

**ANTHROPOLOGICAL RECORDS**

**12:1**

**THE ARCHAEOLOGY OF CENTRAL CALIFORNIA  
I: THE EARLY HORIZON**

**BY**

**ROBERT F. HEIZER**

**UNIVERSITY OF CALIFORNIA PRESS  
BERKELEY AND LOS ANGELES**

**1949**

## PHYSIOGRAPHIC BACKGROUND

Central California comprises parts of three major physiographic sections (map 2).<sup>5</sup> These are, in order from west to east: (1) the California Coast Ranges; (2) the California Trough or Great Valley of California, sections of the Pacific Border province; and (3) the Sierra Nevada section of the Sierra-Cascade Mountains province. The California Trough or Great Valley section is further subdivided into four subsections called: (1) the Delta Country or Delta Tidal Plain; (2) the Victor Alluvial Plain; (3) the River Flood Plains and Channels; and (4) the Arroyo Seco Dissected Pediment. These four land forms have been produced by the Mokelumne River and other streams subsequent to the tilting of the Sierra Nevada block in the Pleistocene epoch.

The Mokelumne River, the stream most closely associated with the settlements of the Early Central California culture horizon, is one of the many drainways that flow westward along the tilted volcanic plain of the Sierra Nevada. It joins the San Joaquin River near that river's confluence with the Sacramento about twenty miles east of the head of Suisun Bay. The Mokelumne drains an area about 47 miles long and 16 miles wide and has a course about 130 miles in length. The lower or western portion of the Mokelumne River basin lies on the central valley plain in northern San Joaquin and southern Sacramento counties. Here on the plain the river grade is flattened to an average of two feet to the mile between the Sierran foothills and tide water, and in this reach the stream is commonly bounded by ill-defined remnants of natural levees along each rim of the river trench. Our site C.56 lies on one of these natural levees.

The Delta Plain forms the lower (western) part of the Mokelumne area. Under natural conditions, i.e., prior to levee building and land reclamation by draining, leveling and filling, it was a tidal marsh traversed by the meandering sloughs of the San Joaquin, Mokelumne, and Sacramento rivers. Most of the sloughs have now been confined by artificial levees and the enclosed "islands" reclaimed for cultivation. These "islands," if we disregard the sloughs, form an extensive and fertile plain of which the greater part is at or below mean sea level. Along the eastern edge of the Delta Plain and between the Mokelumne and San Joaquin rivers are six "blind" sloughs, which head near the zero or sea-level contour and extend westward into the south fork of the Mokelumne River. These are probably to be interpreted as remnants of abandoned distributaries of the Mokelumne which have been succeeded by the river as it formed the Victor Alluvial Plain and established its course farther north. The thick deltaic alluvium<sup>6</sup> is replaced in the marshy sea level island areas west of Lodi by peat

accumulation in excess of fifty feet thick. This depth indicates that the historic environment of sedimentation has prevailed for a considerable period, since tules do not grow in water much more than ten to fifteen feet deep and a conservative estimate places the period required for the accumulation of one foot of peat at about seventy-five years.

The Victor Alluvial Plain, lying above sea level and to the east of the Delta Tidal Plain, is from 12 to 16 miles wide, rising to the east between 5 and 8 feet per mile. The Victor Plain forms a relatively flat cone between Laguna Creek and the Calaveras River, the apex of the cone being situated close to the Mokelumne River where it debouches from its canyon. This cone is a typical alluvial fan built by an ancestral Mokelumne River. Upon this old cone are impressed several intermittent and ephemeral drains, which are old channels of distributaries on the initial slope of the plain. Bear Creek and Jahant Slough are the principal streams of this class. The surface of the central part of the Victor Plain is covered with brown alluvium which is underlain, at a depth of from 2 to more than 6 feet, by a partly consolidated substratum comparable to the older red alluvium of the upper (easternmost) portion of the Victor Plain where it abuts on the Arroyo Seco Dissected Pediment.

