

Familiar Artifacts in Artificial Stone: The Baked Clay Tradition of Prehistoric Northern California

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Abstract

The baked clay tradition of prehistoric northern California is examined. Production and use of baked clay artifacts began at least 5,000 years ago and persisted into the late prehistoric period. Throughout, the items were small, hand-modeled pieces baked in open hearths. Baked clay artifacts were produced for household personal gear and also for trade, used heavily but not exclusively by groups dwelling in stone-poor regions and resource-stressed contexts. Prevailing interpretive models that cast baked clay as a pottery precursor force us to ask why the region's prehistoric peoples did not make pottery. We should be asking why prehistoric peoples did make familiar artifacts in artificial stone.

Introduction

My purpose here is to draw attention to the prehistoric baked clay tradition of northern California. I address an area encompassing the Sacramento River watershed and Sacramento/San Joaquin Delta (Figure 1). I begin with a few definitions then describe four key types: anthropomorphic figurines, zoomorphic figurines, vessels, and cooking balls. The nature, extent, and variability of the region's prehistoric baked clay tradition is revealed as I track the distribution of the four types across space and through time and consider the evidence and arguments for production and function. I summarize 11 additional important but less common types. At the end of the article, I briefly reconsider evidence for the antiquity and chronology of baked clay use and rethink prevailing interpretive models.

Distribution of Clay versus Rock

Clay is a fine to ultrafine grained material that originates in stable depositional environments and forms as a product of in-place weathering of inorganic constituents combined with decomposition of organic constituents which introduces additional compounds and minerals along with binding humates and carbonates. Clays develop over time on stable landforms, and relative clay content is generally determined by the period of residence of a soil at or near the surface where it may be exposed to weathering. Colluvial clay deposits can be subject to erosion, and some of northern California's most important clay deposits were formed by erosion of primary soil deposits and subsequent sorting and redeposition of clays in low-energy floodplain basins. Clays suitable (malleable and plastic) for ceramic manipulation were widespread in the lower reaches of the Sacramento River watershed and Delta region (Dietrich 1928).

Intensive prehistoric production of baked clay occurred in the "stoneless" reaches of the alluvial bottomlands of the Great Central Valley, far out on the plain and well removed from rock supplies found in the bracketing foothills and extending into the valley in association with creek and river debouches. The principal stoneless reach is associated with the Delta region of southern Sacramento and western San Joaquin counties (Figure

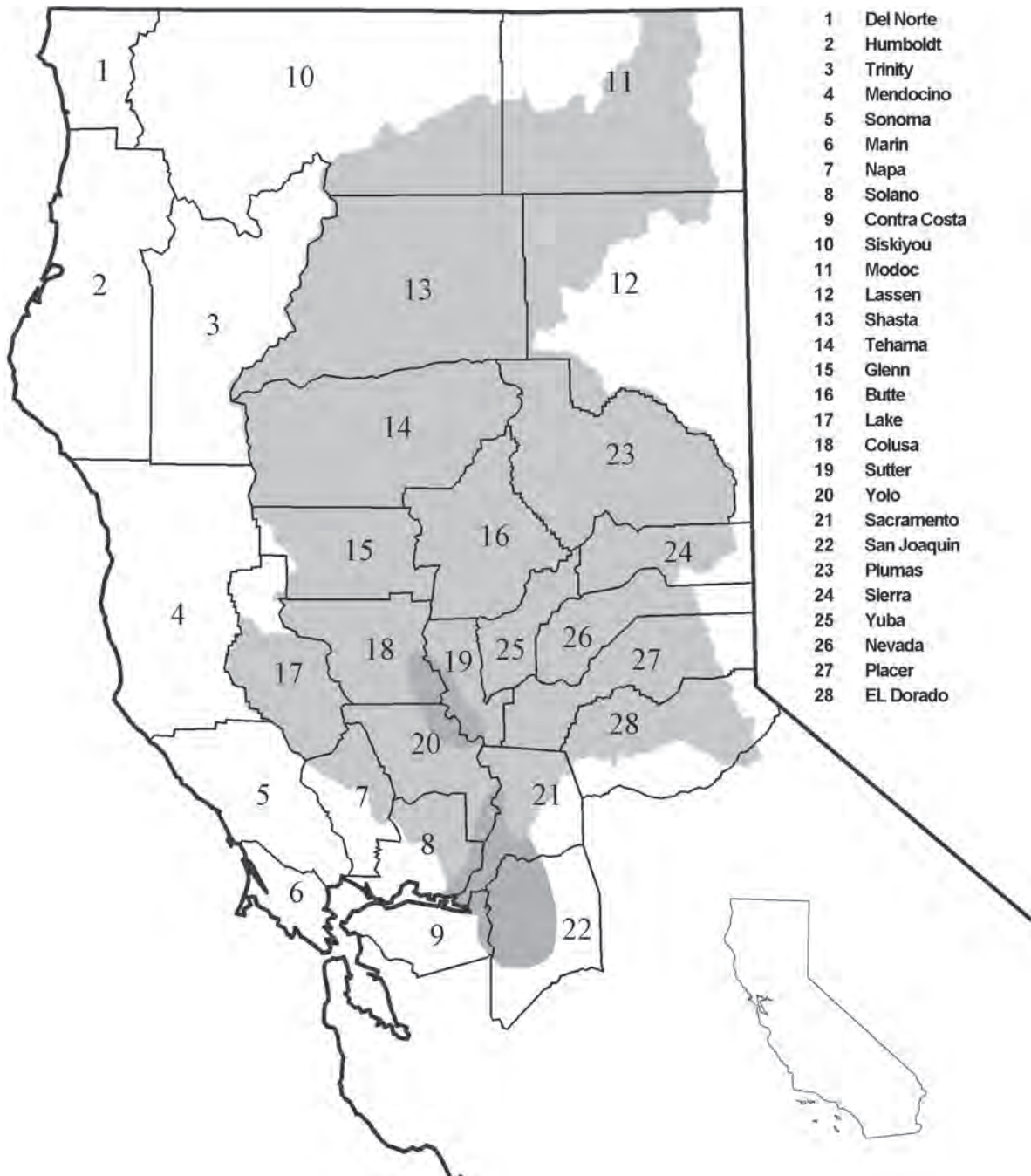


Figure 1. The northern California study area. The Sacramento River watershed is shown in light gray, and the stoneless Delta region and the Colusa-Sutter-Yolo basins are shown in dark gray.

1). A second stoneless reach occurs north of the Delta in portions of Yolo, Sutter, and Colusa counties, where the Sacramento River is contained in a silty, clayey basin to the latitude of central Colusa County. Here the Willows Fault marks a change in the river's bedload, from mud to Tertiary-aged rocky alluvium (Almgren 1978; Harwood and Helley 1987).

Baked Clay versus Fired Earth

In keeping with a fundamental distinction introduced by the earliest researchers and articulated best by Cook and Treganza (1950) and Cook and Heizer (1951), I make a distinction between baked clay and fired earth. "Baked clay" is here defined as objects made from clayey sediments intentionally modeled and deliberately fired, as well as pieces representing by-products of this process. "Fired earth" is defined as a product of the human use of fire which intentionally or unintentionally affected native soils.

Of the two, fired earth is by far the more widespread, common, and bulkier archaeological constituent. Most examples cited in the literature are found at settlement sites and are attributable to hearth lining, house floors, wall daub, and smoke hole packing related to the region's common prehistoric method of domicile construction (Heizer and Fenenga 1939:389; Treganza and Cook 1948; Riddell 1960; Schulz et al. 1979; Chartkoff and Chartkoff 1983; White 2002). Fired earth is generally derived from local soil, in which case the parent material is indicated by variation in grain size, presence of worm holes and fine root tracks, and impressions of fine organics typical of soil. Cook and Treganza (1950) argued that the mound mass of many Central Valley sites is primarily composed of soil, peat, and mud imported by the basket load to pack floors and walls (Treganza and Cook 1948). Fired grub stage mud dauber (*Scelipron caementarium*) nest fragments representing food waste (e.g., Barrett 1952:109; White 2002:372) are also here considered fired earth.

I have used the term "ceramics" in the past (White 2002, 2003) for what Griset (2008) terms "baked clay." I now accept Griset's distinction: "baked clay" has a long history of professional use. The baked clay objects described here are characterized by considerable local variation in grain, texture, and color; much of this variation can be attributed to local manufacturing regimes tapping different local sources. All researchers report objects made by individual hand modeling. Small average size of the products, prevalence of rounded forms, and presence and placement of finger and palm impressions indicate the artifacts were made using moist clay shaped by squeezing, rolling, and pinching with the fingers and hands. There is scant evidence of coiling, and even layering or folding was uncommon. There are some composite forms made with separate clay pieces stuck together before firing or incorporating non-clay elements stuck into the clay or socketed into holes made before firing. Grass and grain temper is infrequent, and no pattern has been observed in its application.

Archaeological associations point to baking in open fire hearths, and no ovens or cowls have been identified. Many researchers report definite associations between morphological types, color, grain, and hardness, indicating that specific controls were applied during the manufacture of specific types and classes of baked clay. Generally, modeled forms exhibit smooth finish, fine-grained exteriors, light red to light grey color, and consistent medium-hardness (Mohs 4–6). Color ranges vary locally based on the proportion of certain compounds and minerals in the parent deposits, especially carbon (generates black to grey baked clay), iron (generates red-phase baked clay) and calcium carbonate (produces lighter-colored baked clay). Many objects exhibit patchy smudge marks of dark charcoal stain related to inefficient burning or baking on charcoal.

No universally accepted chronological scheme exists for northern California. The unique culture history of each district is stitched loosely to that of its

neighbors, despite a half-century effort at unification. Most modern scholars still use the original 3-Horizon system (Heizer and Fenenga 1939; Beardsley 1954) of Early, Middle, and Late, albeit recently replacing “Horizon” with “period.” I use Fredrickson’s (1974, 1994a, 1994b) California adaptation of the Willey and Phillips (1958) Period and Stage system, with those adjustments necessary to reconcile calibrated absolute dating (White 2002:42–44). This approach generalizes broad historical trends while still recognizing that different adaptations coexisted inside and outside the same and adjoining regions.

History of Scholarship

Early ethnographers and journalists occasionally recorded baked clay artifacts in northern California. For example, in 1877 Powers (1976:433) noted a small, button-shaped, clay spindle in the possession of a collector from Freestone, Sonoma County. Baked clay artifacts were described by H. C. Meredith of Stockton, whose chapter on the archaeology of central and northern California appeared in Moorehead’s (1900) survey of North American archaeology. Describing his own and other amateurs’ collections, Meredith (1900:284) noted that “in the San Joaquin and Sacramento Valleys occur various forms, balls, discs, perforated discs, bell-shaped, spool-shaped, and pestle-shaped, etc., all of pottery.” Meredith (1900:291) also described a “biscuit-shaped” object of baked clay found in a cremation area near Ukiah, the object consisting of a clay shell containing a baked nut cake.

W. H. Holmes (1902), after having recently gained the helm of the Smithsonian Institution’s Bureau of American Ethnology (see also Hinsley 1981:263–289), extended the institution’s archaeological survey to the West Coast with a fact-finding California tour focused on reputed “Paleolithic Man” sites, but he also inspected some of the same collections reported by Meredith. Holmes (1902:177) pointedly avoided the term “ceramics” in his report, which noted a large number of globular,

discoidal, and dumbbell-shaped baked clay balls, “some of which may have served for use in slings.”

In his monograph, *Mound Excavations Near Stockton*, Jones (1923) reported on the results of a loose consortium of amateur archaeologists whose efforts yielded prehistoric artifacts, features, graves, and a preliminary culture chronology. The collections, including materials observed by Holmes and reported by Meredith, contained numerous baked clay artifacts. While Jones’ report was generally light on detail, baked clay artifacts received special treatment with attentive, if anecdotal, descriptions and interpretations.

