THE ARCO BEAD ASSEMBLAGE: A GLIMPSE AT EXCHANGE IN RELATION TO ENVIRONMENTAL VARIABILITY

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ABSTRACT

A total of 1,125 beads salvaged from a Late Period (A.D. 1300-1782) Gabrielino burial site at the Arco refinery in Carson, California was analyzed using the typology developed by Bennyhoff and Hughes (1987) and King (1990). By the Late Period extensive exchange networks existed among the native inhabitants of southern California involving a highly developed economic system, craft specialization and trade from diverse environments. Exchange networks served as buffers during times of subsistence stress. This paper analyzes how beads from the Arco site contribute to our knowledge about trade during this time.

Beads recovered from the Arco site (CA-LAN-2682) provide information about exchange patterns and social relationships, as well as changes in the physical environment during the Late Period (A.D.1300-1782). This era is marked by climatic variability with an extreme dry interval occurring between A.D. 1650-1750, followed by an increase in precipitation (Larson et al. 1994). Vacillations in rainfall can have a profound influence on the regional flora and fauna, resulting in a decrease in available subsistence resources. Marine conditions were fairly stable, but less productive than the previous period due to warmer sea surface temperatures (Kennett 1998). During this era exchange networks provided a form of security among the Gabrielino and Chumash, since foods from distinct ecological zones were bartered on a regular basis (King 1990). Trade contributes to an increase in diet breadth, thus minimizing the effects of possible malnutrition and starvation that may have resulted from a change in mobility, population density, climatic fluctuations and competition for resources. As Kennett (1998) points out, the intensity of exchange is dependent upon the degree of risk that individuals experience, and trade between the islands and mainland is most extensive and visible after AD 1300. Risk is defined as unpredictable variation, and risk minimization is of greater importance in environments that have higher variability (Casdan 1985; Gould 1975; Larson et al. 1994). As exchange relationships increase, the intensity of foraging and manufacturing methods also rise. As King (1990) points out, this intensity does not reflect elite control; it was a necessary means to survive during times of stress.

Exchange systems minimize risk by assuring a stable food supply by playing off temporal and spatial variances (Halstead and O'Shea 1989). For the native inhabitants of coastal southern California this food excess is converted to some extent into valuable shell beads. As for the worth of shell beads, King (1990), claims that only callus beads had monetary value because a greater expenditure of labor was required to produce them. Arnold (1987, 1992) suggests that money beads remain scarce because the callus bead is expensive to manufacture. However, Brock (1986) argues that wall beads were just as valuable because a greater number of these thin beads were needed to make up a string of beads. As he states (1986:13), "...the value of an individual bead was a function of its thickness. Yet a string of thin beads, such as saucers, may have had an increased value over a string of thick beads, like cups, because of the quantity of raw material required to produce it."

The distribution of cupped to saucer beads is more or less equal at the Arco site. Because of this equity in distribution and the lack of evidence for the callus beads being the only money form, I consider both wall and callus beads as having

commercial and decorative value. I suggest that wall and callus beads are variations that serve the same function within a market economy. The Gabrielinos may have placed more value on beads if they were not producing them, and according to Kroeber (1925), they were worth a third more to the Gabrielinos in comparison to the Chumash.

The total bead assemblage from the Arco site is 1,125; 603 of these are associated with individual burials and units, while the remaining 522 were salvaged from the unprovenienced area referred to as 503. The classification system used in this report is based upon the works of Bennyhoff and Hughes (1987), King (1994, 1991, 1990,1974, 1976) and Gibson(1992, 1976). *Olivella biplicata* is the primary shell used to manufacture beads, and its modified shape and dimensions are the key attributes for determining bead type (Bennyhoff and Hughes 1987; King 1990; Gibson 1976).