This dissected upland region is one of flat-topped mesalike ridges with broad, flattened summits of poor drainage and thin, sterile, red-colored soil strewn with coarse gravel and rounded stream cobbles. This intricately dissected pediment, 8 to 15 miles wide, which lies at the western foot of the Sierra Nevada, is most conspicuous at its eastern or Sierran margin; on its western margin, contiguous to the Victor Plain, it constitutes a belt 4 to 8 miles wide, with small rounded hills and ridges. These are the "red lands" of Bryan.<sup>7</sup>

Of the evidence of Sierran uplift to the east and subsidence in the Delta peat lands, Stearns says:

The conditions here afford an excellent illustration of the theory of isostasy, for long periods of unloading of the mountain block have always been followed by uplift, and subsidence has always accompanied the deposition and subsequent loading of the valley floor.

Archaeological site locations support Stearns's contention. The base of one of our sites (C.68) lies about four feet below present mean sea level. Since the present land level near the site is now at mean sea level and there is abundant evidence of intensive sedimentation which has buried the site, the only conclusion possible is that subsidence has occurred since occupation by the Early horizon group.<sup>8</sup>

<sup>5</sup>Taken largely from Piper, Gale, Thomas, and Robinson, 1939; Stearns, Robinson, and Taylor, 1930; Cosby and Carpenter, 1937; Bryan, 1923, pp. 7-45, 68-79. The geology of the whole Interior Valley is treated by Clark, 1929. Schenck and Dawson (1929, pp. 293-305) give an excellent survey of the geographic and biotic background of the region discussed here.

<sup>6</sup>At Thornton one well record shows 234 feet of alluvium.

<sup>7</sup>Stearns, *et al.*, 1930, pp. 15-25.

<sup>8</sup>Bryan, 1923, pp. 79-89. Stearns, *et al.* (1930, p. 32) says: "Evidence that subsidence has occurred in this area since the advent of the Indians is found in the mounds formerly inhabited by them that are now below sea level."

are limited to graves of either males or females. They occur with adult skeletons of both sexes and not rarely with skeletons of adolescents and infants.

Projectile points were occasionally made from clear quartz crystals. A C.107 grave produced a splendid specimen measuring 12 cm. long, type SAa (fig. 12,x).

The source of these crystals is unknown; it was probably the foothills of the Sierra Nevada to the east,<sup>30</sup> or the Lake County area to the northeast where clear crystals lacking plane crystalline faces occur naturally.<sup>31</sup>

The sharp edges of some crystals have been worn down, as clearly illustrated in figure 15,l,m,n. No obvious reason occurs to us for this.

#### MORTARS AND PESTLES

The stone mortar is present, though not abundant, in communities of the Windmillier facies. Schenck and Dawson report one fragment from C.68,<sup>32</sup> and the University of California recovered a rim fragment there in 1938. The first of these, of tough diorite, indicates a mortar with shaped exterior, rounded lip, and a diameter of about 22 cm. inside the cavity. The other piece, of vesicular basalt, is nearly identical with the first. C.142 and C.56 yielded no evidence of Early period mortars.<sup>33</sup>

Buried in the Early horizon clay stratum at C.107 was a rough cobble mortar made of an igneous rock. The disk-shaped cavity is 3 cm. deep and 13 cm. in diameter; it bears a heavy coating of iron oxide, which indicates its use as a paint grinder. The outside measurements are 18 cm. diameter and 10 cm. height.

Also from C.107 came an unusual mortarlike implement made of gray andesite, 8 cm. high. The upper or top surface (21.5 cm. x 25 cm.) is worn, as though the slab were originally a metate which was later used for a special purpose served by the long U-shaped groove. The groove is 60 mm. wide at the top, 53 mm. deep, and 20 cm. long; its sloping walls are highly polished. It is impossible to say what use this implement served or the manner in which it was employed.

A long, unshaped, subrectangular cobble of brown quartzite from the red clay subsoil of C.107 has been used as a pestle. It is 25.5 cm. long and 9 cm. in diameter. Only the point shows evidence of grinding, but the smooth, conical tip is clearly a pestle point which was worn in a stone mortar.

