Red Beads in Southern California

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Abstract

Red argillite beads and pendants are rare occurrences in the archaeological record in southern California. They appear to be restricted to southern Orange and northern San Diego Counties. A manufacturing center for these items is hypothesized to have been located in the Trabuco Canyon and Cota de Caza areas of inland Orange County from which they were traded to the coastal areas. Red beads and ornaments may be diagnostic of the Millingstone Horizon (Encinitas Tradition) in this region.

Introduction

The term "red argillite beads" refers to a class of red-colored, stone beads and pendants whose distribution appears to be restricted to south Orange and northern San Diego Counties. The beads, pendants, and raw material have been recovered from a small number of sites since the early 1980s. Although several sites have produced dozens of specimens, red bead items are nevertheless rare in the archaeological record in southern California.

In this synthesis of the red bead data, I will focus upon basic description of the beads and pendants, including raw material, bead types, production stages, and archaeological distribution of the red bead items. I will identify the sites and assemblages in which the beads have been found, along with any feature associations, dating of the assemblages and/or features, and offer hypotheses regarding production and trade of the red argillite beads in Orange County.

Red Bead Raw Material

All of the red beads in this study are made of argillite, a metasedimentary rock type. Argillite is a relatively hard, clay-rich rock, which also contains quartz, feldspar, carbonate, and mica. The parent rock of argillite may be claystone (shale), mudstone, or pipestone (catlinite).

Argillite ranges in color from light to dark gray, black, green, or red. Its texture is very fine (aphanitic) with a grain size less than $1/256$ millimeters. Argillite may exhibit bedding planes. Freshly quarried argillite feels something like talc and can be carved or ground.

Argillite is found in deposits of the Sespe Formation (Morton and Miller 1973), a continental (non-marine) deposit which outcrops in the foothills of the Santa Ana Mountains in inland Orange County (Fig. 1). Local streams, such as the Arroyo Trabuco and Tijeras Creek, are known sources for this raw material. Archaeological Resource Management Corporation (ARMC) personnel have observed red argillite cobbles and cobble fragments in these streams over many years. Some of the raw material used in Adella Schroth's (1999) bead replication study was collected in the Trabuco drainage. The Sespe Formation also is mapped in the San Joaquin Hills in coastal Orange County.

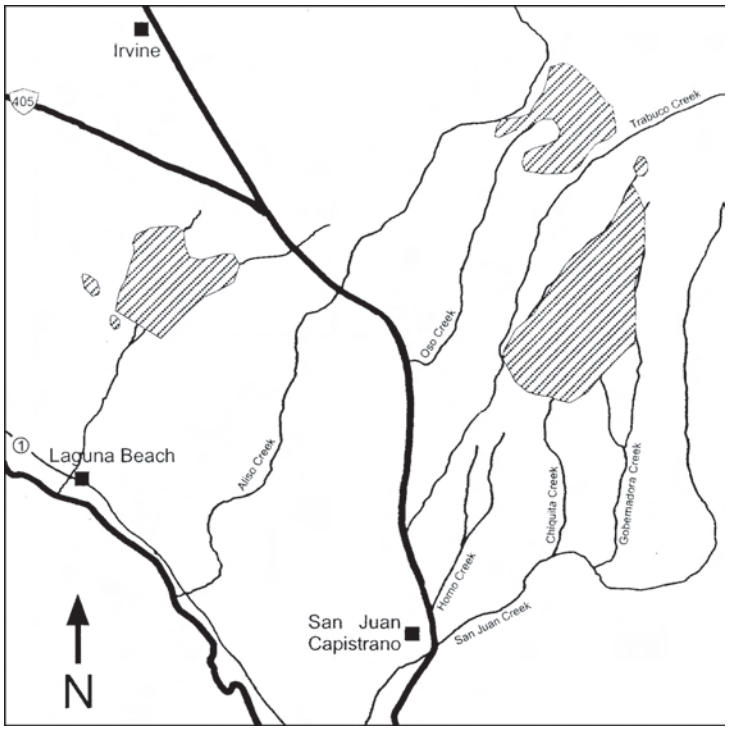

Fig. 1. Sespe Formation in Orange County.

We have not been able to confirm the presence of red argillite in these deposits and, therefore, cannot attest to its availability in the coastal area, either in outcrops or in secondary deposits, such as stream float.

Description of Red Argillite Beads and Pendants

Basic data collected for each red bead item included the following, whenever available: catalog number, provenience (site/unit/level or surface collection data), feature data, weight, length, width (or diameter), thickness, hole size, shape, biconical drilling present/absent, fragmentary/whole, and miscellaneous remarks. See Appendix for raw data.

Classification

The red bead items were classified initially based upon formal attributes. The types included raw material, flake, core, blank, disc bead, square bead, pendant, and tubular bead. The beads were classified as "disc beads' if they were generally circular to oval in outline. "Square beads" were right angled with equal-length sides, while "pendants" were generally teardrop-shaped with off-center drilling. "Tubular beads" were hollow cylinders. After further analysis of shaping and drilling, the items were then assigned a production stage 1 - 6, as follows:

Stage 1 - Raw material; no modification;
Stage 2 - Flake or core (Fig. 2, #'s 63, 170, and 323); minimally modified by percussion;
Stage 3 – Blank; shaped by percussion and/or grinding into rough form (Fig. 2, #'s 279, 1205, 1866, and 1867);
Stage 4 - Shaped into final form but not drilled (Fig. 2, #'s 298 and 853);
Stage 5 - Partially drilled or drilled without final shaping (Fig. 2, # 1636); and
Stage 6 - Finished bead or pendant (Fig. 2, # 1605).

Fig. 2 shows production stages 2 through 6 for a group of red argillite disc beads from archaeological site CA-ORA-876B and -B1 in the Trabuco Canyon area. Figure 3 shows a red argillite disc bead from CA-ORA-64 in the Newport Bay area.