The dominant wall bead is the tiny saucer, accounting for a total of 423 from the entire bead assemblage. The average diameter is 4mm and the range is between 5.15-1.28mm. According to Bennyhoff and Hughes (1987) this bead style does not have any temporal significance and it is commonly found in central and southern California. Several of the tiny saucers are chipped on the edge; however, they are not the same as the historic chipped disk because their small diameter and larger perforation does not allow them to be classified as such. The callus cupped bead is also a popular style, totaling 315 in number. The average diameter in this assemblage is 4.13mm and the range is between 7.27-3.14mm. King (1990) and Bennyhoff and Hughes (1987) both place the cupped bead in the Late Period since these beads begin to appear around AD 1200 and continue into the historic period. Several of the cupped and tiny saucer beads are incised with parallel oblique lines, but sometimes a V-shaped pattern or X cross hatchings are incised. There are also a few edge incised and cog beads. A total of 102 thin and thick-lipped beads was recovered with a mean diameter of 8.40mm and a range between 18.41-3.92mm. Lipped beads evolved from the callus cup bead and they are indicators of the historic and Protohistoric periods.

Other bead types that occur to a lesser extent include: the historic ground disks, rough disks, and chipped disks which are distinguished by their small needle-drilled perforations and larger diameter. The Late Period *Haliotis rufescens* epidermis disk is also found at the site and its average size is similar to the tiny saucer beads. There are 40 *Tivela stultorum* beads; most are coated in asphaltum and the majority came from Unit 27, which had one complete and two partial burials. One *Tivela* bead from Unit 27 was radiocarbon dated to A.D. 500-600. This date is substantially older than the shell and carbon dates and it is probably a result of the bead being curated through time. A few thin *Tivela* disks and tubes are also present in the bead assemblage.

Sixty-six bushing beads were identified; a majority of these are from unit 3, which contained five disturbed burials. These beads are frequently used as bushings for clam or magnesite beads, but they are also commonly strung independently. We actually have two clam beads with their bushing *in situ*, they were both recovered from the screen at area 503. Three black schist beads were excavated, as well as one peach stone bead. They were probably manufactured along the mainland coast during the Late Period (King 1991). Muriatic acid was used in a few cases when it was unclear if the bead was stone or shell. Since many of the beads were burned or corroded it was sometimes difficult to determine their constituent material; as it turns out, the majority of these beads that we tested were in fact burned or corroded *Olivella* beads. Twelve and one-half per cent of the beads from the entire assemblage were burned, 5% had asphaltum, and 2% had a brown pitch that may be a stain from asphaltum.

A single *Dentalium neohexagonum* bead was retrieved from the unprovenienced backfill. This type of bead can be dated to the Late Middle Period and the Late Period (King 1990). During the Late Period *Dentalium* beads were sometimes used as bushings in *Columella* tube beads and *Hinnites* beads (King 1990). A single *Columella* tube bead and a possible *Hinnites* bead were also recovered from area 503. *Columella* beads were manufactured on the islands and mainland coast and also the interior during the Late Period (King 1990). There are seven bone vertebra beads;

three of these are burned and one is covered in asphaltum. Thirteen heavily patinated historic glass beads were recovered. The glass beads can be dated as early as 1602, correlating with the Vizcaino expedition when the Spanish explorers gave glass beads as pacification gifts (O'Neil 1992).

The oval split and oval punched beads are markers for the Middle-Late Transition Period, and the two that we have from area 503 could represent curated technology. A few cap beads appear in the assemblage, and it is also associated with this transition period, although the cap bead is known to occur in Late Period sites (Gifford 1947; Gibson 1992).

The artifact assemblage contains four ornaments. One is a rough unground *Megathura crenulata* ornament. It is chipped on the edges and maintains its natural shape around the callus ring center. King (1990) acknowledges that after Phase L1a these ornaments were rarely used. A single teardrop-shaped steatite pendant is present. It is biconically drilled and incised with parallel diagonal lines. There is one biconically-drilled oval-shaped *Haliotis* pendant and a pendant blank. In addition, three replicated bear claw ornaments were recovered from area 503. According to Wayne Bonner (personal communication), bear claws are frequently used in mourning ceremonies.

