-grained, undifferentiated alluvium that covers much of the site. Below 75 cm the deposit is considerably lighter in color and sandier in composition. Although rodent activity has resulted in some intermixture of these strata, virtually all the artifactual materials recovered were from the upper stratum.

The deposit in Locus 4 consisted of the same dark gray alluvium encountered in Loci 1 and 3. The quantity of decomposing granite intermixed with the alluvium increased as the deposit approached bedrock, with the lower 10 to 15 cm of the deposit consisting almost entirely of this material.

The site has suffered from intensive surface collecting and pothunting in recent years with old excavations evident in and around several of the rock shelters and bedrock milling complexes. The area immediately below the first terrace has been particularly hard hit. In Locus 4, relic collectors have gone to the extreme of using dynamite to break up bedrock outcrops in order to remove portions containing mortars. Bore holes for the placement of explosives can be seen in one bedrock outcrop, and a resident on the farm located there near the turn of the century has indicated that one

boulder containing mortars and weighing upwards of 300 kg has been removed. Nevertheless, disturbance of the deposit itself appears to be relatively minor and confined largely to the area below the first terrace and to small portions of Locus 4.

Surface Features

Bedrock Mortars and Metates

These constitute by far the most numerous features at the site. Within the site proper there are some 63 mortars and 78 metates grouped primarily into four major concentrations designated A, B, C, and D (Figure 19), with isolated examples scattered throughout the site. Complex A lies 70 m southwest of Locus 2 at the edge of the plain. Within a radius of 20 m there are 22 bedrock mortars and 19 metates located on several large outcrops of granite bedrock. Complex B lies directly south of Locus 1 at the edge of the plain, immediately below the first terrace. Within a radius of 10 m are 16 bedrock mortars and 19 metates. Complex C lies at the eastern edge of Locus 1 and consists of 11 mortars and 24 metates. Complex D lies within Locus 4 and consists of 14 bedrock mortars and 16 metates located on several small outcrops within a radius of 30 m.

A series of circular pits resembling small mortars occurs in the surface of a fragmented bedrock outcrop near the summit of the hill designated Locus 5. These features are approximately 1 cm in depth and range from 3.5 to 6.5 cm in diameter. There are two main clusters. One is a roughly linear series of eight pits, spaced approximately 6 cm apart along the top of a narrow boulder. The second group is an apparently random arrangement of eight pits on the top and sloping sides of a small (60 x 40 cm) boulder. Thirteen additional pits occur singly and in pairs on the tops of other boulders within a 2 m radius. The surface of this outcrop is badly weathered, and it is impossible to determine whether the features were pecked or ground into the surface. Considering the small size of the pits, their close proximity to one another, and the location of several on a steeply sloping surface, it seems unlikely that they were used as food-processing mortars.

Pictographs

There are three examples of painted pictographs on the site. The first consists of two right handprints in red pigment, located on the vertical face of a large boulder near the spring southwest of

Locus 1. A second orange pictograph of uncertain form is located just a few meters east of these hands. A third is located in Locus 5 in a crevice between two large boulders at the summit of the hill. Although the surface of the granite is weathered and exfoliated, it still shows the traces of a curvilinear design in red pigment.

Rock Walls and Circles

Near the summit of the hill designated Locus 5, on the western side near the previously noted pictograph, are four semicircular arrangements of large rocks. These rocks range in diameter from 20 cm to 1 m, and the features themselves range from 2 to 3.6 m in diameter. All are semicircular and extend outward from the base of a large vertical granite outcrop. Within the largest of these, two mano fragments were recovered from the surface. Three test pits were excavated within this large rock semicircle and in an adjacent smaller feature, but no additional artifacts were recovered.

Nearby on the same hill are a number of low rock walls like those found throughout the reservoir area. (See article by Ambrose and King in this publication.) These features consist of rows of rocks up to 40 or 50 cm in diameter, piled up one to three tiers high, roughly connecting outcrops of bedrock. Since there are no certain associations of the rock walls and rock circles, it is impossible to determine whether they represent aboriginal construction or the work of historic herdsman.

Sampling Procedure

The site was excavated by a field class in archeology, consisting of graduate and undergraduate students from the University of California at Riverside, under the direction of James F. O'Connell. The central portion of the site, including Loci 1, 2, and 3, was plotted with a 2 m grid system in reference to an east-west datum line. Fifteen 2 x 2 m units, and four 1 x 2 m units were excavated, and 43.6 m³ of midden were removed and screened. Excavation was accomplished with shovels and trowels. Due to the absence of clear stratification in much of the deposit, the fill was removed in arbitrary 10 cm levels. All fill was passed through one-quarter-inch mesh screens, and all debitage and bone fragments were retained. Soil samples were taken from each level, and all soil from within recognizable hearths was retained for recovery of carbonized food materials by water separation.

The excavation was begun in Locus 1. Due to

the homogeneous nature and shallow depth of the deposit in this area, with bedrock occurring an average of 35 cm below the surface, test units were subsequently opened in Loci 2, 3, and 4 in an attempt to secure a more adequate stratigraphic sample. In view of the large area included within the site and the relatively small number of units excavated, the excavation areas will be discussed separately.

Locus 1

The following sections are devoted to discussion of subsurface features, artifacts and ecofacts, and an occupation surface located in Locus 1.

Subsurface Features

Excavations in Locus 1 revealed the presence of eight subsurface features that are identified as follows:

Hearths (Features 1, 13)

Hearths are roughly circular concentrations of burned, unworked cobbles and ground stone fragments, charcoal, and burned bone.

Charcoal Lenses (Feature 21)

These are simply circular, lens-shaped deposits of charcoal.

Bedrock Mortar (Feature 20)

This parabolic depression in the surface of the bedrock at a depth of 30 cm measured 12 cm in diameter and 10 cm in depth.

Bedrock Depressions (Feature 12)

This series of nine roughly circular depressions in the surface of the bedrock is classed as a single feature. The depressions averaged 2 cm in depth and 10 cm in diameter.

Rock cluster (Feature 14)

A circular arrangement, approximately 30 cm in diameter, of eight small, unburned granite cobbles, is classified as a rock cluster.

Rock Scatters (Features 2, 15)

Rock scatters are randomly spaced rocks on a common surface.

The data appear to indicate the presence of a buried occupation surface marked by Features 1, 2, 12, 13, 14, 15, and 20. These features are buried by 18 to 40 cm of midden, but all lie within 2 to 10 cm above bedrock. The occupation surface is defined by the features themselves, rather than by any recognizable soil interface. The only exception is in the case of Feature 15, which rests on a highly compacted soil surface now largely destroyed by rodent activity.

Description of Features

Feature 1

This feature was a hearth consisting of one mano fragment and 17 unmodified granite cobbles ranging from 6 to 20 cm in diameter. All were clustered in a roughly circular arrangement in an area 60 x 80 cm in Unit 8S/10W. The base of the feature occurred at a depth of 18 cm below the present ground surface, 2 cm above the surface of the bedrock. All rocks in the feature were burned and fire cracked. Charcoal and burned bone fragments were recovered from within and around the feature. Cultural material found in the same level included one Lower Colorado Buff sherd, one mano fragment, seven flakes, and twenty-two unidentifiable fragments of burned bone.

Feature 13

This feature, also identified as a hearth, was encountered in Units 0/18W and 2S/18W at a depth of 28cm, 7 cm above the surface of the bedrock. It was a roughly circular arrangement of 34 fire-blackened granite cobbles and 7 ground stone fragments. The feature measured 90 cm in diameter and contained a large quantity of charcoal and numerous fragments of burned bone. Cultural material found at the same level included 1 Cottonwood Triangular concave base projectile point, 10 mano fragments, 1 Tizon Brown Ware sherd, 2 fragments of worked bone, 77 flakes, and 476 bone fragments. Identifiable bone fragments represented, in order of abundance, jackrabbit (*Lepus californicus*), cottontail (*Sylvilagus* sp.), and mule deer (*Odocoileus hemionus*). Water separation of the fill from the hearth yielded a large number of seeds, including those of goosefoot (*Chenopodium* sp.), amaranth (*Amaranthus* sp.), saltbush (*Atriplex* sp.), chia (*Salvia Columbariae*), and fescue (*Festuca* sp.). Fragments of hollyleaf cherry seeds and/or acorn hulls were also recovered. Charcoal from this feature yielded a radiocarbon age of 210±60BP (UCLA-1818).

from this feature yielded a radiocarbon age of 210 ±60 BP (UCLA-1818).

Feature 14

This was a rock cluster found in Unit 2S/20W at a depth of 30 cm, 8 cm above the surface of the bedrock. It was situated 1.7 m west of F13. The feature consisted of eight granite cobbles 5 to 10 cm in diameter, arranged in a circle approximately 30 cm in diameter. None of the rocks was burned. The feature may represent a pedestal for supporting some type of container. Also in the same level, but 20 cm to the north, a nearly complete slab metate was recovered with the working surface upward.

Feature 2

This feature was encountered in Unit 8N/12W at the 30 cm level, 5 cm above bedrock. It consisted of a large rock scatter extending over the entire unit and included 63 unworked granite cobbles ranging from 4.4 to 22 cm in diameter, 9 mano fragments, and 2 metate fragments. Nearly all were fire blackened but little charcoal was found in association with the feature. The feature occurred as six main clusters of rocks with isolated additional rocks scattered among them. At the same level were 2 projectile points (1 Cottonwood Triangular concave base and 1 Cottonwood Triangular straight base), 1 Lower Colorado Buff sherd, an *Olivella* full-lipped (?) bead, 68 flakes, and 307 fragments of bone, many of which were burned. Jackrabbit, cottontail, woodrat (*Neotoma* sp.), ground squirrel (*Citellus beecheyi*), and coyote (*Canis* cf. *latrans*) were the species represented in order of abundance. The feature appears to be an area where hearthstones and other refuse were discarded.

Feature 15

This feature, a rock scatter, was encountered in Unit 14N/14W at a depth of 40 cm, 10 cm above bedrock. It consisted of a number of small ground stone fragments and unworked cobbles, together with one complete mano and eight metate fragments. All of the latter appear to be parts of a single basin metate. The mano was stolen by trespassers before it could be collected and classified. The feature rested upon a layer of compact soil 4 cm thick. This layer may have been somewhat more extensive at one time but this is now impossible to determine because of rodent disturbance. The function of the feature is uncertain.

4-RIV-464
PLAN OF POSSIBLE STRUCTURE

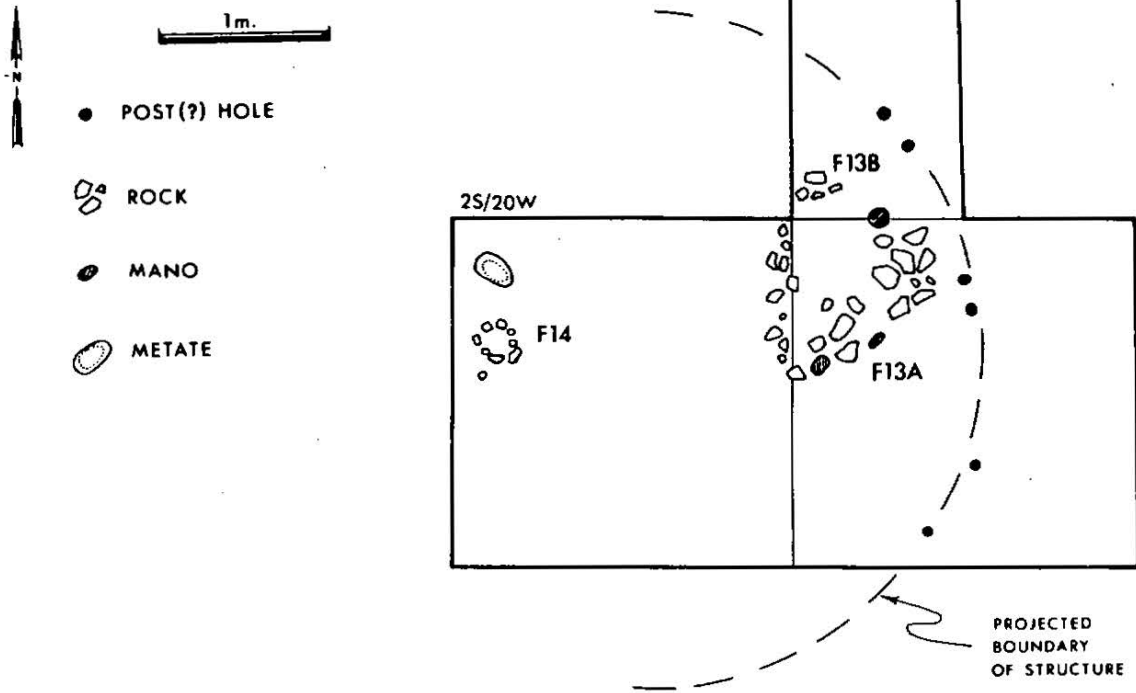


Figure 20. Plan of possible structure, Charles Mott site.

Feature 12 (Figure 20)

Feature 12 consisted of nine roughly circular depressions dug into the decomposing surface of the bedrock in Units 0/18W and 2S/18W. These depressions were located at approximately 30 cm intervals and averaged 2 cm in depth and 10 cm in diameter. They described an arc which, if continued, would have enclosed a circle about 4 m in diameter. One hearth (F13) and a rock cluster (F14) would be enclosed within this circle, with the hearth located about 20 cm from the east side and the rock cluster about 1 m from the west side. It is possible that these depressions represent the bottoms of a series of shallow postholes that could have supported the framework of a circular brush shelter of the type described for the Luiseño by McCown (1955: 6) and for the Cahuilla by Bean (1972: 72). Since the hearth (F13) would have been dangerously close to the wall of the postulated structure (and thus a fire hazard), the hearth and structure were probably not contemporaneous.

