Vessels for change: perspectives on the study of prehistoric ceramics in Baja California after Malcom J. Rogers

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Abstract

Malcolm J. Rogers pioneered the study of prehistoric pottery in the Yuman region, recording important evidence, both archaeological and ethnographic, that otherwise would now be lost. Recent researchers have followed up on several aspects of Rogers's work, elaborating or revising many of his original conclusions. As this work progresses, several key questions still need to be addressed: How long ago did local pottery-making begin? How far did its use extend prehistorically? What internal circumstances or external influences stimulated its adoption and set limits to its subsequent spread? Archaeologists continue to debate which of the attributes of pottery's chemistry, mineralogy, manufacturing techniques, vessel forms, or decoration are most informative about issues relating to regional chronology, the identification of cultural traditions, prehistoric patterns of travel and exchange, and the functions of ceramics within the region's native cultures.

One of Rogers's most important contributions was his pioneering work on the aboriginal pottery of southern California and northern Baja California (Figure 1). He documented ethnographic practices among the surviving Yumans and their neighbors, as well as the characteristics and distribution of prehistoric ceramics. Still critical for us are the very basic questions he asked: when? where? how? and why? Our answers remain tentative, but they have evolved, thanks to the additional data and insights contributed by subsequent studies. This article considers briefly some of those advances and some ideas about possible directions for future studies. Additional information pertaining to these issues is available on the Bajacalifology webpage, under "Databases: Prehistoric Ceramics."

Ethnographic evidence

Rogers's 1936 monograph, *Yuman Pottery Making*, was one of the first detailed ethnoarchaeological studies of aboriginal ceramic practices. Several investigators had previously collected information on Kiliwa, Paipai, Kumeyaay, Cocopa, and Quechan pottery-making, but none had presented accounts as detailed or comprehensive as Rogers's. Studies during subsequent decades have provided important additional data, but without superseding Rogers's summary. At present, Santa Catarina appears to be the last place in either Baja California or southern California where an unbroken local ceramic tradition is still continued. Elsewhere, native potters have attempted to revive the traditional craft on the basis of methods they have learned from ethnography, archaeology, or experiment, rather than through direct personal

Figure 1. Map of Baja California, showing linguistic boundaries and locations relevant to prehistoric ceramics.

transmission.

If the potential for further ethnographic input into the study of prehistoric ceramics in this region is therefore rather limited, experimental evidence may offer a wider scope. Most of the tentative efforts that have been made so far in this direction might perhaps be better characterized as "experiential" rather than "experimental" in a strict sense. They have successfully created reasonable facsimiles of prehistoric vessels using largely traditional methods and materials. However, as a rule they have lacked the rigorous control and documentation of scientific experiments. In the future, replicative studies that give due attention to the costs, relative efficiencies, and observational signatures of alternative pottery-making strategies may be able to advance the understanding of prehistoric Yuman ceramics on a more-than-merely-intuitive plane.

Archaeological evidence

Rogers's 1936 study drew upon archaeological evidence as well as ethnographic observations. However, his main publication on archaeological ceramics was "An Outline of Yuman Prehistory" (Rogers 1945). Together with his collections and unpublished notes preserved at the San Diego Museum of Man, this has formed at least the starting point for most subsequent studies of the region's late prehistory. Earlier observers had collected and commented upon archaeological finds of pottery, but Rogers made the first substantial attempt to create a framework for their interpretation.

Chronological limits

Rogers and some other observers suggested that until the early twentieth century, anthropologists had not known whether pottery-making had been practiced prior to the missions in the western Yuman area (DuBois 1908:170; Rogers 1936:1; Sparkman 1908:201). However, early historical documents clearly establish that pottery was being used at San Diego at least as early as A.D. 1602 and throughout the area between San Vicente and San Diego at the time of the Portolá expedition of 1769.