The three previously noted studies have now set a number of our current perceptions in motion. For example, Holmes (1902:163) identified the Delta region’s ubiquitous clay balls as sling projectiles. Kroeber dismissed this interpretation in his Editor’s Preface to Jones (1923:114–115), instead supporting Jones’s conclusion that the balls were “substitutes for cooking stones in an alluvial region.” Elsewhere, Kroeber (1925:537–538) remarked on the unique prehistoric clay cooking balls of the stoneless Delta plains and also addressed the production of pinch-pots among the Clear Lake Pomo and Yokuts. A decade later, in an oblique reference to ongoing work about to be published by Heizer and others, Kroeber (1936:110–113) noted archaeological evidence for baked clay use in the Early period followed by a more extensive industry in the Late period.

Schenck and Dawson (1929:359–368) described their own collection and previously reported Meredith and Jones collections, as well as a collection from the Stockton area (the Barr collection). Schenck and Dawson (1929:359–408) provided the first systematic typology of baked clay, a well-argued analysis based on feature association, spatial and temporal distribution, and solid interpretations of baked clay production and use. They identified ear tubes, beads, ring-shapes, pipes, bowls or cups, balls, and a distinctive

assemblage of zoomorphic figurines, and they offered a classification of decorative attributes.

Heizer (1937) published the first study solely dedicated to the baked clay objects of the lower Sacramento Valley. His classification closely paralleled that of Schenck and Dawson's (1929), but his interpretations were based on the examination of more sites including CA-SAC-6, the Johnson Mound, a key site along the Cosumnes River south of Elk Grove and west of Wilton. However, Heizer's (1937:39) strident declaration that baked clay was restricted to the Late Horizon and was absent from the Early and Transitional horizons, though initially supported by Lillard and Purves (1936) for the Deer Creek-Cosumnes area, was later rejected by Lillard et al. (1939:75) in their synthesis of central California prehistory. Baked clay was only occasionally found in Early Horizon contexts and increased in frequency and diversity during the Transitional Horizon, while "an elaboration in forms, shapes, uses, etc. of objects of baked clay" was to be found in Late Horizon times (Lillard et al. 1939:79). That same year, Heizer and Fenenga (1939:footnote 9) also corrected the earlier statement and identified baked clay in all three central California horizons. In addition, they identified a new functional type, the ear spool, and a new concept, the Bird Cult, linked to the localized appearance of zoomorphic effigies originally reported by Schenck and Dawson (1929) for sites near Stockton.

This initial phase of scholarship ended with Heizer's (1949) summary of Early Horizon traits and with Ragir's (1968) dissertation, which provided details on baked clay associations and contexts for two key Early sites, CA-SAC-168 (the Erich Mound) and CA-SJO-68 (the Blossom site). The literature on baked clay then diverged into two contrastive paths, one tracking archaeological evidence for baked clay anthropomorphic figurines and the other focusing on a now-virtually untapped body of data on clay as a cultural and natural constituent of mound mass. These two topics and their related literature are covered below.

In recent decades, with a shift in the archaeological enterprise from academic research to cultural resource management only three focused studies have appeared in print. Kielusiak (1982) provided a solid classification and inventory of the baked clay assemblages of the San Joaquin/Sacramento Delta region. Johnson (1990) made a case for a Cosumnes Brownware Tradition composed of vessels from this same Delta region. Griset (2008) offered a general survey of the California baked clay evidence. There are surprisingly few modern cultural resource site reports containing descriptions and interpretations of baked clay objects and assemblages. I cite the latter sparingly here, relying on four reports that document large baked clay assemblages generated by water-screen field recovery (Wilson 1979; White 1984, 2002, 2003).

Baked Clay Artifacts

Comprehensive baked clay classifications appear in Schenck and Dawson (1929), Heizer (1937), and Kielusiak (1982). I generally follow the Schenck and Dawson classification here but depart to an extent by considering anthropomorphic figurines in the context of overall baked clay production.

Anthropomorphic Figurines

The scholarly record of baked clay anthropomorphic figurines is unlike that of any other California artifact type, with a large number of smaller reports forming a mosaic that leaves the overall pattern difficult to comprehend. Leaving aside specimens reported from California's northwest coast in Humboldt County (Mills 1952; Heizer and Pendergast 1955) and from areas south of San Joaquin County, 60 anthropomorphic figurines and fragments are known from northern California. Heizer and Beardsley (1942) reported two from Shasta County and four from Marin County. Wallace and Taylor (1952) described a possible baked clay appliqué breast from excavations at a Siskiyou County rockshelter. Heizer and Pendergast (1955)

described seven figurines from the current study area, four from Marin County (CA-MRN-168), and three from Sonoma County (CA-SON-299). Beardsley (1954:52) provided details on the provenience of the three Marin County specimens earlier noted by Heizer and Beardsley (1942) and reported a possible figurine fragment from the Cauley site (CA-MRN-232). Davis (1959) reported five new specimens from Marin County and one from the Johnson Mound (SAC-6) in Sacramento County. Elsasser (1963) reported a second example from the Johnson Mound and another specimen from Marin County. Elsasser (1978) contributed a report on a baked clay figurine fragment from a Sierra County private collection. Goerke and Davidson (1975) listed 40 Marin County specimens including 28 mentioned in previous reports and 12 newly identified in their work. Fenenga (1977) cited a 1924 newspaper report of a baked clay figurine found at a Marin County shellmound on the Tiburon Peninsula. Kielusiak (1982) identified two unique figurines from CA-SAC-267.

Reports of baked clay figurines are also found in larger site reports. Olsen (1963) described two baked clay figurines from the King Brown site (CA-SAC-29). Riddell (1960:58–61) identified eight baked clay figurine fragments in his Karlo site (CA-LAS-7) collection. King (1967) reported three figurines from CA-MRN-192 on the Marin bayshore. White (2002) reported two anthropomorphic baked clay figurine fragments from the Redbud site (CA-LAK-72) near Lower Lake, Lake County.

Numerous reported specimens are set aside here. Two are too fragmentary to classify; these are specimen 1-153165 reported by Heizer and Pendergast (1955:181) and specimen 92-37-5846 reported by White (2002:370). Ten are too poorly reported to accept uncritically, two from MRN-192 (McBeath 1966), one from CA-MRN-357 (King et al. 1966), one from CA-MRN-158 (Goerke and Davidson 1975:21), two from MRN-168 (Melander and Slaymaker 1969),

and four from the Miller Creek site (CA-MRN-138) in San Rafael (Goerke and Davidson 1975:10). Two cited by Kielusiak (1982) from CA-SAC-267 are reassigned herein as zoomorphic figurines. Finally, six specimens from private collections lacking specific provenience are too problematic to use: one reported by Elsasser (1978) for Sierra County; one reported by Fenenga (1977) for Marin County; and four reported by Heizer and Beardsley (1942) (including two from Marin County and two from Shasta County).

Description

All 41 examples reviewed for this study are “palm-sized.” The majority of specimens are medial or distal fragments. Thirteen complete or substantially complete specimens average 53.6 mm long, 31.0 mm wide, and 15.1 mm thick, and there is little variation from these averages among the fragmentary examples. Overall morphology leaves no doubt that these are human forms. Specimens complete enough to allow for gender determination exhibit pronounced female breasts (3.0–9.0 mm high). All examples are trunks lacking limb elements. However, a few examples have features suggesting composite construction; impressed grooves around the neck may have served to attach a head element (e.g., White 2002:Figures 163 a, b), bilateral holes in the shoulder area may have served to socket stick arms (Heizer and Pendergast 1955:Figure 63e), and holes in the base that may have served to socket stick legs (Riddell 1960:59).

No comprehensive classification has been offered to date, but there are three obvious natural types: Rod-shaped, Tabular-shaped, and Disk-shaped. A chronology may be proposed.

Rod-Shaped Figurines

These “cigar-shaped” objects (Figure 2) were made from rolled clay. Fourteen specimens have been identified. Complete examples fall between 40 and 70

mm in length and 15 to 25 mm in thickness. The type is defined by thickness, specifically thickness more than 70 percent of width. All five examples complete enough to determine sex represent the female form; three have pinched breasts, and two have appliqué breasts. Only three of the 12 specimens are decorated; all three have vertical to diagonal alignments of punctates or thin, zig-zag incised lines between the breasts which appear to depict hanging bead strings or ornament dangles. One of these also has a red ocher stain.

Tabular-Shaped Figurines

Tabular-shaped figurines (Figure 3) were made from a flattened clay ball with modifications confined to the ventral surface. Fourteen specimens have been identified. They are rectangular in plan view, and width is less than or equal to 30 mm. The six that are complete fall between 29 and 61 mm long, 21 to 28 mm wide, and 11 to 16 mm thick. Six complete enough to determine sex are female, all with pinched breasts; three exhibit punctate nipples.

Four have punctate navels, and all but two have decoration representing dress and/or adornment. Eight have punctate decoration, and three have impressed line decoration; only one has both. Generally, decorations consist of “bead string” representations with vertical lines and zig-zags hanging between or wrapping around breasts or vertical and diagonal incised lines below the midsection indicating a skirt. Three have “belt-like” grooves around the midsection.

Disk-Shaped Figurines

Disk-shaped figurines (Figure 4) were also made from a flattened clay ball with modifications confined to the ventral surface. Thirteen specimens have been identified. They are characterized by width greater than 30 mm, and width-length ratios generally greater than .70 (width 70 percent or more of length). Complete specimens fall between 41 and 65 mm long, 32 to 51

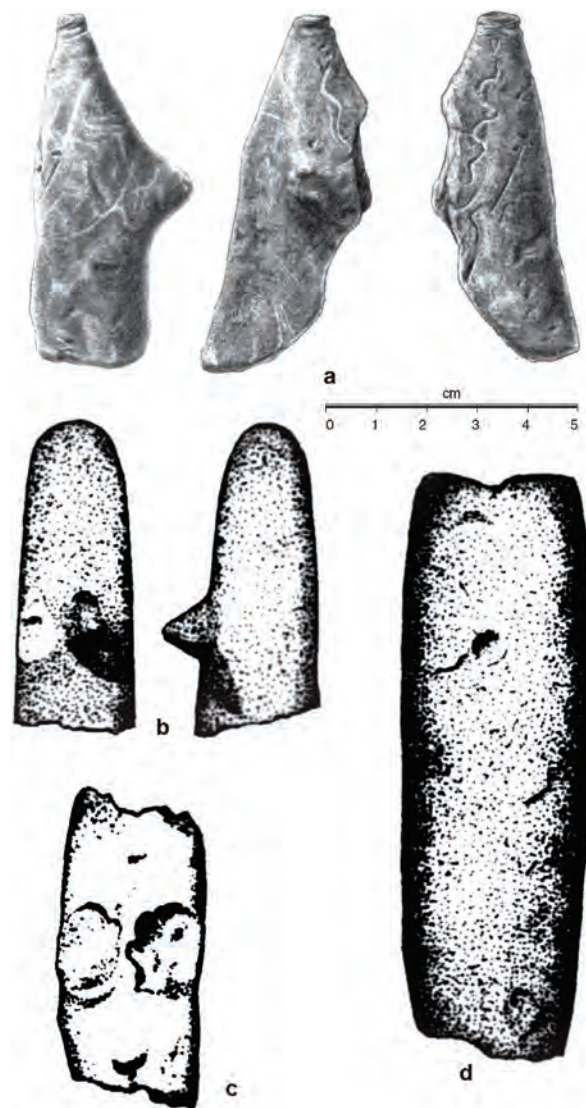


Figure 2. Rod-shaped figurines. (a) CA-LAK-72 (White 2002: Figure 163); (b-d) CA-LAS-7 (Riddell 1960: Figure 14).

mm wide, and 12 to 23 mm thick. Eleven complete enough to determine sex are female, one with appliqué breasts and 10 with pinched breasts; three of the latter have punctate nipples. Two have punctate navels. Eight have decorations, one with red pigment lines between the breasts and across the trunk, and five with “bead string” representations consisting of horizontal punctates around the neck or breasts or vertical lines and zig-zags hanging between or wrapping around the