From C.107 came a pestlelike stone implement, a long, flattened cylinder, of blue amphibolite schist measuring 37.5 cm. long and 6.5 cm. in diameter. One end is rounded, the other has a chisel point. This schist is used only for charmstones in burials of the Windmillier facies,<sup>34</sup> and it

<sup>30</sup>Durrell, 1944.

<sup>31</sup>Information from Dr. Olaf P. Jenkins, Chief, Calif. State Div. Mines and Geology.

<sup>32</sup>Schenck and Dawson, 1929, p. 386. We recovered fragments of at least 8 mortars from this site in 1947.

<sup>33</sup>The intrusive Middle horizon burials of site C.142 were accompanied by stone pestles of the type used with a wooden mortar. See Lillard, Heizer, and Fenenga, 1939, pp. 8-9, 36-37.

<sup>34</sup>Site C.107, 70 specimens; site C.56, 1 example.

is probable that this implement is of ceremonial, rather than profane or utilitarian, significance. Numerous blue schist charmstones occurred with the same burial in which the pestlelike stone was found.

#### METATES AND MANOS

Two stone metates (pl. 5,e) from the red clay subsoil of C.107 may be attributed to the Early horizon. C.56 and C.68 yielded no metates. The two C.107 metates are fragmentary; roughly half of each remains. One is 16 cm. long, 25 cm. wide, 6.5 cm. thick at one edge and 2.5 cm. thick at the center. The grinding depression is ovoid, about 5.5 cm. deep. The other metate is 25 cm. long, 19.5 cm. wide, 4.5 cm. thick at the edge, and 1.5 cm. thick in the center. The edges have been worked so the shape is more or less squared and the bottom is smoothed. The depression is ovoid with the deepest point in the center.

In July, 1946, A. E. Treganza found a broken metate in C.142, but it was lost in transit. He describes it as having straight sides, a concave grinding surface, and a smooth-pecked flat bottom. It was dug from the mound mass and was not a burial accompaniment.

No distinctly recognizable manos have been found, but a number of round, flattened stream cobbles have been recovered which may have been so used. These are all roughly fist-size. From C.107 came a bifaced "mano" 11 cm. long, 7.5 cm. thick, and 11 cm. wide, with a wedge-shaped cross section. Another, of greenish quartzite, is round and flattened, 9 cm. in diameter and 4.5 cm. thick. The flat surfaces show peck marks rather than the smooth grinding surface which would result from metate wear. It is problematical whether this should be considered a mano or a small anvil.

#### FLAKED STONE IMPLEMENTS

Chipped implements (figs. 11-14), which are probably to be identified as projectile points and knife blades, are common burial accompaniments in graves of the Early horizon. The typology of chipped implements (fig. 11,a) follows that of W. D. Strong. It is not very satisfactory, since occasional examples do not strictly conform to the type. Such intermediate or doubtful forms are arbitrarily disposed of by assigning them to one or another shape group. The percentage of burials with chipped implements in Windmillier facies communities is as follows:<sup>35</sup> C.68, 41.2; C.107, 40.7; C.142, 31.1; C.56, 25.5. Site C.107 yielded 22 Early horizon burials with flaked implements of 5 types, and in decreasing order come C.68 with 21 burials and 12 types, C.142 with 14 graves and 7 types, and C.56 with 12 burials and 11 types.

Summarized, class NA chipped implements (fig. 11, b-w) occur as burial artifacts from each settlement, in a total of fifty-five graves; class NB has a single occurrence in C.56; class SA (figs. 12, 13, a-g) is noted in all

<sup>35</sup>After Lillard, Heizer, and Fenenga, 1939, pp. 12-13. Table 6 shows only types in burials. Two or more examples of one type often occurred in the same burial. This accounts for the discrepancy in totals between this and the three following tables which treat the total number of chipped implements recovered, regardless of association.

attractive color. C.107 yielded six burials with such pebbles; C.56, six; C.142, seven. The trait is present in C.68, but the number of grave occurrences is not recorded in Dawson's notes.

