Beads and Pendants from the Coachella Valley, Southern California

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Introduction

During archaeological monitoring of earth-moving activities of two parcels of land situated in the Coachella Valley, a total of 19 cremation features were uncovered from sites CA-RIV-3013 and -64/H. These remains were accompanied by shell beads, pendants, charcoal, ceramic sherds, ceramic pipes, cordage, projectile points, groundstone, and other chipped stone artifacts (Love et al. 2001, Quinn 2001). The opportunity to compare the bead types recovered from the two sites with established bead chronologies was readily apparent and became the primary focus for a thesis research (Dahdul 2002). Researchers have found that variation in bead types can be sensitive time markers and, therefore, can be used in dating archaeological sites. Temporal bead sequences have been established for both central and coastal California (Bennyhoff and Hughes 1987, King 1981) and are used by archaeologists to classify beads found in other regions of California. The main goal of this study is to determine whether the dates derived for the bead types from CA-RIV-3013 and -64/H match the bead chronologies established in other regions of California.

The measurements, material types, perforation shapes, provenience, and distinct markings of each bead as well as specific details for each of the bead and ornament assemblages from individual features are presented in a completed master's thesis by the author (Dahdul 2002). The following paper presents a summary of the findings from that thesis.

Previous Bead Research

When Native American beads are recovered at archaeological sites, they are an important element in understanding Native culture and society. Although some researchers have suggested that beads along with other types of ornaments "had no utilitarian purpose" (Gifford 1947:2), beads were used as adornment, for display of wealth or status, and as money (King 1981). To the archaeologist, beads and ornaments can be very useful in shedding light on what prehistoric societies may have been like. Researchers such as King, Bennyhoff and Hughes have also shown that certain bead types are sensitive time markers that can be used to determine the period of occupation of a particular site.

Beads and Beadwork of the American Indians, Orchard's 1929 report is one of the earliest works describing Native American beads. The author, William C. Orchard, based his research on data available from the Museum of the American Indian, which had an extensive collection of beads from all over the world. Orchard's work offers an introduction to bead and material types along with descriptions

of manufacturing techniques and illustrations of how beads were attached to strings or woven onto fabric. This work is an essential resource for understanding the different uses and importance of beads in Native American societies, but Orchard's bead typology is very limited, and there is no focus on any particular region.

A classification system of *Olivella* sp. shell beads for California and the Western Great Basin was established by James Bennyhoff and Richard Hughes (1987). This work is, as the authors claim, a "more coherent and sensitive shell bead typology" (ibid.:84). The *Olivella* beads are classified into approximately 45 types and the work includes descriptions, measurements, and temporal significance of each type. It is an excellent and essential resource for conducting bead analysis.

A bead chronology was also established for the Channel Islands region of Southern California by Chester De Witt King (1981). King's important study ascertains that changes in artifact types are a result of changes within a society. The research revolved around data obtained from burial lots excavated during the first 30 years of the twentieth century. From this information, King was able to establish a bead chronology for the southern California coast associated with changes within Chumash society.

Setting

The two archaeological sites that are the focus of this study, CA-RIV-3013 and CA-RIV-64/H, are located in the Coachella Valley which is a part of the Colorado Desert in southern California (Wilke and Lawton 1975:9). Site CA-RIV-3013, in the City of La Quinta on the north side of Avenue 50 and west of Jefferson Street, once consisted of mesquite dunes at the 50 foot elevation just above the ancient shoreline of Holocene Lake Cahuilla (Fig. 1). Archaeological finds recorded at the site consisted of human remains, ceramic sherds, animal bones, groundstone implements, chipped stone pieces, a shell midden, a fish bone deposit, and a bead concentration (Parr 1985; Hall and Irish 1998; Love et al. 1999). The data suggest that the various loci of artifacts represent activity areas associated with ancient Lake Cahuilla, including, among others, resource gathering, fish roasting, chipped stone tool making, and funerary activities.

Site CA-RIV-64/H in the present-day City of Indian Wells is located immediately south of Highway 111 and west of Point Happy (Fig. 1) in a protected cove area between the base of the Santa Rosa Mountains and the old course of the Whitewater River. The first recordation of this site occurred in 1954 when it was identified as a campsite consisting of ceramic sherds, beads, groundstone, and bone tools (Smith 1954). A 1999 cultural resources survey of a portion of CA-RIV-64/H identified a number of prehistoric artifact concentrations comprised of chipped stone, ceramic fragments, bone, and groundstone (Love et al. 2002). A subsequent testing program uncovered a large quantity of prehistoric and historic-era artifacts, including a buried site possibly dating to the Archaic Period (ibid.). Ethnohistoric and historic research carried out in conjunction with the testing program determined that CA-RIV-64/H was the location of the historic Cahuilla village of Kavinish. The earliest reference of the village's existence occurs in numerous Cahuilla oral histories (ibid.:85), while historical records indicate that Kavinish was inhabited at the time of initial European contact up to its abandonment between the 1850s and 1890s (ibid.: 87, 91).

Methods

In order to address the research question posed at the beginning of this study, i.e., the potential for establishing a chronological sequence of bead types, two data sets are necessary: careful description of individual beads recovered from the archaeological features in question, and chronometric readings, i.e., C14 dates

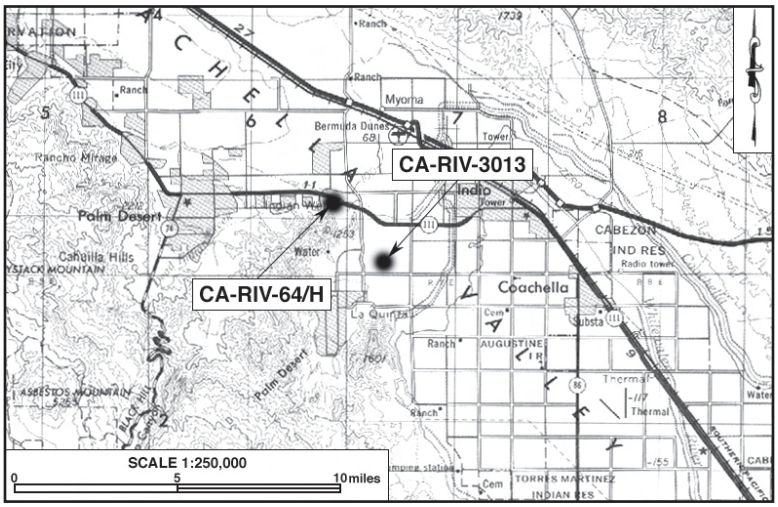

Fig. 1. Approximate locations of CA-RIV-3013 and -64/H within the Coachella Valley (USGS 1979)

for those features. The following methods were used to achieve the descriptive detail necessary for proper comparison and establishment of a working typology.