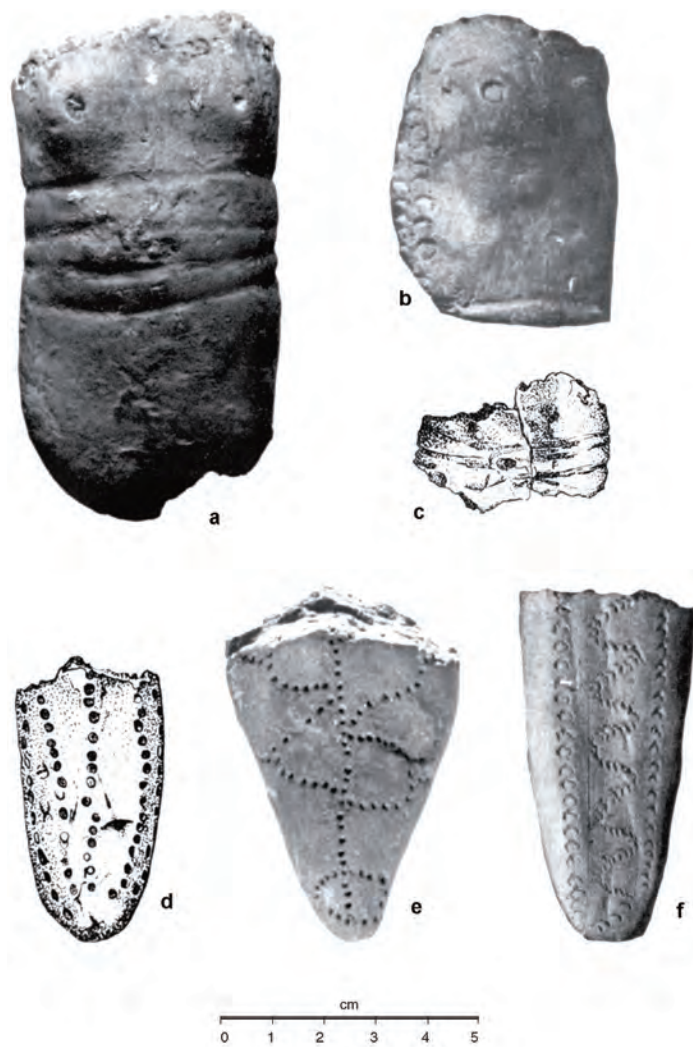


Figure 3. Tabular-shaped figurines. (a) CA-MRN-365 (Elsasser 1963:Figure 1b); (b) CA-MRN-192 (Goerke and Davidson 1975:Figure 8); (c) CA-MRN-80 (Davis 1959:Figure 1f); (d) CA-MRN-232 (Davis 1959:Figure 1e); (e) CA-SAC-6 (Elsasser 1963:Figure 1a); (f) CA-MRN-3 (Goerke and Davidson 1975:Figure 12).

breasts. Five examples have very distinctive impressed horizontal grooves across the trunk representing "belt-like" apparel.

Distribution

Rod-shaped figurines are the most widespread and dispersed, with eight from Lassen County, two from Lake County, two from Marin County, and two from Sacramento County (Heizer and Beardsley 1942; Davis 1959; Riddell 1960; Goerke and Davidson 1975; White 2002). They are also the oldest type, with ten specimens from LAS-7 and LAK-72 recovered

from stratified deposits attributable to the early to late phases of the Upper Archaic, spanning approximately 1200–3200 BP (e.g., Riddell 1960:58–61; White 2002:370–371). Specimens from the King Brown #1 site (SAC-29) in Sacramento, the Estero site (MRN-232) on Drakes Bay, and MRN-192 in the Marin County interior are from mixed deposits primarily attributable to the late Upper Archaic through late Emergent, with no more specific assignment possible (Olsen 1963:170–173; King 1967; King et al. 1970).

All 14 Tabular-shaped specimens are exclusive to Marin County (Heizer and Beardsley 1942; Heizer

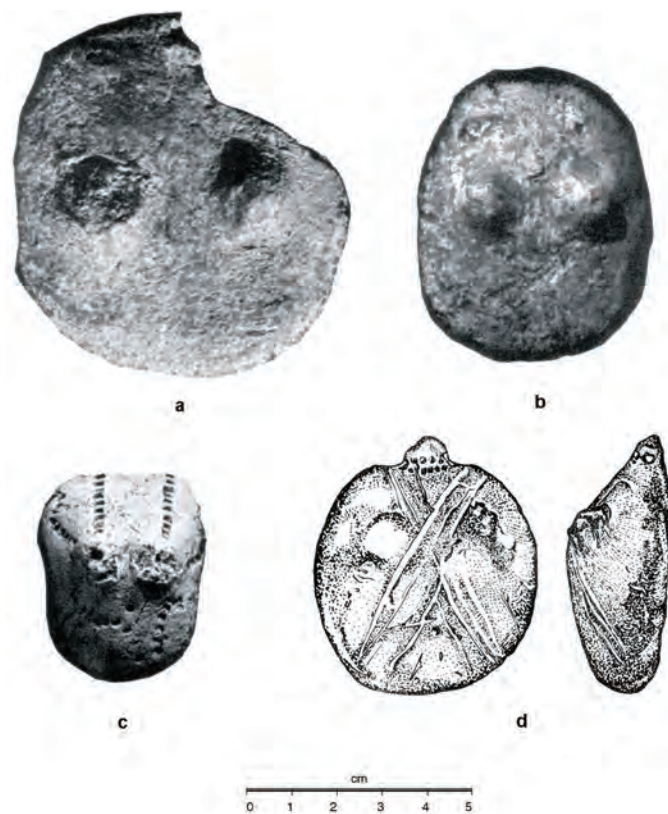


Figure 4. Disk-shaped figurines. (a) CA-MRN-170 (Goerke and Davidson 1975:Figure 6); (b) CA-MRN-365 (Goerke and Davidson 1975:Figure 11); (c) CA-MRN-365 (Goerke and Davidson 1975:Figure 12); (d) CA-MRN-124 (Davis 1959:Figure 1a).

and Pendergast 1955; Davis 1959; Elsasser 1963, 1978; King 1967; Goerke and Davidson 1975). Those with solid provenience and dating, for example, three from CA-MRN-192 (King et al. 1970), two from the Pacheco site, CA-MRN-152 (Goerke and Davidson 1975; Goerke and Cowan 1983), one from MRN-232, the Estero site (Davis 1959), and one from CA-MRN-170 (Chavez 1976), occur in contexts dating to the late Upper Archaic to Emergent McClure and Estero Facies (Beardsley 1954:52; Goerke and Davidson 1975).

Disk-shaped figurines were widespread in central California, including two specimens from Sacramento County, three from Sonoma County, and eight from Marin County (Heizer and Beardsley 1942; Heizer and Pendergast 1955; Davis 1959; Elsasser 1963; Goerke and Davidson 1975). Disk-shaped examples from excavated contexts, including three from the Bodega Bay site, SON-299 (Meighan 1953; Heizer and Pendergast

1955), two from the McClure site, CA-MRN-266 (Heizer and Beardsley 1942; Beardsley 1954), and two from SAC-6, the Johnson Mound (Schenck and Dawson 1929; Heizer 1937; Davis 1959; Elsasser 1963), date to the terminal Upper Archaic to Emergent periods, spanning approximately 1200 BP to Contact.

Interpretation

North Coast Ranges ethnography contains several accounts of clay figurine use. “Clay dolls” are reported for the Pomo (Barrett 1952:350–351), and clay “images of men and women” were made by the Chimariko (Silver 1978:208). Also reporting on the Pomo, Loeb (1926:191) mentioned baked clay “dolls” with modeled breasts placed in miniature cradles by women seeking pregnancy. Kelly (1978b:421–422) recounted a Coast Miwok boy’s initiation ceremony involving clay figurines and dance house rites. In

keeping with the creation theme, many ethnographic accounts contain a reference to Coyote modeling the first humans from earth, clay, or mud (e.g., Kelly 1978a:24). Based on ethnographic analogy, Heizer and Beardsley (1942:205) proposed that a widespread fertility concept involving manipulation of clay figurines existed in prehistoric northern California.

The strongest evidence supporting the Heizer and Beardsley hypothesis is provided by the archaeological specimens themselves. Decorative motifs found on the figurines are clearly meant to convey the dress, regalia, and ornamentation typical of adult females of the California culture area. About half of the decorated figurines have “bead strings” represented by horizontal punctate lines around the neck, across the upper chest above the breasts, or vertically between the breasts. The remaining specimens have impressed lines, including narrow cuts and zig-zags mimicking these same arrangements. The most distinctive decoration appears on Disk-shaped and less often Tabular-shaped examples: one to three broad, horizontal grooves wrapping across the trunk below the breasts (Figure 3a–c). Elsasser (1963:119–120) considered this a depiction of the traditional costume worn by pregnant women, but the form also appears similar to the belt worn by women carrying a cradle board or burden basket slung to the back (Rawls 1984:174, 194). In this same vein, Goerke and Davidson (1975:10) drew an interesting parallel between the decorative patterns evident on some clay figurines and ethnographic reports of the body painting patterns applied by Pomo women during fertility rituals.

Heizer notes a similarity in form and decoration between the baked clay figurines and the carved and painted stone tablets of the Napa district (Heizer and Pendergast 1955:184–185). Both artifact classes share closely similar dimensions, tabular form, and dot, panel, and zig-zag decoration. The stone tablets of Napa and adjoining valleys (Meighan et al. 1953:283; Arnold and Reeve 1959) date to the Emergent, Phase

2 (Bennyhoff 1994). This indicates that figurine forms in the Napa district may have terminated with abstract carved and painted sandstone tablets among the ethnohistoric Patwin. In a parallel case of late stone figurine use (Gifford and Kroeber 1937:183), the Pomo made miniature cradles containing “baby” figurines carved from magnesite. These were hung in dance houses by women hoping to induce fertility.

Zoomorphic Figurines

Zoomorphic figurines have been reported by relatively few authors and from only a handful of northern California sites; the total stands at 235. The first and most substantial zoomorphic figurine assemblage was described by Schenck and Dawson (1929), who identified 202 specimens. An additional 18 fragments were reported by Wilson (1979). A dozen more were reported by (White 2003), and three additional specimens were noted by Keilusiak (1982), including two interpreted here as zoomorphs.

Description

Varied animal forms have been identified. The aviforms are either full bodies with heads or head-and-neck shapes. The full body specimens were made by first rolling a conical taper, pinching the wide end to make the body, next bending the neck to form a curve, or “S-shape,” and finally pinching the head (Figure 5). One specimen is either an animal head with erect ears or a bird body with open wings (Schenck and Dawson 1929:Plate 86, 1). A few specimens are heads only, with finished and rounded necks, suggesting they could represent parts of composite artifacts incorporating non-clay body elements (Figure 5s–v). However, most of the zoomorphic figurines identified to date are fragmentary, and in many cases just a neck, head, or body is represented. A few examples show additional detail modifications around the head, for example shallow punctures to represent eyes (Figure 5v) and pinched topknots or crests. Schenck and Dawson (1929:365)