Feature 20

This feature is a circular depression, 12 cm in diameter and 10 cm deep, cut into the surface of the decomposing bedrock in the southeast quarter of Unit 2S/6W. The decomposed nature of the bedrock makes interpretation difficult, but the depression conforms closely in form and dimensions to the bedrock mortars seen on the surface and probably represents a buried example of the same. The unit in which it is located has only a thin mantle of midden, and it seems likely that this bedrock surface was exposed during the period of habitation represented by the occupation surface.

Feature 21

The single remaining feature in Locus 1 consisted of two charcoal lenses encountered in Unit 8S/10W at a depth of 5 cm. The larger measured 29 cm in diameter and 3 cm in thickness; the smaller was 5 cm in diameter and 1 cm thick. Arti-

facts found at the same level included 2 projectile points (1 Cottonwood Triangular concave base and 1 Desert Side-notched), 2 mano fragments, 61 flakes, and 50 unidentifiable bone fragments. This feature was located well above the proposed occupation surface.

Occupation Surface

Although the upper levels of the deposit yielded the bulk of the artifacts from Locus 1, no other features were encountered above the occupation surface. This may indicate that although the utilization of the site was more intensive in the later stages of occupation, the habitation area shifted away from Locus 1.

As previously noted, the slope of the bedrock is greater than the slope of the ground surface, indicating that deposition was more rapid in the lower areas. Although the features (excluding F21) range in depth from 18 to 40 cm, with depth of the features increasing as the depth of the deposit increases, all occur from 0 to 10 cm above bedrock. This indicates occupation at a time when the slope of the surface conformed more closely to the slope of the bedrock than it does today.

Although ceramics are not abundant at any level in the site, the association of only three sherds with the occupation surface suggests that the site predates the introduction of ceramics or the use of ceramics in this locus, and that the association is probably a result of rodent disturbance.

Remains of animals in association with the occupation surface include jackrabbit (the most frequently represented), followed by cottontail, woodrat, mule deer, deer mouse (*Peromyscus* sp.), coyote, and California quail (*Lophortyx californica*).

Identifiable carbonized plant remains (seeds) in association with the occupation surface included, in order of abundance, goosefoot, amaranth, nutshell fragments (acorn or hollyleaf cherry), saltbush, fescue, and chia.

Floral and faunal remains, together with the artifact assemblage, indicate a subsistence pattern relying heavily on seed gathering supplemented by hunting or trapping, primarily of small game. The fragmentary nature of the faunal sample suggests the processing of small game in bedrock mortars as reported for the Luisenõ by Sparkman (1908: 198).

Artifacts and Ecofacts

The distribution of artifacts and ecofacts in Locus 1 is presented in Table 12.

Projectile Points

Locus 1 yielded 22 projectile points, including sixteen Cottonwood Triangular concave base, three Cottonwood Triangular straight base, and three Desert Side-notched. A majority (17) of the specimens were from the upper 20 cm of the deposit, well above the occupation surface. Although the sample is small, there is no apparent change in the projectile point inventory over time. There is some slight evidence, however, that hunting became more important in the later stages of the occupation since the ratio of projectile points to grinding implements changes from 1 to 5 in the 20 to 30 cm level to 1 to 8 in the 10 to 20 cm level, to 1 to 1 in the 0 to 10 cm level. Given the small sample size and the fragmentary nature of the ground stone implement assemblage, however, this conclusion is tentative.

Ground Stone Artifacts

Manos and metates occur throughout the deposit but are almost entirely unclassified fragments. Only one complete mano (Type IIB-1) was recovered. As in the case of projectile points, manos occurred with the greatest frequency in the upper levels of the deposit, with 43 of the total of 67 specimens recovered from the upper 20 cm. One nearly complete slab metate and 12 additional metate fragments were recovered. Five of these fragments were associated with a rock scatter (F15) and are apparently parts of a single basin metate. The preponderance of grinding implements attests to the continuing importance of seed processing in the subsistence economy.

Although no change in the grinding tool assemblage over the period of occupation is apparent in the vertical distribution, the increasing frequency of grinding tools in the upper levels may suggest a larger population or a change in site function in the later periods of occupation. One mano fragment and one metate fragment were composed of vesicular basalt, a material not available in the reservoir area. The nearest source is in the Santa Ana Mountains 32 km to the southwest. All other specimens were composed of locally available granitics. A possible factor contributing to the fragmentary nature of the ground stone assemblage is the auxiliary use of manos as hammerstones. This is indicated by the fact that virtually all of the complete specimens show evidence of percussion on the lateral edges. The use of discarded and broken manos as cooking stones is reported for the Luisenõ by Drucker (1937) and

TABLE 12
DISTRIBUTION OF ARTIFACTS AND ECOFACTS IN
LOCUS 1, CHARLES MOTT SITE (4-Riv-464)

Category	Number	Depth in cm					
		0-10	10-20	20-30	30-40	40-50	50-60
Bones and Bone Fragments	3890	908	1159	989	502	254	78
Shell Fragments	2	1	1	--	--	--	--
Debitage	1081	334	266	252	156	55	18
Flaked Stone							
Projectile points							
Cottonwood Triangular, concave base	16	10	3	2	1	--	--
Cottonwood Triangular, straight base	4	1	1	1	1	--	--
Desert Side-notched	3	2	--	--	1	--	--
Perforator	1	1	--	--	--	--	--
Drill (Cottonwood point used as drill)	1	1	--	--	--	--	--
Graver	1	1	--	--	--	--	--
End scraper	1	1	--	--	--	--	--
Scraper plane							
Unclassified	1	--	1	--	--	--	--
Knife							
Bifacial	1	1	--	--	--	--	--
Core hammerstone	2	--	--	--	1	--	1
Ground Stone							
Manos							
Type IIB-1	1	--	--	1	--	--	--
Unclassified fragments	66	14	29	14	5	4	--
Metate							
Slab	1	--	--	--	1	--	--
Unclassified fragments	12	1	3	--	--	5	3
Pendants	2	--	2	--	--	--	--
Pipe fragment	1	--	--	--	1	--	--
Bead	1	--	--	--	1	--	--
Other ground stone	1	--	--	--	1	--	--
Ceramics							
Vessel sherds							
Tizon Brown Ware	10	4	4	2	--	--	--
Lower Colorado Buff	16	13	2	1	--	--	--
Parker Red-on-Buff	1	1	--	--	--	--	--
Pipe fragments	2	1	--	1	--	--	--
Worked Bone							
Awl fragments	22	5	5	9	2	1	--
Notched tools	2	--	--	--	1	1	--
Bone tube fragments	2	1	--	--	--	1	--
Saw (?)	1	--	1	--	--	--	--
Unclassified worked bone	9	2	3	1	2	1	--
Worked Shell							
Beads							
<i>Olivella dama</i> , spire removed	1	--	1	--	--	--	--
<i>Olivella biplicata</i> , lipped bead							
Full lipped (?) (weathered)	1	--	--	1	--	--	--

by McCown (1955: 21) and may also have resulted in further damage to these specimens. Nearly half of all manos bear evidence of exposure to fire.

Locus 1 yielded five additional ground stone artifacts. All were recovered from a single unit, 14N/14W, near the northern end of Locus 1, just below the second terrace. The 10 to 20 cm level produced two pendants and a fragment of a tubular pipe. One of the pendants is fragmentary; the second is complete, although it was recovered in two pieces (Plate 14a). This specimen has not been drilled, suggesting that it was broken in the process of manufacture. Both show traces of red pigment. The pipe fragment is a section of the wall of a tubular pipe composed of talc schist, broken and then ground to a rectangular shape. The two remaining specimens were recovered from the 30 to 40 cm level. The first is a fragment of a spherical bead composed of fuchsite. The second is a small fragment of gypsum 17 x 5 x 4 mm, ground on the long edges. The function of this object has not been determined.

No pestles were recovered from the site, suggesting that grinding in the mortars must have been done with wooden pestles. The use of such pestles in conjunction with stone mortars has been reported for the Cahuilla by Bean (1972: 52).

Ceramics

Twenty-nine ceramic artifacts were recovered from Locus 1, including sixteen Lower Colorado Buff Ware vessel sherds, ten Tizon Brown Ware sherds, one Parker Buff sherd, and two ceramic pipe fragments. With the exception of three sherds and one pipe fragment recovered from the 20 to 30 cm level, ceramics were confined to the upper 20 cm of the deposit. Eighteen of the 29 specimens were recovered from the 0 to 10 cm level. The concentration of ceramics in the upper levels suggests that ceramics were introduced relatively late, after the period of habitation represented by the buried occupation surface.

Bone Artifacts

Locus 1 yielded 36 bone artifacts and fragments of artifacts. Awl fragments were recovered from all but the 50 to 60 cm level, but were most common in the 20 to 30 cm level. A total of 15 worked bone specimens was recovered from Unit 14N/14W, which also contained all of the non-utilitarian ground stone. One small bone "saw" fragment was recovered at a depth of 20 cm. This artifact is a fragment of a split cannon bone mea-

suring 26.5 x 14 x 3.5 mm and flaked to a sharp serrated edge (Plate 20s). It presumably served as a cutting tool. Two notched bone tools were recovered from Locus 1, both in Unit 14N/14W, from the 30 to 40 and 40 to 50 cm levels. These artifacts may have served in the preparation of vegetable fibers or basketry material. (See article by Mix in this publication.) Nine unclassifiable fragments of worked bone were also recovered.

Other Artifacts

Two shell beads were recovered from Locus 1. One *Olivella dama* spire-removed bead was recovered from the 10 to 20 cm level, and one *Olivella biplicata* full-lipped (?) bead was recovered from the 20 to 30 cm level in association with the occupation surface near F2. In addition, two fragments of abalone (*Haliotis* sp.) shell were recovered, both above the 20 cm level.

One unclassified scraper plane, one bifacial knife fragment, one perforator, one drill, one graver, and one end scraper also occurred in the 0 to 10 cm level. Two core hammerstones were recovered from the lower portion of the deposit below 30 cm.

Debitage

Waste flakes were numerous throughout the deposit and, as was the case with the major artifact classes, were represented with increasing frequency in the upper levels, supporting the notion of increasing intensity of occupation in later stages. However, the ratio of flakes to flaked artifacts decreases in the upper levels of the deposit from 78 to 1 in the 30 to 40 cm level, to 63 to 1 in the 20 to 30 cm level, to 53 to 1 in the 10 to 20 cm level, to 20 to 1 in the 0 to 10 cm level. This may indicate that fewer flaked stone artifacts were being manufactured on the site or, as suggested earlier, that the major habitation areas shifted away from Locus 1 during the later period of occupation.

Faunal and Floral Remains

Fauna represented in the collection include jackrabbit, the most commonly represented animal in terms of minimum number of individuals, numbering 63 specimens, followed by cottontail numbering 45. Also present in lesser numbers are deer mouse, kangaroo rat (*Dipodomys* spp.), pocket gopher, woodrat, ground squirrel, badger (*Taxidea taxus*), coyote, mule deer, snakes, pied-billed grebe (*Podilymbus podiceps*), eared grebe (*Podiceps*

TABLE 13
DISTRIBUTION OF ARTIFACTS AND ECOFACTS IN
LOCUS 2, CHARLES MOTT SITE (4-Riv-464)

Category	Number	Depth in cm														
		0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120	120-130	130-140	140+
Bones and Bone Fragments	1572	102	158	146	122	99	73	131	103	133	143	70	77	44	12	159
Shell Fragments	6	2	--	--	1	--	--	1	--	--	1	1	--	--	--	--
Debitage	387	59	37	32	39	28	25	17	5	28	30	14	15	7	1	5
Flaked Stone																
Projectile points																
Cottonwood Triangular, concave base	4	1	1	1	--	1	--	--	--	--	--	--	--	--	--	--
Cottonwood Triangular, straight base	1	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--
Cottonwood Triangular, narrow blade	4	3	--	--	1	--	--	--	--	--	--	--	--	--	--	--
Elko Eared	1	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--
Knives																
Flake knife	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1
Core hammerstone	1	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--
Core choppers	2	--	--	--	--	--	--	1	--	1	--	--	--	--	--	--
Ground Stone																
Manos																
Type IA	1	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--
Type IIA	2	--	--	--	--	--	2	--	--	--	--	--	--	--	--	--
Unclassified	1	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--
Unclassified fragments	29	3	2	2	2	1	1	2	2	6	3	1	4	--	--	--
Metates																
Unclassified fragments	8	--	--	--	--	1	1	--	--	2	1	--	1	1	--	--
Other ground stone	3	1	--	--	--	--	--	2	--	--	--	--	--	--	--	--
Ceramics																
Vessel sherds																
Tizon Brown Ware	2	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--
Lower Colorado Buff	2	--	--	--	--	--	--	1	--	--	1	--	--	--	--	--
Worked Bone																
Awl fragments	7	--	--	--	--	--	1	--	3	--	1	1	1	--	--	--
Notched tool	1	--	--	--	--	1	--	--	--	--	--	--	--	--	--	--
Unclassified worked bone	7	--	1	--	--	--	--	--	2	1	1	1	--	--	--	1
Worked Shell																
Beads																
<i>Olivella dama</i> , spire removed (frag.)	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
<i>Olivella biplicata</i> , lipped beads	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
Full lipped (?) (weathered)	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--

caspicus), great blue heron (*Ardea herodias*), unspecified duck, and California quail. The waterfowl, presumably derived from the marshes around San Jacinto Lake, occur without exception in the upper 20 cm of the deposit, suggesting that exploitation of lacustrine resources occurred relatively late in the period of occupation. Faunal remains as a whole increased in frequency toward the upper levels, reaching a maximum in the 10 to 20 cm level and decreasing in the 0 to 10 cm level, further suggesting that the actual habitation area shifted elsewhere in the last stage of occupation.

