

COASTAL LUISENO: REFINING THE SAN LUIS REY COMPLEX

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ABSTRACT

SDM-W-143/146 (SDi-5213 C&D), known as Rising Glen, was a major coastal Luiseno habitation site. In reviewing the literature, this appeared almost oxymoronic. Although the coast is recognized as within ethnographic Luiseno territory, it is often ignored when considering the Luiseno archaeologically. The San Luis Rey complex has been defined solely on the basis of inland sites. The paper presents the "coastal Luiseno assemblage", as seen at Rising Glen and other coastal sites, and compares this assemblage with the traditional San Luis Rey complex. The differences in the assemblages and the ways in which these differences reflect adaptations to various ecological settings are examined.

PROLOGUE

For the original abstract, the paper was titled "Coastal Luiseno: Refining the San Luis Rey Complex". It should actually be called "Broadening the San Luis Rey Complex". The complex was defined on the basis of work at inland Luiseno sites, and much of it is not applicable to the coast. True, Meighan, and Crew (1974) wrote of the proliferation of culture and assemblage names in California. Rather than adding to the confusion with more names, it makes sense to use the names already coined and make them meaningful. The San Luis Rey complex should include all Luiseno sites, both coastal and inland.

INTRODUCTION

In 1984, RBR & Associates conducted a data recovery program at a major habitation site in Carlsbad, just south of Buena Vista Lagoon. The site is known as Rising Glen, SDM-W-143/146 (SDi-5213 C&D). "This site is only the nucleus of a great Shoshonean occupation as the steep benches above the ridge above and saddles carry the same occupation. It is almost impossible to divide this region into specific sites as the occupation is almost continuous for 3/4 of a mile and 1/2 mile wide" (Rogers 1929).

The site is located within Luiseno territory according to ethnographic maps by Kroeber (1925), White (1963), and True, Meighan, and Crew (1974). The site and nearby sattetites may be the village of Palamai, mapped by Kroeber (1925). Portola's 1769 expedition party camped at Buena Vista Creek, and Crespi noted "we saw from the

camp a village of heathen on the summit of a hill" (Palou 1926:115-116, cited in Carrico 1977:36). However, when I began to do background research, almost all the literature I found on the Luiseno dealt with inland areas. The ethnographic literature barely touched on the coast, and the archaeological reports dealt with sites in the foothills and the mountains.

The San Luis Rey complex, the archaeological manifestation of the Luiseno, was originally defined by Meighan (1954). The complex was refined by Meighan and others, especially by True, Meighan, and Crew in their 1974 report, Archaeological Investigations at Molpa, in which Molpa (a village on Palomar Mountain) was defined as the type site for the San Luis Rey complex. My purpose here is not to criticize the work at Molpa, but to serve as a brief reminder that a cultural system cannot be reconstructed on the basis of an assemblage from a single site. As Binford pointed out:

Our expectations then, are for variability in the archaeological record to reflect a variety of different kinds of coping situations. Activities will vary with the particular adaptive situation of the group and the character of tasks performed [Binford 1972:132].

Obviously, different activities leave different archaeological remains. Varying types of sites or similar site types in different physical or cultural environments all leave different traces in the archaeological record. A cultural system cannot be understood without looking at the range of adaptations. That is the purpose of this paper.

First, I will present representative coastal assemblages. SDM-W-143/146 (SDi-5213 C&D) did not include the entire range of coastal materials. However, the site is one of many in proximity to one another which seem to make up a village complex, and it shows a greater range of materials than other sites in the vicinity. I will also use data from Ora-190, which was excavated by Pacific Coast Archaeological Society (PCAS) and reported by Lester A. Ross (1969, 1970). Ora-190 is a coastal Luiseno occupation site on Newport Bay. The assemblage from Molpa will also be presented. Using these data, I will quickly look at the differences between the coastal and inland assemblages and how these affect our interpretation of the Luiseno.