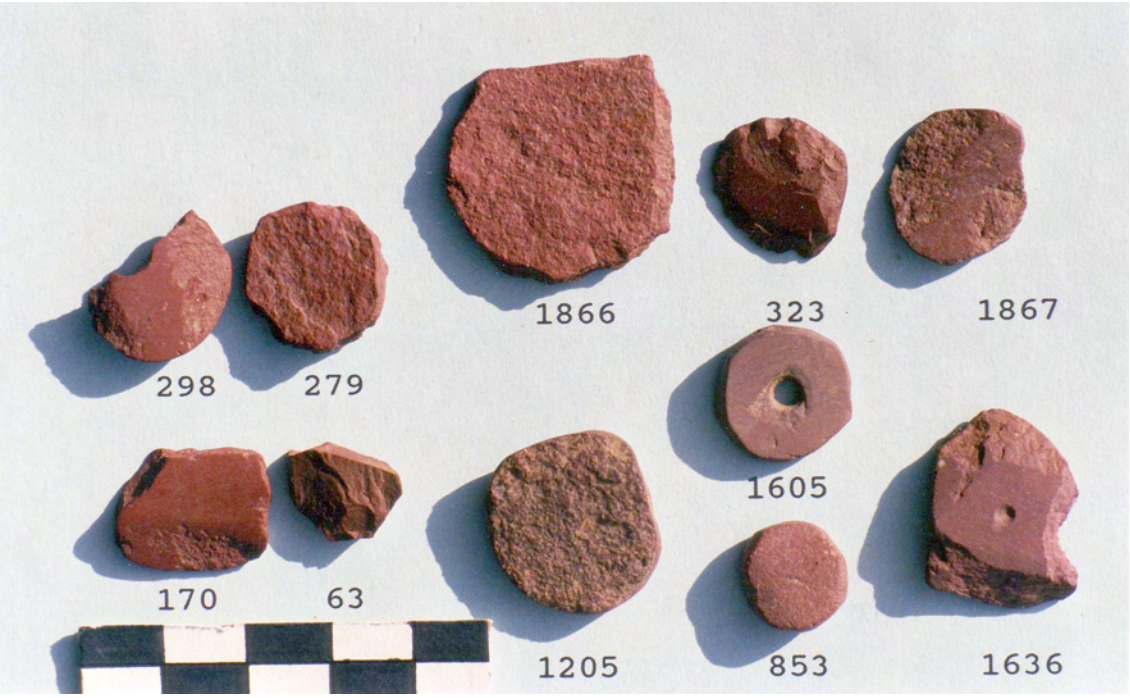

Fig. 2. Red argillite disc beads, production stages 2 - 6, CA-ORA-876B, -B1. Scale shows centimeters.

Fig. 3. Red argillite disc bead from CA-ORA-64. Scale shows centimeters.

Archaeological Distribution of Red Argillite Beads

An extensive search of ARMC records and Orange County site reports housed at South Central Coastal Archaeological Information Center (SCCIC), as well as querying of colleagues revealed that only two areas contained red argillite beads, the inland foothills (Arroyo Trabuco and environs) and the coastal area (Newport Bay and Bolsa Chica). The former is termed the Inland Site Complex (Fig. 4) and the latter the Coastal Site Complex (Fig. 5) in the following discussion of the archaeological distribution of the red bead items.

Each red-bead producing site is described briefly, including its location, size, depth of deposit, frequencies and types of red bead items, production stages, provenience of the artifacts within the sites, a description of the assemblages and features, site chronology; and references (see summary, Table 1).

Inland Site Complex

The majority of the sites containing red argillite beads are found in the Mission Viejo, Rancho Santa Margarita, Ladera Ranch, and Coto de Caza areas, here called the Inland Site Complex (Fig. 4). These sites are concentrated along the Arroyo Trabuco, Tijeras Creek, and Gobernadora Canyon drainages, with an additional site location to the northeast in the Agua Chinon drainage. The sites are described below as they occur roughly from north to south, from Agua Chinon, Tijeras Creek, Cañada Gobernadora, and finally the Arroyo Trabuco.

CA-ORA-1070

This site is located along the Agua Chinon drainage near the El Toro Marine Base in central Orange County. A large, Millingstone (Wallace 1955; Warren 1968) scatter measuring 340 by 235 meters (79,900 square meters), this site

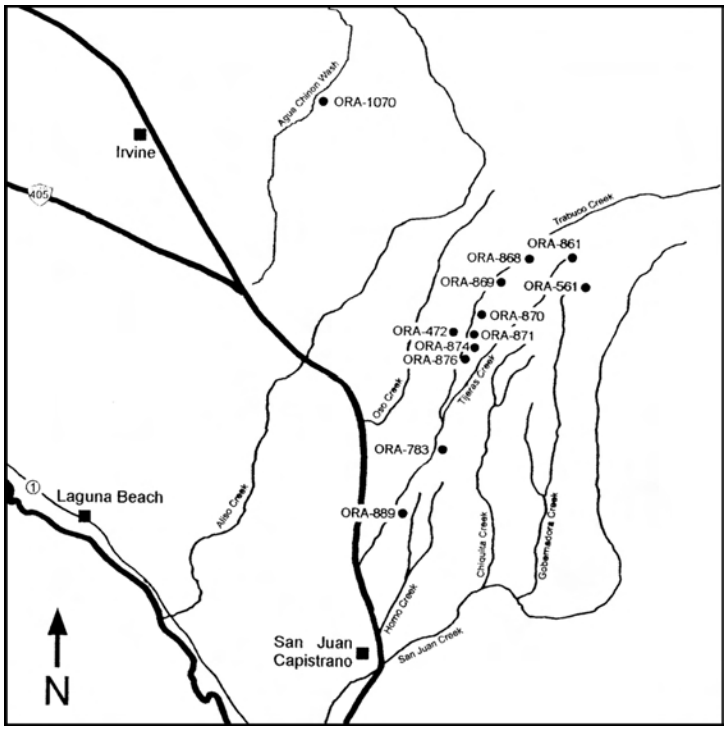

Fig. 4. Inland Site Complex.

revealed a 40-centimeter maximum deposit. Macko, Inc. tested the site as part of the Foothill Transportation Corridor studies, northern segment. The assemblage consisted mainly of core and cobble tools and milling implements. Obsidian hydration measurements (Coso origin) ranged from 6.8–11.7 microns. Macko and Hurd (1992) posit an occupation dated to circa 4000–8000 years before present, or 6000–2000 BC.