Floral remains were derived almost entirely from a hearth (F13) on the buried occupation surface. (See above.) Several additional specimens identified as hollyleaf cherry and laurel (*Umbellularia californica*) were also recovered from the midden. One specimen of olive (*Olea europa*), presumably intrusive, was recovered from the 10 to 20 cm level.

Discussion

Locus 1 appears to have been a habitation and processing area during the time represented by the buried occupation surface. In later time it may have served as a processing or manufacturing area peripheral to the actual habitation area. In the later stages of occupation, the northern part of Locus 1 represented by Unit 14N/14W, where much of the worked bone sample and nonutilitarian ground stone sample was recovered, appears to have been heavily utilized as a maintenance/manufacturing area. The location of the actual habitation area during this terminal period of occupation has not been determined.

Locus 2

Subsurface Features

Feature 17, a hearth, was the only subsurface feature encountered in Locus 2. It occurred at the 55 cm level in Unit 20S/50W. The feature consisted of 15 granite cobbles and two ground stone fragments together with a quantity of charcoal and ash in an area 60 x 90 cm across. All the rocks showed evidence of fire. Five centimeters below the hearth and 90 cm to the southwest, two Type IIA manos were recovered lying side by side. Also recovered were a number of flakes and bone fragments. Identifiable specimens included jackrabbit, cottontail, and bobcat (*Lynx cf. rufus*).

Artifacts and Ecofacts

Virtually all of the artifacts from Locus 2 were recovered from Stratum II, the undifferentiated midden deposit that overlies the fossil stream channel. Cultural materials recovered from the redeposited lower stratum were limited to a few scattered flakes, ground stone fragments, bone refuse, and one slate flake knife. Distribution is summarized in Table 13.

Ground Stone Artifacts

Manos and metates occur throughout the deposit, but with greatest frequency in the lower levels of Stratum II. The sample of manos is largely fragmentary, consisting of one Type IA, two Type IIA, one unclassified mano, and twenty-nine unclassified fragments. Metates are represented by eight fragments, all occurring below 40 cm with six below 80 cm. Although the sample size is small, the vertical distribution appears to suggest a period of early occupation relying heavily upon seed gathering followed by a period of less intense occupation and then by a second period of heavier occupation. The decreasing frequency of manos in relation to other artifacts in the upper levels may reflect an increase in the use of bedrock metates rather than portable or semiportable ones, since the latter are also infrequently represented in the upper levels. Since there are few convenient bedrock outcrops immediately on Locus 2, milling would have been performed elsewhere, resulting in fewer manos in the area.

Only three additional ground stone artifacts were recovered from Locus 2. The first, recovered from the 0 to 10 cm level, appears to be a fragment of a flat dish-like object composed of talc schist. The second, recovered from the 60 to 70 cm level, appears to be a rim fragment of a small circular vessel or mortar composed of chlorite schist (Plate 14d). The third, also encountered in the 60 to 70 cm level, is a small, ovoid granite pebble showing polish from use. Its function is undetermined.

Projectile Points

Projectile points from Locus 2 include four Cottonwood Triangular narrow-blade and one Elko Eared point (Plate 16v). Projectile points are confined to the upper 70 cm of the deposit, and apparently coincide with the later period of intensive site use.

Ceramics

Only four sherds were found in Locus 2 (two Tizon Brown Ware and two Lower Colorado Buff Ware). The latter two occurred in the lower levels of the deposit (70 cm and 110 cm) and must be considered intrusive in view of the restriction of ceramics to the upper levels over the rest of the site.

Bone Artifacts

Locus 2 yielded seven bone awl fragments, with the maximum frequency occurring in the 70 to 80 cm level. Also recovered were one notched bone tool, similar to those recovered from Locus 1, and seven miscellaneous fragments of worked bone.

Other Artifacts

Locus 2 yielded eight artifacts and fragments of shell. One *Olivella dama* spire-removed bead and one *Olivella biplicata* full-lipped (?) bead were taken from the 10 to 20 cm level. Unworked shell consisted of six fragments of abalone.

Other flaked stone artifacts included one flake knife from Stratum I and two core choppers and one core hammerstone from Stratum II.

Debitage

Waste flakes were numerous throughout the deposit, and their vertical distribution appears to support the notion of two major occupational periods, which is also suggested by the distribution of the major artifact classes. Flakes increase in frequency in the lower levels up to about 80 cm, decrease sharply in the 70 to 80 cm level, and then increase again to a high in the 0 to 10 cm level.

Faunal Remains

Faunal species recovered from Locus 2 include, in order of frequency, jackrabbit, cottontail, and pocket gopher, with a single specimen each of kangaroo rat, woodrat, ground squirrel, weasel (*Mustela* sp.), striped skunk (*Mephitis* sp.), raccoon (*Procyon lotor*), coyote, bobcat, mule deer, domestic pig (*Sus* sp.), (apparently intrusive; see Hammond, "Faunal Remains," in this publication), pond turtle, unspecified duck, California quail, coot (*Fulica americana*), and poor-will (*Phalaenoptilus nuttallii*). One of the waterfowl specimens was recovered from the 100 cm level, suggesting that during the earliest period of occupation, the resources of Lake San Jacinto were being exploited. The vertical distribution of bone fragments is similar to that of flakes, increasing in the lower

TABLE 14
DISTRIBUTION OF ARTIFACTS AND ECOFACTS IN
LOCUS 3, CHARLES MOTT SITE (4-Riv-464)

Category	Sur- face	Level (cms)											
		0- 10	10- 20	20- 30	30- 40	40- 50	50- 60	60- 70	70- 80	80- 90	90- 100	100- 110	110- 120
Bones and Bone Fragments	15	99	52	81	78	70	90	54	24	25	16	10	12
Shell Fragments	--	1	--	--	--	--	--	--	--	--	--	--	--
Debitage	2	12	6	7	5	8	2	2	--	2	--	--	--
Flaked Stone													
Projectile points													
Cottonwood Triangular, concave base	1	--	--	--	--	1	--	--	--	--	--	--	--
Cottonwood Triangular, narrow blade	1	--	--	--	--	--	--	--	--	--	--	1	--
Drills													
Cottonwood point used as drill	--	--	--	--	--	1	--	--	--	--	--	--	--
Ground Stone													
Manos													
Unclassified fragments	1	1	--	--	1	--	--	--	--	--	--	--	--
Metates													
Basin	--	--	--	--	--	--	--	--	1	--	--	--	--
Other ground stone	1	--	--	--	--	--	1	--	--	--	--	--	--
Worked Bone													
Unclassified fragments	--	1	--	--	1	2	--	--	--	--	--	--	--

levels to a high in the levels from 60 to 100 cm, then decreasing in the 40 to 60 cm levels before increasing again to a maximum frequency in the 10 to 20 cm level.

Locus 3

Artifacts and Ecofacts (Table 14)

Ground Stone Artifacts.

Three mano fragments and one basin metate constituted the only milling implements recovered from Locus 3. The mano fragments occurred in the upper levels of the deposit above 40 cm. The metate occurred at the base of the artifact-bearing stratum at a depth of 75 cm.

Two other ground stone artifacts were recovered in Locus 3. The first, collected from the surface, is a carved disc composed of muscovite schist, 27 mm in diameter and 6 mm thick, with a straight-sided hole 11 mm in diameter drilled through the center. All surfaces are highly polished. The "upper" and "lower" surfaces are ground nearly flat, as is the peripheral edge, giving the object fairly well-defined shoulders. A series of 12 notches 1 mm in depth and 6 mm in length are ground into the shoulder on one surface at intervals of approximately 6 mm around the periphery. The reverse surface is marked by eight conical depressions averaging 3 mm in diameter and 2 mm in depth at intervals of 8 mm around the central hole (Plate 14c). Its function is undetermined.

The second object, composed of chlorite schist, is a fragment, measuring 15 x 11 mm and is 5 mm in thickness. It appears to have been produced by drilling two biconical holes, 6 mm in diameter and 4 mm apart, through the object and then making two parallel cuts or breaks, one through each hole. One of the broken edges was then ground smooth, the other only slightly ground, leaving a roughly H-shaped object of undetermined function (Plate 14f).

Flaked Stone

Locus 3 yielded four projectile points (two Cottonwood Triangular concave base and two Cottonwood Triangular narrow blade). One of each type was recovered from the surface, one of the former type from a depth of 110 cm. It is likely that the latter specimen is intrusive since it occurs deep in the lower stratum, which otherwise yielded only two flakes. Abrasion on the distal lateral

edges of one of the concave-based points indicates that it had been used as a drill.

Worked Bone

Four fragments of worked bone were found, but all were too fragmentary to permit classification.

Debitage

Few flakes were recovered from Locus 3. The vertical distribution shows a slow increase in frequency from the base of the artifact-bearing deposit to a maximum at the 0 to 10 cm level.

Faunal Remains

Identifiable bone fragments represented jack-rabbit and cottontail, the most frequently represented animals, followed by woodrat, badger, coyote, mule deer and coot.

Locus 4

Subsurface Features

The only feature encountered was a rock concentration (F18), which occurred at a depth of 60 cm. It consisted of ten granite cobbles, five mano fragments, and two metate fragments concentrated in an area 30 x 50 cm. Several of the rocks were fire blackened, but no charcoal or ash was in evidence. The feature appears to be merely a collection of lithic refuse from the living area.

Artifacts and Ecofacts (Table 15)

Ground Stone Objects

Ground stone fragments were present in all levels of the unit, reaching a maximum frequency in the 40 to 60 cm level, where five mano and two metate fragments occurred as components of F18. One mano fragment was encountered in the 0 to 20 cm level, four in the 20 to 40 cm level, and three in the 60 to 80 cm level, at which point bedrock was encountered.

One other ground stone artifact was recovered. A small, 10 x 8 mm rectangular bead, 1 mm in thickness, composed of red chert, with a biconical hole 1 mm in diameter drilled through the center, was recovered from the 30 to 40 cm level (Plate 14b).

Projectile Points

Only two projectile points were recovered from Locus 4. One unclassified specimen made of chalcedony, which appears to be a reworked basal fragment of a larger concave-base point, was recovered from the surface (Plate 16y). One Cottonwood Triangular straight base point was recovered from the 20 to 40 cm level in association with F18.

Other artifacts

Locus 4 produced two *Olivella dama* spire-removed beads, one from the 0 to 20 cm level and one from the 40 to 60 cm level, in association with F18. A pendant of abalone (*Haliotis* sp.) shell was recovered from the 0 to 20 cm level, and another fragment of unworked abalone was found in the 40 to 60 cm level. One unclassified fragment of worked bone was recovered from the 20 to 40 cm level. Other flaked stone artifacts included one bifacial knife fragment from the 0 to 20 cm level, and one core hammerstone from the 60 to 80 cm level.

Debitage

Waste flakes were present in all levels within the unit, occurring with maximum frequency in the 20 to 40 cm level.

Faunal Remains

As is the case with debitage, bone fragments occurred at all levels and reached a maximum frequency in the 20 to 40 cm level. Faunal species represented included jackrabbit, again the most frequent species, cottontail, pocket gopher, badger, coyote, bobcat, mule deer, an unspecified snake, and an unspecified duck.

Summary and Conclusions

The vertical distribution of artifacts in Locus 2 suggests two major periods of occupation in that locus (Table 13). The lower stratum (Stratum I) consists of redeposited fill in the fossil arroyo channel and yielded little artifactual material. The upper stratum (Stratum II), although physically undifferentiated, appears to include two distinct occupational zones which pertain to the two periods of intensive occupation. The earliest of these is represented by the artifacts recovered from below 80 cm in Stratum II and is not apparent elsewhere in the site. It probably correlates with

the earliest occupation at the Peppertree site. (See article by Wilke in this publication.) Although artifacts from the earliest occupation are few, they suggest a subsistence economy relying heavily on the gathering of seeds supplemented by hunting or trapping of small game, primarily jackrabbits and cottontails. The data also suggest some exploitation of the waterfowl, and presumably other resources of Lake San Jacinto and the marshes that surrounded it.

The relative frequencies of metates and manos suggest that in this earliest period of occupation "portable" metates were used in the processing of seed resources to a greater extent than in the later period, when more milling was apparently done on bedrock facilities. In the levels below 80 cm in Locus 2, the ratio of metates to manos is 1 to 2.3. In the levels above 70 cm in Locus 2 and in Locus 1, the ratios were 1 to 8.5 and 1 to 7.5, respectively. Due to the small size and the fragmentary nature of the sample, however, conclusions based upon such frequencies are hazardous, and the evidence should be considered suggestive.

