EXCHANGE NETWORKS AND BEADS AMONG THE HISTORIC KUMEYAAY

CARMEN I. ZEPEDA

Pre and post-contact Kumeyaay trade is examined. Ethnographic records are reviewed, as well as archaeological data from the late prehistoric and contact periods. Archaeological findings indicate that the Kumeyaay obtained shell beads manufactured some 300 miles away in Santa Barbara, implying that the Chumash trade network must have extended further south than previously documented. The results from statistical analyses of the bead measurements also challenge the assumption that long-distance trade among Kumeyaay groups diminished or completely ceased after Spanish contact. The dramatic changes that the Spanish invasion caused did not stop long-distance exchange networks from operating. Persistence of these networks indicates that communication and organization that existed before contact was still in effect.

After the founding of the San Diego Mission in 1769, life for the California Indians of the San Diego area, the Kumeyaay, changed dramatically. The Kumeyaay were primarily hunters and gatherers who lived in semi-nomadic bands, moving seasonally according to available food resources (Luomala 1978:597; Spier 1923:307). The Spanish invasion disrupted the Kumeyaay settlement patterns, hunting and gathering activities, and exchange networks (Shipek 1991:27). Most ethnographic and historic accounts assume that long-distance trade among California Indian groups broke down due to the Spanish invasion (Bamforth 1993:68; Earle and Ericson 1977:9).

This, however, does not seem to have been the case in San Diego County. In fact, artifacts have been recovered from several historic sites in the county that indicate long-distance trade (Carrico and Day 1981:90; McDonald 1992:305; McGowan 1972:24). One such site is *A-mutt-nook* in Mason Valley, eastern San Diego County. *A-mutt-nook* was one of the three large Kumeyaay winter villages. It was occupied until 1870 and then abandoned due to a smallpox epidemic. The site was first excavated by Malcolm Rogers in 1925 and 1929. It consists of three cemeteries with an estimated 100 cremations (Rogers 1929:1-10). Rogers recovered various historic-period artifacts, including metal objects and 7,630 *O. biplicata* rough disc shell beads, but no evidence of bead manufacturing. These beads are similar in diameter, perforation size, thickness, and finish to those manufactured in the Chumash area near Santa Barbara, where ample documentation exists for an abundance of shell bead manufacturing (Arnold 1987, 1991, 1992; Arnold and Munns 1994; King 1976, 1978, 1990a). Because Chumash shell beads had a wide distribution, it can be hypothesized that the beads from *A-mutt-nook* were made in the Chumash area and traded to the Kumeyaay. The goal of this paper is to examine this issue of exchange between the Kumeyaay and the Chumash during the historic period (A.D. 1769-1834). I looked specifically at the distribution of *O. biplicata* rough disc beads.

EXCHANGE NETWORKS IN SOUTHERN CALIFORNIA

The Indians of southern California had an established system of exchange at the time of Spanish contact. There is some documentation of the Kumeyaay's extensive trade network, which included the Mohave, Yuman, Cocopa, Cahuilla, and Luiseño (Carrico and Day 1981; Davis 1961; Eidsness *et al.* 1979). According to Davis (1961), the Diegueño, (western Kumeyaay) traded their eagle feathers to the Cocopa in exchange for salt. They obtained vegetal foods and salt from the Kamia (eastern Kumeyaay) in return for tobacco, acorns, baked mescal roots, yucca fibers, sandals, baskets, carrying nets, and eagle feathers. The Kumeyaay traded acorns with the Mohave and Yuman in exchange for gourd seeds. From the desert, the Diegueño obtained tule roots, bulbs, cattail sprouts, yucca leaves, mescal, pine nuts, manzanita, berries, chokecherries, and mesquite beans (Davis 1961:20). Davis' ethnographic account is informative as to which items were traded.