The beads and ornaments from these two sites were found associated with 19 archaeological features, most of which contained cremation remains and various grave goods. The beads and ornaments from each of the features were individually analyzed using a 10X hand lens. They were first examined for material type, e.g., shell, stone, or bone. Whenever possible, shell beads and ornaments were identified to genus and species using a reference book on Pacific Coast shells (Morris 1966) and a comparative collection of marine shells. The beads were then measured, and their shapes were noted in order to classify them according to Bennyhoff and Hughes' (1987) bead typology. The ornaments were compared to Gifford's (1947) typology of California shell artifacts.

The measurements for certain bead types, such as Spire-lopped, Oblique Spire-lopped, Barrel, and Cap, included the width of the specimens around the circumference of the body whorl (Fig. 2). The dimensions of the circumference of the *Olivella* sp. shell was then used to determine which sub-type of Spire-lopped, Oblique Spire-lopped, Barrel, and Cap beads were represented. For instance, the Spire-lopped type, A1 (Bennyhoff and Hughes 1987:116-119), is sub-divided into three categories: A1a measuring 3.0-6.5 mm; A1b measuring 6.51-9.5 mm (millimeters); and A1c measuring 9.51-14.0 mm. The same divisions of sub-types based on circumference size apply to the Barrel, Cap, and Oblique Spire-lopped beads.

For cylinder/disk-shaped beads or ornaments, the overall diameter and thickness of the artifact were measured along with the perforation diameter (Fig. 2). Beads with pronounced concave cross-sections, such as Split Oval types, were measured for curvature rather than thickness.

The perforations of the beads were carefully examined in order to determine the hole shape (Gibson 1992:13). Gibson identifies three distinct hole shapes: biconical, conical tapered, and straight bore hole (Fig. 2). Biconical refers to perforations that are drilled from opposing sides of the shell wall. Conical tapered perforations are wide at one end and gradually become

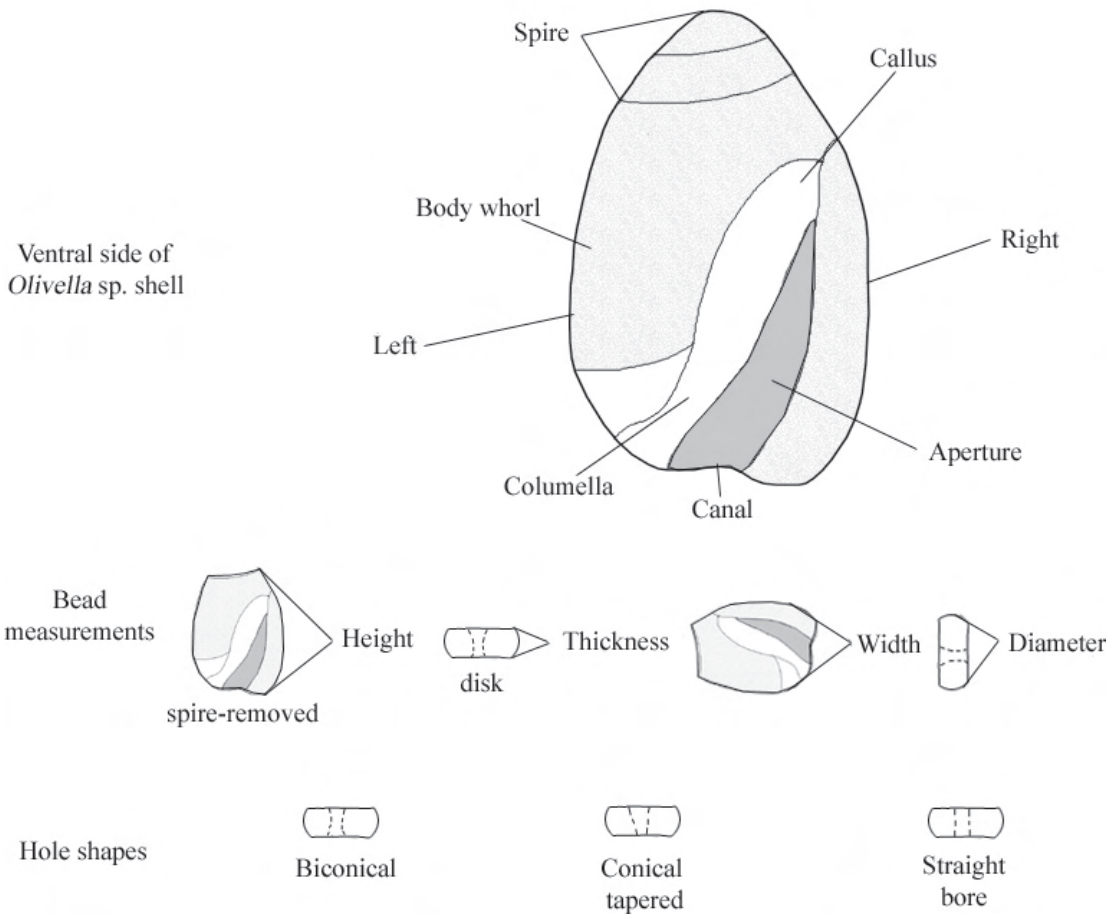

Fig. 2. Olivella sp. shell landmarks, measurements, and hole shapes (adapted from Bennyhoff and Hughes 1987:89, Gibson 1992:7).

thinner at the other end. Straight bore holes do not taper and are "straight parallel-sided holes."

Spire-removed beads were inspected for ground surfaces around the circumference of the body whorl of the shell. For beads with ground body whorls, the number of flat surfaces present was noted and their locations were identified. Left and right refer to the viewer's left and right (Fig. 2).

Attention was also paid to the shape of ground spires. Some of the spires appear to have been ground straight, while others have a slight U-shaped curve or a notch (Fig. 3). The variation in spire shapes is obviously a result from differing manufacturing techniques, as yet to be fully understood.