A core-cobble tool (#3013) and a flake (#319) of red bead material were recovered from a surface collection unit at the site. Drills were present at the site, although no red argillite beads were found.

CA-ORA-861

This large, base camp or village site consisted of two loci on adjoining hills east of Tijeras Creek with a combined area exceeding 30,000 square meters and a midden deposit with a maximum depth of one meter. The site contained a Millingstone assemblage; dart points and discoidals were present. Obsidian hydration measurements of 7.8 and 7.0 microns (Coso origin) point to an early occupation of the site, circa 4000 years BP, or 2000 BC (Demcak et al. 1990).

Excavators recovered a single, well-made red bead (#1095) of disc type. The bead was biconically drilled and represents the final stage of production (Stage 6). The bead was recovered from Unit 21W/20S from the 50-60 centimeter level. It was recovered in a feature that represented a domestic work area where food preparation was the principal activity with tool manufacturing and maintenance also represented.

CA-ORA-561

This large scatter of Millingstone tools is located at the northern end of Cañada Gobernadora in Coto de Caza. ARMC conducted some initial test excavation at the site and discovered a shallow deposit of approximately 15 centimeters. The data recovery program consisted of an intensive, 100% surface collection at the site (T. Cooley, personal communication, 1999). The area investigated encompassed 72 by 104 meters (7,488 square meters). Among the items recovered were two discoidals and 40 items of red bead material, including eight flakes, 14 cores, seven pieces of unmodified raw material, seven blanks, three disc beads, and one tube bead. Other than CA-ORA-472, this site contained the greatest frequency of red bead items in the Inland Site Complex. The breadth of the assemblage (flakes, cores, utilized flakes, flake and core scrapers, plano-convex tools, manos, metates, discoidals, and bead materials) suggests that this site served as a base camp, or village, where generalized activities took place. No obsidian hydration measurements or radiocarbon dates are available for CA-ORA-561.

CA-ORA-868

This small camp was investigated by ARMC (Cottrell et al. 1982). The site measured approximately 3,000 square meters with a maximum depth of 60 centimeters. The assemblage consisted primarily of hammerstones, flakes, and chipped stone tools with few ground stone implements. Apparently a specialized camp for chipped stone tool production, the site yielded one red bead blank. Obsidian hydration readings for two Coso-origin flakes included 6.7 and 7.9 microns, converted via Ericson's (1978) rate of 344 yrs/micron to 320 and 730 BC, respectively (Cottrell 1991).

CA-ORA-869

This small, seasonal camp on the eastern bank of the Arroyo Trabuco contained a Millingstone

assemblage. The site was tested by ARMC (Cottrell, Del Chario, Demcak 1982). The site measured approximately 6,600 square meters in area and had a depth no greater than 10 centimeters. The ARMC crew recovered a core fragment of red bead material from the surface collection (#7575, Field No. 60).

CA-ORA-870

This small, seasonal camp on the eastern bank of the Trabuco drainage was investigated by ARMC (Demcak and Van Wormer 1987). The site measured 4,000 square meters in area with a maximum depth of 30 centimeters, essentially a surface scatter. The assemblage was Millingstone, consisting primarily of manos, metates, and core and cobble tools. A single red bead material core was recovered from the surface (#39). No datable materials were present at the site.

CA-ORA-871

This base camp, covering approximately 24,000 square meters, lies on the eastern bank of the Arroyo Trabuco. Tested by ARMC (Cottrell, Del Chario, Demcak 1982), this site yielded a partially shaped red bead blank (Cottrell 1991). Two obsidian flakes from that excavation yielded three hydration measurements that have been converted to dates of 3450 and 2700 years BP (Cottrell, personal communication 1986). A later data recovery program at the site (Jones et al. 1995) produced a diverse assemblage of Millingstone artifacts: manos and metates, core and cobble tools, as well as dart points. Excavated to a maximum depth of 80 centimeters, the site yielded no additional red bead items.

CA-ORA-874, Locus B

This surface base camp was located on a small knoll east of the terrace adjoining the Arroyo Trabuco. The site measured approximately 13,860 square meters with a maximum depth of 15 centimeters. The Millingstone assemblage contained manos, metates, large core and cobble tools, and a discoidal. A single red disc bead, shaped and partially drilled, was recovered from the site during the data recovery program (Cottrell 1991).

CA-ORA-876B, B1

This large, base camp or village was located on the Plano Trabuco just east of the Arroyo Trabuco and the Trabuco Adobe. A field school from California State University, Los Angeles (CSULA) under the direction of Dr. Fred Reinman conducted test excavations at CA-ORA-876B1, an area of 2,430 square meters with a maximum excavated depth of 70 centimeters that lay adjacent to and west of the main site area. ARMC excavators conducted a data recovery program on the main site area (ORA-876B) of 79,500 square meters to a maximum depth of 80 centimeters (Jones et al. 1995). The field program included an intensive 100% surface collection and excavation of a large number of test units. A Millingstone assemblage was recognized at the site, consisting of milling implements, and large core and cobble tools. A dart point and discoidals were also recovered.

The CSULA fieldwork produced 14 flakes, four cores, two pieces of raw red argillite material, and three red bead blanks. The ARMC fieldwork resulted in the collection of one disc bead, one flake, one core, six red bead blanks, and one piece of raw red argillite material.

CA-ORA-783

This very large site encompassed 550 by 350 meters (192,500 square meters) and had a maximum depth of 80 centimeters. The majority of the artifacts were

surface finds. Only a small bench on the western edge of the site produced a subsurface deposit. Two extensive features were recorded in that area.

Two red argillite beads, one pendant, one bead blank, and 13 flakes of red bead material were recovered during recent test and extended test/salvage phases at the site (Demcak 1998). In addition, two pieces of raw material, two bead blanks, one flake and one core were collected during the monitoring phase (Demcak and Velechovsky 2002).