Given that the local industry was genuinely prehistoric, how far back in time did it extend? Lacking the subsequently developed tool of radiocarbon dating, Rogers was forced to base his answer primarily on intrusive pottery coming from the better-documented American Southwest, as well as on the chronology of Lake Cahuilla, which he believed to have been present in the Salton Basin between about A.D. 1000 and 1450. According to Rogers's chronological scheme, ceramics had come into use on the lower Colorado River during a Yuman I period, beginning about A.D. 800; had extended their range into the Lake Cahuilla and Laguna Macuata basins during the Yuman II period, ca. A.D. 1050-1500; and had reached the Pacific coast and areas farther south in northern Baja California during the Yuman III period, after A.D. 1500.

Rogers's chronology for Lake Cahuilla has now been superseded. Recent studies have confirmed that there were lake stands both prior to A.D. 1000 and subsequent to A.D. 1450, as well as at least one hiatus for the lake during the A.D. 1000-1450 interval (Laylander 1997; Love and Dahdul 2003). Along with other evidence from radiocarbon dates associated with pottery, these advances have cast substantial doubt on Rogers's overall chronological scheme.

The most radical challenge to that scheme comes from sites on Santa Catalina Island and

in Orange and Riverside Counties in California, just to the north of ethnographic Yuman territory. According to the sites' investigators, thermoluminescence and radiocarbon dates indicate that solid pottery objects and crude vessels were being used in southern California as early as 1500 B.C. or 3000 B.C. (Drover 1971, 1975, 1978; Drover et al. 1979; Porcasi 1998). If these claims are confirmed, the finds would represent some of the earliest known pottery in North America. However, the attributes of these early artifacts do not suggest any continuity with the local Late Prehistoric ceramic tradition.

More definitively, radiocarbon dating of ceramic associations and direct accelerator mass spectrometry (AMS) radiocarbon dating of sherds themselves seem to push the appearance of ceramics on the west coast of California back to at least A.D. 1000, and perhaps several hundred years earlier than that (Griset 1996). Estimates for the earliest pottery in the Colorado River valley generally range between about A.D. 500 and 800. The refinements of AMS and luminescence dating now offer possibilities for directly dating sherds from Baja California sites and discovering the true chronological limits of pottery-making and pottery use in that region.

Geographical limits

Rogers proposed a rather expansive spatial range for Yuman III ceramics, encompassing most of the state of Baja California. His limits included everywhere north of a line that included Isla Angel de la Guarda and Bahía de las Animas on the Gulf coast and Punta Santa Rosalita opposite them on the west coast.

Occasional plain brownware sherds have since been reported from archaeological sites even farther south, around Guerrero Negro, in the Sierra de San Francisco, at Bahía de la Concepción, near Comondú, and on Isla Espíritu Santo (Gutiérrez and Hyland 2002; Ritter 1979; Ritter and Payen 1992; Harumi Fujita, personal communication 2006). However, this pottery has been interpreted as a product of Jesuit mission influence rather than as prehistoric. The same disclaimer may apply to the scattered sherds that have been reported at some sites farther north, within Rogers's Yuman III range, for instance to the south of San Quintín and near Bahía de los Ángeles. In many of these areas, sherds occur most frequently at mission sites or at sites that contain historical materials, although they are not confined exclusively to such sites. Many, but not all, of the sherds in question contain fiber or dung temper, which may be an historic-period marker (May 1978:32). If the sherds at non-mission sites in central and southern Baja California were indeed produced only during the mission period, future historical studies may need to consider why pottery became integrated into substantially aboriginal lifeways during that period but not earlier.

It is also likely that some of the pottery reported from near the southern fringe of Baja California's ceramic zone was traded in prehistorically, rather than locally manufactured. For instance, Ronald D. Douglas (1981) reported that sites in Arroyo Matomí, south of San Felipe, contain buffware sherds, which suggests that the material may have originated in the Colorado River area, more than 100 km to the north.

In the future, as more archaeological field inventories are reported, a more complete picture will emerge concerning the presence or absence of ceramics at late prehistoric sites throughout Baja California. Together with refined dating methods and chemical or mineralogical paste analyses, these studies may make it possible to delineate more accurately the limit of the prehistoric Yuman (or possibly we may have to say "Yuman-Takic-Cochimí") ceramic industry, as distinguished from the outer halo of sherds representing prehistoric trade networks or later

mission-period innovations.