The archaeological record confirms this widespread trade. Lithic artifacts made from Salton Butte obsidian have been recovered from the late

Carmen I. Zepeda, California Department of Parks and Recreation

Proceedings of the Society for California Archaeology, Volume 14, 2004. pp 125-132

prehistoric village of *Ystagua* (Carrico and Day 1981:90; Eidsness *et al.* 1979:96). This type of obsidian is found near the Salton Sea; therefore, its presence on the coast indicates an exchange network between the Kumeyaay and the Cahuilla near the Salton Sea. Chert and Palomar Brown ceramic sherds from the Luiseño territory were also recovered from the village of Ystagua, indicating trade with the Luiseño to the north (Eidsness *et al.* 1979:96).

Most of the trading among tribes occurred through a barter system, although there is one account that describes food being traded for shell beads which were used as a form of monetary exchange (Shipek 1982:299). Another report mentions that the Kumeyaay used *Olivella* shell beads as a mainstay in their widespread trade and barter system (Carrico and Day 1981:75). Shell beads may have been used as a form of money in these cases, but this is not made clear in the ethnographic accounts.

In contrast, it has been clearly documented that the Chumash used *Olivella* shell beads as a form of money in their exchange system (Arnold 1987, 1991, 1992; Arnold and Munns 1994; King 1976, 1978, 1990a). The Chumash had an intricate trade network that involved three different environmental regions: island, mainland, and inland. Each region had its own resources that were exploited at different seasons and traded for profit and/or desired items. Trading supplemented each region's resources (King 1976).

Chumash exchange with groups outside their area is also well documented in the ethnographic and ethnohistoric records. The mainland Chumash sent wooden vessels inlaid with *Haliotis* shell to the Kitanemuk (Davis 1961:28). The Chumash imported red ochre and soft blankets from the Mohave (King 1976:305). They also exported steatite vessels to the Salinans, and shell beads and "unspecified goods" to the Mohave. The Chumash imported fish, obsidian, steatite beads, salt, seed, herbs, and vegetables from the Southern Valley Yokuts and piñon nuts from the Tubatulabal. Chumash shell beads, *Olivella* shell, and other shells were traded to these same groups (Davis 1961:28). One ethnographic account states that shell beads were taken from the Chumash to the Gabrieleño, and then to the Cahuilla in the Palm Springs area (Strong 1929:95-96).

The archaeological record demonstrates that Chumash shell beads were traded throughout southern California and some surrounding areas. Spire-removed beads from the Chumash have been found in the Great Basin that date to the Early period (6000-7000 years B.P.), indicating exchange 4500-6000 B.C./6500-8000 B.P. (Bennyhoff and Hughes 1987:156-160; King 1990a:107). In the Southwest, *O. biplicata* disc (saucer) beads dating to the end of the Middle period (A.D. 900-1150/1100-850 B.P.) have been recovered from the northern Anazasi area and the Great Basin (King 1990a:150). In San Diego County, at least two sites have evidence of exchange with the Chumash prior to the historic period (King 1990a:110; McDonald 1992). Los Angeles, Orange, San Bernardino, and Riverside counties also have produced Early, Middle, and Late-period shell beads similar to those from the Chumash area (King 1990a:111, 122, 129). Finally, in central California, *O. biplicata* spire-lopped beads have been recovered that are possibly contemporary with Middle-period Phase 1 (800-1400 B.C./2800-3400 B.P.) (King 1990a:119). Clearly, Chumash shell beads had a wide distribution among numerous Indian tribes.

SHELL BEADS

Next, I will take a closer look at shell beads and shell bead manufacturing. *O. biplicata* shell was the most commonly used material for beads in California throughout all periods (King 1990a:103). These beads are one of many forms that are temporally diagnostic in King's (1990a) bead typology for southern California, which is based on the premise that bead diameters, hole sizes, and thicknesses are indicative of a particular time period.

O. biplicata rough disc beads are made from the wall of the shell. They appeared after A.D. 1776, when wall disc beads had diameters larger than 4.0 mm and less smooth ground edges. After 1782, the perforations of *Olivella* rough disc beads became smaller, because stone drills were being rapidly replaced by iron needles. By 1816, the outside diameter of the rough disc beads is between 5.0 and 6.2 mm (King 1990a:179-181). With the passing of time, bead edges and diameters become more variable. As discussed above, the different diameters and hole sizes are indicative of a particular time.