The Millingstone assemblage included large numbers of milling implements, dart points, a cog stone, and discoidals. Thirteen obsidian flakes from the site produced hydration readings ranging from 12.4–5.3 microns. Sourced to the Coso Volcanic Field, the hydration values, when converted to calendric dates, using Ericson's (1978) linear rate of 344 years/micron, resulted in projected dates ranging from 2280 BC–420 BC, with one date falling in the Christian era.

A red disc bead and pendant, as well as a red bead blank were recovered from Feature 2 at the site. The feature encompassed 15 square meters and 30 centimeters of depth, from 20–50 centimeters. Feature activities included food preparation and cooking, as well as stone tool production and maintenance.

CA-ORA-472

The largest collection of red argillite beads, blanks, and raw material was found in the inland area at CA-ORA-472, Mission Viejo. The deposit at CA-ORA-472 has been radiocarbon dated to 5070 ± 220 BP (Allen 1981), providing an absolute date for red argillite beads in Orange County. The red bead items were recovered as part of a Millingstone assemblage, with large numbers of milling implements, core and cobble tools, dart points, and discoidals.

Red bead items included 3 disc beads, 22 bead blanks, 11 cores/cobbles, and 159 flakes for a total of 195 red bead items from the site. Thirteen items came from the surface, the remainder from excavation units.

CA-ORA-889

CA-ORA-889 occupies roughly 2,400 square meters on a high ridge line east of the Arroyo Trabuco and is the southernmost of the sites in the Inland Site complex. A surface collection and test excavation revealed a Millingstone assemblage. Manos and metates, large core tools, flake tools, and a dart point were recovered. A single flake of red bead material was recovered from Test Unit 7, 20-30 centimeters (Demcak 1998).

CA-ORA-649

This site is located on a ridge in the Lomas de Santiago, near Bee Canyon. The site produced a single red disc bead fragment (catalog # 296). The bead was recovered from Unit 13 at 50-60 centimeters below datum. There is no directly associated date. Two bulk soil samples from two other units resulted in dates between 4300 and 4800 BP (Beth Padon, personal communication, March 6, 2006) Note: This site is not mapped on the inland site complex map because the site data arrived after map preparation.

Coastal Site Complex

Only two sites on the coast produced red argillite beads, one located on upper Newport Bay and one at Bolsa Chica. Neither produced any red bead raw material, flakes or cores. Only finished beads and

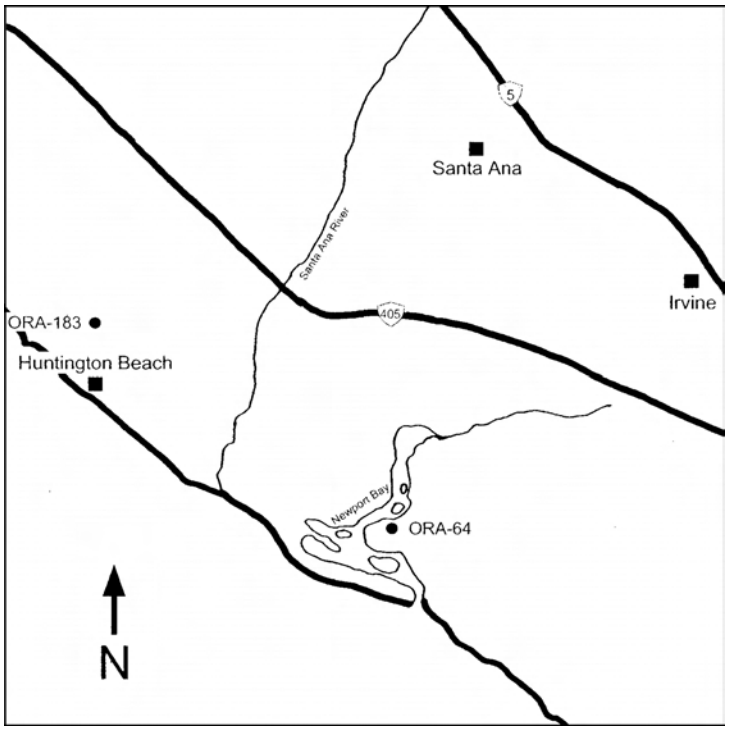

Fig. 5. Coastal Site Complex.

pendants or blanks, production stages 5 or 6, were found on the coast.

CA-ORA-64

CA-ORA-64 was one of the largest archaeological sites in Orange County. The site encompassed approximately 380 by 290 meters (110,200 square meters). Radiocarbon dates from the earlier testing of the site (ARI 1977; Drover, Koerper, and Langenwalter 1983; LSA 1987) revealed it to be one of the oldest sites in Orange County. The recent data recovery program at CA-ORA-64 (Macko et.al. 1998) produced radiocarbon dates ranging from 9010 BP (7055 BC) to 4340 BP (2385 BC). Obsidian hydration readings provide evidence for site occupation during hiatuses indicated by the radiocarbon dates, breaks occurring between 6500 and 7500 years ago (Macko et al. 1998). Both Paleo-Coastal and Millingstone occupations (Early and Middle Holocene) are recognized for the site. Among the more interesting artifacts recovered from the site are the ceramics, including cylinders, beads, small vessels, globular pieces, and molds, perhaps the earliest ceramics in the New World, two caches of large bifaces with stemmed bases, and immense stone balls (Macko et al. 1998).

The recent recovery at CA-ORA-64 produced 25 red disc beads (see example in Fig. 3), six (6) pendants, seven (7) tubular beads, and four (4) bead blanks. The site contained 772 features. Ten of the red bead items from CA-ORA-64 were recovered from features. Feature 268, encompassing 10 square meters, contained a red disc bead (#30976), and four (5) burials, associated with a rock cairn. The cairn was composed of principally ground stone items. Fire-affected rock, flaked stone tools, bone beads, and miscellaneous lithics were also recorded in the feature (Macko et al. 1998:88-89).