The correlation of beads to burials is not a direct association due to the nature of the project and the layout of the units, since each unit does not contain a single burial. However, some general conclusions can be drawn. What is interesting is that most of the burials did not have a definitive number of beads associated with them, and some of the beads came from the upper levels above the burials or in units that lack skeletal remains. For example, Unit 22, which did not contain a burial, had a total of 71 beads as well as a gorget and dart point. Many of the beads are covered in asphaltum while others are burned. In ethnohistoric accounts, the Gabrielino held mourning ceremonies during which relatives of the deceased burned items of wealth such as shell beads as offerings for the dead (Kroeber 1925). Perhaps the beads from Unit 22 reflect a mourning ceremony.

Burial 8 consists of a male adult holding a wand and he has a ground *Columella* spindle placed in his throat. He is believed to be a shaman, a position of high religious status, yet only three tiny saucers and one glass bead were correlated with this burial. Burial 9, a male adult with an ocher covered skull, is considered another individual of high religious status; however, only one clear glass trade bead was recovered. With burials of high status we should expect to find a greater number and diversity of beads in association.

Burials 15 and 19 were located in Unit 8 and are correlated with 24 beads; the majority are cups and saucers with one historic disk and five lipped beads also present. Burial 15A is an infant cremation which was found with nine cupped, saucer and historic disk beads. Since these beads were not burned, we are led to believe that they were placed with the infant after the cremation ritual.

Burial 22 contained an adult male whose hands were placed over his face. He was found with disarticulated infant bones, and had the greatest number of beads identified with a single burial, with a total of 63. Thirty-three of these were *Tivela* disks covered in asphaltum, one of which was radiocarbon dated to A.D. 500-600. It is believed to have been curated because it was found in association with historic disk beads. In addition to the common callus and wall beads distributed throughout the site, there is one small spire-lopped bead and a stone disk bead. Burial 23, also from Unit 27, consisted of an adult with a crushed sternum linked to 22 beads. Ten of these are cupped, seven are tiny saucers; in addition, a single bone bead, a historic bead, a *haliotis* disk bead, a *Tivela* disk and bushing were also present.

Unit 3 contained five burials which were heavily disturbed from trenching. Sixty-seven beads were affiliated with these burials, including nine bushings believed to be part of a necklace associated with an adult female. The majority of beads identified with these five burials were tiny saucers and cups. There were also two historic disks, two glass beads, a burned bone bead, and

a *haliotis* disk.

Seventy-one beads were found in association with five burials and two bone concentrations from Unit 4, a 1x2m unit. Cups and tiny saucers were once again dominant. Eight historic disks were also present, as well as a glass bead.

Burials 1, 12, 13, 14, 16, 17, 20, 21, and 25 have only a few common beads related to each burial. However, some beads were recovered in layers above these sites, especially those in Unit 5 (burials 14, 16, and 20) which would again lead us to believe that some of the beads from the upper level burials may be the result of a mourning ceremony.

The exchange networks of the native inhabitants of southern California was disrupted and abandoned by the 19th century. Prior to the Mission Period, trade was an adaptive strategy that functioned as a buffer against subsistence loss. The desire to reduce risk is a primary concern for many hunting and gathering societies (Casdan 1985, 1987; Wiessner 1977; Jochim 1981). According to Jochim (1981:92), "People conditioned by frequent subsistence disasters would place greater emphasis on the relatively more rewarding practices aimed at minimizing risk." Furthermore, it appears that many behaviors and strategies are not aimed at maximizing profit, but at managing risks that are associated with subsistence stress. Resources may become sparse due to several reasons such as: variation in climate, reduced settlement mobility and/or increased competition (Kennett 1998; Raab and Larson 1997). As evidenced from the Arco site, the Gabrielino played an important role in this exchange system. However, additional research on the material recovered from this site, as well as other Gabrielino sites, is necessary for a conclusive test of these hypotheses.

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