Results of Bead and Ornament Analysis

Over 1,200 ornaments were recovered from features located during archaeological investigations at sites CA-RIV-3013 and -64/H. Nearly 95% of these are identified as *Olivella* sp. shell beads that can be typed according to Bennyhoff and Hughes' (1987) bead classification system. A new type of *Olivella* sp. bead, however, also was identified during the analysis and is

Fig. 3. Ground spires of spire-removed beads. Note the U-shaped curve (bead on the left) and notch (bead on the right) on each of the specimens pictured.

discussed in greater detail below. The remaining ornament assemblage consists of pendants.

Cylinder

The most abundant bead type identified during this study was the Cylinder (K3) bead, with a total of 972 specimens recovered from five features at Site CA-RIV-3013 (Fig. 4). According to Bennyhoff and Hughes (1987:137), cylinder beads are generally manufactured from the callus portion of the *Olivella* sp. shell and measure 2.0-3.0 mm in diameter, 1.0-3.0 mm in thickness, and possess 1.0-2.0 mm diamter perforations. All but one of the specimens from this Coachella Valley assemblage are made from the *Olivella* sp. shell—a single bead was found to be made from *Conus californicus* shell. The beads from this 2002 assemblage have all been fire-affected and measure 1.5-4.5 mm in diameter, 0.5-3.0 mm in thickness, and possess 1.0-2.0 mm perforations. It should be noted that some of the beads measuring less than 1.0 mm in thickness were probably much thicker before being burned. As mentioned, the Cylinder beads were produced from the callus portion of *Olivella* sp. shell. The callus is made up of layers of shell and when burned, these layers tend to separate (Bennyhoff and Hughes 1987:136). A few of the 1.0 mm thick Cylinder beads retain small portions of the layers of the callus, which attest to this process.

Approximately 30% (n=288) of the Cylinder beads exhibit incising around the circumference (Fig. 4). Of the incised beads, 2% (n=6) have been engraved with slash-like markings (////) and 98% (n=282) are engraved with X-shaped markings (XXX). As the markings identified on each bead do not reach the edges of the artifact, it is likely that these were engraved individually.

Cupped

A total of 194 fire-affected Cupped (K1) beads made from *Olivella* sp. shell were recovered from sites CA-RIV-3013 and -64/H (Fig. 5). This bead type is made from the upper callus portion of the *Olivella* shell (Bennyhoff and Hughes 1987:137), which makes it a

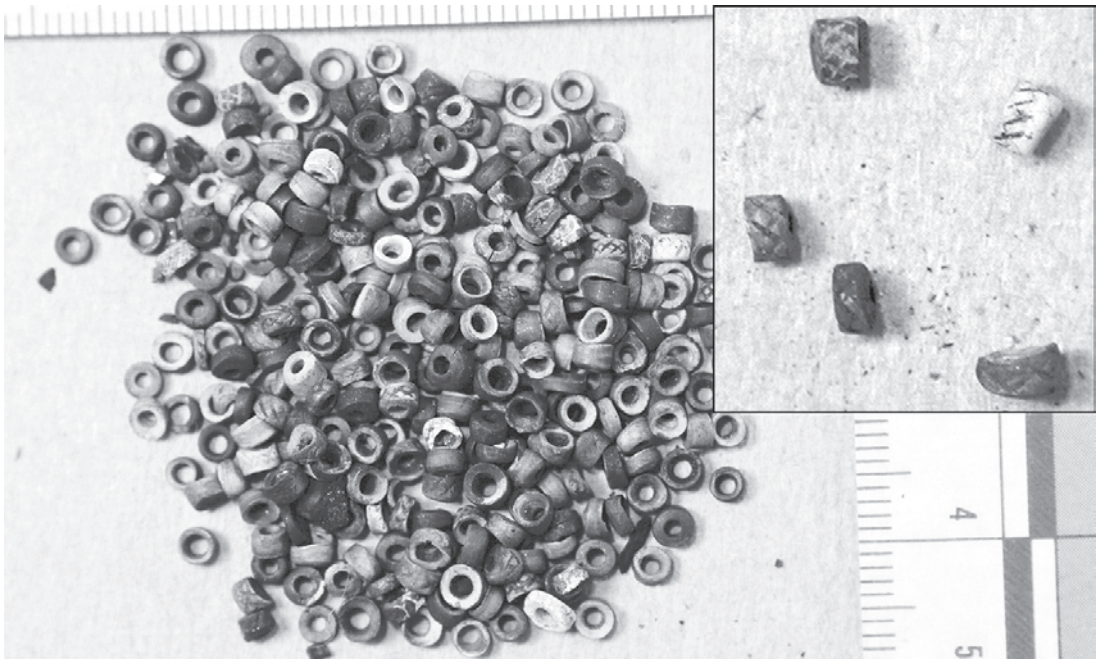

Fig. 4. Cylinder beads recovered from CA-RIV-3013. Inset: Specimens with incised markings. Scale on this and subsequent figures is in millimeters.

Fig. 5. Cupped beads recovered from CA-RIV-64/H.

small, thick, circular-shaped bead. Dimensions for the beads from this assemblage range around 3.0-5.0 mm in diameter (15 of the beads are unusually large and measure 6.0 mm in diameter), 1.0-4.0 mm in thickness, and possess 0.5-2.0 mm diameter perforations. Like the Cylinder beads discussed above, two of the Cupped specimens exhibit X-shaped markings around the circumference.

Spire-lopped

A total of 32 fire-affected Spire-lopped beads were collected from CA-RIV-3013 and -64/H (Fig. 6). The specimens include 16 made from *Olivella baetica*, 12 from *Olivella dama*, 2 from *Olivella biplicata*, and 2 from an indeterminate species of *Olivella.* Measurements of the shell found that the beads measured 5.0-7.5 mm in diameter—29 are of the A1a type while 3 are of the A1b type (Bennyhoff and Hughes 1987:117).

Close examination of the spire of each bead found that 20 of these were ground and 12 were broken. It should be noted that some of the broken spires may have been broken during firing; thus, the spires on some specimens may have been ground off during manufacture. Two of the Spire-lopped beads that have been ground possess U-shaped spires (see Fig. 3).