Bead Manufacturing

Shell bead manufacturing requires an abundance of shell in addition to tools such as drills. Small stone drills were used to make the perforation until iron needles were introduced by the Spaniards in 1782 (Gibson 1995:4). Massive amounts of shell detritus, stone drills or broken drill bits, and bead blanks are evidence of shell bead manufacturing. Results from a study of Late-period (A.D. 1300-1782) bead manufacturing sites from the Chumash area show that for every finished bead there were seven bead blanks,

nine stone drills, and 300 shell fragments (Arnold 1992:135-136). It is clear that at a bead manufacturing site, hundreds of shell beads would be made; therefore, there should be huge amounts of detritus to mark such a site.

Chumash Area

Ample archaeological and ethnographic evidence exists that indicate that the Chumash had craft specialization in the form of shell bead manufacturing (Arnold 1987; King 1976). Many shell bead manufacturing sites have been found on Santa Cruz Island. Late-period manufacturing sites (A.D. 1300-1782), in particular, have high concentrations of shell bead detritus; therefore, thousands of shell fragments have been recovered from these bead manufacturing sites (Arnold and Munns 1994:479-480).

Evidence of Shell Beads and Shell Bead Manufacturing in San Diego County

In San Diego County, on the other hand, there is very little evidence of shell bead manufacturing, and only a few ethnographic accounts exist with discussion of shell beads found in the area. In two of these accounts, informants claim to have no knowledge of bead manufacturing (Drucker 1937:25; Gifford 1931:37). When shell beads are mentioned in ethnographies on the Kumeyaay, it is usually related to trade.

The archaeological record supports the ethnographic record in the lack of evidence of bead manufacturing in San Diego County. In fact, the majority of San Diego County sites do not have many shell beads in their lists of recovered materials. Usually fewer than 100 shell beads are recovered from sites in the county; therefore, large numbers of shell beads are not characteristic of San Diego County sites, as they are for Chumash sites.

BEAD ANALYSIS

Given this background on San Diego County shell beads, *A-mutt-nook* is a unique site because of the large quantity of shell beads recovered. The majority (7,630) of the shell beads are *O. biplicata* rough discs and were expected to be similar to historic Chumash *O. biplicata* rough discs. Such beads from historic Chumash sites are usually over 4.0 mm in diameter, with straight perforations of 1.0 mm, indicating the use of iron needles (King 1990a:8-19). The thicknesses of rough disc beads drilled with iron needles from the Chumash region average 1.0 mm. It was expected that the majority of *O. biplicata* rough disc beads from *A-mutt-nook* would be similar to the measurements of beads found in the Chumash area in the late 1700s and early 1800s, implying they were being manufactured in the Santa Barbara area.

Bead Sampling Method

A sample of 1,268 shell beads was selected for measurement. The maximum diameter, maximum thickness, and minimum perforation diameter were measured for each bead in the sample. All measurements were taken in millimeters with a plastic dial caliper and comparator. Complete measurements were not possible for all beads, because some were broken or the edges were so eroded that an exact measurement was not possible. The burnt state of the beads from *A-mutt-nook* caused them to be more fragile and subject to erosion, which perhaps affected the accuracy of the bead measurements and resulted in smaller bead diameters and larger perforation diameters. Of the total sample of 1,268 rough disc beads, the diameters of 120, the hole perforations of 45, and the thickness of 23 were not recorded due to these problems (Table 1).

In order to determine the similarity of *O. biplicata* rough disc beads from *A-mutt-nook* with those from historic Chumash sites, bead diameters from *A-mutt-nook* were compared to those from three midden units from Ventura Mission and from three cremation and two midden units in Tahquitz Canyon (King 1995; Schaefer 1995:VI-2). For purposes of this study, each cremation and midden unit was arbitrarily assigned a lot number (Table 2). The Tahquitz Canyon lots with enough beads (lots 1, 3, 4, 6, and 7) were used for comparison. T-tests were used to compare the bead diameters. The diameters from *A-mutt-nook* were also compared to King's sequence of diameter ranges of rough disc beads (Figure 1).