The small projectile points of the Cottonwood series and the Desert Side-notched type, characteristic of the later period, are absent in deposits of the initial period of heavy occupation. Whether the introduction of these points is coincident with the introduction of the bow and arrow into the area or whether the inhabitants used un-tipped or hardwood-tipped arrows prior to their introduction is impossible to determine from the available evidence. However, some slight support for the former hypothesis may be gained from the large Elko Eared point, which was recovered from the same level at which Cottonwood Triangular points first appear, suggesting an earlier reliance on heavier projectiles and hence use of the atlatl in hunting.

The vertical distribution of artifacts in Locus 2 also suggests that following the first intensive occupation of this locus, there was a period of decreased utilization of it and possibly also of the site, which was in turn followed by the introduction of projectile points of the Cottonwood series, after which occurred the second major period of occupation. The first appearance of Cottonwood series projectile points at the nearby Peppertree site is dated at 870±80 radiocarbon years BP (UCLA-1815). The beginning of the second period of occupation (or at least use of Locus 2) at the Charles Mott site is probably of similar age.

A late intensive occupation is represented by the artifacts and features in Loci 1, 3, and 4 and in

the upper portions of Stratum II in Locus 2. This period of intensive site use consists of two phases differing primarily in the absence of ceramics in the first and their presence in the second and corresponds closely with Meighan's (1954) San Luis Rey I and II phases. Charcoal from F13, a hearth on the living surface just preceding the introduction of ceramics, yielded a radiocarbon age of 210 ± 60 BP (UCLA-1818). This is consistent with similar phenomena at Peppertree, where ceramic vessel sherds appear after deposits dated after 215 ± 60 radiocarbon years BP (UCLA-1816).

Little change is evident in the subsistence pattern over the period of the second intensive occupation. It appears to have been largely a continuation of that noted for the buried occupation surface in Locus 1. The continued preponderance of grinding tools attests to the importance of such vegetable resources as oak, hollyleaf cherry, goosefoot, amaranth, saltbush, chia, and fescue. The

ratio of projectile points to grinding implements gives an indication that hunting may have become relatively more important in the second phase. Faunal remains suggest that, in addition to the continuing reliance on jackrabbits, cottontails, and other small game, the inhabitants of the site were exploiting the waterfowl resources of San Jacinto Valley to a greater extent in the second phase. This development may have been the result of a gradual increase in population suggested by the increase in all types of artifacts in the later stages of occupation.

It seems certain that the site served as more than a temporary camp, occupied for a short period during the year to exploit a particular resource. The performance of manufacturing and maintenance activities is indicated by the presence of scrapers, perforators, drills, and awls. In addition, the recovery of a number of ornamental objects, including one unfinished pendant, indi-

TABLE 15
DISTRIBUTION OF ARTIFACTS AND ECOFACTS IN
LOCUS 4, CHARLES MOTT SITE (4-Riv-464)

Category	Sur- face	Level (cms)			
		0- 20	20- 40	40- 60	60- 80
Bones and Bone Fragments	--	74	127	48	54
Shell Fragment	--	--	--	1	--
Debitage	--	29	49	12	2
Flaked Stone					
Projectile points					
Cottonwood Triangular, straight base	--	--	1	--	--
Unclassified	1	--	--	--	--
Knife					
Bifacial	--	1	--	--	--
Core hammerstone	--	--	--	--	1
Ground Stone					
Manos					
Unclassified fragments	--	1	4	5	3
Metates					
Unclassified fragments	--	--	--	2	--
Bead					
Rectangular, chert	--	--	1	--	--
Worked Bone					
Unclassified worked bone	--	--	1	--	--
Worked Shell					
Beads					
<i>Olivella dama</i> , spire removed	--	1	--	1	--
Pendant					
<i>Haliotis</i>	--	1	--	--	--

cates that some of these objects may have been manufactured at the site, further suggesting an extended period of occupation. The importance to the subsistence economy of resources unavailable in the immediate vicinity of the site is indicated by the large number of bedrock mortars, which are ethnographically associated with processing of acorns and hollyleaf cherry. The floral data suggest an annual period of occupation extending from late spring, when herbs and grasses become available for harvest, into the fall for the harvest of hollyleaf cherry and acorns.

The large number of bedrock mortars, the scattered, extensive distribution of midden deposits, the evidence of the use of resources not immediately available at the site, and the evidence indicating the occupation of the site for a relatively

long period during the year, all suggest that the site served as a base camp from which groups of foragers, perhaps family groups, left for periods of time to exploit the resources of other sites in the locality and to which they returned to process their stores. If this notion is correct, other occupation sites and processing sites in the reservoir locality may represent in part the food procurement activities of groups ranging out from the Charles Mott site. One paramount factor in the selection of a site for such a central camp would be the availability of water, necessary in large quantities for the leaching of tannic acid from acorns and hollyleaf cherry fruits. In this resource, the Charles Mott site is singularly favored, with two permanent springs assuring a reliable water supply even in the dry late summer and autumn when these foods are harvested.

TABLE 16
DISTRIBUTION OF GROUND STONE ARTIFACTS BY SITE

Category	Assemblage						
	Reservoir assemblage	Dead Dog (4-Riv-202)	Peppertree (4-Riv-463)	Pictograph (4-Riv-452)	Oleander Tank (4-Riv-331)	Charles Mott (4-Riv-464)	Survey site (4-Riv-465)
Manos							
Type IA	3	--	--	--	1	1	1
Type IB	2	--	--	--	1	1	--
Type IIA	11	5	2	--	--	2	2
Type IIB-1	11	3	1	1	1	2	3
Type IIB-2	2	--	--	--	2	--	--
Unclassified manos	3	--	1	--	--	2	--
Unclassifiable fragments	236	63	15	8	21	124	5
Pestles							
Type I (food processing)	5	--	2	2	--	1	--
Type II (non-food processing)	2	1	--	--	--	--	1
Metates							
Slab metates	5	1	--	3	--	1	--
Basin metates	9	3	2	2	1	1	--
Unclassifiable fragments	32	3	1	3	2	22	1
Non-Processing Artifacts							
Various	14	--	1	1	--	12	--

*Bedrock mortars and bedrock metates are not included.

GROUND STONE ARTIFACTS

Clayton A. Robarchek

This paper is devoted to a description and analysis of the total assemblage of ground stone artifacts from the sites in the Perris Reservoir study area. I wish to acknowledge the assistance of G. T. Jefferson and D. L. Weide in the identification of lithic materials.

This class of artifacts includes all those produced primarily by a process of abrasion. As such, it constitutes the largest class of artifacts recovered from the study area and includes manos, metates, pestles, mortars, ornamental objects, and several artifacts of undetermined function. The majority of these artifacts functioned primarily in the processing of vegetable resources for consumption as food. This paper will therefore attempt a classification and analysis of the assemblage in terms of the subsistence practices followed by the inhabitants of the study area and to facilitate comparison with other assemblages. Toward these ends, the assemblage was first divided into two subclasses: processing and nonprocessing artifacts.

Processing Artifacts

This subclass is composed of those artifacts whose primary function was in the modification of environmental resources for consumption and use. It includes manos, pestles, and metates, as well as such functionally related features as bedrock mortars and bedrock metates. As has been noted, the majority of these artifacts and features were employed in the processing of vegetable resources for consumption as food, and it is to these that the most detailed attention will be given.

In defining categories and types, primary weight has been given to those features of the implements that reflect the ways in which they were used. Such features as general form, number of faces, amount of deliberate shaping and relative angles of faces have been weighed less heavily in the taxonomy. Analysis of the assemblage follows in part that of Greenwood (1969) in attempting to infer the motor habits involved in the use of the artifacts and in attempting to correlate the various categories of functionally related artifacts and features.

Two general categories of processing implements have been defined: (1) those used in a crushing and pounding process; and (2) those

employed in a grinding or milling process.

Crushing and Pounding Implements

This category consists of those artifacts and features used in an up-and-down pounding process or in a rotary crushing process. It includes two subcategories: bedrock mortars and pestles (Table 16).

Mortars

Although no portable mortars were found in excavations or site surveys, bedrock mortars were recorded at 16 of the 61 sites located in a survey of the Perris area. These features occur in outcrops of granite bedrock and are second only to bedrock metates as the most numerous features in the study area, numbering at least 194. (See article by Ambrose and King in this publication.) Strikingly regular in form, they are often nearly cylindrical with smooth, polished walls tapering slightly inward from top to bottom. A sample of 24 mortars from the Charles Mott site (4-Riv-464) ranged in diameter from 11.0 to 22.0 cm and had depths ranging from 3.3 to 26.4 cm. Mean dimensions were 16.5 cm in diameter and 12.5 cm in depth. Twelve mortars from the Peppertree site (4-Riv-463) averaged 15.5 cm in diameter and 9.5 cm in depth.

The bedrock surfaces surrounding mortars are frequently ground smooth, and bedrock mortars are almost invariably located adjacent to metates. Ten of the mortars in the sample exhibited single cuplike depressions ground into the surface of the bedrock, intersecting the lip of the mortar and producing semicircular pockets ranging in diameter from 6.6 to 11.0 cm and in depth from 1.5 to 3.5 cm. McCown (1955: 16-17) has described similar features from Temecu which he interprets as acorn hullers.

Pestles

Few pestles were recovered from the study area in relation to the large number of bedrock mortars in evidence. In all, only seven artifacts were so identified. These have been divided into two types depending on their presumed function as

food processing or non-food processing implements.

Type I (food processing) (Figure 21c): This type is represented by five specimens, all large, heavy (2 to 6 kg) granite cobbles, unshaped except by use. Three of these show the effects of percussion and abrasion on the lateral margins extending from 9.5 to 21.0 cm from the working end. The remaining two specimens expand rapidly from a rounded working end and are too wide to fit into mortars more than 4 to 5 cm deep. Only one of the pestles would fit into the deepest mortars recorded.

Two Type I pestles each were recovered from the Pictograph (4-Riv-452) and Peppertree (4-Riv-463) sites. Only one was recovered from the Charles Mott site (4-Riv-464), the site with the greatest number of bedrock mortars.

Type II (non-food processing): The remaining two pestles, recovered from the Dead Dog site (4-Riv-202) and from survey site 4-Riv-265, are cylindrical and made of soft, friable sandstone. One appears to be complete, measuring 5.7 cm in diameter and 8.3 cm in length. The second specimen is the working end of a pestle and is 5 cm in diameter and 4.3 cm in length. Both show the effects of percussion on one end, and both are shaped by grinding along the lateral edges. It would appear that the composition of these two artifacts precludes their use in food processing due to the gritty residue that they would produce.

Grinding Implements

This category consists of manos, basin and slab metates, and bedrock metates. Although grinding implements constitute a majority of the artifacts recovered, the bulk of the assemblage consists of fragments insufficiently complete to classify in specific types.

Manos

Of the 268 artifacts identified as manos, only 32 are sufficiently complete for further classification. The fragmentary nature of the sample is apparently the result of a secondary use of manos as hammerstones, with 60 percent of the specimens showing a significant amount of battering on the lateral edges. A second possible contributing factor is the use of broken manos as cooking stones, a practice suggested for the Luiseño by McCown (1955: 21) and indicated in this area by the evidence of exposure to fire displayed by 42 percent of the fragmentary specimens in the assemblage.

All of the complete specimens and all but one of the fragments are made of locally available materials. Most are granite or rhyolite, one is quartz, two are sandstone, and one is porphyritic basalt. The single nonlocal specimen is made of vesicular basalt, a material available in the Santa Ana Mountains about 32 km to the southwest. All of the manos are of a size and form suitable for use with one hand.

When the grinding surfaces of the manos are examined, it is immediately apparent that several distinct configurations are represented in the assemblage. The artifacts were classified using the grinding motion, as inferred from the configuration of the working surface, as the principal diagnostic feature. Two primary types were defined depending on whether the grinding motion was circular (Type I) or reciprocal (Type II). Type I manos have working surfaces that, when viewed from any point on the periphery, show the same profile: flat to slightly convex. The working surfaces of Type II manos are biconvex in profile along the short axis, flat in profile on the long axis.

Type IA (Figure 22a):

Number of specimens: 3

Distribution: 4-Riv-331 (1); 4-Riv-464 (1); 4-Riv-465 (1)

This type consists of those specimens with working surfaces that show a slightly convex profile when viewed from any point on the periphery. All three specimens are bifacial, circular in outline, pecked and ground to shape, and nearly identical in size, averaging 11.7 cm in diameter and 5.0 cm in thickness.