CA-ORA-183

This shell midden, described as representing successively occupied base camps (Drummy-Chapel, Cottrell, and Cameron 1983), had an early component radiocarbon dated to 4320 ± 210 BP (2370 BC) and 2974 ± 190 B.P. (1024 B.C.). Obsidian hydration readings of 4.0–9.1 microns indicate two occupations, one as early as 1148 BC. A single red disc bead was recovered on the surface, apparently re-deposited from the lower level by rodent action.

Chronology

In reviewing the contexts of the red argillite beads, the majority of the items has been recovered from Millingstone assemblage sites and thus appear to be diagnostic of a Millingstone component. Table 1 provides a review of the beads and their time associations.

Beads in Social Context

Beads and other ornaments are items used primarily for social maintenance (cf., King 1974, 1981). They serve as visual signals from the wearer to the group. Size is an important dimension of the ornaments as signaling elements. Their size reflects the need to be seen by more people over a greater distance (large size) or by small numbers of people over a shorter distance (small size). Individual red argillite beads are generally small, but strung with other beads, they could serve as a more highly visible social

Table 1. Sites with red argillite beads, blanks, and/or raw material.

Site Number	Beads/raw material	Dating	Reference(s)
ORA-472	Beads, blanks, raw material	Millingstone; 5070±220 BP	Allen (1981); Cottrell (1991)
ORA-561	Beads, blanks, raw material	Millingstone	Cooley (personal communication 1999)
ORA-649	Red bead	Millingstone; 4300–4800 BP (preliminary dating)	Padon (personal communication 2006)
ORA-861	Red bead, raw material	Millingstone; Obsidian 3890 BP; 2860 BP	Demcak et al. (1990)
ORA-868	Blank	Obsidian 730 BC, 320 BC	Cottrell, Del Chario, and Demcak (1982); Cottrell (1991)
ORA-869	Raw material		Cottrell, Del Chario, and Demcak (1982); Cottrell (1991)
ORA-870	Raw material	Millingstone	Demcak and Van Wormer (1987)
ORA-871	Raw material	Millingstone; Obsidian 703 BC, 1185 BC	Cottrell (1991); Jones et al. (1995)
ORA-874B	Red bead		Cottrell (1991)
ORA-876B	Red beads, blanks, raw material	Millingstone, Intermediate	Jones et al. (1995)
ORA-876B1	Red bead blanks, raw material	Millingstone	Jones et al. (1995)
ORA-889	Raw material	Millingstone	Demcak (1998)
ORA-1070	Raw material	Millingstone; Obsidian 4000–8000 BP	Macko and Hurd (1992)
ORA-64	Beads, blanks	Paleo-Coastal, Millingstone; 9010–4340 BP	Macko et al. (1998)
ORA-183	Red bead	Early component; 4320±210, 2974±190	Drummy-Chapel, Cottrell, and Cameron (1983)

signal. Their visibility at best would be limited to close contact or to small groups.

Color is also a strong element of social signaling. Although there was sporadic use of pigments by Homo Erectus populations, their use increased markedly among Middle Paleolithic populations (Neanderthals), among whom they were utilized for the first time on burials (Bahn and Vertut 1997:23-26). Subsequent Upper Paleolithic populations (Cro-Magnon) made extensive use of red ocher and other pigments in rock art and portable art. Pigments were also likely used on perishable materials, such as textiles or human skin (face painting, tattooing). Red was an important symbolic color among southern California early Shoshonean populations. Along with black, the color red marked the duality of society, eg., distinguishing "Coyote" from "Wildcat" moieties among the Luiseño (Strong 1929:290); was used for body and face painting (Hooper 1920:96, 359; Kroeber 1925:640; Boscana 1978:30,46,60), ground paintings (Strong 1929:175), and rock paintings (Dubois 1908: 92; Sparkman 1908:209-210); and appeared on ceremonial objects, such as the quiver used in the boys' initiation ceremonies among the Desert Cahuilla (Strong 1929:117-118), a painted mortar used in the girls' initiation ceremony among the Mountain Cahuilla (Strong 1929:173), and a painted metate found at CA-RIV-102, a Mountain Cahuilla village (Demcak et al. 1990).

Shape is another element of social signaling. The majority of the red argillite beads are flattened discs with a center perforation. This form may be largely dictated by the need for stringing the beads. However, squared argillite beads, oval pendants, and tubular beads were also manufactured.

The position of the ornament on the body is also an important element in signaling. Stone beads and pendants were worn strung about the neck, sometimes intermixed with shell beads, in prehistoric southern California (King 1981:292). This position would place the ornaments in a highly visible position on the body when the wearer was in close contact with others; otherwise, the beads would not be readily seen, as in a crowd or at a distance.

In the same way that an elaborate necklace of rare stones and precious metals signals high social status in the modern Western world, red argillite beads and pendants may have served as social indicators for the Native inhabitants of Orange County. The stone is rare, known to occur only in outcrops of the Sespe Formation in the inland foothill area. The stone is relatively hard and requires extensive percussion and grinding to be shaped into a finished ornament. Within the producing community, artisans would have had to be freed from subsistence activities in order to create the ornaments. They would have needed to collect the raw material, shape it into rough form, drill it and then shape the material into final form, or shape it into final form and then drill it, arriving at the final red disc bead, squared bead, tubular bead, or pendant. By the time the bead or pendant was completed, from procurement to final shaping, producing the object would have required a large number of man-hours, resulting in a relatively high production cost and concomitant high value to the consumer.

There remains the question of the intended consumers. If the bead consumers were local, the cost of transport was nil. Within the producing village a consumer would have received the ornament(s) directly from the artisan or from another group member (leader) who controlled access to wealth items. If the intended consumers were located in a distant community, for example in a coastal site, then ornaments would have been

transported on foot for perhaps 20 miles to the other community.

In Orange County the red bead production was carried out generally in large, habitation sites (Table 2) that appear to have been occupied by sedentary or semi-sedentary populations. The production of food surpluses would have provided for the subsistence needs of certain group members who could then produce wealth goods, in this case beads and pendants, for elites within the group. The elites (eg., village head, elders, or shaman) would collect the wealth goods and redistribute them for the general welfare of the group (Earle and Ericson 1977:214-217). The ornaments (wealth goods) would then have become the means of visually signaling the status of the wearer to the group. Not every member of the group would receive such goods. The unequal access to wealth items is an indication of social stratification that may have already begun to take place among early populations in Orange County (Cottrell 1985:833, 834, 848).