Oblique Spire-lopped

Four Oblique Spire-lopped beads (A2) were recovered from CA-RIV-3013 and -64/H (Fig. 7). This bead type consists of an *Olivella* sp. shell that has the spire removed at an angle. Of the four beads analyzed from this assemblage, three are made from *Olivella baetica* shell. A fourth bead is too fragmentary to identify as to the species of *Olivella* shell. This particular bead, however, possesses two distinctly ground surfaces on the body whorl (see "Whorl Ground," below). All of the Oblique Spire-lopped specimens are of the A2a

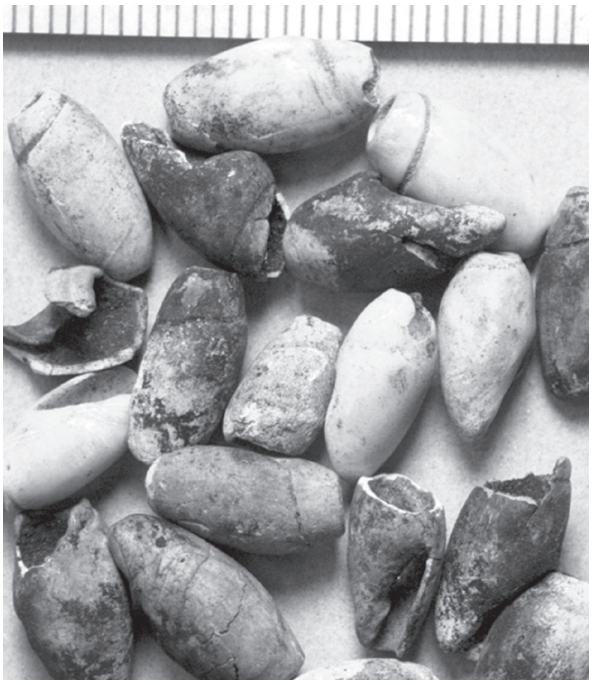

Fig. 6. Spire-lopped beads from CA-RIV-64/H.

Fig. 7. Oblique Spire-lopped beads from CA-RIV-64/H.

division (Bennyhoff and Hughes 1987:117, 119), measuring 4.5-6.0 mm around the circumference of the shell.

Barrel

The burned Barrel beads (B3) identified from the artifact assemblage all came from Site CA-RIV-3013 (Fig. 8). This bead type is manufactured by removing both the base and spire of the *Olivella* sp. shell. All but one of the specimens analyzed for this study had both the base and spire broken off—a single bead had been ground on both ends. During the laboratory analysis, 32 of the beads were found to be small Barrel (B3a) and 27 were medium Barrel (B3b) (Bennyhoff and Hughes 1987:117, 122). The remaining beads were too fragmentary to measure around their circumference.

Cap

A total of 31 Cap (B4) beads were identified in the bead assemblage from the two archaeological sites under investigation (Fig. 9). With this bead type, the aperture and most of the spire are removed (Bennyhoff and Hughes 1987:122). The Cap beads recovered during this study are all made from *Olivella* sp. shell and measure 5.0-8.0 mm around the circumference of the shell. For this assemblage, 13 are of the B4a type and 18 are of the B4b (Bennyhoff and Hughes 1987:117, 122). Approximately 60% (n=18) of the specimens had both ends ground off, while only a single bead was positively identified as having had the ends broken off. Because of the highly burned condition of the remaining beads, it is difficult to determine if

Fig. 8. Barrel beads from CA-RIV-3013.

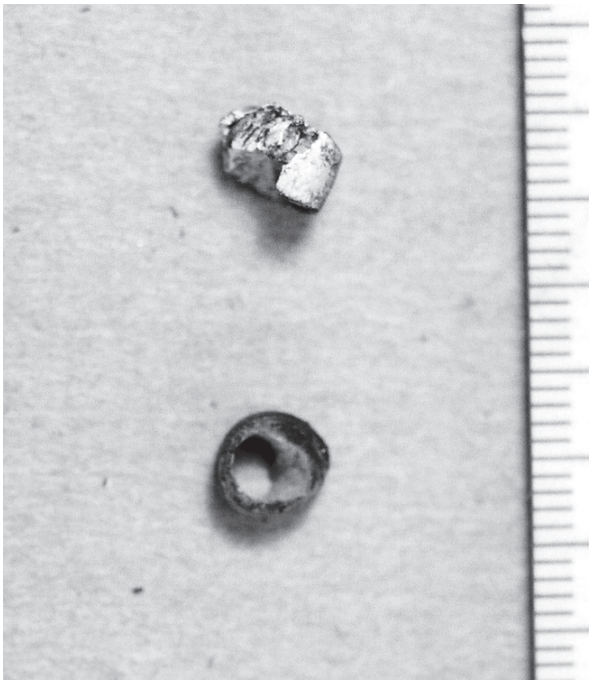

Fig. 9. Cap beads from CA-RIV-3013.

the broken ends were purposefully produced or if the specimens broke during firing.

Split Oval

A single Split Oval bead was recovered from Site CA-RIV-3013 (Fig. 10). The bead is made from *Olivella*

Fig. 10. Split Oval bead from CA-RIV-3013.

sp. shell and measures 11.0 mm in length and 9.0 mm in width, and has a 5.0 mm deep curvature. The specimen's 2.0 mm-conical tapered perforation was drilled from the outside in, and the edges of the bead are slightly chipped.

Whorl Ground

As stated earlier, the analysis of shell beads from CA-RIV-3013 and -64/H also resulted in the identification of a new bead type henceforth designated as Whorl Ground. The Whorl Ground is similar to the Spire-lopped type in that the spires of both classes of bead are removed. Whorl Ground beads, however, exhibit at least one ground surface on the circumference of the body whorl (Fig. 11). This new bead type falls into Bennyhoff and Hughes' (1987:116) Class A, and is designated as type A7: Whorl Ground.

A total of 56 Whorl Ground beads were recovered from both sites and include 38 made from *Olivella dama*, 10 from *Olivella biplicata*, 6 from *Olivella baetica*, 1 from *Olivella gracilis*, and 1 from *Olivella tergina* (Table 1). Of this total, 9 exhibit four ground surfaces around the body whorl, 5 have three ground surfaces, 30 have two ground surfaces, and 6 have one ground surface (Table 1). The majority of the ground surfaces are slight and barely noticeable; on others, however, the grinding has been so extensive that perforations were produced on the sides of the body whorl. Furthermore, four of the beads have been ground so extensively on four sides that the artifacts appear to be rectangular in cross-section. Of the beads that possess perforations around the body whorl, 4 contain one hole, 2 contain two holes, and 1 has three holes. In addition to the ground surfaces, some of the Whorl Ground beads also have notched (n=6) or U-shaped spires (n=14).