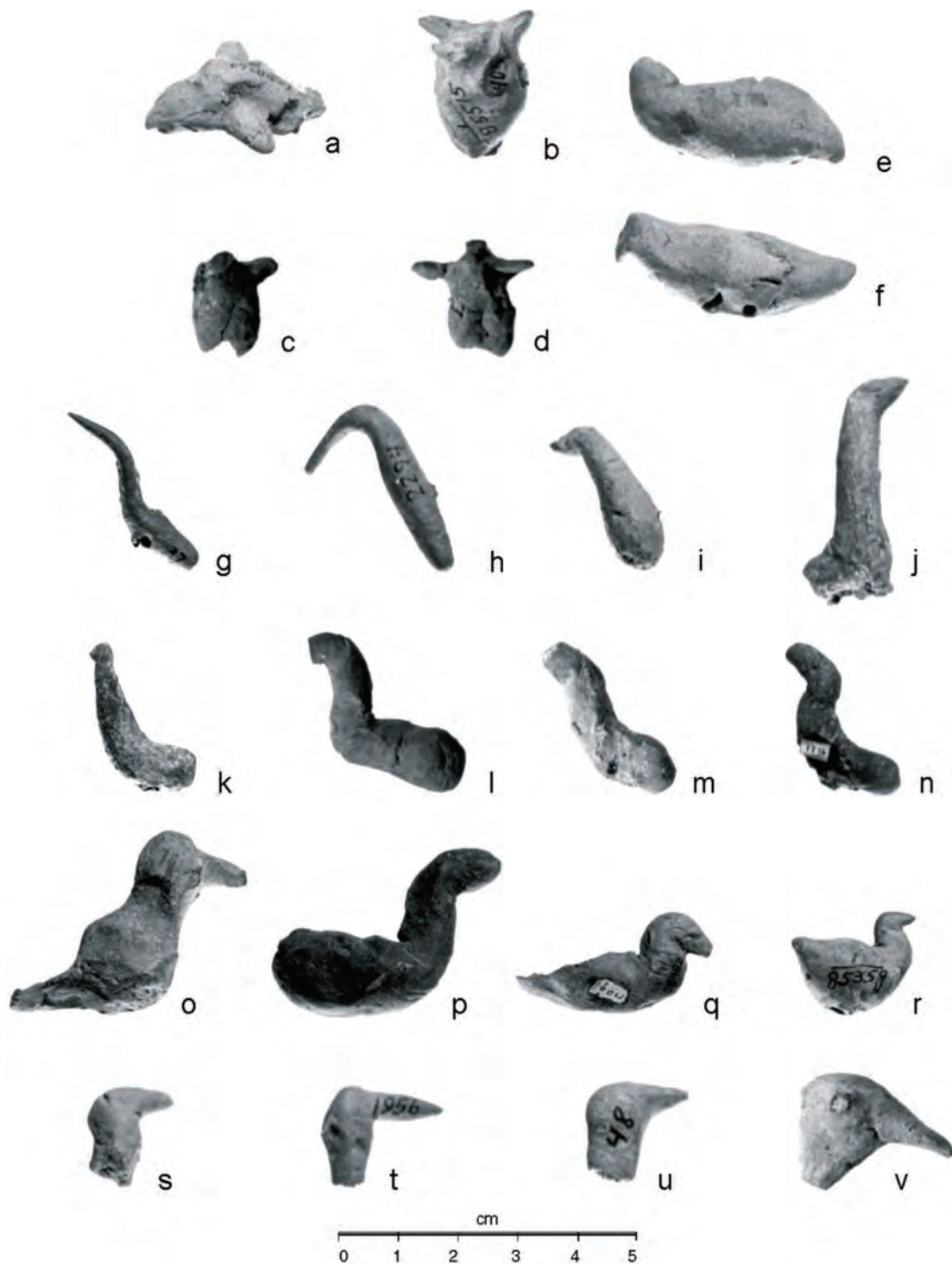


Figure 5. Zoomorphic figurines. (a–d) possible animal heads, birds in flight, or plucked birds; (e,f) quadruped bodies; (g–n) possible Ardidae models; (o–r) possible anatid models; (s–v) possible anatid head models. Specimens a, b, e–g, i–k, n, p, and q–u, CA-SAC-6; specimens c, d, and l, CA-SAC-267; specimen h, CA-SAC-196; specimens m and y, CA-SJO-42; specimen o, CA-SJO-43. Photographs by C. M. Kielusiak, used by permission, Department of Anthropology, California State University, Sacramento.

also indicated that many of the zoomorphic figurine bodies exhibit one or two deep punctures at the base made with a twig before firing and probably used to mount a figurine in an upright posture using a “twig or bone holder” mimicking legs. White (2003) reported 12 thin, rolled tapers including one apparent head fragment and others bent in “C-shape” or “S-shape” to form necks and heads (Figure 5g–n) identical to the Schenck and Dawson specimens. Examples with long, “S-shaped” necks appear to model birds of the Ardidae family (herons, bitterns, and egrets).

Only six possible non-bird animal forms have been identified. Wilson (1979) noted a possible turtle form clay figurine head fragment with an incised mouth and punctate eyes. One of the figurines illustrated by Schenck and Dawson (1929:Plate 86, j) is a bulbous body with a broad, pinched head and four twig holes suggesting a mammal form supported by four legs (Figure 5f). Kielusiak (1982) reported another possible quadruped body (Figure 5e), two possible “heads with ears” (Figure 5a–b), and two additional specimens that could represent heads, birds in flight, or even plucked birds (Figure 5c–d).

A number of small fragments of rolled tapers, including straight or bent forms, have been identified as possible parts of zoomorphic or anthropomorphic figurines. Wilson (1979) reported 18 rolled taper fragments but no bodies. Kielusiak (1982:48) and White (2003:152–153) acknowledged that some of the bent tapers they attribute to zoomorphic figurines may belong to anthropomorphs; to date, however, no anthropomorphic figurines from the region have been identified with clay limb appliques, and so the zoomorphic attribution is more likely.

Distribution

The 202 specimens reported by Schenck and Dawson were found at or near the surface of just three sites clustered in the Deer Creek–Cosumnes floodplain

region, including 200 from SAC-6, one from CA-SAC-15, and one from CA-SAC-43. Kielusiak (1982:48) reported three specimens from SAC-6, all of which are also described by Schenck and Dawson (1929) (compare Kielusiak 1982:Figure 14B and E and Schenck and Dawson 1929:Plate 86 j, l), and three new specimens from SAC-267. Wilson (1979) reported 18 figurine fragments from CA-SUT-55, and White (2003) described 12 from CA-COL-247.

Schenck and Dawson (1929:365) argued that the zoomorphic figurines represented a distinct and highly localized expression limited to the late prehistoric or immediate precontact period (Schenck and Dawson 1929:365), and the Delta finds tend to support this claim. SAC-6, SAC-15, CA-SAC-43, and SAC-267 all produced clamshell disk beads, arrowpoints, and other markers of late phase Emergent occupation. SAC-267 also yielded Contact-era artifacts (Kielusiak 1984).

The 30 fragments reported by Wilson (1979) and White (2003) not only extend the distribution of zoomorphic figurines farther north but also indicate that they are older than previously assumed. The 18 specimens from SUT-55, a buried deposit located 40 km north of Sacramento on the east bank of the Sacramento River, date to the early Upper Archaic, 2300–2500 BP, and the 12 specimens from COL-247, a buried site located 19 km north of Colusa on the west bank of the Sacramento River, were associated with deposits spanning the Upper Archaic, dating 1675–3205 BP (White 2003:152).

Interpretation

Schenck and Dawson (1929) proposed that zoomorphic figurines were used as toys or ceremonial items. Bennyhoff (1977:50) supported the latter hypothesis, speculating that they were part of dance regalia, for example, danglers on the Kuksu headdress. While there is a defensible case to be made based strictly on the

singularity of these artifacts, the evidence for ceremonial attribution can also be buttressed via ethnographic analog to the treatment of certain birds. For example, Goldschmidt (1951:352, 405) recounted Nomlaki testimony that captive eagles were kept and the dead buried in full ceremonial regalia. Similar accounts were so widespread that based on age-area interpretation Kroeber (1932:416–417) considered the Bird Cult as part of the region's earliest cultural stratum.

The toy hypothesis is consistent with one dimension of the evidence; Schenck and Dawson (1929:365) argued that because 94 percent of their zoomorphic figurines occurred in the midden matrix and just six percent with graves the figurines were treated just the same as utilitarian objects and thus were more likely to have been broken in play. In my opinion, however, the weight of the archaeological evidence supports a ceremonial attribution. All five sites reported to date are located along the core track of the Pacific Flyway, associated with the Central Valley's axial rivers and habitats likely to support significant bird populations. Thus, the bird figurines can be regarded in the same light and with the same strength of association and context as rock art found in hunting territories. Further buttressing this argument, Heizer and Hewes (1940:599–600) cited archaeological evidence of a bird cult in the Delta region in the form of burial-associated skulls, lower leg bones, and bones from feet and talons of large falconiformes and cathartiformes; elsewhere Heizer (1949:Table 13) showed these bones primarily associated with Early period burials. This is consistent with the Colusa Reach excavations where bird bone was common and "non-economic" hawk, eagle, barn owl, and flicker wing and leg bones occurred almost exclusively in deposits dating to the late Middle Archaic (White 2003:249).

Ceramic Vessels

I use the functionally neutral term "vessels" to avoid conflating functional and descriptive interpretation

(different researchers call the same things "bowls," "cups," or even "pottery"). Between 88 and 110 vessels and fragments have been reported from the study area. Jones (1923) mentioned "pottery" but provided no detail. Schenck and Dawson (1929:366–368) described 15 specimens including 12 from SAC-6, one from SAC-15, one from CA-SJO-50, and one from CA-SJO-57. Lillard et al. (1939:Plate 31j) reported one from CA-SAC-56. Ragir (1968:92–93, 256–257, Plate XLI) reported a complete vessel from SAC-168 and three fragments from SJO-68. Seven fragments were reported from the Lower Lake area of Clear Lake, including two from LAK-72 and five from CA-LAK-510 (White 1984:275–278; 2002:368). Also, six fragments are documented from the Colusa Reach of the Sacramento River, including two each from CA-COL-158, CA-COL-246/H, and COL-247 (White 2003).

In addition to these 33 specimens, a large number of vessel fragments were reported by two Sacramento State University investigators. Kielusiak (1982:58–66) provided the most detailed account, identifying 58 specimens, including four complete vessels and 54 fragments from 12 sites (Kielusiak 1982:Tables 4 and 7). Johnson (1990) reviewed many of the same assemblages, reporting a total of 78 specimens. The differences between Kielusiak's and Johnson's interpretations and totals are doubtlessly attributable to different samples, criteria, and analytical approaches. Unfortunately, no concordance is possible between these authors' work and with earlier reports on three sites they considered: SAC-6, SAC-168, and SJO-68 (cf. Schenck and Dawson 1929; Ragir 1968). For present purposes I confine my observations to their general descriptions and the distribution of all reported sites.

Description

There was significant variation in vessel form, with complete examples including cylindrical, globular, conical, and shallow cup or bowl shapes. A globular specimen from SAC-56 (Figure 6a) measures 62 mm

tall and has a 62 mm maximum exterior diameter (wall); walls are 14 mm thick, and its inside depth is 41 mm (Kielusiak 1982:65). A cup-shaped specimen from SJO-68 (Figure 6b) measures 69 mm tall with a 59 mm maximum diameter, and walls are 10–20 mm thick (Ragir 1968:257). A globular specimen with impressed cross-hatching decoration (Figure 6c) was found at SAC-6 (Schenck and Dawson 1929:Plate 84h). A conical specimen from SAC-6 (Figure 6d) measures 115 mm tall, with a 91 mm maximum exterior rim diameter; walls are 14 mm thick, and inside depth is 62 mm (Kielusiak 1982:65). A cylindrical specimen from SAC-168 measures 42 mm tall and 34 mm wide (Ragir 1968:92–93). A large wall fragment from SAC-6 (Figure 6e) appears to be from a broad, shallow bowl, 70 mm in diameter by 40 mm high, with walls about 15 mm thick (Schenck and Dawson 1929:366–368).

Fragmentary specimens fall within this range of forms and dimensions. Kielusiak (1982:Table 7) reported wall thickness for 36 specimens from 10 sites ranging between 8 and 20 mm and averaging 12.14 mm (s.d. = 3.11). The seven specimens from Lake County are all wall and rim fragments, and they appear to be from wide, shallow bowls with wall thickness up to 11.1 mm (White 1984, 2002). The six specimens from Colusa County are wall and rim fragments which likely came from shallow bowl or globular specimens measuring 100–150 mm wide and 50–100 mm tall (White 2003).

Schenck and Dawson (1929), Lillard et al. (1939), Ragir (1968), and White (1984, 2002, 2003) all reported vessels shaped by modeling a single ball of clay. Rims were turned (folded) or rounded, and walls and bases were pinched to form. One specimen from LAK-510 is particularly instructive regarding the method of



Figure 6. Complete vessels and large fragments. (a) CA-SAC-56; (b) CA-SJO-68; (c–e) CA-SAC-6. Photographs a, b, d, and e by C. M. Kielusiak, used by permission, Department of Anthropology, California State University, Sacramento; photograph c from Schenck and Dawson (1929:Plate 84).

manufacture of the shallow cup form (Figure 7a). It is a rim fragment made from very fine-grained clay, fired to a hard consistency, and showing clear evidence of grass temper, with grass shaft holes evident in cross-section along the contact between folds and a seed head plainly pressed into the rim on the interior face. The rim exhibits multiple fingerprint and finger-nail impressions.