Table 2. Orange County Red Bead Production Sites: Site Types and Area.

Site Number	Site Type	Area (m^2)
ORA-1070	Base camp/village	80,000
ORA-861	Base camp/village	30,000
ORA-561	Base camp/village	7,500
ORA-868	Specialized camp	3,000
ORA-869	Seasonal camp	6,600
ORA-870	Seasonal camp	4,000
ORA-871	Base camp/village	24,000
ORA-874B	Base camp/village	13,860
ORA-876B, B1	Base camp/village	80,930
ORA-783	Base camp/village	192,500
ORA-472	Base camp/village	19,500

Red Argillite Beads: Trade or Local Manufacture?

Hypothesis 1. The red argillite beads and ornaments in Orange County were made by the inland populations.

The Inland Site Complex by virtue of its proximity to the raw material source and its large numbers of beads, blanks, and raw material (in particular CA-ORA-472 and CA-ORA-561) is likely to have been the manufacturing and distribution center for red argillite beads and pendants in Orange County. The Coastal Site Complex (CA-ORA-64 and CA-ORA-183) by contrast contains no raw material, only finished or nearly finished beads, and apparently no raw material is locally available.

Hypothesis 2. Red argillite beads and pendants were exchanged by inland populations for marine/coastal-related items from coastal populations.

Coastal populations could have traveled inland to the source area and procured the raw material directly. This would have meant carrying cobbles or modified cobbles for a distance of over 20 miles. In addition, local groups might have controlled access to the stone. It is far more likely that the coastal people received the finished items from inland populations who traveled to the coastal villages to trade. What was being traded in return? Was it marine or littoral resources? There is little material evidence of marine-related products (shellfish, fish, marine mammals or artifacts created from these animals) in the inland sites containing red argillite beads. Site CA-ORA-861 did contain an abalone disc bead. If not marine items, unknown perishable items may have been exchanged for the red argillite beads.

Hypothesis 3. Red argillite beads and pendants were brought by inland populations to coastal populations through marriage.

An alternative explanation is offered. The beads and pendants were carried by their owners to the coastal sites. The Native Americans who lived in this area most likely practiced exogamy, selecting mates from distantly related groups, perhaps from another moiety ("Coyote" or "Wildcat"), as seen among later populations in the area. Inland brides would have carried their wealth goods (red argillite beads and pendants) with them to the husband's residence in one of the coastal villages.

These hypotheses require further testing and refinement. Red argillite beads and pendants continue to be an important research issue in Orange County. There is a great need for refinement of the chronology of stone bead making, red argillite bead and others. We still do not know the sequence of bead and pendant types. We want to learn how the beads changed and how their evolution reflects the wider development of the society that made them.

Acknowledgements

The red beads have been a major research interest of ARMC for over 20 years, and much of the data was readily available in one location. In addition, the SCCIC allowed free access to site reports for Orange County. The Pacific Coast Archaeological Society loaned red bead items and the catalog from the CA-ORA-561 collection. Theodore G. Cooley provided field recovery data for the CA-ORA-561 collection. The Irvine Company, through its agent, Michael E. Macko of Macko, Inc., loaned red beads and the catalog from the data recovery program at CA-ORA-64. Dr. Stephen Williams identified the raw material. Beth Padon supplied data on a red bead from CA-ORA-649. Chris Demcak prepared the graphics. Thanks to all who provided assistance in this research.

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Appendix. Raw Data from the Red Argillite Beads and Bead Raw Material.

Site number ORA-	Catalog number	Type	Unit	Level	Surface	Feature	Weight	Length
783	286	Flake	6	10			1.3	2.1
783	604	Flake	24	50		2	13.1	5.0
783	330A	Flake	11	20			0.5	1.8
783	330B	Flake	11	20			0.8	1.5
783	542	Flake	18	20			7.3	3.4
783	570A	Flake	18	50		2	7.5	3.6
783	570B	Flake	18	50		2	3.7	2.8
783	333	Raw material	11	30			0.7	2
783	599A	Raw material	24	30		2	9.4	3.7
783	599B	Flake	24	30		2	1.7	2.8
783	376	Flake	19	20			3.6	3.1
783	547	Flake	18			2	7.8	3.7
783	326A	Raw material	11				0.6	1.5
783	326B	Raw material	14	10			0.2	1
783M	4	Core			Yes		34.2	4.7
783M	5	Blank			Yes		0.4	1.6
783M	6	Blank			Yes		0.6	1.7
783M	1	Flake		30	Yes		7.6	4.1
783M	2	Raw material		10	Yes		3.1	3
783M	3	Raw material			Yes		0.7	1.9
561	5007	Flake			0N/36W		23.8	6.1
561	3688	Flake			12N/10W		12.9	3.8
561	5054	Sq. bead			52S/12W		1.2	2
561	5050	Blank			4S/36W		3.1	2.4
561	3465	Disc bead			40N/48W		2.3	1.5
561	5052	Disc bead			8S/40W		0.8	1.5
561	5055	Blank			36S/32W		2.9	2.2
561	5051	Core			4S/36W		107.6	6.2
869	7575	Blank			F60		22	5.7
561	5566	Flake			20S/52W		12.5	3.6
561	3974	Raw material			0N/28W		32.4	5.2
561	5565	Core			20S/52W		37.5	4.1
561	5041	Raw material			12S/56W		140.6	7.1
561	5039	Flake			12S/24W		56	0.4
561	5047	Blank			4S/44W		21.3	4.7
561	5045	Core			8S/32W		31.9	4
561	3975	Tube bead			0N/28W		0	0
561	3589	Raw material			44N/36W		0	0
561	3467	Core			40N/48W		12.5	3.4