Other

Aside from the Whorl Ground beads, five additional beads were identified during the analysis that could not be placed within the bead typology established by Bennyhoff and Hughes (1987). The first of these is half of a broken bone bead that closely resembles the shape of a Barrel (B3) type. The ends of the artifact are broken and taper inward, with a notch present on one end. The bead measures 13.0 mm in length and 9.5 mm in width. A small limpet ring was noted during the analysis. The specimen measures 9.0 by 5.5 mm and appears to be a *Fissurella volcano* (volcano limpet). It is 2.5 mm thick with all edges ground.

A *Mytilus* cylinder bead measuring 3.0 mm in diameter and 1.0 mm in thickness was also identified. The specimen has been ground on both the dorsal and ventral sides and possesses a 1.0 mm diameter perforation. A fourth bead is made from clam and exhibits a ring/disk shape. It measures 4.0 mm

Table 1. Whorl Ground Beads recovered from CA-RIV-3013 and -64/H.

Catalog number	Shell type	Size around circumference (mm)	Number of ground surfaces	Perforations around body whorl	Shape of spire
0170a*	*Olivella biplicata*	5.0	2		
0170b	*Olivella biplicata*	5.0	2		Notched
0170g	*Olivella dama*	5.0	2		
0170h	*Olivella dama*	5.5	2		
0170i	*Olivella dama*	6.5	2		U-shaped
0170j	*Olivella dama*	6.0	3		
0170k	*Olivella dama*	6.0	3		
0170l	*Olivella dama*	6.0	4		
0170m	*Olivella dama*	5.5	3		U-shaped
0170n	*Olivella dama*	5.0	2		U-shaped
0170o	*Olivella dama*	6.0	4		
0170p	*Olivella dama*	5.0	3		U-shaped
0170q	*Olivella dama*	5.0	4	2	U-shaped
0175g	*Olivella dama*	?**	2		
0175h	*Olivella dama*	5.0	4		U-shaped
0175i	*Olivella dama*	5.5	2		
0175j	*Olivella dama*	6.0	2		
0175k	*Olivella dama*	5.0	4	1	Notched
0175l	*Olivella dama*	6.0	2		
0175m	*Olivella dama*	5.0	4	3	
0175n	*Olivella dama*	5.5	2		Notched
0175o	*Olivella dama*	5.0	2		
0175p	*Olivella dama*	4.5	4	1	Notched
0175q	*Olivella dama*	5.0	4		Notched
0175r	*Olivella dama*	5.0	3		Notched
0175s	*Olivella biplicata*	6.0	4	2	U-shaped
0175t	*Olivella biplicata*	5.5	2	1	U-shaped
0175u	*Olivella biplicata*	6.0	2		
0175v	*Olivella biplicata*	6.5	2		
0175w	*Olivella biplicata*	6.0	2		U-shaped
0175x	*Olivella biplicata*	5.5	2		U-shaped
0175y	*Olivella biplicata*	6.0			U-shaped
0157	*Olivella biplicata*	6.0	2	1	U-shaped
0152	*Olivella dama*	7.0	?		
0162	*Olivella dama*	7.0	?		
0204	*Olivella dama*	7.0	2		
0310b	*Olivella dama*	7.0	2		
0400	*Olivella dama*	6.0	2		U-shaped
0355a	*Olivella baetica*	6.0	2		
0355b	*Olivella dama*	7.0	2		
0355c	*Olivella dama*	6.0	2		
0355d	*Olivella dama*	5.5	2		
0365a	*Olivella dama*	6.0	?		
0357a	*Olivella dama*	6.0	?		
0357b	*Olivella dama*	6.0	2		U-shaped
0338	*Olivella tergina*	6.0	2		
0349	*Olivella dama*	6.0	?		
0347	*Olivella gracilis*	5.5	2		
0188a	*Olivella baetica*	6.0	2		
0203a	*Olivella baetica*	6.0	1		
0203b	*Olivella dama*	5.5	1		
0203h	*Olivella dama*	5.0	1		
0203i	*Olivella baetica*	5.5	2		
0193l	*Olivella baetica*	5.5	1		
0193m	*Olivella dama*	6.0	1		
0193p	*Olivella baetica*	6.0	1		