Bead Analysis Results

The results showed that the *O. biplicata* rough disc bead measurements from *A-mutt-nook* fall within the range of historic ones from the Chumash area. The diameters from *A-mutt-nook* are all larger than 4.0 mm and range between 5.1 mm and 9.8 mm. The average diameter is 6.71 inches/0.018 mm. The hole diameters for the *A-mutt-nook* beads range between 0.7 mm and 1.8 mm, with an average of 1.22 inches/0.005 mm. This average coincides with more variable beads of the later historic period. The thicknesses of the *A-mutt-nook* beads range between 0.6 mm and 3.0 mm, with an average of 1.21 inches/0.009 mm. This average thickness of 1.21 mm is close to King's 1.0-mm average

	Diameter	Hole Perforation	Thickness
Valid measurements	1148	1223	1245
Missing	120	45	23

Table 1: Missing data from the A-mut-nook bead sample.

Locus	Feature(s)	Unit(s)	Assigned Name	Number of Beads
E	East (cremation)	136, 137, 145, 148	Lot 1	332
E	West (cremation)	47	Lot 2	18
E	West (cremation)	48, 49	Lot 3	484
E	West (cremation)	38	Lot 4	60
E	West (cremation)	17, 28, 29	Lot 5	10
C	1, 2	midden deposit	Lot 6	109
E	West	midden deposit	Lot 7	114
E	East	midden deposit	Lot 8	23

Table 2: Tahquitz Canyon cremations and midden deposits.

Location	n	Mean	SD	df	Results	
S8-W6	103	4.99	0.7	1249	t = 4.19	p value = 0.01
Net Nook	1148	6.54	0.627			
S12-W62	364	5.89	1.41	1510	t = 3.22	p value = 0.01
Net Nook	1148	6.54	0.62			
S17-W20	539	5.85	1.22	1685	t = 1.53	p value = 0.01
Net Nook	1148	6.54	0.62			

Table 3: T-test results of the Olivella rough disc beads from A-mut-nook and three Ventura Mission units.

Location	n	mean	SD	df	results
Lot 1	332	7.40	0.87	1478	t = 8.85
Net Nook	1148	6.72	0.60		p value = 0.01
Lot 3	484	7.87	0.93	1632	t = 8.77
Net Nook	1148	6.72	0.60		p value = 0.01
Lot 4	60	7.66	0.94	1208	t = 1.67
Net Nook	1148	6.72	0.60		p value = 0.01
Lot 6	109	7.74	0.84	1255	t = 5.58
Net Nook	1148	6.72	0.60		p value = 0.01
Lot 7	114	7.72	1.04	1262	t = 1.43
Net Nook	1148	6.72	0.60		p value = 0.01

Table 4: T-test results of the Olivella rough disc beads from A-mut-nook and five Tahquitz Canyon lots.