THE SITES

SDM-W-143/146 (SDi-5213 C&D), Rising Glen, is a large habitation site located on a ridge 1.6 km south of Buena Vista Lagoon in Carlsbad, San Diego county. The site is just 2.5 km north of Agua Hedionda Lagoon and 2.9 km inland from the coast. A spring at the site provides

water, and there are a number of seasonal drainages nearby. The site currently supports non-native vegetation, but Coastal Sage Scrub is thought to have been the predominant plant community during prehistoric times (Cardenas and Robbins-Wade 1985).

At the time of excavation the site covered an area of 140,470 m²; it was larger before the construction of houses on the ridge during the 1920s and 1930s. The cultural deposits at Rising Glen are deep and varied. A few excavation units bottomed out on hard, sterile clay at less than 20 cm, others were well over a meter in depth. Loci D and E were the richest areas of the site, and five of the ten units at these loci were excavated to depths of 190 cm, 140 cm (two units), and 120 cm (two units) (Cardenas and Robbins-Wade 1985).

Obsidian hydration and radiocarbon analysis were used to date SDM-W-143/146 (SDi-5213 C&D). The results of these analyses appear in Tables 1 and 2 at the end of this paper (Appendix 1). These analyses indicate that the site was occupied from at least 2200 years ago probably until the time of missionization. Radiocarbon samples were general level samples of charcoal, except one sample, which was Chione sp. It yielded a date of 2830 \pm 70 years B.P. However, shell samples tend to date older than charcoal, so this date cannot be considered totally reliable. The date of 2190 \pm 90 years B.P. (330-150 B.C.) was used as the basal date for purposes of analysis (Cardenas and Robbins-Wade 1985).

The artifact assemblage and the results of both radiocarbon and obsidian analyses indicate that Rising Glen was occupied from the end of the Early Milling period through the Late Prehistoric period.

Ora-190 is located on the southwestern edge of the San Joaquin Hills, overlooking the city of Corona Del Mar, Orange County. The site is about 1.7 km from the ocean and approximately 3.3 km from Newport Bay. A freshwater stream flows about 135 m away from the site. The vegetation on and near the site belongs to the Coastal Sage Scrub community.

The horizontal extent of the site was defined by the presence of: Field mustard, cultural material, increased rodent activity, midden soil, and a relative surface soil pH of 7.0. Ora-190 covered an estimated 75 m by 40 m, 2355 m². It appears to be contiguous with site Ora-189, and the two sites cover a total area of 13,855 m².

The midden was generally 12-18 inches (30-46 cm) thick, the maximum depth of cultural material being 24 inches (61 cm). Soil monoliths were analyzed, and Ross presented detailed stratigraphic information (Ross 1969, 1970).

Three radiocarbon dates were obtained from bulk samples from the entire site. One sample was charcoal, one fish bone, and one shell (Chione californiensis). These yielded dates of A.D. 604-1354 (charcoal), A.D.

850-1350 (bone), and A.D. 55-755 (shell). Ross felt the shell date was in error, because it was so different from the other two dates (Ross 1969:41). Obsidian hydration measurements were made (see Table 3, Appendix 1), however, the obsidian sources were not given. Obsidian from different sources hydrates at different rates. Therefore, it is important to know the obsidian source in order to interpret hydration measurements.

The artifact assemblage and the radiocarbon dates indicate that Ora-190 was occupied during the Late Prehistoric period (Ross 1969, 1970).

Molpa, SDi-308, is located on the slopes of Mount Palomar in northern San Diego county, approximately 40-45 km from the coast. The site covers portions of two knolls overlooking an open grassland. A number of granitic bedrock exposures are found on the site. A range of vegetation types occurs in the area (True, Meighan, and Crew 1974).