**Two beads are represented in this catalogue number.*
***The bead is too fragmented to measure.*

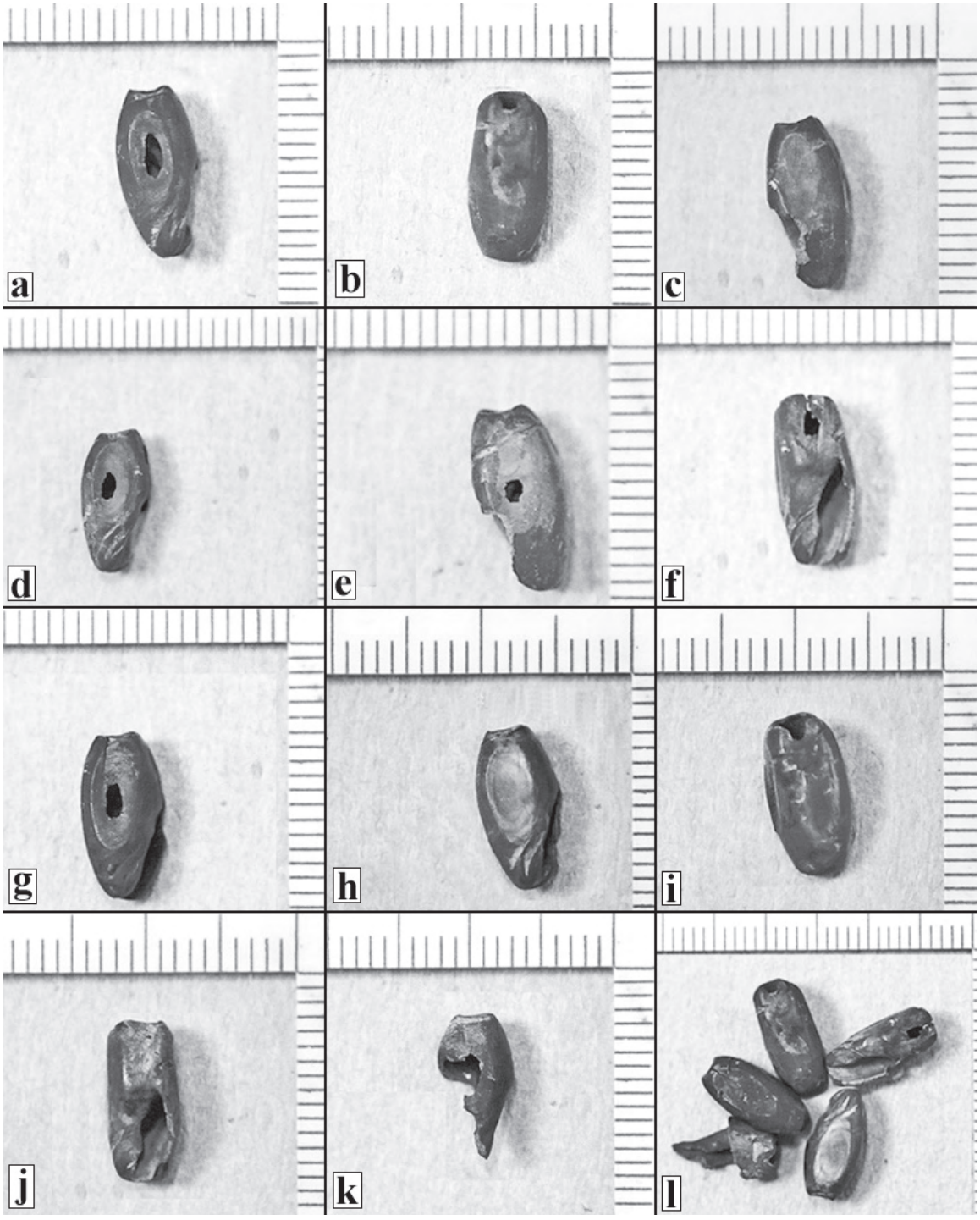

Fig. 11. Whorl Ground beads from CA-RIV-3013: (a-c) Specimen 643-0175k; (d-f) 643-0175m; (g) 643-0175p; (h-j) 643-0175q; (k) 643-0175h; (l) five beads rectangular in cross-section.

in diameter, 1.0 mm in thickness, and has a 2.5 mm diameter perforation. Finally, an *Olivella* sp. shell measuring 3.0 mm in diameter and 1.0 mm in thickness was identified. The bead resembles Bennyhoff and Hughes' (1987:137) Bushing (K2) type, except that this particular specimen has an oval-shaped perforation measuring 1.0 by 0.5 mm.

Pendants

Several pendant fragments were also recovered from the two archaeological sites under investigation. Over 20 pieces of pecten shell representing at least two pendants were identified. One of the pecten artifacts is disk-shaped with the edges ground, and retains a portion of a perforation measuring 3.0 mm. A second pendant has a serrated edge and a single perforation also measuring 3.0 mm.

Pendants made from abalone shell were the most abundant in the assemblage, with at least seven pendants represented. A large, elongate pendant fragment that is almost triangular in shape (Fig. 12) was determined to be made from *Haliotis rufescens* (red abalone). Portions of the edge of the artifact are serrated. The pendant measures at least 98 mm in length and contains one perforation measuring 3.0 mm in diameter.

Fragments of a highly fire-affected *Haliotis cracherodii* (black abalone) shell pendant were also recovered. One of these fragments is at least 36 by 32 mm in size and contains two perforations measuring 3.0 mm each. Although fragmentary, enough of the pendant is present to positively identify it as Gifford's (1947:18, 75) type K6bIII, which is a semi-circular abalone pendant with two perforations at the top.

Fig. 12. Abalone pendant from CA-RIV-3013.

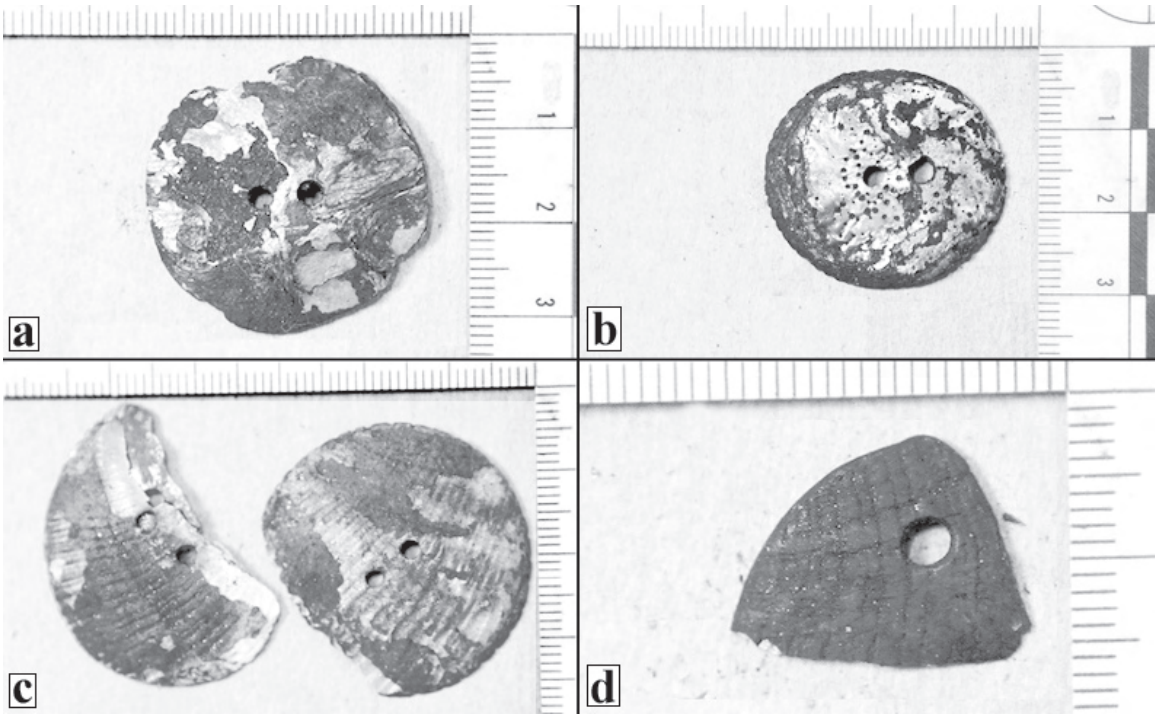

Fig. 13. Abalone ornaments from CA-RIV-3013.

Five other pendants made from *Haliotis cracherodii* were identified during the analysis (Fig. 13). Four of these are disk-shaped (resembling buttons) and possess two perforations at their centers. Two pendants measure 32.0 mm in diameter, one measures 30.0 by 29.0 mm, and a fourth measures 28.5 by 27.0 mm. The perforations measure between 2.0 mm and 3.0 mm in diameter. A fifth black abalone pendant is triangular in shape (Fig. 13d) and measures 16.0 mm at the broken base. Its has a 3.0 mm perforation at the tip and two of its intact edges are ground.