Type IB (Figure 22b):

Number of specimens: 2

Distribution: 4-Riv-331 (1); 4-Riv-464 (1)

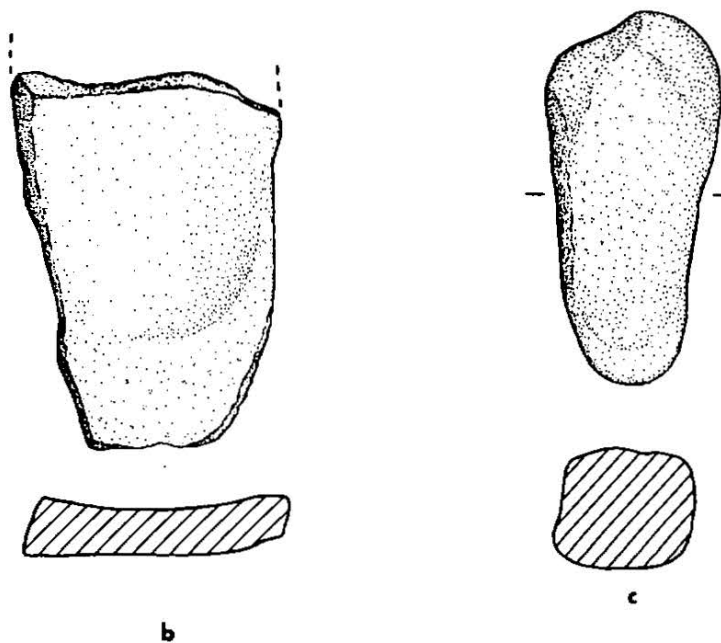
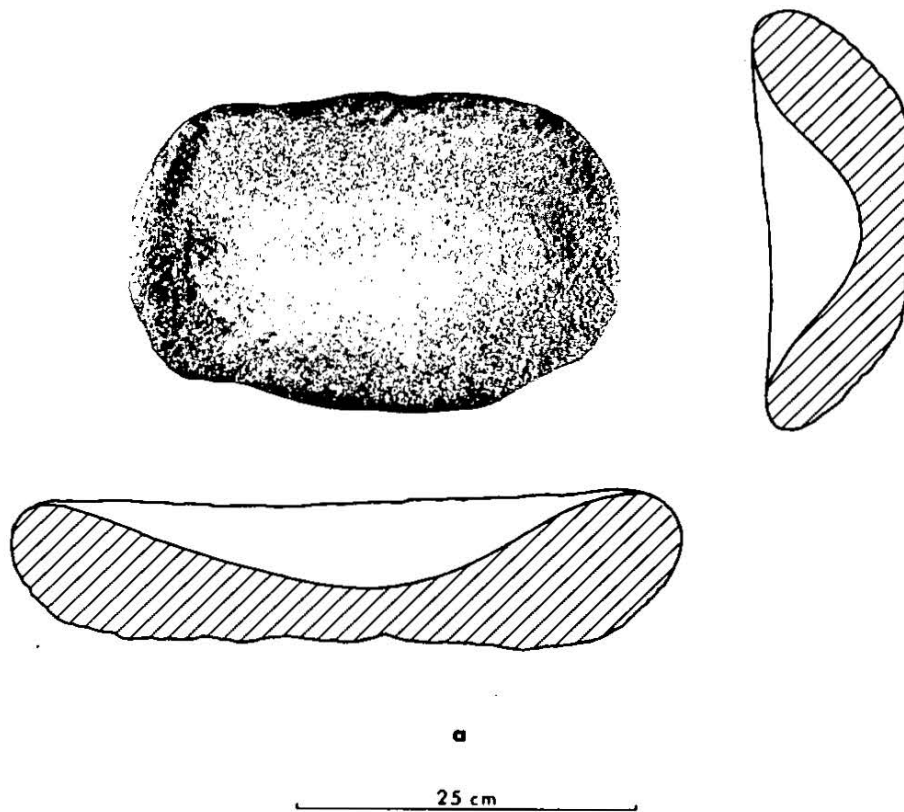
This designation is arbitrary in that the two specimens are both bifacial, exhibiting one Type I face and one Type IIA face. Both are pecked and ground to a circular outline and are nearly identical in size, measuring 10.7 x 4.1 cm and 10.6 x 3.8 cm. The Type I face on both specimens is flat.

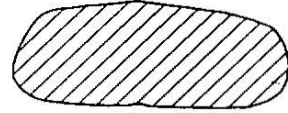
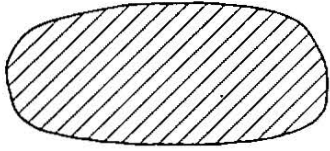
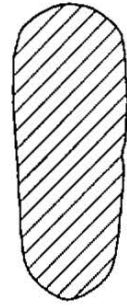
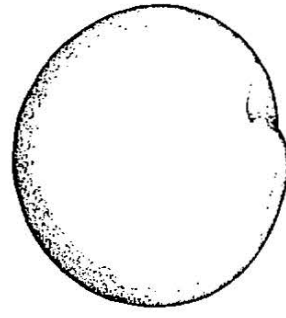
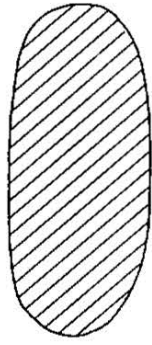
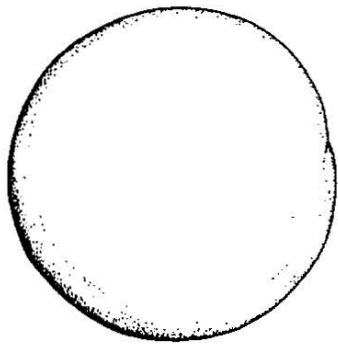
Type IIA (Figure 22c):

Number of specimens: 11

Distribution: 4-Riv-202 (5); 4-Riv-463 (2); 4-Riv-464 (2); 4-Riv-465 (2)

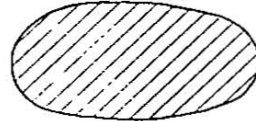
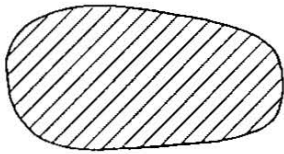
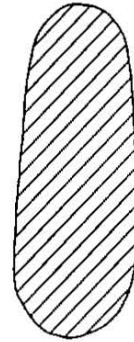
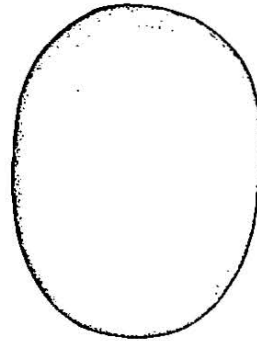
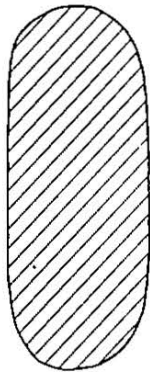
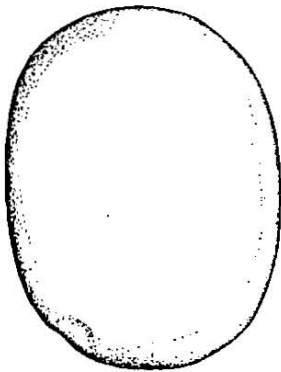
Figure 21. Ground stone artifacts. Figure 21a: 20-320b, basin metate; b: 21-873, Slab metate; c: 17-181, Type I (food processing) pestle.





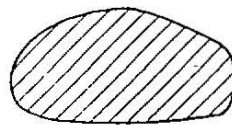
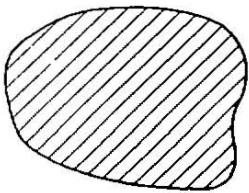
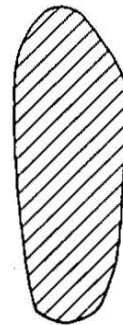
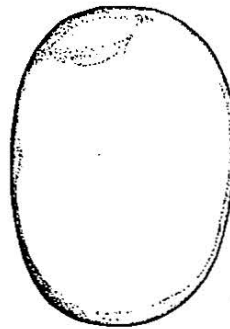
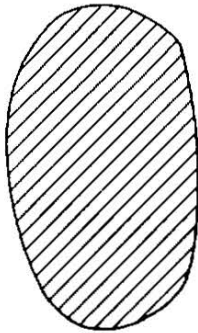
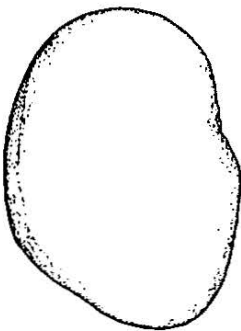
a

b



c

d



e

f

The working surfaces of these specimens show two distinct curvatures at right angles. All are ovoid to triangular in outline with the long axis of the grinding surface less convex than the short axis. The apex of the curve on the short axis is nearer one lateral margin than the other. Of the eleven specimens, two are unifacial, seven bifacial, and two trifacial. Eight are unshaped to roughly pecked cobbles, three are pecked and ground to an oval outline. The trifacial specimens show two Type IIA faces and one small, flat grinding face on one of the lateral edges.

Type IIB-1 (Figure 22d):

Number of specimens: 11

Distribution: 4-Riv-202 (3); 4-Riv-331 (1); 4-Riv-465 (3); 4-Riv-463 (1); 4-Riv-452 (1); 4-Riv-464 (2)

These manos exhibit working faces similar to Type IIA except that the apex of the curve on the short axis is equidistant from the lateral margins. The specimens range in form from ovoid to subrectangular with the exception of one badly battered specimen that is nearly circular. Two of the specimens are unifacial, eight are bifacial, and one is trifacial. Two are unshaped to roughly pecked, nine are pecked and ground. One specimen exhibits two "skewed" faces; e.g., the axis of the working face is diagonal to the long axis of the tool (Figure 22e).

Type IIB-2 (Figure 22f):

Number of specimens: 2

Distribution: 4-Riv-331 (2)

This subtype consists of two specimens, both trifacial and pecked and ground to an ovoid form. One working face is similar to Type IIB-1 except that the curvature on the short axis is more steeply convex with a more pronounced apex, giving the tool a keeled appearance. The opposite side of the mano exhibits an essentially flat grinding face that is intersected by a third small face at an angle of 30° at one end of the tool.

←
Figure 22. (Opposite page) Ground stone artifacts. Figure 22a: 19-455-17, mano, Type IA; b: 21-951, mano, Type IB; c: 17-30, mano, Type IIA; d: 19-467-1, mano, Type IIB-1; e: 16-271, mano, Type IIB-1; f: 20-58, mano, Type IIB-2.

Unclassified manos: One small artifact composed of granite and resembling a Type IIB-1 mano was recovered from the Peppertree site (4-Riv-463) (Plate 14e). The artifact is pecked and ground to an ovoid form and has two well-developed grinding faces; however, it measures only 4.3 x 3.8 x 2.5 cm. Its function is undetermined.

Two artifacts resembling unifacial manos were recovered from the Charles Mott site (4-Riv-464). Both are hemispherical in form and are composed of a soft, friable sandstone, which appears to preclude their use in food preparation. They may have served to grind pigment, a possibility suggested by the recovery from the site of a metate fragment composed of a similar material and stained with a red substance.

Bedrock Metates

As previously noted, bedrock metates are the most numerous features in the study area. They are recognizable as smooth, polished areas, circular to subrectangular in form, located on outcrops of granite bedrock, often adjacent to bedrock mortars but also frequently occurring singly or in groups without associated mortars.

Analysis of a sample of 32 bedrock metates from the Charles Mott site revealed two distinct configurations.

Type I: This type consists of eight examples that exhibit a wear pattern essentially circular in form, ranging in diameter from 8.8 to 23.1 cm and averaging 16.9 cm. Depth ranged from perfectly flat to 2.2 cm, averaging 1.1 cm.

Type II: This type consists of 24 examples that exhibit an ovoid to subrectangular wear pattern and that range from 22.0 to 46.2 cm in length, from 12.1 to 34.1 cm in width, and from perfectly flat to 2.4 cm in depth. Average dimensions are 29.5 x 22.2 x 0.86 cm.

Slab and Basin Metates

This designates all those milling surfaces not located on bedrock outcrops. The sample numbers 46 specimens, but only 14 are sufficiently complete for further classification. One fragmentary specimen is made of vesicular basalt, probably derived from the Santa Ana Mountains, and another is a loosely consolidated sandstone. The remainder consist of locally available granitic and metamorphic materials. All of the complete or nearly complete specimens exhibit working surfaces that are ovoid to subrectangular in form.

Slab metates (Figure 21b):

Number of specimens: 5

Distribution: 4-Riv-452 (3); 4-Riv-202 (1); 4-Riv-464 (1)

These metates are characterized by milling surfaces that are ovoid to subrectangular in outline and that range from flat to 1.0 cm in depth. This pattern of wear is found on thin (2.8 to 4.4 cm) slabs of gneiss and granite. One specimen, measuring 19.5 x 26.5 cm, appears to be approximately two-thirds complete; excess stone has been removed from around the milling surface leaving an unused rim approximately 3.5 cm wide. This artifact weighs 4.1 kg and appears to have been truly portable. None of the specimens is complete.

Basin metates (Figure 21a):

Number of specimens: 9

Distribution: 4-Riv-202 (3); 4-Riv-331 (1); 4-Riv-452 (2); 4-Riv-463 (2); 4-Riv-464 (1)

This type is characterized by working surfaces that are ovoid in outline and that range from 1.7 to 8.5 cm in depth. All the specimens are composed of granite, and all are thick, rather massive blocks of stone. These artifacts are at best minimally portable, since they range in weight from 8 to 90 kg.

Unclassified metates: One fragment composed of friable sandstone with a basin of indeterminate form was recovered from site 4-Riv-464. This implement was probably not used in food preparation, but may have served to prepare paint, since the working surface shows traces of red pigment of the same color as the red pictographs found throughout the study area.

Nonprocessing Artifacts (Plate 14)

This subclass includes the remainder of the ground stone assemblage, including all artifacts that functioned other than as processing or manufacturing implements. It consists of 13 items including pendants, beads, a pipe fragment, carved disc, and several other objects of undetermined function. All but two of the specimens were recovered from the Charles Mott site (4-Riv-464) (Table 16).