Defining variation

Analyzing the variability that exists in the region's prehistoric ceramics is potentially a key to reconstructing the industry's origins, its chronological development and diffusion, and prehistoric patterns of trade and seasonal mobility. Three main approaches have been used to characterize ceramic variation: observation of specific macroscopic attributes, typological classification and microscopic or instrumental detection of attributes. These approaches are complementary, not mutually exclusive.

Variability in macroscopic attributes has been documented both ethnographically and archaeologically, and significant chronological, geographical and ethnic patterns in trait distributions have been suggested. Rogers's publications offered fairly detailed conclusions regarding attribute distributions. However, the empirical evidence needed to substantiate Rogers's generalizations was never presented. Michael R. Waters (1982a) reiterated Rogers's attribute chronology, while making some modifications to it. Attributes of potential archaeological significance include the shapes given to ceramic artifacts, the methods of their embellishment, the materials used in their construction, and the methods employed in manufacturing them.

A considerable range of ceramic artifact forms has been distinguished in the Yuman area, and patterns in their chronological and ethnic ranges have been suggested, notably by Rogers himself. General functional types include ollas or jars, bowls, trays or dishes, and ladles or scoops, as well as smoking pipes, pottery anvils, figurines, and rattles. Within the artifact classes, variations in size or in the details of shape (such as the "Colorado shoulder" on jars) have also been considered significant. One obstacle to detecting patterns in the distribution of variability in form is that substantially complete archaeological specimens are relatively scarce. This has been partially overcome by considering more detailed differences in form, such as the presence of direct or recurved rims, several lip shapes, and body sherd thickness. However, the chronological, geographical or ethnic significance of these traits is not yet well established. In a cautionary note concerning one trait often given heavy interpretive emphasis, Gerrit L. Fenenga and Verenice Y. Heredia (1995:8) observed that "single Paipai potters ... make similar vessels with markedly different rim shapes."

Forms of embellishment include painting with red or black lines, incising, notching, polishing or burnishing and adding slips. In the Yuman region, the decoration of prehistoric pottery was relatively uncommon, and when it was used, the patterns that were produced were not generally highly elaborated or standardized. As a consequence, this type of variability has been much less useful for archaeological interpretations than in some other regions.

Investigators have often focused on differences in the clays that were used and in other materials that were naturally present within or added to them. The most widely noted contrast has been between residual and sedimentary clays. Residual clays are generally richer in iron, and when they are fired they turn brown rather than buff. Residual clays also generally contain fairly abundant natural inclusions and may not require any additional temper, and the inclusions may betray their origin by their mineral composition and by the absence of grain size sorting or rounding. However, recent studies of Salton Brown pottery associated with the Lake Cahuilla shoreline suggest that this ware, made from sedimentary clay, often grades into and is difficult to distinguish macroscopically from the residual Tizon Brown pottery of the Peninsular Ranges to

the west (Gallucci 2001; Hildebrand et al. 2002). Within the latter, some attempts have also been made to distinguish variability on the basis of the specific suites of mineral inclusions, notably in Ronald V. May's (1978) reworking of Rogers's typology. However, other observers have expressed skepticism about the replicability or the interpretive significance of such contrasts (e.g., Lyneis 1988). Greater success has been achieved by looking at variability in the amounts and types of temper added to buffware, including various kinds of sand, crushed rock, and potsherd fragments.

Variations in manufacturing methods may also be archaeologically recognizable. In the Yuman region, larger vessels seem to have been formed exclusively by the paddle-and-anvil method rather than the alternative coil-and-scrape method, while smaller items such as pipes and figurines were modeled. Shaping method is therefore not an important intraregional variable. Some Yuman sherds contain interior basketry impressions, produced by using a basket as a base upon which to begin forming the pot or as an anvil during its subsequent shaping. Ceramics were fired in oxidizing or reducing environments; the latter may be evidenced by fire clouds on vessel surfaces and carbon streaks visible in sherd cross sections. Other manufacturing traits are potentially discoverable in the distribution and character of archaeological features. Some ethnic groups believed that pottery ought to be made at private locations, while other potters did their work at habitation sites. Ceramics might be fired either in surface fires or within excavated pits. If pits were used, they might or might not be rock-lined, and they might or might not have been reused repeatedly. Investigators have not yet explored the interpretive value (if any) of variability in these manufacturing traits.