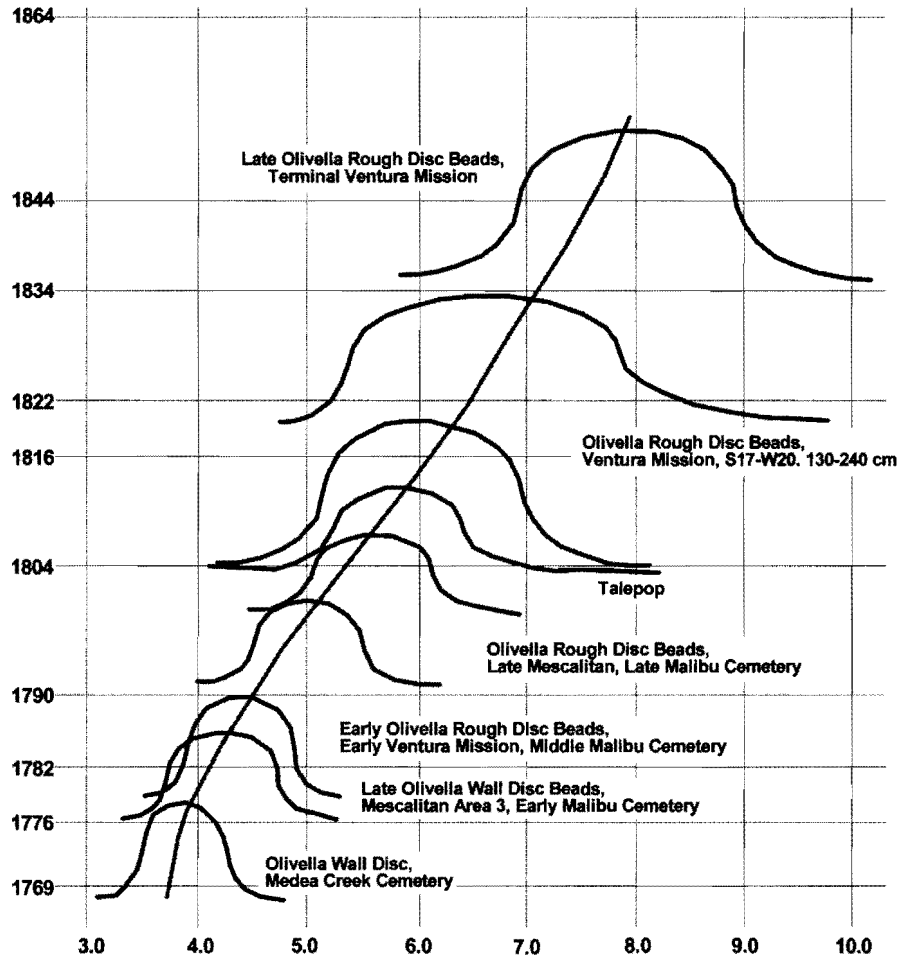

Figure 1: C. King's Diameter Ranges of Rough Disk Beads (adapted from King 1995).

thickness for historic Chumash *O. biplicata* rough disc beads (King 1990b:8-20).

The edges of the majority (52%) of the beads are slightly ground, coinciding with the trend of edges being rougher and less smoothly ground in the historic period (King 1990b:8-19, 1995:XII-14, 1996:23). Also, the majority (75%) of the beads are burnt, as was expected due to their association with cremations. All of these measurements and characteristics indicate that the *Olivella* rough disc beads from *A-mutt-nook* are similar to those found in historic Chumash sites.

When the diameter of the rough disc beads from *A-mutt-nook* are compared to King's graph, the *A-mutt-nook* diameters coincide closest with diameters dating to around A.D. 1822-1850 (King 1995:XIII-17) (Figure 1). King's graph indicates that the 1822-1850 diameters of *Olivella* rough disc beads range between approximately 5.5 mm and 7.8 mm, while the *A-mutt-nook* diameters range between 5.1 mm and 9.8 mm.

When diameters of beads from *A-mutt-nook* are compared to those from three midden units at Ventura Mission, the former are significantly larger than the beads from two of the units from the Mission (S8-W6 and S12-W62). The diameters from the third unit (S17-W20) are closer in size to the diameters from *A-mutt-nook*: the t-test comparing bead diameters from the two samples indicates no significant differences in diameter sizes (Table 3). King (1995) suggests that the sample of Ventura Mission beads were used between 1804 and 1850. In general, the bead diameters from *A-mutt-nook* are larger than those from Ventura Mission.

The diameters of the *O. biplicata* rough disc beads from *A-mutt-nook* were also compared with those from a historic Cahuilla site in Tahquitz Canyon. King (1995:XIII-18) suggests that the beads found at Tahquitz Canyon were manufactured by the Chumash, perhaps at the Ventura Mission. When diameters from *A-mutt-nook* beads were compared to five Tahquitz Canyon lots, the t-tests from three lots

showed significant differences and the results from t-tests from the two other lots showed no significant differences (Table 4). Therefore, the beads from *A-mutt-nook* are similar to those from these two Tahquitz Canyon lots. The bead diameters from *A-mutt-nook* are generally smaller than those from other lots at Tahquitz Canyon.