Kielusiak (1982) and Johnson (1990) reported vessel fragments apparently made by the coiling technique. Kielusiak (1982:63–64) mentioned “pinched and pressed-together rolls of clay which resemble pottery coils” from SAC-6 and specimens with “similar workmanship” found in sites not included in her analysis. Johnson (1990:149, Figure 2) illustrated “pinched and rolled clay left over from the construction of clay

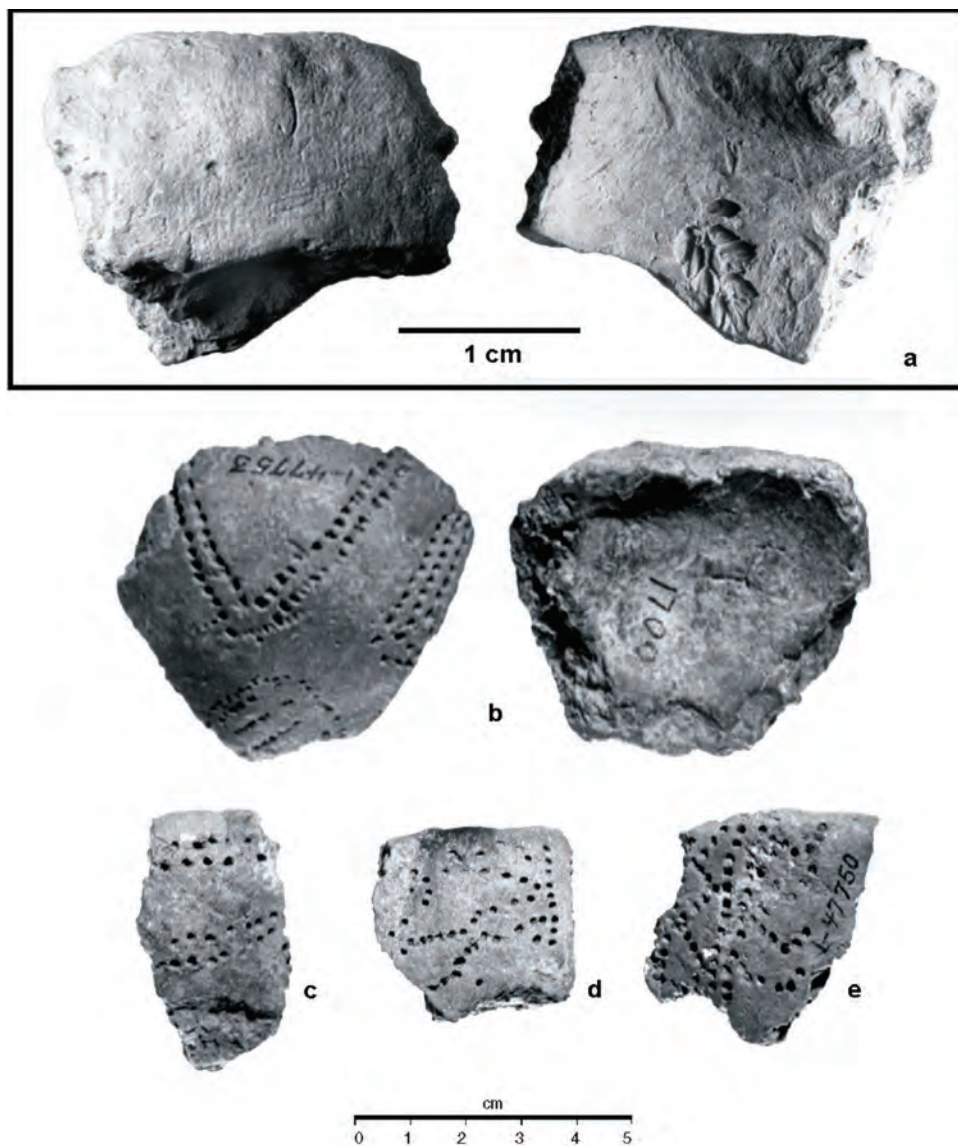


Figure 7. Vessel wall and rim fragments. (a) CA-LAK-510 (White 1984:Figure 101); (b–e) CA-SAC-6. Photographs of specimens b–e courtesy of C. M. Kielusiak and used by permission, Department of Anthropology, California State University, Sacramento.

vessels” from SAC-267. Both authors indicated that coiled pieces are uncommon and that vessel fragments modeled from a single clay ball predominate.

A number of specimens exhibit stains or patina on the inner wall. Three specimens from Colusa County, one from COL-158 and two from COL-247, were stained a dark brown color on the interior wall and may have been used to hold organic materials (White 2003:149). A wall fragment from SAC-6 has a dark interior surface (Schenck and Dawson 1929:366). Ragir (1968:257) reported a wall fragment from SJO-68 and a complete specimen from SAC-168 with ocher stains on the interior walls (see also Kielusiak 1982:66). Kielusiak (1982:65) reported a blackened specimen from CA-SJO-165.

Some examples have exterior decoration, generally around the rim but in some cases covering the exterior walls. Site CA-COL-245/H, likely the ethnographic River Patwin village of *Coru*, produced a very hard, well-formed rim fragment decorated with a double line of small, square punctate holes around the outer rim (White 2003). One specimen from LAK-510 exhibits a single impressed groove around the exterior wall (White 1982:282). A wall fragment from CA-SAC-50 has impressed on the exterior “a diamond design formed by heavy lines” (Schenck and Dawson 1929:368). Kielusiak (1982:Table 7) reported punctate, incised, and fingernail-impressed decoration on 16 of 54 wall fragments (Figure 7b–e) and on one vegetation-impressed specimen similar to the LAK-510 rim described above.

Distribution

The spatial and temporal distributions of baked clay vessels are becoming clear at least in broad outline. A greater time depth and broader geographic spread than recognized by Johnson (1990) can now be established. Approximately 62 specimens derive from dated contexts. Among the Delta region Archaic examples, the

oldest are middle to late Middle Archaic. Four are from definitive Middle Archaic contexts, including three wall fragments from SJO-68 (Ragir 1968:256–257) and a complete globular specimen from SAC-168 (associated with Burial 26) (Ragir 1968:92–93). Vessel fragments from Colusa and Lake counties span the early to late phases of the Upper Archaic. The seven Lower Lake specimens include two dated to 2030–2871 BP and two dated to 1293–2030 BP (White 1984, 2002). Two specimens from the Colusa Reach date to 1675–2755 BP (White 2003). Notably, at Lower Lake and in the Colusa Reach, other baked clay types were found, but vessels were absent from deposits older than 3205 BP (White 1984, 2002, 2003).

However, consistent with Johnson’s (1990) arguments, the Emergent period ceramic evidence is indeed concentrated in the Delta region. Of the 58 complete and fragmentary specimens reported by Kielusiak (1982), 45 were recovered from definitive Emergent contexts, including 33 from SAC-6, eight from SAC-267, two from CA-SAC-145, and two from CA-SAC-329. Other specimens came from sites with mixed Archaic/Emergent deposits. Four Emergent period specimens were also reported for the Colusa Reach (White 2003). The chronological distribution has both the oldest and youngest specimens primarily from the Delta and specimens dating in-between from farther north; this is probably the result of a sampling error.

There is clear evidence for change over time in decorative attributes. Archaic specimens are all undecorated with the exception of one wall fragment from LAK-72 with an impressed groove on the exterior surface. All punctate examples (Figure 7b–e) are from Emergent period contexts, primarily later than 450 BP (Kielusiak 1982; Johnson 1990).

Interpretation

Based on the ocher-stained specimen from SJO-68, Ragir (1968) proposed that Early Horizon baked clay

vessels were used as paint containers, perhaps by shamans. Several authors have adopted this interpretation. However, it should be pointed out that for Archaic as well as Emergent examples a brown patina is more common on inner walls, and thus the archaeological evidence points to more varied uses.

Function is clearly indicated by the small capacity and compact size of the vessels; they appear to have been made for an adult to hold in one hand and could have accommodated only about 4–8 oz of liquid. Thus, evidence indicates that the baked clay vessels served a role analogous to the Native Californian spoon, part cup, part dipper, personal gear owned by an individual, and the source of pride and personal expression. On California's northwest coast and adjacent regions spoons were made of elk antler, while within the Central culture area spoons were made from mussel shell, wood, bone, and even textile (Kroeber 1925; Beardsley 1954). No ethnographic clay examples are recorded for this region.

A functional analogy for the ceramic vessels can also be made with the carved soapstone vessels of the Bidwell and Mesilla complexes, defined by excavations on the lower Feather River drainage, east-central Sacramento River watershed. These vessels, part of an extensive soapstone industry dating to the Upper Archaic through early Emergent and linked to high-quality natural deposits found east of Oroville, are very similar to the baked clay vessels of the study sample in overall size, morphology, and capacity. Patinas and stains described for the soapstone examples are equivalent to those described for clay vessels. Previous investigators have interpreted the soapstone vessels as primarily food serving and preparation implements, used occasionally as pigment containers or mortars (Olson and Riddle 1963; Ritter 1970).

Cooking Balls

Baked clay balls are mentioned in the region's earliest archaeological studies, and a great deal of attention

has been paid to their morphological variation, production, use, and distribution, especially in documents published during the 1920s through 1950s. The notion that clay balls were used as replacement cooking stones was originally proposed by Jones (1923) and endorsed by Kroeber in Jones (1923:114), who also commented on the dearth of ethnographic evidence for baked clay cooking ball production and use, leaving investigators to infer use based on the archaeological evidence of context and association. Unlike some baked clay artifact types, balls were rare to absent from burial contexts (Jones 1923:122; Schenck and Dawson 1929:361; Heizer 1937:40) but common in the midden matrix and concentrated in and around ash deposits and hearths, supporting a "connection with cooking" (Jones 1923:122; Heizer 1937:40). Jones (1923:122) also reported that many of the balls showed evidence of cycles of "repeated heating and cooling." A series of studies (Cook and Treganza 1947, 1950; Treganza and Cook 1948; Cook and Heizer 1951) revealed conclusive evidence for production, use, and distribution of cooking balls.

Description

Objects classified as cooking balls incorporate a wide range of geometric variation, compelling researchers to speculate about alternative functions. Schenck and Dawson (1929:362–364, Table 3) reported 2,613 specimens with "much variation in size," including 1,300 specimens too fragmentary to classify and 1,313 specimens representing eight distinct morphological types: Unspecialized (n=730), simple spherical to ovate solids with average dimensions of 75 mm long, 40 mm wide, and 30 mm thick; Spool-shaped (n=160), like a thick hour glass and measuring 20–70 mm long and 18–56 mm diameter; Cylindrical (n=100), some with faceted sides and considered of average size; Cupped (n=50), with a depression on one or both sides and measuring 35–75 mm diameter and 15–40 mm thick; Triangular (n=25), tetrahedral with bulging facets and measuring 60–75 mm long; Double-cone

(n=10), like a thick spinner-top and measuring 62 mm diameter and 62 mm thick; Cone (n=3), concave-based and a short taper measuring 50 mm long; and Grooved (n=235), of varied form averaging 35–95 mm long, 25–125 mm wide, and 5–50 mm thick. They identified 11 “Grooved,” including Heart-shaped, Spade-shaped, and forms with various arrangements of longitudinal and transverse grooves and end and side knobs. Dimensions appearing in modern reports fall within the averages and ranges first offered by Schenck and Dawson (Schulz et al. 1979:8; Bouey 1995:239; White 2003:152–154).

Kielusiak (1982:39–74) reported 9,286 “solid forms” but restricted the “cooking ball” designation to simple spherical to ovate forms, offering no judgments as to function for geometric variants. This caution stands in contrast to the opinions of earlier authors and is unwarranted. How could all this variability represent cooking balls? Previous attempts at explanation ranged from weak to intriguing, with Heizer (1937:42) framing the case most clearly by suggesting that extreme morphological variability is a predictable outcome of “manufacture of primarily utilitarian objects of fictile material” which provided “an easy path to individual initiative in making other forms.” In other words, easily manipulated clay permits a greater variety of culturally conditioned, spatially and temporally discrete expressions than other, less tractable, mediums. A utilitarian dimension may also explain the fundamental purpose of specific geometric forms. Assuming that the cooking balls were meant for boiling mush in a basket, some geometric structures might be favored over others by cooks attempting to seize the ball with the wooden tongs (Goldschmidt 1951:421; Barrett 1952:181). Angles and grooves would facilitate easier purchase and quicker, surer grasp.