The site covers 33,600 m², some of which may represent slopewash. Depth of the midden varies across the site, but no obvious stratigraphy was noted. "Based primarily on the distribution of potsherds in the main deposit and typical milling-stone elements recovered from the test trench area", True, Meighan, and Crew (1974:21-22) suggested three components at Molpa: Pauma complex, San Luis Rey I, and San Luis Rey II. The majority of the site represented SLR II occupation. The Pauma complex material was excluded from the report (True, Meighan, and Crew 1974).

THE ASSEMBLAGES

The Rising Glen assemblage addressed here includes only material collected by RBR & Associates during the 1984 data recovery program. Data from the earlier testing program (Carrico 1983) was not included in this analysis. Twenty 1 m by 2 m units were excavated, in 10 cm levels. Material was dry screened through 1/8-inch mesh. Because of the huge amount of shell mixed with gravel, all material in the screens was brought to the lab to be washed and sorted. This technique increased recovery of small items, such as fish bone and beads (Cardenas and Robbins-Wade 1985).

PCAS volunteers excavated 39 5 ft. (1.5 m) square pits at Ora-190 in 1966. An unspecified number of pits were excavated in 1967. Six inch (15 cm) levels were dug. Soil was dry screened through either 1/4- or 1/8-inch mesh (Ross 1969).

The excavations at Molpa (SDi-308) were carried out between 1955 and 1957 by field classes from UCLA. The material was analyzed by True, Meighan, and Crew a dozen or more years later. Seventeen 5 ft. (1.5 m) square units were excavated in 6 inch (15 cm) levels. One 50 ft. (15 m) by 2 ft. (0.6 m) trench was also excavated. Soil was screened through 1/4-inch mesh (True, Meighan,

and Crew 1974). Unlike the excavations at Rising Glen and Ora-190, at Molpa faunal material and debitage were discarded without benefit of tabulation or analysis.

The differences in excavation methods must be borne in mind when looking at the site comparisons. Data may not all be comparable. Because debitage from Molpa was not counted or analyzed, debitage from Rising Glen and Ora-190 was left out of the tables and was not included in the artifact totals and percents.

One important element of the coastal assemblage is the high proportion of cobble-based tools. Moriarty has said of the La Jolla complex, "the artifact assemblage is based on a rather crude cobblestone, chopper and scraper typology..." (Moriarty 1966:21). However, this reliance on locally available cobbles is not restricted to the Early Milling period; it continues well into Luiseno times. At Rising Glen there is no break either in the stratigraphy or in the lithic assemblage. Cobble tools continue from near the bottom of the deposit to the top, with the addition of ceramics and Cottonwood series projectile points in the upper levels marking the transition from the Early Milling to the Late Prehistoric period.

The coastal Luiseno assemblage, as seen at SDM-W-143/146 (SDi-5213 C&D), Ora-190, and other sites, differs significantly from the inland assemblage as represented at Molpa. These differences are considered to reflect adaptations to different environments. For an earlier time period, Gallegos (1987) has suggested that the La Jolla complex and San Dieguito complex are manifestations of the same people, the two complexes reflecting adaptations to different environments. True (1980; True and Beemer 1982) has suggested that the La Jolla and Pauma complexes are coastal and inland manifestations of the same Early Milling period people. The same concept holds true for the Late Prehistoric peoples; both the Luiseno and the Diegueno exhibit very different subsistence patterns and tool assemblages on the coast compared with inland areas.

Table 4 presents the assemblages recovered at Rising Glen and Molpa. Table 5 lists the Ora-190 assemblage. In looking at Table 1, you will see that ceramics greatly outnumber all other artifact classes at Molpa, and there are over 20 times as many ceramic items at Molpa as at Rising Glen (as discussed below). The huge percentage of ceramics made comparison of other artifact types rather difficult. So, ceramics were subtracted from the artifact totals, and adjusted percentages were used for comparison.