CONCLUSIONS

Because the bead diameters from one Ventura Mission sample is similar those from *A-mutt-nook* (Table 3) and the bead diameters from two Tahquitz Canyon samples are similar to those from *A-mutt-nook* (Table 4), the beads from these samples were probably made at the same time. Although the overall results do not confirm that the *O. biplicata* rough disc beads from *A-mutt-nook* came from the same bead population of either the Ventura Mission or Tahquitz Canyon samples, there is still a good possibility that the beads came from the Chumash region. In fact, because *Olivella* rough disc beads are described as increasing in overall size between A.D. 1780 and 1840, the *A-mutt-nook* sample seems to fall in the continuum between the bead diameters from the Ventura Mission and those from Tahquitz Canyon (King 1995:XIII-14, 1996:8-19). The beads from *A-mutt-nook* seem to fit the trend of increasing in overall size during the historic period. Given the similarity of the beads at *A-mutt-nook* with Chumash beads, it is highly likely that the former were manufactured by the Chumash during the historic period and then traded down to the Kumeyaay, either directly or indirectly.

Why, then, is there no evidence in the literature of exchange between the Kumeyaay and the Chumash? A likely explanation is that these beads were brought down to the Kumeyaay region via middlemen or through goods passing from group to group in a "down-the-line" trade system. For example, it is known that the Chumash exchanged shell beads with the Cahuilla (King 1995), and that there was exchange between the Cahuilla and the Kumeyaay; therefore, it is possible that exchange of Chumash shell beads with the Kumeyaay occurred via the Cahuilla (Carrico and Day 1981:90; Eidsness *et al.* 1979:96; Phillips 1975:17). One source mentions shell bead money specifically being exchanged between the Cahuilla and Kumeyaay (Phillips 1975:17).

Another possible route of exchange between the Chumash and Kumeyaay is via the Spanish ships and/or the Spaniards who traveled up and down the California coast. Often times the Spaniards had American Indian guides who could have been another avenue through which the Kumeyaay acquired Chumash historic shell beads. Middlemen involved in intertribal trade may have been key for the exchange of Chumash rough disc beads into the Kumeyaay region during the historic period.

IMPLICATIONS

What does all this mean? The results from the statistical analyses of the bead measurements challenge the assumption that long-distance trade among California Indian groups diminished or completely ceased after Spanish contact (Bamforth 1993:68; Earle and Ericson 1977:9). The analyses of beads indicate that after Spanish contact, long-distance exchange networks among California Indian societies continued.

The findings imply that the Chumash trade network must have extended further south than previously documented. The Kumeyaay obtained shell beads that were manufactured some 300 miles away in Santa Barbara. The dramatic changes that the Spanish invasion caused did not stop long-distance exchange networks from operating. In order to continue these networks, communication and organization that existed before contact would have to have been still in effect. Exchange networks could not have survived without the cooperation and effort of the groups involved. Therefore, despite the Spaniards' efforts to control them, California Indians continued aspects of their traditional way of life, including intertribal exchange.

BIBLIOGRAPHY

Arnold, Jeanne E.

1987 *Craft Specialization in the Prehistoric Channel Islands.* University of California Press, Berkeley.

1991 Transformation of a Regional Economy: Sociopolitical Evolution and the Production of Valuables in Southern California. *Antiquity* 65: 953-962.

1992 Cultural Disruption and the Political Economics in Channel Islands Prehistory. In *Essays on the Prehistory of Maritime California*, edited by Terry L. Jones, pp. 129-144. Center for Archaeological Research at Davis, Davis, CA.

Arnold, Jeanne E. and Ann Munns
1994 Independent or Attached Specialization: The Organization of Shell Bead Production in California. *Journal of Field Archaeology* 21:473-489.

Bamforth, Douglas B.
1993 Stone Tools, Steel Tools: Contact Period Household Technology at Helo'. In *Ethnohistory and Archaeology: Approaches to Postcontact Change in the Americas*, edited by J. Daniel Rogers and Samuel M. Wilson, pp. 49-72. Plenum Press, New York.

Bennyhoff, James A. and Richard E. Hughes
1987 Shell Bead and Ornament Exchange Networks between California and the Western Great Basin. *Anthropological Papers of the American Museum of Natural History* 64 (2): 79-175.

Carrico, Richard and Sandra Day
1981 *Archaeological Investigations at Ystagua: A Late Prehistoric Village Complex (The Hallmark Circuits/ Cavanaugh Properties: SDI-5443).* Unpublished report for WESTEC Services, Inc., San Diego.