Some of the balls were deliberately impressed. Schenck and Dawson (1929:362–363) reported that nearly all cylindrical specimens were augmented with intentional textile impressions (Figure 8i–j). Nine

fragments from Colusa Reach were impressed with a knotted, open weave textile, apparently by rolling the moist clay mass over a tray or mat or wrapping it in a net bag before firing (White 2003:155). A third of Schenck and Dawson’s (1929:362–363) Spool-shaped forms were impressed with tule or bulrush wrapped endwise or crosswise before firing (Figure 8k).

Distribution

Heizer (1937:42–43) argued that the cooking ball industry was confined to the immediate stoneless region. In turn, he claimed, “where stone is prevalent in the deposits, or is found in the environs, only isolated and rare findings of baked clay objects have been noted, and these are probably of extraneous origin” (Heizer 1937:38). Current evidence indicates that cooking ball production and use was indeed concentrated in the stoneless Delta, but not exclusive to this region. Schenck and Dawson (1929:360) listed 18 Delta-area sites with 2,613 baked clay balls. Kielusiak (1982: Table 1) listed 9,286 cooking balls and fragments from 20 sites in the same region, adding 18 new sites for a total of 36. Bouey (1995:239) added one more significant Delta assemblage from CA-SAC-43, which produced 85 balls including 62 Unspecialized, 15 Grooved, and eight Spool-shaped specimens. However, baked clay cooking balls have also been found outside the Delta region in sites situated within short travel distance to alluvial stone sources, including 99 specimens from the late Upper Archaic site CA-SOL-2 (Treganza and Cook 1948; Kielusiak 1982:Table 1), 13 from the early Emergent type site CA-YOL-13 (Kielusiak 1982: Table 1), and 31 from the Colusa Reach sites (White 2003), the latter located north of the Willows fault, along a portion of the Sacramento River where rock is readily available on bars and beaches. The Colusa Reach examples include 22 fragments of Unspecialized cooking balls and nine textile-impressed Cylindrical ball fragments (White 2003:152–155). No baked clay cooking balls have yet been archaeologically identified within the Clear Lake basin (White 1984, 2002).

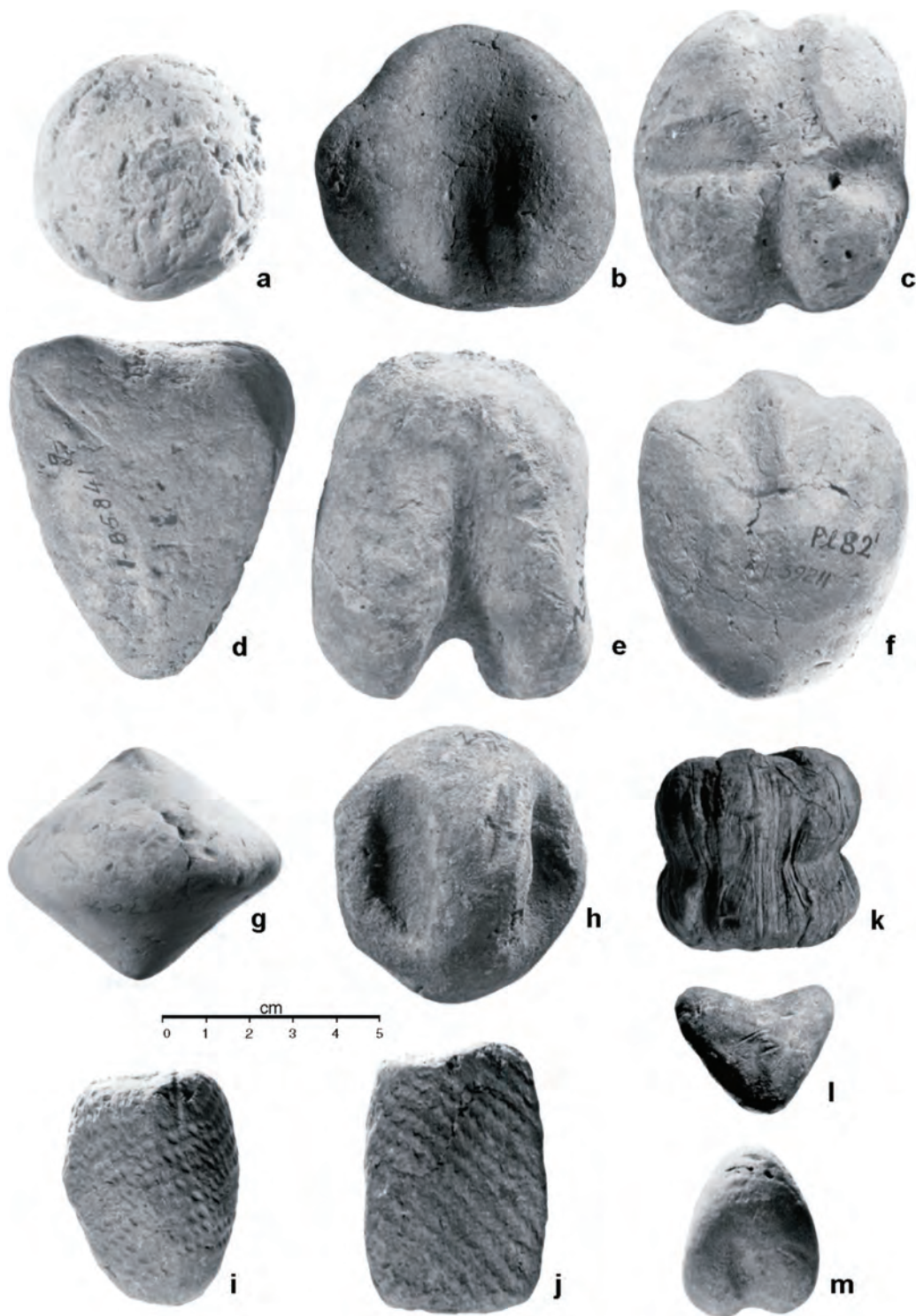


Figure 8. Cooking ball variability. (a) CA-SAC-64; (b) CA-SAC-56; (c) private collection, Delta region; (d) CA-SAC-6; (e) private collection, Delta region; (f) CA-SAC-6; (g) CA-SAC-43; (h) private collection, Delta region; (i) CA-SAC-6; (j) CA-SAC-107; (k) CA-SAC-6; (l) CA-SAC-6; (m) CA-SAC-64. Photographs by C. M. Kielusiak, used by permission, Department of Anthropology, California State University, Sacramento.

It is clear that baked clay cooking balls were introduced during the Middle Archaic, indicated by the presence of 317 specimens from the Early Horizon type site SJO-68 (Kielusiak 1982:Table 1) and seven from late Middle Archaic deposits at COL-247 (White 2003). Cooking balls are common in Upper Archaic sites of the Delta and Colusa Reach. However, the Emergent period explosion of cooking ball production and use was largely, if not exclusively, confined to the stoneless Delta. Based on age assignments offered by Kielusiak (1982), only a handful of Delta examples date to the Archaic; the remainder are associated with Emergent sites, and the largest and most varied assemblages were found at key Emergent period sites including SAC-6, CA-SJO-43, CA-SJO-80, and CA-SJO-82.

There is tentative evidence for change over time in morphological types. All well-dated Archaic assemblages are dominated by the Unspecialized, Conical, and Cylindrical forms. Based on data supplied by Kielusiak (1982:Table 1), distinctive geometric forms are associated primarily or exclusively with Emergent period contexts, most later than 450 BP.

Interpretation

In the late 1940s a team from UC Berkeley embarked on a series of fascinating studies of the physical composition of California prehistoric archaeological sites (Cook and Treganza 1947, 1950; Treganza and Cook 1948; Cook and Heizer 1951). Their goals were twofold: 1) to recover potentially important cultural and natural details too often lost during “normal” field practice and 2) to determine the volume and proportion of common constituents. Such quantification would then facilitate objective comparisons between sites. The initial paper announcing this new avenue of research presented an analysis of screened samples and subsamples from two mounds located in different regions. (Cook and Treganza 1947). The next paper reported the complete excavation of one

site, SOL-2 (the Peterson II Mound) (Treganza and Cook 1948). They quantified the relative proportions of various constituents (rock, bone, shell, obsidian, charcoal, fired earth, and baked clay) and compared these against results for screened subsamples in order to establish the statistical soundness of extrapolation from small samples to the larger archaeological context. They identified fired earth as well as baked clay artifacts, the paucity of the latter explained by the proximity of the site to rock sources which “largely eliminated the necessity of substituting baked clay balls for rocks used in ‘stone boiling’” (Treganza and Cook 1948:296). Two more studies followed, each with notable focus on baked clay variability. Cook and Treganza (1950) reported microconstituent analysis of samples from 12 sites—five Late Horizon, four Middle Horizon, and three Early Horizon—allowing the authors to examine change over time in central California. Cook and Heizer (1951) followed with a detailed examination of column samples from nine sites in the lower Sacramento Valley, detailing results from 5 ft x 5 ft x 1 ft soil samples screened through 1/2-in and 1/8-in mesh.

Cook and Treganza (1950:253) found that Upper Archaic and Emergent sites located in stone-rich environments contain a predictable proportion of fire-affected stone, 4 percent rock by weight, which they proposed represented the minimum quantity of cooking stones necessary to support the prevailing acorn economy. They examined constituents from sites near and at a distance from natural supplies of rock and found a remarkable pattern; in order to maintain the minimum quantity of rock, occupants of sites located near depleted rock supplies on the valley margin used every available stone, “even small fragments and pebbles,” while occupants of sites located well out on the valley floor, produced “artificial rock by burning clay” (Cook and Treganza 1950:253).

The team also addressed the nature, extent, and variability of the baked clay industry, focusing on

SAC-6. Schenck and Dawson (1929) had previously identified the site as the nucleus of the Delta's baked clay distribution, accounting for 90 percent of their specimens. Heizer (1937:39) also cited SAC-6 as the center of distribution: "the farther one proceeds from this key site, the fewer grow the number of types in individual sites." In fact, Cook and Heizer (1951:290) found evidence of a prehistoric clay mine adjacent to the site: "[O]n the southern edge of the midden is a large depression... a borrow pit from which red clay was dug, presumably for making clay balls." Baked clay was 54 percent of the mound mass at SAC-6 (Cook and Heizer 1951:Table 3). Another apparent Emergent period production site on the stoneless plain south of Galt, SJO-43, yielded 34 percent baked clay by weight, while no other site addressed in their study produced more than 1 percent baked clay by weight (Cook and Heizer 1951:Table 3).

Based on column sample results, Cook and Treganza (1950:235) estimated that the SAC-6 mound contained "3,000,000 kg of burned or baked clay refuse," and given the average weight of products and their frequency in controlled samples, they estimated that over 1,800,000 baked clay objects had been produced during the span of occupation. They concluded:

There seems little doubt that here we are dealing with a real manufacturing industry for local use and for export. The purpose... was partly to provide various types of clay artifacts, but most of the material went into the fabrication of balls or masses which could serve as cooking stones, sinkers, and other objects; that is, the clay was a substitute for natural rock. The market was no doubt provided by numerous small villages situated along the lower Sacramento and San Joaquin rivers, which possessed no good local source of rock or clay deposits [Cook and Treganza 1950:235].

Because the SAC-6 clay firing locations were inside domiciles, Cook and Heizer (1951:290) concluded it probable that the clay industry operated on a family basis. Cook and Treganza (1950:241) noted the rarity of both rock and cooking balls from Early Horizon sites, suggesting that "early people employed a different method for cooking and processing food and may not have built as many fires as the later people or may have done so in a different manner."

Other Artifacts

In addition to the four key artifact types discussed above, 11 distinctive types appear in the region's archaeological record. All are described and discussed below.