The pebbles are unworked and are therefore artifacts only in the sense that their natural form was such that they were picked up, retained, and considered of sufficient value as possessions to have been repeatedly selected as grave offerings. They can hardly have been slingstones, since they are too heavy. The stoneless floodplain might induce a man who happened to be in the gravelly area some miles to the east to carry back with him these nicely shaped and colored stones as curiosities.<sup>45</sup> They may have been weapons, serving as throwing stones, which a man carried with him for special purposes in hunting or war. Their employment in some ceremonial or magical context is not to be overlooked as a possibility, particularly since they repeatedly occur (as offerings?) with the dead.

#### BAKED-CLAY OBJECTS

The occurrence of hand-molded objects of fired clay in the Early Central California horizon is of considerable interest, not only because the trait can be construed as near-pottery in a presumably ancient horizon, but also because it may represent the germ of the Late Sacramento culture magnitude of molding and baking clay objects.<sup>46</sup>

My 1937 analysis of the baked-clay art of the lower Sacramento Valley is deficient chiefly on interpretative grounds because the three Central California culture horizons had not then been clearly defined. Instead of a simple twofold sequence, wherein the earliest horizon was recognized from only one site (C.107) and in addition was but ill defined,<sup>47</sup> we now recognize three successive culture horizons, each of which is known from a series of scientifically excavated settlements.

In emendation of my earlier hypothesis that the baked-clay trait is more or less directly derived from the ceramic complex of the Anasazi area, it is proposed here that the practice of Late horizon cultures of molding and baking clay objects may be an outgrowth of the small-scale practice originating in the Early horizon.<sup>48</sup> The following forms are known from Early horizon settlement deposits: C.107, 2 small (1 in. long), well smoothed, pecan-shaped balls with a cut or cord-impressed groove traversing the longitudinal exterior surface and 2 biconically shaped balls (fig. 16,i); C.68, 8 grooved pieces identical with the last except that they exhibit variations in length from one-half to one and one-quarter inches; a flat, thin, round disk with center perforation; 1 plain clay ball; and an angular piece with twined basketry impressions (fig. 16,g,h). No baked-clay objects were found with burials in C.56 and C.142, although the site deposits show evidence of baked-clay fragments and chunks which may

occasionally bear a smoothed surface indicating hand-molding. A large angular piece with twined basketry impression, in a private collection, is reported to have come from the surface of C.142, and there is little reason to doubt this in view of an almost identical piece from C.68 (fig. 5,f).

Middle culture horizon deposits produce a greater variety and frequency of baked-clay objects than Early horizon sites. S.66 yielded 1 flat perforated disk, one cache of 6 baked-clay objects in three matched pairs (2 longitudinally grooved and 4 loaf-shaped), 1 tute-impressed, and 3 plain, spool-shaped objects. The perforated disk and plain ball forms, known only from single occurrences in one Early horizon deposit (C.68), carry over to Middle horizon times, but the small pecan-shaped form with cut groove is unique to the Early horizon where it is known from only the C.68 and C.107 communities.

Late horizon sites excavated since 1937 by the Sacramento Junior College and the University of California<sup>49</sup> have yielded a great number of baked-clay objects all of which are in the University collection,<sup>50</sup> awaiting study.

In conclusion, it now appears likely that the Late Central California elaboration of the baked-clay art has a vertical or local, rather than horizontal or outside, derivation. But there remains the problem of the origin of the Early horizon baked-clay forms, rare as they are.<sup>51</sup>

#### BONE IMPLEMENTS

Only 59 bone implements<sup>52</sup> were recovered from the four communities of the Windmillier facies. In view of the amount of the deposit excavated and the number of burials found, it is apparent that bone was not a material particularly favored for implements in the Early period. The later cultures (Middle and Late horizons) operating in the same area apparently utilized bone more extensively, although in these horizons we may be dealing with the special factor of deeper refuse accumulation deposits containing larger numbers of discarded or lost implements. The nature of the deposits may partly explain the paucity of bone implements in Early Sacramento culture sites, yet in Middle and Late burials the bone objects tend to be more numerous and of more varied types than those of the Early horizon. This observation is submitted as evidence of significantly less interest of the Early people in bone as a tool material.