Pendants

Two artifacts have been identified as pen-

dants; both were recovered from site 4-Riv-464. One is complete, although recovered in two pieces; the second is fragmentary. Both are made of an unidentified schist, and both show traces of red pigment. The complete specimen (Plate 14a) is ovoid in outline, measuring 7.4 cm in length, 3.5 cm in width at the broadest point, and 0.8 cm in thickness. All surfaces are ground. Both faces are slightly concave with the axis of the concavity diagonal to the long axis of the artifact, giving it a slightly twisted appearance similar to a propeller blade. The fragmentary specimen, consisting of one end of a pendant, appears to have been similar in size and form. Neither of the artifacts has been drilled.

Beads

Two ground stone beads were recovered, both from 4-Riv-464. The first is complete, rectangular in form, and made of red chert (Plate 14b). It measures 10 x 8 x 1 mm with a biconical hole 2 mm in diameter drilled through the center. The second specimen is a small fragment of a spherical or tubular bead composed of fuchsite. The complete artifact appears to have been 20 to 25 mm in diameter with a hole 8 to 10 mm in diameter drilled through the center.

Pipe Fragment

A reworked fragment of a tubular pipe made of talc schist was also recovered at 4-Riv-464. Essentially rectangular, the specimen measures 17 mm in length, 7 mm in width, and 4 mm in thickness. The inner (concave) surface is blackened, and the two short sides have been ground smooth. The two long sides, which were parallel to the long axis of the pipe, were broken smoothly and not ground.

Carved Disc (Plate 14c)

This artifact, recovered from the surface at the Charles Mott site (4-Riv-464) is made of muscovite schist. Circular in form, it measures 27 mm in diameter and 6 mm in thickness with a straight-sided hole 11 mm in diameter drilled through the center. All surfaces are highly polished, with the faces and the peripheral edge ground nearly flat. Around the periphery, where the edge and "upper" face meet, a series of 12 notches, 1 mm in depth and 6 mm in length, are ground. The notches occur at approximately 6 mm intervals completely around the periphery. The opposite face bears eight conical depressions averaging 3 mm in dia-

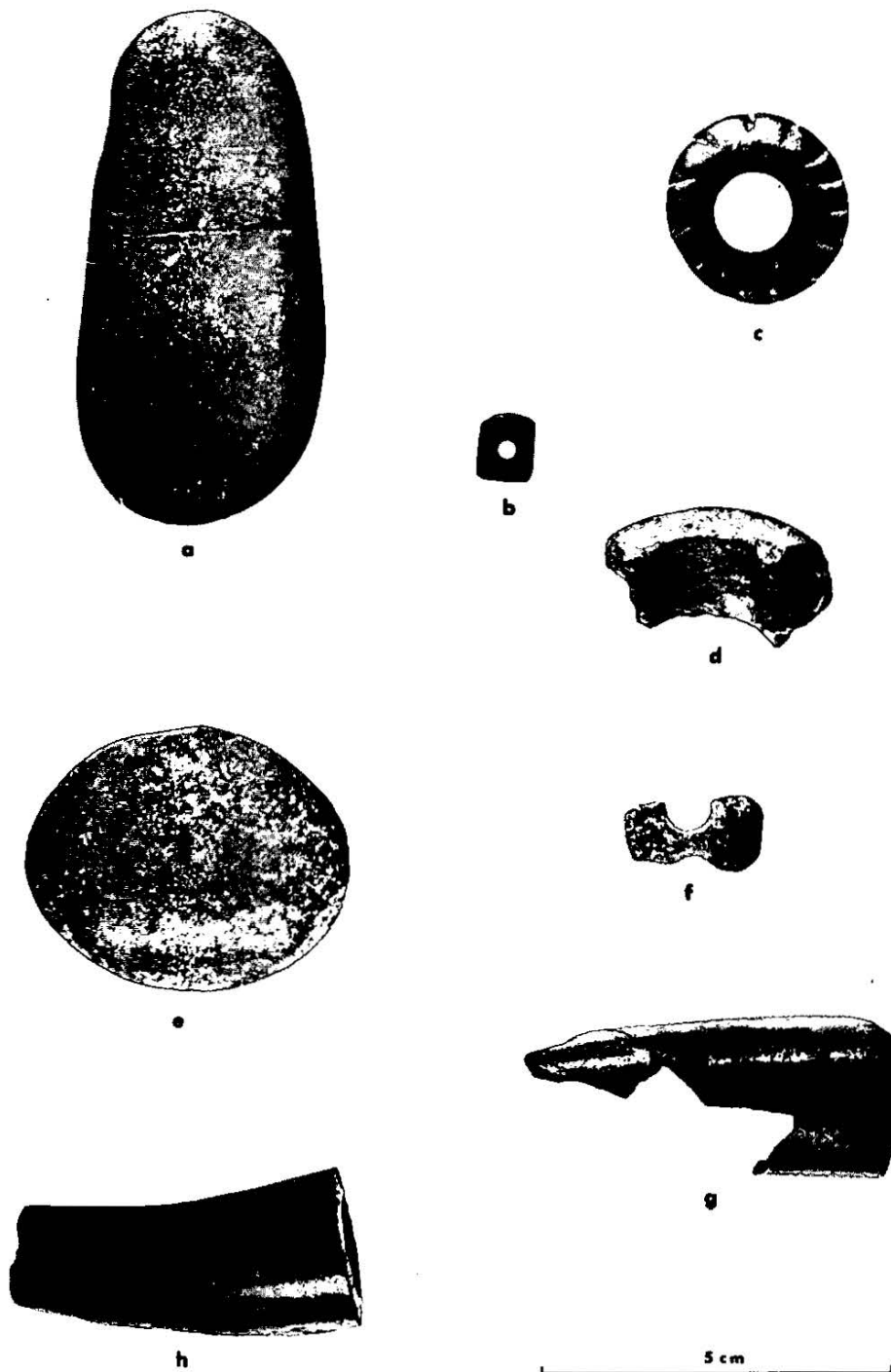


Plate 14. Ground stone and ceramic artifacts. Plate 14a: 21-708, ground stone pendant; b: 21-483, chert bead; c: 21-647, ground object of muscovite schist; d: 21-948, vessel or mortar fragment of chlorite schist;

e: 17-277, small grinding stone; f: 21-664, ground object of chlorite schist; g: 20-111, ceramic pipe fragment; h: 18-11, ceramic pipe with ends and flange removed.

meter and drilled to an average depth of 2 mm. These occur at intervals of 8 mm surrounding the central hole.

Other Artifacts

Six artifacts of undetermined function were also recovered. The Peppertree site (4-Riv-463) yielded a small triangular fragment of gray slate measuring about 25 mm on a side and 2 mm in thickness. One of the edges has been ground smooth. The Pictograph site (4-Riv-452) yielded a small, flat, semicircular fragment of red chert measuring 10 x 21 x 3 mm. Both surfaces, as well as the curved peripheral edge, show grinding. The object may be a fragment of a pendant or large bead.

The remaining four artifacts were recovered from the Charles Mott site (4-Riv-464) and include the following:

1. A fragment of chlorite schist measuring 15 x 11 x 5 mm (Plate 14f). This object appears to have been produced by drilling two biconical holes, 6 mm in diameter and 4 mm apart, through a rectangular blank, equidistant from the long edges. Two parallel cuts or breaks, one through each hole, were then made, leaving a roughly H-shaped object. One of the broken edges was then ground smooth and the other slightly ground.
2. A small rod-shaped fragment of gypsum 17 x 5 x 4 mm, roughly rectangular in cross section and ground smooth on all the long edges. The object resembles an awl fragment but the softness of the material would appear to preclude its use as a tool.
3. A flat triangular fragment of talc schist resembling a section of a flat, circular dish. One edge is ground to form a curved rim measuring 66 mm long. The two broken edges are 65 and 72 mm in length. One surface is slightly concave, the opposite surface slightly convex. The thickness increases from 10 mm at the rim to 18 mm at the apex of the two broken edges. If the suggestion of a circular form is correct, the complete artifact would have measured approximately 150 mm in diameter.
4. A rim fragment of a small, apparently circular vessel or mortar composed of chlorite schist (Plate 14d). The specimen is highly polished

on the outer (convex) surface and shows transverse striations on the inner (concave) surface. Whether these striations are the result of manufacture or use is impossible to determine. The lip or rim is ground flat and the wall increases in thickness from 5 mm at the rim to 10 mm. If circular, the complete artifact would have had an outside diameter of approximately 60 mm and an inside diameter of approximately 50 mm at the rim. Sparkman (1908: 201) notes that the Luiseño used small polished mortars for mixing paint and for preparing jimson weed (toloache) (*Datura* spp.) in male initiation ceremonies.

Functional Analysis of the Processing Assemblage

This analysis attempts to reconstruct the motor habits associated with various artifacts by consideration of the wear patterns they display and by so doing to define the several subsistence practices represented in the assemblage. The possibility of estimating aboriginal site populations from counts of bedrock mortars will also be discussed.

Crushing and Pounding Implements

The complex of crushing and pounding implements consists of bedrock mortars and pestles. These implements are generally associated with the processing of acorns (*Quercus* spp.) and hollyleaf cherry (*Prunus ilicifolia*) among the Luiseno (Sparkman, 1908: 193-194), Cahuilla (Bean, 1972: 52; Bean and Saubel, 1961; 1972: 120, 127-128; Barrows, 1900: 61-62) and numerous other California groups. Both acorn and hollyleaf cherry are locally available. Interpretation of the bedrock mortars and recovered pestles is not without problems, however.

The recovered pestles clearly show the effects of percussion at the working end, which would result from a pounding process. The highly polished walls of the mortars, however, would seem to indicate that a rotary motion of the pestles was also employed, and while the lateral margins of three of the pestles show abrasion from contact with the walls of mortars, they do not exhibit the high degree of polish and regularity that characterizes the mortars, even though they are composed of the same granitic material. In addition, few pestles relative to the number of mortars have been recovered and, due to their irregular forms, only one of the recovered pestles will fit into the deepest mortars. The largest pestles are quite unwieldy, weighing over 4.5 kg, yet pestles even

larger and longer would have been required to fill the deepest mortars.

At least two hypotheses may be offered to account for this situation: (1) long cylindrical pestles that better fit the configuration of the mortars have been removed from the sites by relic collectors; or (2) large stone pestles were occasionally used in conjunction with the shallower mortars, while most processing was done with wooden pestles, probably employed in both an up-and-down and a rotary motion. The first explanation, while possible since the area has been extensively surface collected, is not sufficient to explain the complete absence of long cylindrical pestles, or at least fragments of them, within the cultural deposits.

The second hypothesis, the use of wooden pestles, appears to explain better both the low frequency of cobble pestles and the absence of long cylindrical pestles in the study area. There may be some question whether wooden pestles are sufficient to produce the polished walls observed in the mortars. However, the use of wooden pestles in conjunction with stone "gyratory crushers" has been proposed for northern Sonora by Hayden (1969: 154-161), who notes that the tufa, scoria, and vesicular basalt basins were "usually well-polished, obviously from wear." The absence of wooden pestles in the collections is readily accounted for as loss due to decay.

Mortars and pestles were probably also used for crushing small game animals as described ethnographically by Sparkman (1908: 198). This use is suggested at Perris Reservoir by the extremely fragmentary nature of the recovered faunal remains. (See also Hammond, "Faunal Remains," this publication.)

Bean and Saubel (1961: 241) report that among the Cahuilla "a woman might have as many as 3 or 4 [bedrock mortars] which were used by herself and her daughters but no one else. A keen sense of ownership was attached to these mortars." If these assertions are true, and if all mortars at a given site were in use simultaneously, an estimate of the population of the site might be possible. However, inasmuch as there is no way of determining whether all or only part of the mortars at a site were used at one time or whether the sex ratios of the site inhabitants reflect those of the populations described by Bean and Saubel, such estimates would probably be at best *maximum* population estimates. Studies of other nonagricultural populations (e.g., Lee, 1965; Schoolcraft, 1851-57; Krzywicki, 1934) are useful in attempting such population estimates. These studies indicate that adult and near-adult females constituted 35 to 40

percent of the total population. Using these figures and assuming one bedrock mortar for each woman, we can derive the following maximum population estimates for the excavated sites in the study area:

Site	Number of bedrock mortars	Estimated maximum population
Dead Dog (4-Riv-202)	14	35-40
Charles Mott (4-Riv-464)	63	158-180
Pictograph (4-Riv-452)	6	6-18
Peppertree (4-Riv-463)	15	38-41
Oleander Tank (4-Riv-331)	12	30-34

If these figures are taken literally, and similar estimates are projected for other sites displaying bedrock mortars (article by Ambrose and King, Table 1, this publication), the estimated aboriginal population of the study area approaches 500 individuals. This population estimate of 20 persons per square mile seems completely out of the question. If value is to be found in an attempt to derive population estimates from bedrock mortar counts at Perris Reservoir, it would seem to lie in an indication that not all of the occupation sites were used simultaneously. Rather, we would postulate that perhaps three or four of the sites with mortar complexes were occupied at a given time.

Grinding Implements

The assemblage of grinding implements consists of manos, basin and slab metates, and bedrock metates. Examination of the working surfaces of all these artifacts indicates that two distinct grinding motions were employed: circular and reciprocal. The following analysis will attempt to correlate particular types of manos and metates on this basis.

Both faces of the Type IA manos and one face of the Type IB manos exhibit a working surface that is symmetrically flat to slightly convex when viewed from any point on the periphery. It is proposed that this configuration was attained through a circular motion of the mano on a flat or slightly concave surface, such as is represented by the Type I bedrock metates, which are circular in form.