Width	Thick.	Hole diameter	Stage	Shape	Biconically drilled	Fragment	Remarks
1.9	0.3	0	2				
3.7	0.9	0	2				
1.1	0.2	0	2				
1.1	0.5	0	2				
2.3	0.9	0	2				
3.2	0.6	0	2				
1.8	0.6	0	2				
1.6	0.2	0	1				
2.6	0.7	0	1				
1.8	0.4	0	2				
2.3	0.6	0	2				
2.3	0.9	0	2				
1	0.3	0	1				
0.7	0.3	0	1				
3.7	1.4	0	2				Monitoring find
1.5	0.4	0	3				Monitoring find
1.6	0.4	0	4				Monitoring find
2.3	0.9	0	2				Monitoring find
1.8	0.6	0	1				Monitoring find
1	0.3	0	1				Monitoring find
3.4	0.9	0	2				
2.7	1.2	0	2				
0	0.4	0	5.8	Squared		Yes	
2.2	0.4	0	3				
1.4	0.8	0	5	Circular			Part. drilled; one face
0	0.5	0	6	Circular		Yes	
1.8	0.4	0	4				
5.2	2.3	0	2				
2.4	1.2	0	3				
2.4	1.2	0	2				Striations one face
3.3	1.4	0	2				
3.6	1.9	0	2				Pecked
5.7	2.4	0	1				Poss. core tool
3.8	1.6	0	2				Flake removed
3	1.2	0	2				
3.4	1.8	0	2				
0	0	0	6	Tubular			Missing
0	0	0	1				Missing
2.7	1.1	0	2				

Site number ORA-	Catalog number	Type	Unit	Level	Surface	Feature	Weight	Length
561	5546	Core			20S/36W		102.9	7.3
561	5048	Flake			4S/44W		2.7	2.6
561	4934	Flake			4N/44W		1.5	28
561	3940	Raw material			0N/24W		1	2.3
561	5044	Core			4S/20W		11.7	3.3
561	3836	Raw material			24N/28W		1	2.1
561	5651	Core			24S/48W		2.9	2.2
561	5049	Core			4S/44W		13.8	4
561	3271	Raw material			16N/32W		1.9	1.9
561	3468	Disc bead			40N/48W		6.2	3.1
561	5042	Flake			12S/28W		6.7	3.5
561	3888	Core			28N/12W		5.9	2.9
561	5389	Flake			12S/52W		2.9	3.4
561	5038	Blank			12S/24W		13.5	3.6
561	3557	Core			16N/16W		166.4	10.3
561	3299	Core			8N/44W		82.4	6.4
561	3466	Core			40N/48W		99.2	5.8
561	2895	Core			12N/4W		51.1	5.8
561	5627	Blank			24S/40W		19.1	3.5
561	5040	Disc bead			12S/24W		0	0
472	8823	Blank					0	0
472	9523	Blank					0	0
472	3147	Disc bead					0	0
472	8384	Disc bead					0	0
472	3117	Disc bead					0	0
783	742	Disc bead	25	50			1.4	0
783	378	Pendant	19	30			2.2	0
783	714	Disc bead					1.4	0
861	1095	Disc bead	21S/28W	60			0	0
876B	323	Blank					1.18	0
876B	853	Blank					1.44	0
876B	1205	Blank					4.4	0
876B	1605	Disc bead					1.3	0
561	5043	Disc bead	4S/28W				0	0
561	5046	Disc bead			12S/20W		0	0
876B	1636	Disc bead					3.6	2.38
876B	1866	Blank					3.95	0
876B	1867	Blank					1.5	0
876B	1188	Flake			I/170		0	0
876B	1865	Core			A/60		0	0
876B	1868	Raw material			K/170		0	0

Width	Thick.	Hole diameter	Stage	Shape	Biconically drilled	Fragment	Remarks
4.9	2.9	0	2				
1.4	0.8	0	2				
1.6	0.4	0	2				
1.2	0.4	0	1				
2.5	1.3	0	2				Locus II
1.2	0.5	0	1				
0.9	0	0	2				
3.3	0.9	0	2				
1.4	0.6	0	1				
2.7	0.7	0	5	Circular			
2.5	1.1	0	2				
2.1	1	0	2				
1.9	0.5	0	2				
2.8	1	0	3				
7.4	1.9	0	2				
5.1	1.9	0	2				
4.1	2.9	0	2				
4.3	1.5	0	2				
2	1.8	0	3	Globular			
0	0	0	6	Circular			Missing
2.4	0	0	3				
1.8	0	0	4				
1.3	0	0	6	Circular			
1	0	0	6	Circular			
0.9	0	0	6	Circular			
0.12	0.16	0.05	6	Circular			
1.17	0.71	0.3	6	Globular	Yes	Yes	
1.38	0.57	0.59	5.8		Yes	Yes	
0.82	0.16	0.23	6	Circular	Yes		
1.8	3.2	0	3				
1.33	0.5	0	4				
2.26	0.68	0	3				
1.63	0.39	0	6	Circular	Yes		
0	0	0	6	Circular			Missing
0	0	0	6	Circular			Missing
1.6	0.56	0	5.5				
2.98	0.35	0	3				
1.99	0.3	0	3				
0	0	0	2				
0	0	0	2				
0	0	0	1				