<sup>49</sup>In July, 1937, a University of California summer field party under the author's supervision excavated seven stratigraphic test pits in site C.6, the Late horizon focus of the baked-clay art. Several thousand baked-clay objects were recovered, each assignable to a 12-in. level in a stratipit. When these are analyzed, we should learn something about type sequences in the Late horizon, where the art reached its zenith.

<sup>50</sup>In 1947 Mr. Russell Newman, with a crew of eight University students, conducted extensive excavations at site C.6. His collection includes several hundred pounds of these baked-clay objects. New collections from Walnut Grove, Isleton, and west of Rio Vista will aid materially in defining the distribution of types of baked-clay forms.

<sup>51</sup>Cf. Ford and Quimby, 1945, pp. 31-32.

<sup>52</sup>Antler and bone implements are separately discussed. The total of 59 here, however, includes for convenience 3 antler implements of the flat spatula class from C.56 and C.107.

<sup>45</sup>This custom of carrying home unusual mineral specimens is known from other evidence (cf. the zincblende and malachite in site C.68, Schenck and Dawson, 1929, p. 394).

<sup>46</sup>For a general discussion see Heizer, 1937, which gives additional references.

<sup>47</sup>As presented by Lillard and Purves, 1936.

<sup>48</sup>See also Heizer and Fenenga, 1939, p. 383.

bone (fig. 18,d). Also from C.68 came three awls made from fortuitous splinters (lengths of 2 complete pieces, 11.5 cm. and 6.5 cm. respectively) and one awl of the split leg bone of some animal (coyote?), with a sharp beveled point. This piece is 16 cm. long and 9 mm. wide. Bird-bone awls made by grinding a beveled point like a quill pen occurred only at C.68. Four specimens were recovered by E. J. Dawson, but three of these may possibly be fragmentary whistles, the slanting break occurring at what appears to be the edge of the ovoid opening. The other piece, however, is definitely an awl of this type (fig. 18, l). From C.68 comes another slender awl of bird bone also from a fortuitous splinter; it measures 5 cm. in length and could not have served any heavy duty purpose. Generally speaking, awls recovered from settlements of the Windmillier facies are an unstandardized, scrappy lot which do not compare well with the abundant, well-made, basketry awls of Middle and Late horizon sites.

Flat bone or antler spatulae.--These pieces have been referred to as sudatores or strigils. Four examples are known, three from C.107 and one from C.56. Similar pieces also occur in some Middle horizon sites.<sup>56</sup>

The largest example is from C.107; although fragmentary, it is 39 cm. long, 3 cm. wide, and 3 mm. thick. It appears to be made of antler (fig. 17,f). A similar specimen from C.107, a fragment showing a curved cross section and rounded end, is 26 cm. long and 4 cm. wide and is also of antler. The third piece from C.107 is very thin, being fashioned probably from a scapula blade. It is 22.5 cm. long and 3.5 cm. wide at the broad end, tapering to a point at the other.

The C.56 spatula (fig. 17,e) is made of antler (probably elk) and is complete. It has a concave base and lenticular cross section and measures 32.8 cm. long and 4.5 cm. wide.<sup>57</sup>

Long bipointed cylindrical pins.--Four of these well-fashioned "pins" were recovered, two from C.107, two from C.142. The C.142 pieces (figs. 17,c, 19,f) are 28.2 cm. and 20.5 cm. long respectively; each is 8 mm. in diameter. The longest bears definite wrapping marks which appear to have been of a very fine twisted string. These binding impressions, occurring for about 4 cm. near one end, completely encircle the object, indicating that it was not bound to a shaft but was probably a wrapping to which feathers or some other decorative materials were affixed. The two fragmentary C.107 pieces are similar but show no traces of wrapping.