Beyond considering individual attributes, analysts have constructed ceramic typologies, which have usually been based on complex, implicitly structured combinations of multiple attributes. Rogers himself worked on but did not publish a typology (Waters 1982a:277). Some of his working notes were subsequently published (Van Camp 1979:81-86). Rogers's collections and notes formed the basis of several elaborate typologies, including ones proposed by Albert H. Schroeder (1958), May (1978), and Michael R. Waters (1982a, 1982b, 1982c). Schroeder and Waters offered competing classifications for buffware, while May's scheme addressed both brownware and buffware types. John A. Hildebrand and his associates (2002) used studies of ceramic pastes to propose a tripartite division between Lower Colorado Buffware, Salton Brownware, and Tizon Brownware, and to provisionally identify several chemically distinct types within the brownwares. The adequacy of some of the type definitions in these various schemes and the chronological and geographical ranges proposed for the types have not gone unchallenged by subsequent researchers (e.g., Hildebrand 2003; Laylander 1997; Schaefer 1994). It remains to be examined more closely whether ceramic typology itself is a necessary or effective tool, and if so, how it can be made most informative.

Microscopic and instrumental methods have been used to examine variability in the mineralogical or chemical contents of ceramic clays and inclusions. Methods of mineralogical analysis include the examination of sherd cross sections under a high-powered microscope and the study of thin sections under a petrographic microscope (e.g., Gallucci 2001; Hildebrand 2003; Hildebrand et al. 2002; Tuohy and Strawn 1989). X-ray diffraction offers another potential tool for identifying mineralogy (Simms and Bright 1997). Chemical analysis has been done by quantifying trace element frequencies using instrumental neutron activation analysis (INAA) or inductively coupled plasma spectroscopy (ICP) (Hildebrand et al. 2002; Plymale-Schneeberger 1993). In one study, clay samples from possible source areas were collected, fired, and similarly analyzed in order to match them with archaeological specimens (Hildebrand et al. 2002). These

studies show promise, but the costs involved may set limits to their application.

Interpretive values

Among the potential values that ceramic studies can contribute to Baja California prehistory, chronology is one of the more obvious. The presence of pottery at a site may (arguably) date it as having been occupied within the last millennium or so, which is about the same chronological resolution offered by projectile point types. If something similar to Rogers's tripartite scheme of Yuman I, II and III periods (or Waters' corresponding Patayan I, II and III periods) is accepted and if it is linked to specific pottery attributes or types, a resolution of plus or minus a few centuries will be available. This is better than what most lithic or shell bead analyses can presently offer, and it is probably as good or better than obsidian hydration at present, although it is still a little less precise than radiocarbon dating. Potentially, even finer-grained ceramic chronologies may be possible, if overlapping time ranges can be established for several individual ceramic attributes or types.

Prehistoric travel and exchange constitute another research domain to which Baja California pottery studies may make significant contributions. The archaeological occurrence of pottery at sites outside the geographical range of pottery manufacturing is one obvious type of evidence. Usually on a finer spatial scale, specific wares, clays, or suites of inclusions may be traceable back to source areas that were remote from the artifacts' archaeological occurrences. Patterns in the distribution of exotic ceramics may shed light on preferred corridors and directions of travel and exchange or on barriers that blocked them, as well as on the organization of seasonal transhumance. For instance, within Kumeyaay territory in southern California, recent analyses suggest that the predominant movement of pottery vessels went from east to west, from the desert lowlands up into the peninsular range mountains, and from the mountains to the Pacific coast (Gallucci 2001; Hildebrand et al. 2002; Schaefer 1994). A little farther north, in Cahuilla territory, the main flow seems to have occurred in the opposite direction. Why such contrasting patterns existed is not yet clearly understood, but it may reflect differences in natural resources or seasonal scheduling.