Discussion

Eight bead types and several shell pendants were identified from the features found at CA-RIV-3013 and -64/H. The most numerous were Cylinder (n=966), followed by Cupped (n=194), Barrel (n=78), Whorl Ground (n=55), Spire-lopped (n=32), and Cap (n=31). Both the Cylinder and Cupped types date to the Late Period in central and coastal California, whereas the Cap bead type dates to the Early Period and Middle to Late Period transition phase in coastal California (Bennyhoff and Hughes 1987:122, 137). Barrel beads occurred throughout all time periods, but certain sizes are characteristic of certain time periods (ibid.:122). Small Barrel beads appear to have been manufactured during the Late Period in central California, while the medium and large types were made in the transition phase of the Early and Middle Periods (ibid.). Spire-lopped, generally speaking, do not have any temporal significance (ibid.:118). The presence of Whorl Ground beads constitutes a new bead type. Its temporal significance is discussed in later sections of this paper.

The remaining bead types such as Oblique Spire-lopped and Split Oval are few in number in this assemblage. Oblique Spire-lopped specimens date to the transition phase of the Early and Middle Periods

and the early phase of the Middle Period in coastal California (ibid.:119). In central California, this type was produced during the Early Period. As for the Split Oval type, it was produced during the Early Period in the Great Basin area and in the transition phase of the Middle and Late Periods in California (ibid.:123). In coastal California, Oval beads were produced during the M2b or early phase of the Middle Period (King 1981:212).

Two disk-shaped beads made of *Mytilus* and clam and a *Fissurella volcano* small ring ornament were also recovered from Site CA-RIV-3013. According to King (1981:242), *Mytilus* disk beads date from the late phase of the Middle Period up to the "Spanish Mission" Period in coastal California. Clam disk beads in coastal California were common in the Early Period, with a smaller size version being produced during the early and middle phases of the Early Period (ibid.:175, 176). The clam disk ceased to be produced during the Middle Period, but emerged again in the Late Period (ibid.:310). *Fissurella volcano* ornaments were used throughout the Middle Period, ca. 1400 BC to AD 1150 (ibid.:206). Importantly, King notes that no such ornament has ever been found outside of the Santa Barbara Channel region, except for two from San Nicolas Island and from the Salinas River drainage (ibid.).

Comparison of Beads with Established Chronologies

Since the bead types recovered from CA-RIV-3013 and -64/H came from features containing large quantities of charcoal, the radiocarbon dates for those features have been used to date the beads from this assemblage and compare the results to the bead sequences established for coastal and central California. Charcoal samples from the features were sent to Beta Analytic, Inc. for dating. Table 2 presents the resulting radiocarbon dates from the features found at the two sites under investigation.

Table 2. Results of radiocarbon dates from CA-RIV-3013 and -64/H.

Bead Type	Radiocarbon Dates* for the Features Containing this Bead Type
Cylinder	Sample 1: AD 1660 to 1950 Sample 2: AD 1510 to 1600 and AD 1620 to 1950 Sample 3: AD 1460 to 1670
Cupped	Sample 1: AD 1530 to 1560; AD 1630 to 1690; AD 1730 to 1810; and AD 1920 to 1950 Sample 2: AD 1450 to 1670; AD 1770 to 1800; AD 1940 to 1950
Spire-lopped	Sample 1: AD 1430 to 1660 Sample 2: AD 1450 to 1670; AD 1770 to 1800; AD 1940 to 1950
Oblique Spire-lopped	Sample 1: AD 1660 to 1950 Sample 2: AD 1450 to 1670; AD 1770 to 1800; AD 1940 to 1950
Barrel	Sample 1: AD 1430 to 1660 Sample 2: AD 1460 to 1670
Cap	Sample 1: AD 1660 to 1950 Sample 2: AD 1460 to 1670
Split Oval	No charcoal samples were retrieved from the feature containing this bead type.
Whorl Ground	Sample 1: AD 1660 to 1950 Sample 2: AD 1510 to 1600 and AD 1620 to 1950 Sample 3: AD 1450 to 1670; AD 1770 to 1800; and AD 1940 to 1950