Basket Molds

The term "basket mold" is used here to distinguish a class of baked clay deliberately formed against the inside wall of a basket as opposed to "basketry impressed clay," which is often simply an attribute of other modeled pieces. Basket molds are thin, flat on the incurvate dorsal face and textile-impressed on the excurvate ventral face, indicating the clay was pressed into a basket interior and smoothed to form a thin layer (Figure 9). Examples are widespread but most striking and varied in the collections reported for Lower Lake (White 1984, 2002) and the Colusa Reach (White 2003). Two alternative explanations are proposed: 1) the predominant tile-shaped examples may have been the unintentional product of a cooking rock at rest on the wall of a clay-lined (waterproofed?) basket during cooking activities and 2) thin and delicate basket-mold cups may have been deliberately manufactured, and only tiny fragments remain (White 1984:2003). With regard to the Clear Lake basin, impressed basketry shows evidence for an increase in the diversity of weave types over time. This change is associated with an increase in the rate of production and use of basketry awls (White 2002:528–529).

Sling Projectiles

Gifford and Kroeber (1937:122–126, 142, 182) reported the use of slings for war or hunting among the Northern, Southern, Central, Southwestern, and Eastern Pomo, and among the neighboring Patwin, Lake Miwok, and Nomlaki. Ethnographic sources also reported the Pomo's historical use of baked clay balls thrown from slings to hunt ducks on Clear Lake (e.g., Palmer 1881:23–26; Kniffen 1939:364). Barrett provided detail on Pomo production and use of baked clay sling projectiles.

The clay or “mud” balls are from about an inch and a half to two inches in diameter, and are made of a special white earth found in a very few places. They are carefully shaped and then baked, or rather hardened, by the

fire. They are not spherical, but have two sides decidedly flattened, for the purpose of making them skip over the surface of the water. Informants maintained that this missile could be thrown as much as a hundred and fifty yards, and that it skipped through a flock of waterfowl sitting on the water so as to hit sometimes as many as four or five birds. The hunter then paddled over and dispatched any crippled birds and collected his catch [Barrett 1952:145].

The “white earth” described by Barrett is probably the clayey, argillaceous marlstone of the Lower Lake Formation, found in the hills around Lower Lake basin (Reymer et al. 1988). No excavated examples are reported. However, a number of specimens have been found during surveys of bottomland marsh deposits.

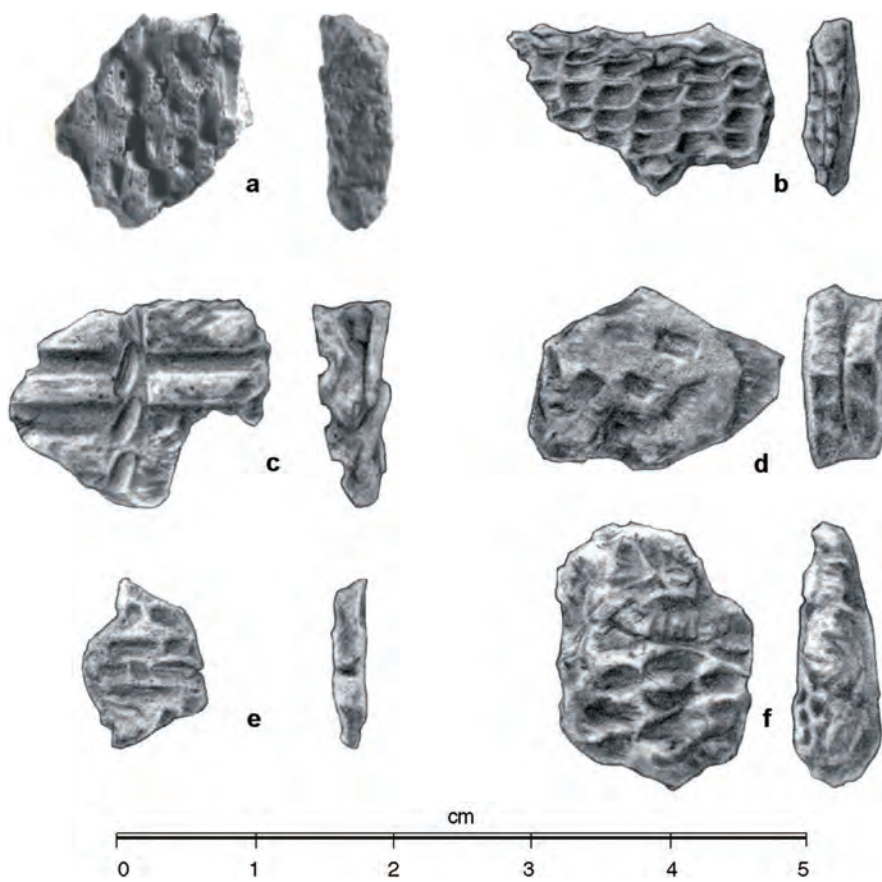


Figure 9. Basket molds or impressions. (a) CA-LAK-72; (b–f) CA-COL-247. From White (2002, 2003).

Heizer (1937:41) reported a similar scatter of baked clay sling balls associated with lake-bottom and marsh deposits in the Delta region.

One distinctive baked clay ball type may represent an early sling projectile form exclusive to the Middle Archaic. Heizer considered the form, which he termed the “biconical ball,” to represent an Early Horizon marker type (Lillard et al. 1939:Plate 31k; Heizer 1949:Figure 16I). Ragir (1968:93, 255) reported nine specimens from SJO-68 and one from SAC-168. White (2003:149–150) described the largest collection, 133 specimens from the Colusa Reach, noting their similarity in size and shape to Bantam hen eggs (Figure 10): 44.4–50.3 mm long, 23.6–32.0 mm thick, and 20.3–35.4 g (White 2003:149). The Colusa examples were “fired to a uniform brown to grayish brown color, suggesting significant control of firing temperature,” and the artifacts had a distinctive crosshatch impression of broad grooves on one side “suggesting they were mounted on a wicker frame for firing” (White 2003:150). All were found at COL-247, and all but two were associated with late Middle Archaic deposits. Based on the pattern of breakage and lack of evidence of binding or other use, White (2003:150) proposed that they were used as sling projectiles, “appropriate given their weight, size, aerodynamic shape, and likely tendency to right themselves and impact with the heavy end first if released with a hard spin.”

Pecans/Sinkers

Heizer (1949:Figure 16g–h) first identified the baked clay net sinker, or “pecan,” as an Early Horizon marker type. The pecans are ovate to bipointed clay balls measuring 30–55 mm long, with a perimeter groove, generally around the long axis and sometimes formed in an “S-shaped” curve (Figure 11a–d). Ragir (1968:256) noted that “pecans are the only clay pieces which were deliberately used as grave offerings” in Early Horizon contexts. In fact, the i rooved balls

later reclassified by Heizer (1949) and Ragir (1968) as “pecans” account for most of Schenck and Dawson’s burial-associated balls. Ragir (1968:253) described the largest assemblage, 26 specimens from SJO-68, dating to the middle phases of the Middle Archaic. Eighteen of the SJO-68 specimens were found associated with graves, singly and in pairs. Wilson (1979:12) reported pecans with rounded ends from SUT-55, dating to the late Middle Archaic. Heizer (1949) and Ragir (1968) argued that the pecans were most likely fishing line sinkers but acknowledged that their common association with burials had not been explained (Kielusiak 1982:52–54).

Beads

Decorated and undecorated baked clay beads were made by rolling clay onto a grass stem, finishing the end, and firing. Most specimens are around 6.5 mm in diameter, and complete specimens were probably around 7.0–12.0 mm long. Baked clay beads are widespread in the study area, reported for the Delta (Schenck and Dawson 1929:364; Heizer 1937:42; Kielusiak 1982:69) and farther north in Sutter County (Wilson 1979:12), Colusa County (White 2003:152), and Lake County (White 1984:278–279; White 2002:370). Specimens span the late Middle Archaic through late Emergent, with a few decorated examples reported. Many of the decorated pieces are impressed with fingernail patterns (White 2002:Figure 162c).

Torus-Shaped Objects

Baked clay “donuts,” or torus-shaped objects, measuring 40–80 mm in diameter and 20–39 mm thick (Figure 11e–g) are reported by Heizer (1937:36–38), Kielusiak (1982:66–67), and Schenck and Dawson (1929:366). Kielusiak (1982:67) made a solid case that these served as digging-stick weights based on favorable comparisons to ethnographic examples. Some, however, are small and appear to be better adapted to serve as spindle-whorls for drills or fire-starters.

Button-Shaped Spindles

This type is composed of small, button-shaped disks measuring 35–75 mm in diameter and 15–25 mm thick, with a thin, central to slightly offset perforation made by inserting a stick prior to the firing process (Figure 11h–j). The form is strongly reminiscent of traditional “spinner whistle” cams, albeit small, and may have produced a high-pitched buzz or whistle when spun on a tensioned string. The majority of reported specimens are from the Delta region, with approximately 24 reported by Kieluskiak (1982:68), who identified the type as the “Complete-perforated Disc.” One of Kieluskiak’s specimens was found associated with a Middle Archaic burial at SJO-68, and others were attributed to Emergent deposits at SAC-6, SAC-168, and CA-SAC-66 (see also Lillard et al. 1939:Plate 31i). Wilson (1979:12) reported a single specimen from SUT-55, attributable to the early phases of the Upper Archaic.

Plummetts

Baked clay plummet forms (charmstone/pendant-shapes) (Figure 11k–l) are reported by Schenck and Dawson (1929:364, 369), Kieluskiak (1982:58), and White (2003:151–152).

Ear Plugs and Labrets

Baked clay ear plugs (Figure 11m–n) and labrets (Figure 11o) are reported by Schenck and Dawson (1929:364); Heizer (1937:42); Heizer and Fenenga (1939:382), and Kieluskiak (1982:45).

Pipes

Baked clay pipes or cloud blowers (Figure 11p–r) are reported by Schenck and Dawson (1929:366), Lillard et al. (1939:Plate 31 m),



Figure 10. Egg-shaped sling projectiles. (a–c) CA-COL-247 (White 2003).