A more fundamental objective is to understand why prehistoric pottery-making was adopted when and where it was, and why it failed to establish itself any earlier or farther afield (Arnold 1985; Eerkens et al. 2002). Several potential hypotheses may be suggested. One would concern slowness in the rate of diffusion of the essential technological know-how. This hypothesis would have been more favored in Rogers's own time than it is today. Ethnographic and archaeological evidence attesting to prehistoric interaction and cultural diffusion through the Baja California peninsula is now fairly abundant, and no significant time lags in diffusion have yet been proven. A second explanatory hypothesis might propose that some resource critical for making pottery was scarce or absent. It is unlikely that suitable clay sources were lacking, but conceivably the substantial amounts of fuel needed to fire the pottery may have been in short supply. Or quite possibly contrasting patterns of mobility, settlement and social organization at different times and places can account for pottery's adoption or its rejection. Presumably the investment involved in pottery-making would have been favored by a lower degree of mobility (less frequent and/or shorter-distance moves), greater frequency in revisiting previously used sites, stronger group control over territories, and more individualistic rights in portable property. Contrasts in the subsistence resources that were being exploited might also have been involved; pottery-making would have been favored by resources that could be stored or that required

extensive boiling to be processed. These hypotheses still lie within the realm of speculation. Nonetheless, their validity may be tested as the true chronological and geographical limits of ceramics in Baja California become known and as other archaeological studies clarify the general picture of prehistoric cultural diffusion, resource use, settlement systems and social organization on the peninsula. Ceramic studies, in their turn, will be able to feed back important data for testing those interpretations.

References cited

Arnold, Dean A.
1985 *Ceramic theory and cultural process*, Cambridge University Press.

Douglas, Ronald D.
1981 "An archaeological reconnaissance in Arriba de Arroyo Matomi, Baja California Norte, Mexico", *Pacific Coast Archaeological Society Quarterly* 17(1):63-69.

Drover, Christopher E
1971 "Three fired-clay figurines from 4-Ora-64, Orange County, California", *Pacific Coast Archaeological Society Quarterly* 7(4):45-49.
1975 "Early ceramics from coastal southern California", *Journal of California Anthropology* 2:101-107.
1978 "Prehistoric ceramic objects from Catalina Island", *Journal of California Anthropology* 5:78-83.

Drover, Christopher E., R. E. Taylor, Thomas Cairns and Jonathon E. Ericson
1979 "Thermoluminescence determination on early ceramic materials from coastal southern California", *American Antiquity* 44:285-295.

DuBois, Constance Goddard
1908 "The religion of the Luiseño Indians of southern California", *University of California Publications in American Archaeology and Ethnology* 8:69-186, Berkeley.

Eerkens, Jelmer W., Hector Neff and Michael D. Glascock
2002 "Ceramic production among small-scale and mobile hunters and gatherers: a case study from the southwestern Great Basin", *Journal of Anthropological Archaeology* 21:200-229.

Fenenga, Gerrit L. and Verenice Y. Heredia
1995 "Pai Pai ethnoarchaeology: some implications for California archaeology", paper presented at the Society for California Archaeology southern data-sharing meetings, Los Angeles.

Gallucci, Karen Louise
2001 *From the desert to the mountains: Salton brownware pottery in the mountains of San Diego*, thesis, San Diego State University.

Griset, Suzanne
1996 *Southern California brown ware*, dissertation, University of California, Davis.

Gutiérrez, María de la Luz and Justin R. Hyland
2002 *Arqueología de la sierra de San Francisco: dos décadas de investigación del fenómeno Gran Mural*, Instituto Nacional de Antropología e Historia, Mexico City.

Hildebrand, John A.
2003 "Ceramics excavated from the lower Colorado River region by the North Baja Pipeline project", in *A view across the cultural landscape of the lower Colorado*

Desert: cultural resource investigations for the North Baja Pipeline project, by James H. Cleland and Rebecca McCorkle Apple, pp. 245-259, EDAW, San Diego.