Flattened bone tools with blunt ends.--This appears to be a specialized Early culture horizon form. Six pieces come from three settlements (C.107, C.68, C.56). Three C.107 specimens came from one burial. All are fragmentary, now measuring 7.2 cm., 10 cm., and 11.5 cm. in length, 1.1 cm. average width, and 4 mm. average thickness. Two C.56 pieces (fig. 19,d,e) are somewhat curved and appear to have been formed from a split animal rib. They measure 19 cm. and 22.5 cm. long, respectively, and each is 1 cm. wide. One has a sharp point, the other is blunted. Since both are somewhat irregular (i.e., broken or unfinished) on the broad end, it may be that they were originally perforated. If so, they would fit the classifica-

tion of the pieces described below as "perforated, flat, thin, long needles." The C.68 piece (fig. 18,c) was found in the mound mass without association; it is 14.2 cm. long, 1.2 cm. wide, and 5 mm. thick.

"Dagger" of cannon bone.--This unique Early horizon piece from site C.56, represented now by the handle end fragment, is formed from a split cannon bone with the epiphysis nicely ground down (fig. 18,e). It is 8.2 cm. long and 3 cm. wide; the original length may have been as much as 20 cm. Its function may have been that of a dagger or perhaps a scraper but its use cannot now be determined, since the working point is missing.

Long cylindrical or elliptical pins.--Five pieces of this class were recovered, four from C.107 and one from C.56. Two of the C.107 pieces (shown in fig. 19,c,g) are now lost<sup>58</sup> but their measurements are recorded as 22.5 and 20.0 cm. long with an elliptical cross section 17 mm. by 14 mm. The remaining specimens are, respectively, 29.2 cm. and 21.8 cm. long with one pointed end and one flattened or beveled end (figs. 17,d, 19,a). The central diameter of each is 9 mm. The C.56 piece of this class (fig. 19,b) is 23 cm. long.

Wide, heavy, split animal-bone tools.--The two examples of this group come from C.107. These are rough service implements, judging from their rugged construction. Of flattened cross section, with one end rounded to fit the hand and the other pointed for a working tip, they may even have served as weapons. Both are now fragmentary, measuring about 20 cm. long, 1.5 cm. wide, and 1 cm. thick.

Bipointed gorge hook.--This is the sole evidence for bone gorge hooks of the Early horizon. The piece (fig. 18,b), measuring 8.8 cm. long, 10 mm. wide, and 5 mm. thick, was found dissociated in the deposit mass of C.56.

Single-piece curved fishhook.--A single specimen (fig. 18,f) came from the burial of an adolescent male (No. C.9) in C.68. It is unlike other single-piece bone or shell fishhooks from the Santa Barbara and Humboldt Bay localities, which are the only sites outside our area known to yield such hooks.<sup>59</sup>

The hook lay in the grave with a notched bone "point" lying along the shank of the hook proper in such a position as to suggest that the two were originally bound together.<sup>60</sup> The hook itself is 6 cm. long and 22 mm. from tip to outside of shank; the end is somewhat enlarged to permit attachment of the line. The bone "point" is described below.

The only other single-piece curved bone fishhook known from our area comes from site C.117, a Late horizon settlement. It is in the private collection of Mr. S. Martine of Sacramento.

Notched bone "point."--This is a difficult piece to describe, and the reader is referred to the illustration in

<sup>56</sup>Between 1940 and 1942 a number of complete artifacts were stolen from the Lillard Collection, which in this period was in the Sacramento Junior College without curatorial supervision. Among the stolen pieces were all of the phallic charmstones, several obsidian blades, and a number of bone objects.

<sup>59</sup>Santa Barbara types are illustrated by Gifford, 1947, p. 110; Woodward, 1929; Robinson, 1942; and Orr, 1947, p. 127. The Humboldt Bay hooks, of bone, are in the collection of Dr. H. H. Stuart of Eureka. Examples are on exhibit in the State Indian Museum, Sacramento.

<sup>60</sup>As illustrated, Lillard, Heizer, and Fenenga, 1939, p. 66, pl. 20, k.

<sup>56</sup>Lillard, Heizer, and Fenenga, 1939, pp. 45, 48, 51 (listed as "sudatores"). See also Gifford, 1940, p. 172.

<sup>57</sup>Illustrated, *ibid.*, pl. 10, j.