Site number ORA-	Catalog number	Type	Unit	Level	Surface	Feature	Weight	Length
64	6296	Blank		20			0.5	0
64	19243	Blank		60			1.4	1.8
64	31055	Disc bead					0.4	0
64	7733	Blank		20			0.2	0
64	21406	Pendant		50			5.1	4.3
64	19426	Pendant		40			0.1	1.0
64	19553	Pendant		45			1.4	2.1
64	31834	Pendant		20		89	1.8	2.5
64	21715	Pendant		40			1.5	1.7
64	47442	Disc bead		45			0.1	0
64	47273	Disc bead		50			0.3	0
64	47060	Disc bead		70		28	0.1	0
64	46582	Disc bead		30		77	0.2	0
64	37872	Disc bead		60		38	0.8	0
64	22002	Disc bead		40			0.2	0
64	20063	Disc bead		60			0.2	0
64	21602	Disc bead		50			0.7	0
64	11237	Disc bead		20			0	0
64	9479	Disc bead		80			0.05	0
64	8856	Disc bead		10			0.05	0
64	8747	Disc bead		40			0.3	0
64	494	Disc bead		40			0.3	0
64	19521	Disc bead		50			0.9	0
64	13776	Disc bead		60			0.1	0
64	31040	Disc bead		90			0.5	0
64	31053	Disc bead		30			0.1	0
64	31071	Disc bead		30		236	0.3	0
64	40319	Tube bead		50		22	3	3.3
64	30956	Tube bead		50		6	2.1	2.4
64	30976	Tube bead				268	0.9	1.7
64	47293	Tube bead		50			1.2	1
64	19550	Tube bead		50			1.1	1.6
64	31023	Blank		10			0.8	1
64	31024	Tube bead		65			1.25	1.2
64	11750	Disc bead		10			1.2	1.6
64	9019	Pendant		10			1.8	2.1
64	21016	Tube bead		40			0.12	0.9
64	35598	Disc bead		55		6	0.3	1
64	21938	Disc bead					0.05	0
64	22865	Disc bead		40			0.01	0.7
64	29597	Disc bead		10		126	0.06	0

Width	Thick.	Hole diameter	Stage	Shape	Biconically drilled	Fragment	Remarks
1.1	0.4	0	4				
1.6	0.4	0	4				
0.9	0.4	0.2	5	Circular	Yes		Partially drilled
0.7	0.2	0	4				
2.2	0.5	0.2	6	Oval	Yes		Rodent damage
0.8	0.2	0	6	Oval			
1.1	0.7	0.1	6	Globular	Yes		
1.7	0.7	0.3	6	Oval	Yes	Yes	
1.5	0.5	0.3	6	Oval	Yes		
1	0.2	0	6	Circular			Beveled
0.9	0.3	0.4	6	Circular			
0.7	0.2	0.3	6	Circular	Yes		
0.7	0.3	0.3	6	Circular	Yes		
1.2	0.3	0.5	6	Circular			
0.8	0.1	0.3	6	Circular	Yes		
0.8	0.3	0.4	6	Circular	Yes		
1.2	0.3	0.4	6	Circular			
0.8	0.3	0.3	6	Circular	Yes	Yes	
0.9	0.1	0	6	Circular		Yes	
0.9	0.1	0	0	Circular		Yes	
1	0.2	0.3	6	Circular	Yes		
1	0.3	0.4	6	Circular	Yes		
1.6	0.7	0	6	Circular		Yes	
0.9	0.9	0	6	Circular	Yes	Yes	
1.1	0.3	0.3	6	Circular	Yes		
0.6	0.3	0.2	6	Circular	Yes		
1.1	0.2	0.3	6	Circular	Yes	Yes	
1.5	0.5	0	6	Tubular	Yes	Yes	
1.5	0.6	0	5	Tubular		Yes	
1.1	0.4	0	6	Tubular		Yes	
1	1	0.4	6	Tubular	Yes		
0.4	0.4	0	5	Tubular	Yes		
0.7	0.6	0	4	Tubular			
1.1	1.1	0	5	Tubular	Yes		
1.3	0.5	0	5	Oval			
1.2	0.4	0.2	6	Oval	Yes		
0.5	0	0	6	Tubular		Yes	
0.7	0	0	5	Oval		Yes	
0.45	0.2	0.15	6	Circular			
0.5	0.2	0	5	Circular		Yes	
0.7	0.15	0	6	Circular	Yes	Yes	

Site number ORA-	Catalog number	Type	Unit	Level	Surface	Feature	Weight	Length
64	33936	Disc bead		70		16	0.06	0
1070	3013	Core	42		Yes		226.47	9.37
1070	319	Flake	441		Yes		32.62	3.85
876B1	279	Blank	4	20			1.9	0
876B1	170	Blank	8	10			1.9	1.98
876B1	298	Blank	8	10			1.91	0
876B1	430	Flake	5	20			0	0
876B1	299	Flake	E/20	20			0	0
876B1	300	Flake	6	30			0	0
876B1	301	Flake	7	20			0	0
876B1	302	Flake	E/20	20			0	0
876B1	276	Flake	4	20			0	0
876B1	299	Flake	E/20	20			0	0
876B1	292	Raw material	5	20			0	0
876B1	285	Flake	3	10			0	0
876B1	171	Core	G/20	30			0	0
876B1	58	Core			F/30		0	0
876B1	63	Flake	E/0	10			0	0
876B1	86	Core	D/30	40			0	0
876B1	34	Core			C/40		0	0
889	71	Flake	7	30			0	0
868	Unknown	Blank			Yes		0	0
870	39	Core			T3		0	0
874B	Unknown	Disc bead			Yes		0	0
561	3919	Raw material			28N/20W		0	0
871	Unknown	Blank			Yes		0	0
183	56	Disc bead			Yes		0	0
649	296	Disc bead	13	60			2.4	2.33

Notes:
Levels are expressed by the deeper of two measurements; for example, level 10-20 cm is listed as 20.
All measurements are in centimeters (cm).
Weights are in grams (g).

Width	Thick.	Hole diameter	Stage	Shape	Biconically drilled	Fragment	Remarks
0.9	0.1	0	6	Circular	Yes	Yes	
5.48	3.58	0	2				
3.57	1.9	0	2			Yes	
1.76	0.43	0	3				
1.48	0.39	0	3				
1.87	0.53	0	4			Yes	
0	0	0	1				
0	0	0	2				Missing
0	0	0	2				2 flakes
0	0	0	2				2 flakes
0	0	0	2				Missing
0	0	0	2				1 flake
0	0	0	2				Missing
0	0	0	1				
0	0	0	2				1 flake
0	0	0	2				Split pebble
0	0	0	2				Split pebble
0	0	0	2				1 flake
0	0	0	2				Split cobble
0	0	0	2				Split cobble
0	0	0	2				1 flake; missing
0	0	0	3				
0	0	0	2				
0	0	0	5				
0	0	0	1				Missing
0	0	0	3				
3.76	0.68	0.52	6	Circular	Yes		
0.97	0.55	0.3	6	Circular	Yes	Yes	Shaped on outer edge