Type IIA manos (and the second face of the two Type IB manos) exhibit a working face that has two distinct profiles at right angles. The curve on the short axis is more steeply convex, with the apex nearer to one lateral margin than to the other. It appears that, when used in conjunction with a

Type II bedrock metate (ovoid to subrectangular) or a slab metate, a reciprocal motion is employed, the mano being held with the long axis perpendicular to the direction of the stroke. The curvature of the short axis is apparently the result of a vertical rotation of the wrist as the mano is pushed away and drawn back. Thus the distal edge of the mano is rotated slightly upward on the "away" stroke allowing the material to feed between the faces of the mano and milling stone. At the end of the stroke, the proximal edge is rotated upward, and the trailing edge is used to draw the material back for the next stroke. The differential pressures exerted on the proximal and distal edges caused differential wear, resulting in the apex of the curve being nearer the distal edge. Observable striations on the manos tend to be parallel and perpendicular to the long axis of the mano. This interpretation seems to be in essential agreement with the observation of Maidu and Paiute grinding operations reported by Riddell (1960: 42-43).

Type IIB-1 manos differ from Type IIA in that the apex of the curve on the short axis is midway between the lateral margins. This configuration appears to result from use in a deepening basin. As the basin becomes deeper, the stroke becomes more elliptical and the wrist rotates laterally until in a deep basin the long axis of the mano becomes parallel to the direction of the grinding stroke. Thus one side of the working face is in contact with one side of the basin of the metate on the "away" stroke, and the opposite side of the same face is in contact with the opposite side of the basin on the "return" stroke. This lateral rotation of the wrist as the depth of the basin increases would also account for the occurrence of manos with "skewed" faces noted by Greenwood (1969: 19-20), and also apparent on one of the Type IIB-1 manos in this collection. This condition would result from use of the mano

in a basin of intermediate depth where the relationship of the long axis of the mano to the direction of the stroke is intermediate between perpendicular (on a flat surface) and parallel (in a deep basin).

Type IIB-2 manos differ from Type IIB-1 in having one side that exhibits a Type IIB-1 face with the opposite side exhibiting two flat grinding faces that meet at an angle of about 30°. This second side is apparently a specialized tool for grinding in the bottom of a deep basin metate. The grinding stroke is "away" against the bottom or side of the basin. The tip of the mano is then used to draw the material out of the bottom for the next stroke. Wear at the distal end of the mano results in a small flat plane that intersects the main working surface. This interpretation of the technique of grinding in a deep basin corresponds essentially to that of Greenwood (1969: 19).

There are no sharp distinctions between the configurations of Type II bedrock metates and regular metates of the slab or basin types. All appear to have been produced by the same slightly elliptical reciprocal grinding motion with depth a function of duration of use. While the depth of the milling concavity of slab metates is necessarily restricted by the thickness of the original block, this may have been merely a concession to portability. However, the possibility of a specialized function for the bedrock metates and slab metates cannot be discounted in view of the numerous bedrock metates that were apparently abandoned when a maximum depth of approximately 2 cm was reached. This seems especially probable in view of the fact that no deep-basined bedrock metates were found in the study area.

It does appear from the analysis, however, that Type II bedrock metates and portable slab metates are functionally equivalent to and associated with Type IIA manos, while basin metates are associated with mano types IIB-1 and IIB-2.

FLAKED STONE ARTIFACTS

Philip J. Wilke

Flaked stone artifacts are described in the following pages. In order of presentation, the categories of artifacts are projectile points, scraper planes, scrapers, knives, drills, perforators, gravers, choppers, hammerstones, and cores. The discussion will consider the chipped lithic assemblage from the study area as a whole. No particular attempt will be made in this section to deal with individual site assemblages; for these the reader is referred to the individual site reports. I am indebted to G. T. Jefferson for assistance in the identification of lithic materials.

Projectile Points

The Perris collections include 109 artifacts described as projectile points. Nineteen of these specimens are too fragmentary to classify. Eighty-seven of the remaining 90 are grouped into six types or varieties within types; three are complete specimens that do not conform to any established type. Eighty-one of the 87 classified specimens are grouped within the Cottonwood series described by Lanning (1963). Eighty of the Cottonwood specimens fall into the type Cottonwood Triangular, with the following varieties represented: concave base, 60 specimens; straight base, 9 specimens; narrow blade (described below), 11 specimens.

Other types represented are Cottonwood Leaf-shaped, 1 specimen; Desert Side-notched, 5 specimens; Elko Eared, 1 specimen. In terms of material, quartz is the most common, accounting for 41 percent of the classified specimens. Of the remainder, 12 percent are of chert, and 9 percent of chalcedony. In order of decreasing importance, other materials used in projectile point manufacture are obsidian, jasper, aphanitic ultrabasic, opal, slate, flint, fine-grained quartzite, sandy siltstone, and welded tuff. The composition of three specimens could not be determined without thin sections. Quartz is extremely common in the vicinity of Perris Reservoir, but most of the other materials are foreign to the immediate locality. Table 17 shows the distribution of the various types among the five sites excavated and the typological breakdown of the site assemblages.

Cottonwood Series

This series of projectile point types includes specimens that are small, thin in cross section, non-stemmed, and light in weight. They are fashioned almost exclusively by pressure flaking and may be serrated (Lanning, 1963:252).

Cottonwood Triangular. Specimens of this type are roughly triangular in outline. Lateral edges

TABLE 17
DISTRIBUTION OF PROJECTILE POINT STYLES BY SITE*

Style	Total	Site									
		4-Riv-202			4-Riv-463		4-Riv-452		4-Riv-331		4-Riv-464
		Number	Percent in site assemblage	Number	Percent in site assemblage	Number	Percent in site assemblage	Number	Percent in site assemblage	Number	Percent in site assemblage
Cottonwood Triangular											
concave base	60	8	53.33	13	81.25	1	50.00	16	84.21	22	57.87
straight base	9	3	20.00	--	--	--	--	1	5.26	5	13.16
narrow blade	11	3	30.00	--	--	--	--	2	10.53	6	15.79
Cottonwood Leaf-shaped	1	--	--	1	6.25	--	--	--	--	--	--
Desert Side-notched	5	--	--	2	12.50	--	--	--	--	3	7.89
Elko Eared	1	--	--	--	--	--	--	--	--	1	2.63
Unclassified points	3	1	6.67	--	--	1	50.00	--	--	1	2.63
Total	90	15	100.00	16	100.00	2	100.00	19	100.00	38	99.97

* Nineteen unclassifiable fragments are not included.

may be straight, concave, or convex. Lanning distinguishes four varieties according to differences in base form; two of these are represented in the Perris collections. A variety not recognized by Lanning, defined on the basis of lateral edge form, is also described below.

Concave base (Plate 15):

Number of specimens: 60

Distribution: 4-Riv-202 (8); 4-Riv-463 (13); 4-Riv-452 (1); 4-Riv-331 (16); 4-Riv-464 (22)

Material: Quartz (28); chert (8); obsidian (6); aphanitic ultrabasic (6); opal (4); slate (3); jasper (2); welded tuff (1); chalcedony (1); undetermined (2)

Length: Maximum, 38 mm*, minimum 12 mm*; average, 20.3 mm

Width: Maximum, 20 mm; minimum, 8 mm; average, 13.2 mm

Thickness: Maximum, 7.5 mm; minimum, 1.5 mm; average, 3.9 mm

Weight: Maximum, 2.88 g*; minimum, .23g*; average, .85 g*

The definitive characteristic of points of this variety is a basal concavity that may vary from a slight arc to a pronounced V-shape. Lateral edges vary from convex to concave and may be serrated. This is the most abundantly represented projectile point style in late prehistoric contexts in interior southern California (cf. True, 1970; Kowta *et al*, 1965; Hicks, 1958; Meighan, 1954).

Most of the 60 specimens found at Perris have slightly convex lateral edges; although on a few the edges are recurved. The basal concavity averages 3 mm, but on a few examples it approaches 6 mm in depth. Thirteen percent have serrated lateral edges, with the serrations varying from slight to pronounced. Proximal lateral edges are ground on about 35 percent of the examples. Such grinding would tend to reduce the possibility of the lashings being severed by the sharp edges of the point. A few of the points also display a smoothing of the distal lateral edges and a blunting of the tip itself. This form of wear may represent use of the point for incidental cutting and/or perforating, perhaps even while hafted (cf. Marshall, 1956).

Another nonprojectile function is suggested by two of the specimens (21-661 and 21-682a, Plate 15r, w). These pieces display definite step flaking, abrasion on mid- to distal lateral edges, and

An asterisk () indicates an approximate measurement inferred for an incomplete specimen.

abrasion on the faces of the blade. Such a wear pattern indicates that these specimens were used as drills. One specimen (20-403, Plate 15n) retains a cement or resin, resembling asphaltum, on both proximal blade surfaces. Since the proximal lateral edges of this point are also ground, it was apparently affixed to the shaft with both pitch and lashings.

Straight base (Plate 16p-t):

Number of specimens: 9

Distribution: 4-Riv-202 (3); 4-Riv-331 (1); 4-Riv-464 (5)

Material: Quartz (4); flint (2); chalcedony (1); chert (1); fine-grained quartzite (1)

Length: Maximum, 24 mm*; minimum, 15 mm*; average, 20.1 mm

Width: Maximum, 15 mm; minimum, 10 mm; average, 12.7 mm

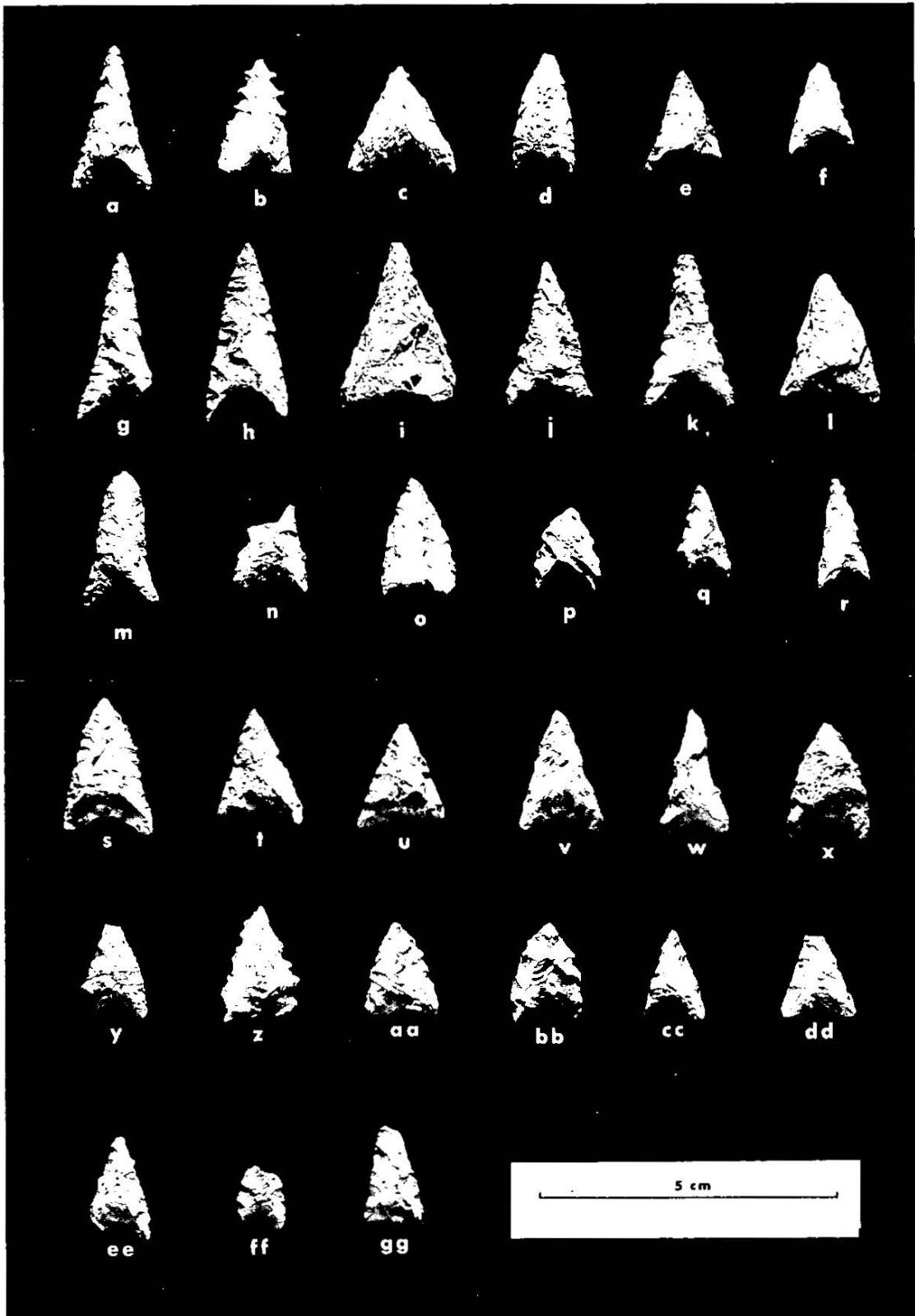
Thickness: Maximum, 5 mm; minimum, 2.5 mm; average, 3.8 mm