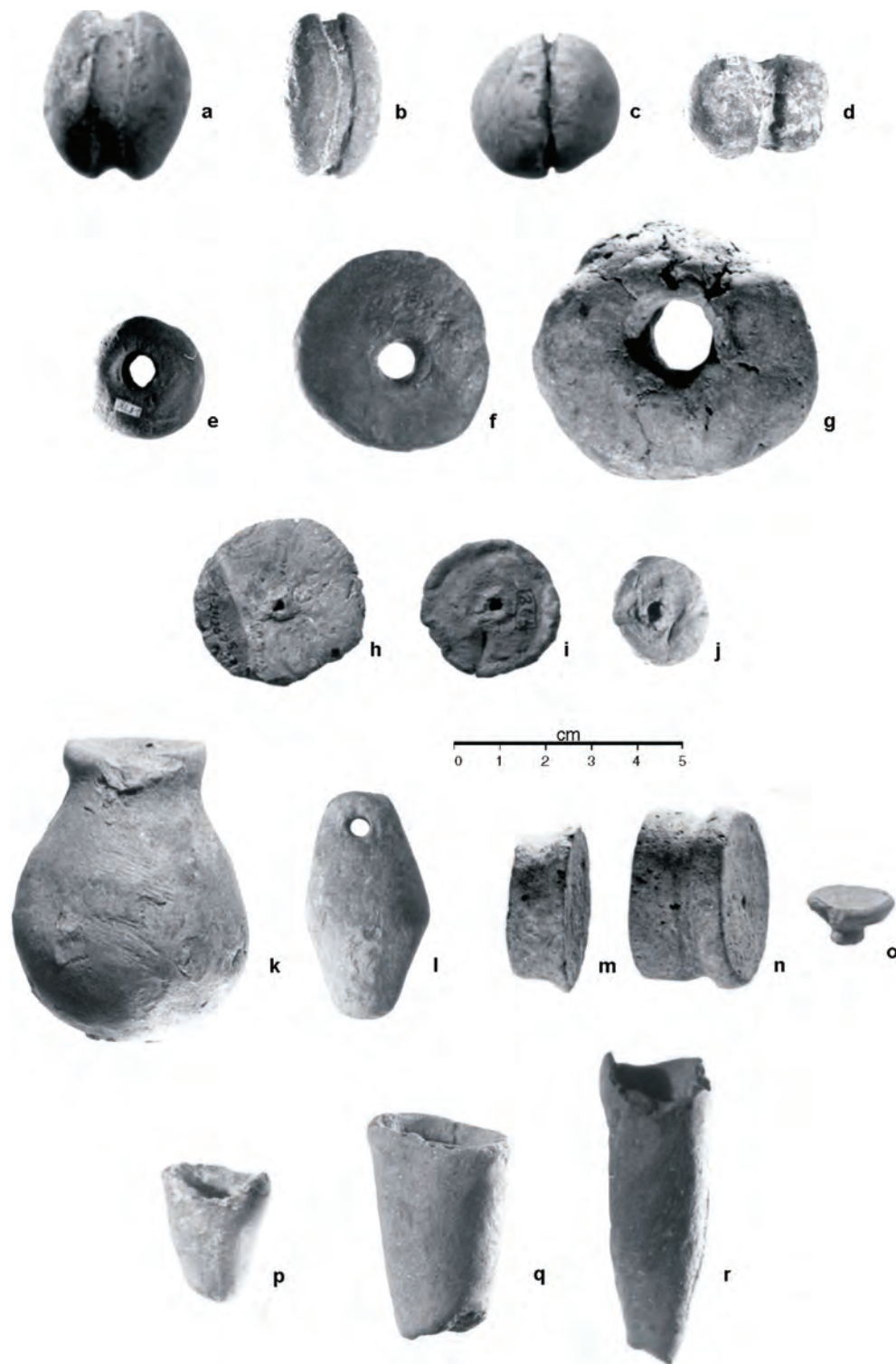


Figure 11. Miscellaneous clay artifacts. (a, d) CA-SAC-56; (b, e, f, j, k, p-r) CA-SAC-6; (c, l) CA-SAC-29; (g) CA-SAC-21; (h) CA-SJO-105; (m) CA-SAC-66; (n) CA-SAC-107; (o) CA-SAC-145; Photographs by C. M. Kielusiak, used by permission, Department of Anthropology, California State University, Sacramento.

Kielusiak (1982:71), White (1984:278), and Bouey (1995:224).

Small Spheres and Rattle Pellets

Kielusiak (1982:43) identified 86 “Small Balls” consisting of rolled spheres 10–47 mm in diameter. The Delta region examples appear to span the chronological record. Chartkoff and Chartkoff (1983:31) reported two small spheres from Emergent period contexts at the Patrick site (CA-BUT-1), which they interpreted as rattle shot. The Colusa Reach sites produced 142 small spheres 8–30 mm in diameter, many exhibiting pinched or pressed facets with clear fingerprint, plant, or textile impressions and one with distinct string-wrap grooves. The small spheres may have represented counters, gaming pieces, and/or rattle pellets (White 2003:154). At Colusa Reach, small spheres were primarily Archaic in age, with 58 specimens associated with Middle Archaic deposits, 76 associated with Upper Archaic contexts, and just four assigned to Emergent occupation.

Daubers

Rosenthal and White (1994) and White (2003:150–151) reported baked clay objects similar in shape and size to “Hershey’s Kisses,” many with pigment stains, as possible paint applicators meant to apply body pigment in the form of small, round to comma-shaped dots. Dot paint schemes were a common California ceremonial dance costume (Sherwin 1963). Similar specimens were illustrated by Kielusiak (1982: Figure 16a–e). Daubers date to the late Upper Archaic through early Emergent periods.

Chronology and Distribution

Middle Archaic Baked Clay

The earliest Middle Archaic baked clay assemblage of our northern California study area, dating 2500–6000

BP, is notable for a focus on weaponry and personal gear, including biconical egg-shaped sling projectiles, grooved net sinker pecans, basket molds, small, dish-shaped to globular vessels, beads, and button-shaped spindles. Two Middle Archaic sites, COL-247 (White 2003) and LAK-510 (White 1984, 2002), produced baked clay “scrap,” or the non-utilized by-products of manufacture. These include small fragments of twisted, pinched, and rolled clay, as well as clay that appears to have simply been dropped during manufacture and incorporated into the mound mass after trampling and accidental firing. Notable examples are “sandal-impressed” pieces from LAK-510 (White 1984:Figure 103B). Clay scrap (5,131 pieces), weighing 12,127.9 g (White 2003:155), was recovered from 63.9 m³ of water-screened deposits, or about 80 objects (together, 189 g) for each cubic meter of water-screened deposit at Colusa Reach. This indicates a low rate and intensity of production throughout the Archaic. Very few objects dating to the Middle Archaic exhibit decorative attributes, and many of the impressions that have been identified, such as the apparent “wickerwork” traces on egg-shaped sling projectiles from COL-247, are more likely by-products of manufacture.

Upper Archaic Baked Clay

Upper Archaic (1200–2500 BP) assemblages are notable for an emphasis on personal gear, ceremonial objects, and the expanded use of vegetal food processing equipment. These assemblages included anthropomorphic and zoomorphic figurines, beads, button-shaped spindles, plummets, pipes, and paint daubers; there occurred more varied and frequent basket molds, an increase in the production of cooking stones, and introduction of torus-shaped digging stick weights and spindle whorls. Sling projectiles and net weights dropped out of the material inventory.

Six sites dating to the Upper Archaic, LAK-72 (White 2002), LAK-510 (White 1984, 2002), COL-247

(White 2003), SUT-55 (Wilson 1979), and CA-SOL-263 (Rosenthal and White 1994), produced baked clay scrap related to manufacture and use. The SOL-263 results are typical; Rosenthal and White (1994) reported 1,856 pieces of clay scrap weighing 5,949 g from 27.7 m³ of water-screened deposits. About 67 objects together weighing 215 g were recovered from each cubic meter, indicating that low-intensity production prevailed.

However, baked clay artifacts associated with ceremonial activities underwent rapid remodeling across space and over time. Undecorated Rod-shaped anthropomorphic figurines were widespread in the early phases of the Upper Archaic, and by the late phases of the Upper Archaic, local variants were common, including the Tabular figurine predominant in Marin County and the Disk-shaped figurine more typical of the interior. Throughout this sequence, figurines were increasingly embellished with decorative forms signaling bead wealth display, on the one hand, and fertility/fecundity on the other. Decoration appears to have been rare to absent on all other baked clay artifact classes. Only one non-figurine decorated object, an Upper Archaic bead fragment from Lower Lake, has been reported (White 2002:Figure 162c).

Emergent Period Baked Clay

Emergent period assemblages, dating from 1200 BP to European contact, are different from those preceding by degree but not kind. Production of artifacts used in the acquisition and processing of vegetal food expanded and resulted in an augmented clay toolkit. Use of anthropomorphic and zoomorphic figurines continued and expanded from the Archaic; vessel forms were more varied and more common, and production of a variety of personal gear including beads, button-shaped spindles, plummets, and pipes, also expanded. Baked clay cooking ball production exploded in the stone-poor Delta region. Basket molds of the type described for Archaic Lower Lake and

the Colusa Reach appear to be absent from Emergent period contexts. The production and use of baked clay duck hunting sling projectiles seem to have been a unique, local Clear Lake Pomo tradition restricted to ethnographic/Contact times.

Constituent studies (Cook and Treganza 1947, 1948; Cook and Treganza 1950; Cook and Heizer 1951) show that the rate of deposition of baked clay artifacts and production debris was roughly equivalent to the Archaic rates in areas peripheral to the Delta plain. However, in the Delta region baked clay cooking ball production reached a crescendo during the Emergent period. Cook and his associates argued convincingly that village life in Upper Archaic to Emergent period central California required a fundamental need for boiling stones when an acorn-intensified subsistence economy developed post-2500 BP (see also Basgall 1987; Rosenthal et al. 2007). For populations living on the valley margins and those living along the Sacramento River north of the Willows Fault, stone was readily available in river and stream bedload. Populations situated on the stoneless plain must have increasingly faced territorial constraints imposed by neighbors throughout this period, eventually making direct provisioning expeditions to external territories too expensive (Beaton 1991). For most Delta residents the acquisition of artificial cooking stones must have represented the least expensive alternative to meet fundamental provisioning needs. Cook and Treganza (1950) and Cook and Heizer (1951) provided a clear demonstration that baked clay cooking ball production centers emerged during this period at SAC-6 and probably SAC-43, and residents of SAC-6, situated in proximity to an open-pit mine in natural clay deposits, developed an economy centered around the production and trade of clay cooking balls.

Geometric cooking balls and decorated objects, including vessels, plummets, beads, pipes, and button-shaped spindles, all appear to be restricted to the Emergent period and were in common use during

the late Emergent (post-400 BP). In the Napa Valley abstract painted tablets may have developed from the decorated anthropomorphic Tabular figurine tradition.

Conclusions

There is a long history of scholarship on northern California baked clay, but the prevailing theoretical model has barely shifted from its original focus. Jones (1923:122) argued that the central California baked clay tradition was “a preliminary step toward the discovery of true pottery.” Logical corollaries have also long been part of our thinking; for example, Holmes argued that California’s elaborate basketry tradition hindered or supplanted pottery development.

A most notable peculiarity of the art of the region is the rarity of earthenware, which for some peculiar reason was never utilized, save in the making of rude balls of baked clay...and in sporadic efforts at vessel making. Utensils of stone and wood occupied the field covered by pottery in other sections, and basketry grew into unexampled importance displaying remarkably varied phases of form, technique, and achievement [Holmes 1902:163].

Some have implied that the baked clay tradition was so robust that it might only be understood as incipient pottery interrupted by culture contact just as it was poised to fluoresce.

It is interesting that a people should possess so much knowledge of baked clay and develop it no further. Perhaps this may indicate that such knowledge was relatively recent [Schenck and Dawson 1929:359].

Griset (2008) revitalized the developmental argument, citing the common preconditions for pottery around the world, two of which (population and resource stress) may have reached threshold conditions in

California. However, low-fired or unfired clay artifacts appear in the pedestrian hunter-gatherer tool kit worldwide. The presence of hand-modeled baked clay figurines, rolled tapers, beads, and fiber-tempered pinch-pots in Paleolithic artifact assemblages from Europe, northeast Asia, and Japan, in some cases dating as early as 27,000 BP (Rice 1999), suggest that North America’s earliest and subsequent waves of colonizers could have arrived here already possessing the knowledge and practice of modeling malleable sediments. Pottery production emerged in some areas but not others; northern California is one of the latter.

Northern California baked clay research has long been yoked to the question, “why not pottery?” I have to ask, “why bother with this question?” Since we can only conclude that prehistoric northern California populations, well, just didn’t—didn’t produce pottery, engage in agriculture, or build earthen pyramids—then pursuit of the “why not” question will likely end in a protean, unrewarding restatement of the proposition in the terms of the conclusion. Best illustrated in the disconnect exhibited by the figurine literature, our relentless focus on a presumed continuum with ceramic production and Southwestern diffusion has conceptually isolated the tradition and drawn attention away from the very interesting objects and the contexts in which they occurred. As I have attempted to demonstrate here, we are probably better off remembering to ask, “where, when, why, and how” these things were produced and used.

In closing, it is clear that the northern California baked clay industry was primarily if not exclusively focused on the production of familiar artifacts in artificial stone. Baked clay was used heavily but not exclusively by groups dwelling in stone-poor regions and resource-stressed contexts, and objects were made and used for both technological and sociocultural functions. Baked clay artifact production was low-scale throughout most of the prehistoric period and largely focused on utilitarian forms, but three important shifts occurred: 1) an increase over time in the production

of ceremonial items and personal gear designed for display; 2) intensified Emergent period production of artificial cooking stones to supply the Delta market; and 3) increased Emergent period application of punctate and incised decoration to a variety of previously undecorated personal gear.

I find the latter shift most interesting, primarily because punctate and incised baked clay decoration originated during the Archaic period, in an exclusive setting, that is, the evocation of wealth display on female figurines used in ceremonial settings. The increased use of this decoration during the Emergent period to embellish a wider range of objects bears further scrutiny and calls renewed attention to Heizer's (1937:42) admonition that this most plastic of artifact forms, destined for stony endurance, was a very likely venue for the material expression of culturally and economically conditioned signal and display.

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