Hildebrand, John A., G. Timothy Gross, Jerry Schaefer, and Hector Neff

2002 "Patayan ceramic variability: using trace elements and petrographic analysis to study brown and buff wares in southern California", in *Ceramic production and circulation in the greater Southwest: source determination by INAA and complementary mineralogical investigations*, Donna M. Glowacki and Hector Neff, eds., pp. 121-139, University of California, Los Angeles.

Laylander, Don

1997 "The last days of Lake Cahuilla: the Elmore site", *Pacific Coast Archaeological Society Quarterly* 33(1&2):1-138.

Love, Bruce and Marian Dahdul

2003 "Desert chronologies and the Archaic period in the Coachella Valley", *Pacific Coast Archaeological Society Quarterly* 38(2&3):65-86.

Lyneis, Margaret M.

1988 "Tizon brown ware and the problems raised by paddle-and-anvil pottery in the Mojave Desert", *Journal of California and Great Basin Anthropology* 10:146-155.

May, Ronald V.

1978 "A southern California indigenous ceramic typology: a contribution to Malcolm J. Rogers research", *Journal of the Archaeological Survey Association of Southern California* 2(2).

Plymale-Schneeberger, Sandra

1993 "Application of quantifiable methodologies in ceramic analysis: petrographic and geochemical analysis of ceramics from Riverside County, California", P*roceedings of the Society for California Archaeology* 6:257-276.

Porcasi, Judith F.

1998 "Middle Holocene ceramic technology on the southern California coast: new evidence from Little Harbor, Santa Catalina Island", *Journal of California and Great Basin Anthropology* 20:270-284.

Ritter, Eric W.

1979 *An archaeological study of south-central Baja California, Mexico*, dissertation, University of California, Davis.

Ritter, Eric W. and Louis A. Payen

1992 "Archaeological discoveries along Laguna Ojo de Liebre, Baja California, Mexico", in *Essays on the prehistory of maritime California*, Terry L. Jones, ed., pp. 251-266, Center for Archaeological Research at Davis Publication 10, Davis, California.

Rogers, Malcolm J.

1936 *Yuman pottery making*, San Diego Museum Papers 2.

1945 "An outline of Yuman prehistory", *Southwest Journal of Anthropology* 1:167-198.

Schaefer, Jerry

1994 "The stuff of creation: recent approaches to ceramic analysis in the Colorado Desert", in *Recent research along the Colorado River*, Joseph A. Ezzo, ed., pp. 81-100, Statistical Research Technical Series 51, Tucson, Arizona.

Schroeder, Albert H.

1958 "Lower Colorado buff ware: a descriptive revision", in *Pottery types of the Southwest*, Harold S. Colton, ed., Museum of Northern Arizona Ceramic Series 3D, Flagstaff.

Simms, Steven R. and Jason R. Bright
1997 "Plain-ware ceramics and residential mobility: a case study from the Great Basin", *Journal of Anthropological Science* 24:779-792.
Sparkman, Philip S.
1908 "The culture of the Luiseño Indians", *University of California Publications in American Archaeology and Ethnology* 8:187-234, Berkeley.
Tuohy, Donald R. and Mary B. Strawn
1989 "Thin section analysis of mission period pottery from Baja California, Mexico", *Nevada Archaeologist* 17(2):36-48.
Van Camp, Gena R.
1979 *Kumeyaay pottery: paddle-and-anvil techniques of southern California*, Ballena Press, Socorro, New Mexico.
Waters, Michael R.
1982a "The Lowland Patayan ceramic tradition", in *Hohokam and Patayan: prehistory of southwestern Arizona*, Randall H. McGuire and Michael B. Schiffer, eds., pp. 275-297, Academic Press, New York.
1982b "The Lowland Patayan ceramic typology", in *Hohokam and Patayan: prehistory of southwestern Arizona*, Randall H. McGuire and Michael B. Schiffer, eds., pp. 537-570, Academic Press, New York.
1982c "Ceramic data from Lowland Patayan sites", in *Hohokam and Patayan: prehistory of southwestern Arizona*, Randall H. McGuire and Michael B. Schiffer, eds., pp. 571-580, Academic Press, New York.