**All radiocarbon dates are presented as 2 Sigma calibrated results.*

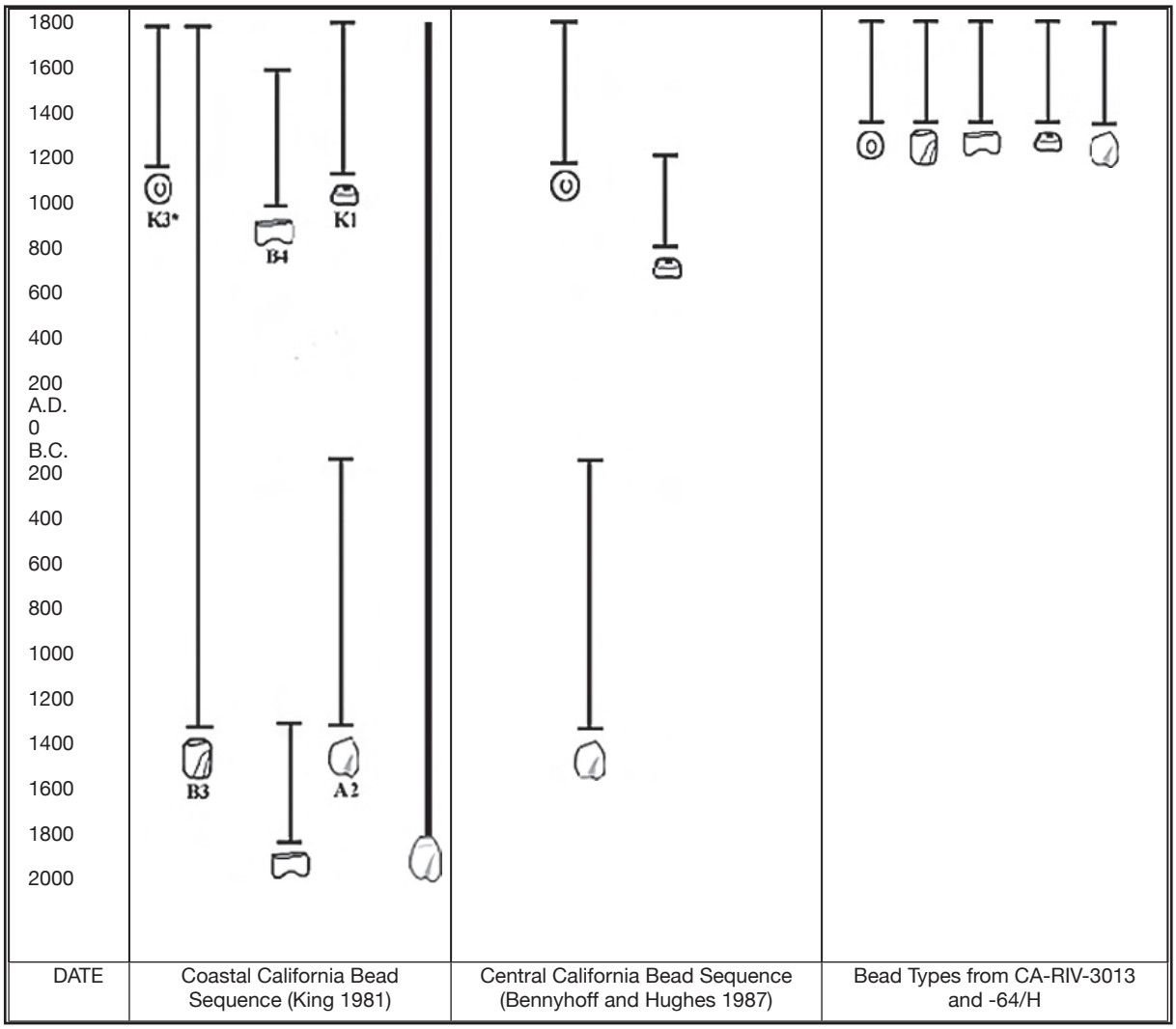

*Fig. 14. Dates for bead types found at CA-RIV-3013 and -64/H compared to the coastal and central California sequences. (*K3-Cylinder, B3-Barrel, B4-Cap, K1-Cupped, A2-Oblique Spire-lopped.)*

From the 15 features that produced C14 dates, seven bead types were present—Cylinder, Barrel, Cap, Cupped, Oblique Spire-lopped, Spire-lopped, and Whorl Ground. Although many of the dates range into the twentieth century, it is reasonable to assume that the features in question pre-date the second half of the nineteenth century. In spite of the influx of non-Indians to the Coachella Valley after the 1850s, and especially after the construction of the railroad in the 1870s, not a single non-Native artifact was found in the features examined.

Based on the radiocarbon results presented above, and eliminating twentieth century dates for reasons just given, the range of dates for the beads recovered are as follows: Cylinder–AD 1460 to 1850; Barrel–AD 1460 to 1670; Cap–AD 1460 to 1850; Cupped–AD 1450 to 1850; Oblique Spire-lopped–AD 1450 to 1850; Spire-lopped–AD 1430 to 1850; and Whorl

Ground–AD 1450 to 1850 (Table 2). This does not suggest that these bead types could not have occurred during earlier time periods, but that they were present during the dates just given. Figure 14 compares the radiocarbon dates for the beads from the two sites in question with King's bead chronology for coastal California and Bennyhoff and Hughes' sequence for central California.

Only two of the bead types—Cylinder and Barrel—recovered from the two sites in question match the bead sequences established for central and coastal California. According to King (1981), Cap beads in coastal California ceased to be used in AD 1500. The Cap beads from the two sites in question post-date the coastal sequence. The Oblique Spire-lopped bead type does not match the established bead sequence for coastal and central California. According to King (1981) and Bennyhoff and Hughes (1987), Oblique Spire-lopped beads are Early Period or early phase of the Middle Period bead types. However, this bead type is found in the Coachella Valley in Late Prehistoric Period context. The Cupped type found in the Coachella Valley matches the bead sequence for coastal California, but not for central California. In central California, this bead type ceased to be produced around AD 1100. Finally, the limpet ornament found at CA-RIV-64/H dates to at least AD 1530, in contrast to the Middle Period date it is given in coastal California.

Whorl Ground Beads

The analysis of beads from CA-RIV-3013 and -64/H identified a number of *Olivella* sp. spire-removed beads exhibiting ground surfaces on the circumference of the body whorl of the shell. Some of the grinding has been so extensive that holes were produced as a result. A literature search on this bead characteristic revealed that similar beads were found at Site CA-RIV-45 in Tahquitz Canyon (King 1995). No illustrations of those beads were presented in that study. Gibson (1992:167) also describes Spire-lopped beads with "wear patterns" on the sides. He attributes this to the specimens being strung side-by-side (Gibson 1992; 2001). Perhaps some of the spire-removed beads from CA-RIV-3013 and -64/H were strung side-by-side or on the ends of skirts (Quinn 2001), thus producing the abrasions on the body whorl from the specimens rubbing against each other. The possibility that these abraded surfaces are the result of incidental rubbing cannot be completely discounted at this time, but the uniformity of the ground surfaces and their occurrence as two, three, or four from opposing surfaces, suggests intentional grinding by the bead maker. Until further research points in another direction, the proposition that Whorl Ground constitutes a new bead type remains valid.

Approximately 85% of the Whorl Ground beads are made from *Olivella dama* shell indicating that this new bead type may have been manufactured near the Gulf of California, perhaps in the Imperial Valley. It is difficult to determine if the specimens were traded into the Coachella Valley in their final form, or if the beads were further modified after they entered the valley. Based on radiocarbon dates from the features containing this new bead type, Whorl Ground (A7) beads date to the Late Prehistoric Period in the Coachella Valley, appearing between AD 1450 and ca. 1850.

Summary

The main focus of the study was to compare the bead types recovered in the Coachella Valley with established bead chronologies from coastal and central California. The current research indicates that these established sequences do not consistently apply to the desert regions of southern California. Chronometric readings—i.e., radiocarbon dates from features—show that at least seven of the bead types present in these collections range in date from AD 1430 to ca. 1850. Some of these types, such as the Cap, Cupped, and Oblique Spire-lopped do not match the sequences for

coastal and central California, which occur during earlier time periods for those regions.

One final result of this research was the identification of a previously unrecorded bead type, Whorl Ground (A7). Whorl Ground beads are made of *Olivella* sp. shell that resemble the Spire-lopped type, but possess ground surfaces on the body whorl of the shell. Some specimens exhibit two or three ground areas, while others have four. Yet other Whorl Ground beads have been abraded so extensively that perforations are present on the ground surfaces. Future research will yield more information on this new bead type.

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