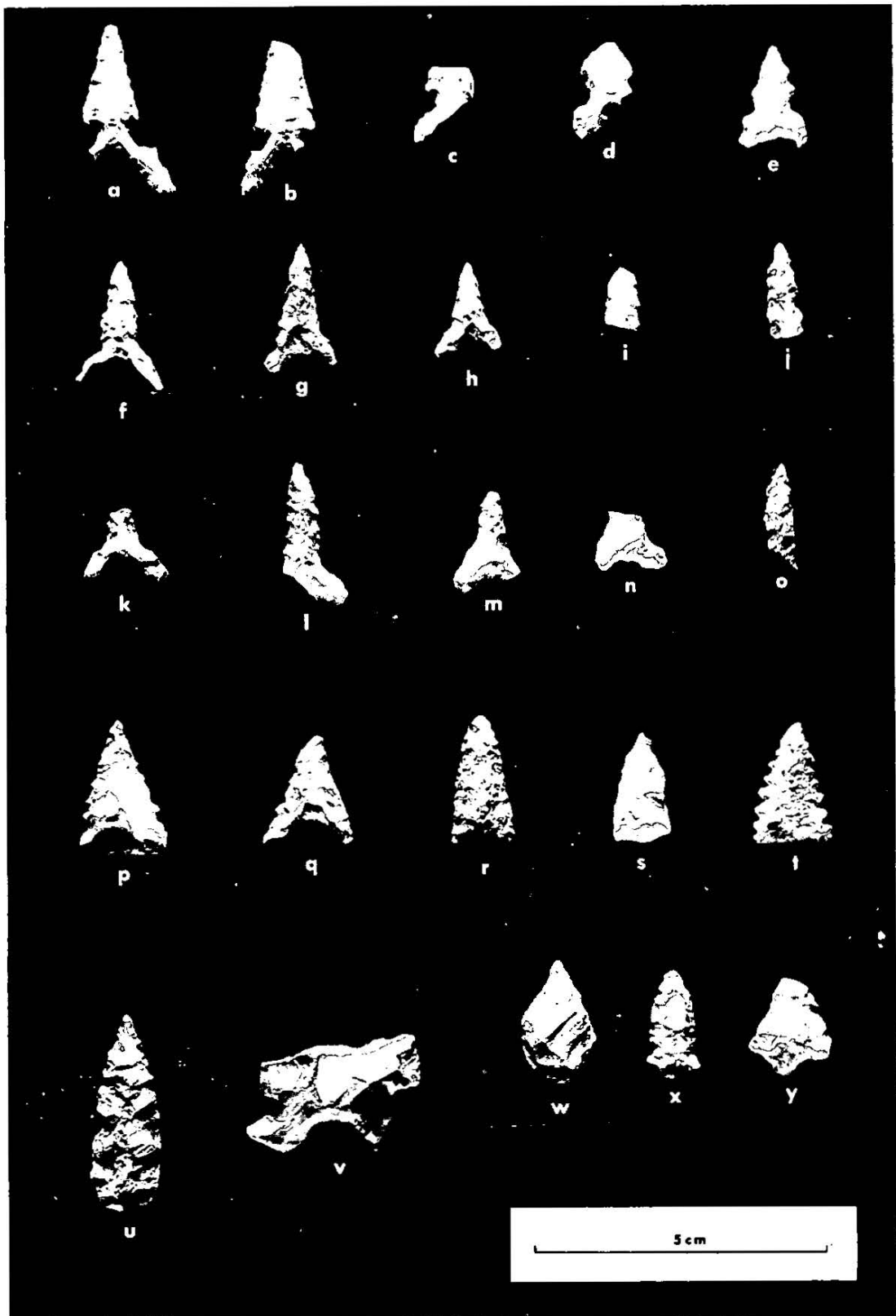
Weight: Maximum, 1.35 g*; minimum, .46 g*; average, .89 g

Points of this variety are distinguished by a straight rather than concave or convex base. The lateral edges are subject to the same forms of modification that occur in the concave-base variety. This is a relatively common projectile point style in interior southern California, although it is apparently never as abundant as the concave-base variety (True, 1970; Kowta *et al*, 1965; Hicks, 1958; Meighan, 1954).

Three of the nine specimens in the collections have serrated lateral edges; only one specimen shows grinding on the proximal portions of the lateral edges.

Plate 15. Projectile points. All Cottonwood Triangular, variety concave base. Plate 15a: 17-137, chert; b: 16-305a, chert; c: 17-2a, welded tuff; d: 21-237, composition undetermined; e: 20-91, aphanitic ultrabasic; f: 20-291, aphanitic ultrabasic; g: 21-969, chert; h: 17-120, jasper; i: 20-307, aphanitic ultrabasic; j: 21-68, jasper; k: 21-773, chert; l: 21-380, aphanitic ultrabasic; m: 21-115, aphanitic ultrabasic; n: 20-403, composition undetermined; o: 17-144, obsidian; p: 17-124, obsidian; q: 17-133, obsidian; r: 21-661, obsidian; s: 20-134, quartz; t: 21-64, quartz; u: 16-305b, quartz; v: 20-392b, quartz; w: 21-682a, quartz; x: 20-123, quartz; y: 16-305e, quartz; z: 20-133, quartz; aa: 17-295, quartz; bb: 21-26, opal; cc: 17-208, quartz; dd: 18-148, quartz; ee: 20-92, quartz; ff: 20-252, quartz; gg: 21-362, quartz. (Photographed items coated with ammonium chloride powder.)





Narrow blade (Plate 16f-o):

Number of specimens: 11

Distribution: 4-Riv-202 (3); 4-Riv-331 (2); 4-Riv-464 (6)

Material: Quartz (5); jasper (3); chalcedony (2); undetermined (1)

Length: Maximum, 24 mm; minimum, 16 mm; average, 19.5 mm

Width: Maximum, 16 mm*; minimum, 11 mm; average, 13.4 mm

Thickness: Maximum, 4.5 mm; minimum, 2.5 mm; average, 3.6 mm

Weight: Maximum, .72 g*; minimum, .44 g; average, .58 g

These small projectile points resemble the concave-base variety in overall dimensions and method of manufacture. They differ in that the blade narrows sharply just above the base and remains narrow to the tip. The blade is thus slender, nearly parallel sided, and flares out sharply near the base. The points resemble T-shaped drills in outline, but they do not show the wear that is characteristic of drills. Lateral edges are sometimes serrated. Similar specimens have been reported elsewhere in the region (Michels, 1964; Hicks, 1958).

The very narrow blade, averaging only 6 mm in width at midpoint, is extremely fragile. Several blade sections with basal portions lacking have been placed in this variety. Only one specimen shows a smoothing of the lateral edges at a point just above the base where the blade narrows. In terms of weight, the specimens average about 30 percent less than the concave-base variety, of which they may be a subvariety. This lighter average weight is readily explainable as a result of the narrowing of the blade.

←
Plate 16. Projectile points. Various styles. Plate 16a-e: Desert Side-notched; f-o: Cottonwood Triangular, variety narrow blade; p-t: Cottonwood Triangular, variety straight base; u: Cottonwood Leaf-shaped; v: Elko Eared; w-y: unclassified. Plate 16a: 21-114, brown jasper; b: 17-72, tan chalcedony; c: 17-233, gray chert; d: 21-28, pink chalcedony; e: 21-248, quartz; f: 20-112, chalcedony; g: 21-899, composition undetermined; h: 20-72, chalcedony; i: 21-504, jasper; j: 16-140, quartz; k: 21-505, jasper; l: 16-129, quartz; m: 21-406, quartz; n: 21-970, quartz; o: 16-255, quartz; p: 20-127, flint; q: 21-340, chalcedony; r: 21-125, flint; s: 16-124, quartz; t: 21-799, quartz; u: 17-306, obsidian; v: 21-778, chert; w: 18-18, sandy siltstone; x: 16-168, chalcedony; y: 21-975, chalcedony. (Photographed items coated with ammonium chloride powder.)

Cottonwood Leaf-shaped (Plate 16u). The diagnostic attributes of points in this type are an overall foliate outline, a rounded base, and convex lateral edges that may be serrated. This style is not common in interior southern California but increases in frequency of occurrence near the coast (cf. King *et al*, 1968).

The single specimen is of obsidian, measures 34 x 11 x 5 mm, and weighs 1.81g. It has serrated lateral edges and was found in the lowest level of Site 4-Riv-463 that yielded projectile points.

Desert Side-notched (Plate 16a-e)

Number of specimens: 5

Distribution: 4-Riv-463 (2); 4-Riv-464 (3)

Material: Chalcedony (2); chert (1); quartz (1); jasper (1)

Length: Maximum, 29 mm; minimum, 15 mm; average, 22.5 mm

Width: Maximum, 20 mm*; minimum, 12 mm; average, 16 mm

Thickness: Maximum, 4 mm; minimum, 3 mm; average, 3.3 mm

Weight: Maximum .98 g*; minimum, .55 g*; average, .76 g

Desert Side-notched projectile points were originally described by Baumhoff and Byrne (1959). They are small, thin, and triangular in overall outline. Lateral edges are usually straight to slightly convex. There is usually a single pair of notches in the lateral edges. These may be near the base of the point but frequently occur near the midpoint. The base may vary from straight to a deep V-shape, and there is frequently a single basal notch. The type is found in generally low frequency in sites in the immediate region that bear affinities to the San Luis Rey I and II phases described by Meighan (1954). In contrast, sites of the Cuyamaca phase in San Diego County (True, 1970) have a greater percentage of Desert Side-notched projectile points.

The Perris specimens are all either damaged or very fragmentary. Two of them resemble the Delta variety of Baumhoff and Byrne (1959); one appears to have been resharpened after the tip was damaged. Specimen 21-248 (Plate 16e) resembles the type Cottonwood Triangular in that two of the proximal lateral serrations are enlarged but slightly to form side notches.

Elko Series

Elko series projectile points are large, broad, and triangular. They are stemmed and are characteristically thin in cross section relative to the width. The series was first described by Heizer and Baumhoff (1961).

Elko Eared (Plate 16v). Points of this type are characterized by corner notches, an expanding stem, and a single broad basal notch. The lateral edges are sometimes slightly recurved. A single specimen consisting of a basal portion is from 4-Riv-464. It is of white chert. Length and weight are indeterminable; it is 30 mm wide and 7 mm thick.

Unclassified projectile points

Number of specimens: 3

Distribution: 4-Riv-202 (1); 4-Riv-452 (1); 4-Riv-464 (1)

Material: Chalcedony (2); sandy siltstone (1)

These points are essentially complete but do not conform to recognized types. Specimen 18-18 (Plate 16w) is roughly leaf shaped in outline and is of sandy siltstone. It measures 21 x 12.5 x 3.5 mm and weighs 99 g. It only superficially resembles the type Cottonwood Leaf-shaped. The material from which it is made is not susceptible to careful flaking and the roughly foliate outline of the point may thus be accidental rather than intentional. Specimen 16-168 (Plate 16x) is of red and gray chalcedony and is apparently a reworked distal fragment. The base has been unifacially flaked, and it has small side notches near the base. It does not, however, resemble the majority of specimens of the Desert Side-notched type. Specimen 21-975 (Plate 16y) is apparently a reworked basal fragment of a larger concave-based point. Depending on its orientation, it may be taken as generally symmetrical with a short contracting stem, or it may appear highly asymmetrical with a short contracting stem.

In terms of chronology, all of the classified projectile points except the single Elko Eared specimen are of types recognized as indicators of the late prehistoric period (Bettinger and Taylor, n.d.).

Scraper Planes

Scraper planes are unifacial implements flaked by percussion. They all have a flat or nearly flat planar surface that is usually called the base, and most examples are generally ovoid in outline. They

have a working edge along all or part of the basal perimeter. The edge is executed at an angle that is steep to the base, and the resulting implement displays a profile that is usually equal to or greater than one-half the greatest basal dimension (Johnson, 1966; Kowta, 1969).

Johnson (1966: 5-7) described scraper planes from site LAN-2 at Topanga Canyon in the Santa Monica Mountains and offered a tentative scraper plane typology based on earlier work by Treganza and Malamud (1950). This typology was used by Kowta (1969) to describe scraper planes in the Sayles Complex near Cajon Pass, San Bernardino County. The probable function of scraper planes has been discussed at some length, and the following suggestions have been offered: use in processing plant fiber and/or skin working (Rogers, 1939); as generalized multipurpose implements (Treganza and Bierman, 1958); and specifically for processing yucca and agave for food and fiber (Kowta, 1969; Hester and Heizer, 1972).

In terms of numbers, scraper planes are not an important category of artifacts in the collections from Perris Reservoir (Table 18). Only nine were recovered. Of these, two specimens conform to Johnson's Type IIA (1966:6); two fragments are considered parts of the working edges of scraper planes. Two tabular specimens and three of an elongate form are also classed as scraper planes because their edge angles and overall form, as well as abrasion on the base at the working edge and the presence of resharpening flake scars, suggest that they may have been used for a similar function.

Type IIA (Plate 17)

Number of specimens: 4

Distribution: 4-Riv-202 (3); 4-Riv-454 (1)

Material: Fine-grained igneous (1); banded chert (1); fine-grained granodiorite porphyry (1); banded medium-grained quartzite (1)

Dimensions: 5.2 x 4.7 x 3.3 cm; 7.1 x 6.6 x 4.4 cm (complete specimens only)

According to Johnson (1966:6), this type has a working edge extending around one-half to three-fourths of the basal perimeter. The remainder of the basal perimeter is unworked and consists of either a flake facet or the natural cortex of the rock. This is the most abundant scraper plane type at LAN-2 and is codominant with Johnson's Type IIB in the Sayles Complex (Kowta, 1969).

On the two complete examples from Perris, the angle of the working edge varies from about