Davis, James T.
1961 Trade Routes and Economic Exchange among the Indians. *University of California Archaeological Survey Report* 54: 1-48.

Drucker, Philip
1937 Culture Element Distribution V, Southern California. *Anthropological Records* 1: 1-52.

Earle, Timothy K. and Jonathan E. Ericson
1977 Exchange Systems in Archaeological Perspective. In *Exchange Systems in Prehistory*, edited by Timothy K. Earle and Jonathon E. Ericson, pp. 3-12. Academic Press, New York.

Eidsness, Janet P., Douglas Flower, Darcy Ike, and Linda Roth
1979 *Archaeological Investigation of the Sorrento Valley Road Pipeline Project Limited Linear Test.* Unpublished report for Mike Masanovich Construction Company, Arcadia, CA.

Gibson, R. O.
1995 *Analysis of Beads, Ornaments, and Fish Hooks, ORA-106, Orange County, California.* Unpublished report for Chambers Group, Inc., Irvine, CA.

Gifford, Edward Winslow
1931 The Kamia of Imperial Valley. *Bureau of American Ethnology* 97: 1-94.

King, Chester D.
1976 Chumash Intervillage Economic Exchange. In *Native Californians: A Theoretical Retrospective*, edited by Lowell J. Bean and Thomas C. Blackburn, pp. 289-318. Ballena Press, Ramona, CA.

1978 Protohistoric and Historic Archeology. In *Handbook of North American Indians, Vol. 8 California*, edited by Robert F. Heizer, pp. 58-68. Smithsonian Institution, Washington, D.C.

1990a *Evolution of Chumash Society: A Comparative Study of Artifacts Used for Social System Maintenance in the Santa Barbara Channel Region before A.D. 1804.* Garland Publishing Inc., New York.

1990b Beads from Heló. In *Archaeological Investigations at Heló on Mescalitan Island.* pp. 8-1 - 8-63. Unpublished report for the County of Santa Barbara, Santa Barbara.

1995 Beads and Ornaments from Excavations at Tahquitz Canyon (CA-RIV-45). In *Archaeological, Ethnographic, and Ethnohistoric Investigations at Tahquitz Canyon. Palm Springs, California*, pp. XIII-1 - XIII-77. Unpublished report for Cultural Systems Research, Inc., Menlo Park, CA.

Luomala, Katherine
1978 Tipai-Ipai? In *Handbook of North American Indians, Vol. 8 California*, edited by Robert F. Heizer, pp. 592-608. Smithsonian Institution, Washington, D.C.

McDonald, Alison Meg
1992 *Indian Hill Rockshelter and Aboriginal Cultural Adaptation in Anza-Borrego Desert State Park.* Southeastern California. Ph.D. dissertation, Anthropology Department, University of California at Riverside.

McGowan, Charlotte
1972 *A Preliminary Report on the Excavation of an Archaeological Site in South San Diego County.* Unpublished report on file at South Coastal Information Center, San Diego.

Phillips, George Harwood
1975 *Chiefs and Challengers: Indian Resistance and Cooperation in Southern California.* University of California Press, Los Angeles.

Rogers, Malcolm J.
1929 *C-144 Main Cemetery A, Mason Valley 1925-1929 Period of Excavation Notes.* Unpublished notes on file at the Museum of Man, San Diego.

Schaefer, Jerry
1995 Site Descriptions. In *Archaeological, Ethnographic, and Ethnohistoric Investigations at Tahquitz Canyon. Palm Springs, California*, pp. VI-1-VI-141. Unpublished report for Cultural Systems Research, Inc., Menlo Park, CA.

Shipek, Florence C.
1982 Kumeyaay Socio-Political Structure. *Journal of California and Great Basin Anthropology* 4: 293-303.

1991 *The Autobiography of Delfina Cuero.* Ballena Press, Menlo Park, CA.

Spier, Leslie
1923 Southern Diegueño Customs. *University of California Publication in American Archaeology and Ethnology* 20 (16): 292-358.

Strong, William D.
1929 Aboriginal Society in Southern California. *University of California Publication in American Archaeology and Ethnology* 26 (1): 1-358.