Assuming that bifacial tools were used mainly in hunting and processing of animal material, a hunting tool kit is heavily represented at Molpa. The 423 projectile points found comprise 52.9% of the artifact assemblage. Knives account for 9.3% of the artifacts. At SDM-W-

143/146 (SDi-5213 C&D), points make up only 1.1% of the assemblage and knives 1.7%. Ora-190 shows a little more reliance on hunting, but projectile points still comprise only 5.7% of the assemblage, and knives make up 2.7%.

Scrapers and scraper planes are considered to be tools for plant processing (Corum 1978; Salls 1985), as well as hide-working (scrapers) and wood-working (scraper planes) (Crabtree and Davis 1968). While scrapers and scraper planes account for only 2.4% of the artifacts at Molpa, they comprise 33.7% of the Rising Glen assemblage. At Ora-190, scrapers make up 22.9% of the recovered artifacts. These data indicate the importance of hunting in the overall subsistence of the inhabitants of Molpa, and a greater reliance on the gathering of plant resources at the coastal sites. Unfortunately, no data were available on the faunal remains at Molpa. Therefore, the subsistence base must be inferred from the recovered artifact assemblage and from ethnographic records.

Ethnographic literature emphasizes the importance of acorn collecting and processing in the lives of San Diego's Late Prehistoric inhabitants (e.g., Cuero 1970; Luomala 1978). Milling implements recovered at Molpa comprise only 15.4% of the assemblage. However, bedrock milling features at the site contain hundreds of mortars and slicks. We are not certain how acorn collection fits into the coastal pattern. Bean and Shipek (1978) note that most inland Luiseno owned collecting tracts on the coast. But they fail to mention acorn gathering or use of other inland resources by the coastal Luiseno. Milling implements make up 35.9% of the Rising Glen assemblage. Both seeds and small mammals were probably processed through grinding.

Shell beads comprise 2.0% of the artifact assemblage at Molpa and 5.5% of the Rising Glen assemblage. At the 95.0% level of confidence, the confidence intervals overlap, indicating the difference between the amounts of shell beads in the two assemblages is not statistically significant. King (1974) has written on the importance of shell beads as economic items in far-reaching trade networks. Boscana noted that the Indians "formed, from shells, a kind of money, which passed current among them" (Boscana 1947:3). Many investigators seem to take for granted that more shell beads would be found at coastal sites, where shell is more readily available. However, if beads were important economic items to the Luiseno, the inland people would also make an effort to attain them. This is borne out by a comparison of the percentages of shell beads from Molpa and Rising Glen.

As noted above, the amount of pottery at the sites reflects another major difference. Ceramic sherds comprise 77.3% of the unadjusted artifact total at Molpa, and other ceramic artifacts make up 0.4%. At Rising Glen, ceramic sherds account for 43.1% of the unadjusted

total, and the one sherd abraded is 0.3% of the assemblage. It was initially thought that this difference represented an economic difference between the mountains and the coast, perhaps a differential distribution of good pottery-making material or differing degrees of use of storage vessels. However, the assemblage from SDM-W-137 (SDi-4990), part of the Rising Glen village complex, includes 1295 ceramic sherds (Flower, Ike, and Roth 1977), 78.2% of the assemblage. This figure is comparable to the relative amount of pottery recovered at Molpa. The relatively low frequency of ceramics at Rising Glen may be a function of differential activity areas within the village area. Perhaps more tasks requiring use of ceramic vessels were undertaken at SDM-W-137 (SDi-4990) than at SDM-W-143/146 (SDi-5213 C&D). However, the artifacts, ecofacts, and features at Rising Glen seem to make this explanation unlikely; cooking and storage activities are represented at the site. It seems more likely that the difference may be due to the fact that at SDM-W-143/146 (SDi-5213 C&D) there is a substantial preceramic component underlying the ceramic-bearing levels. At both Molpa and SDM-W-137 (SDi-4990), the majority of the deposit was from a later period, when ceramics were largely in use.

Bone awls have been identified as tools used in basketry manufacture (Ross 1969), as well as fur-working and shell-working (Corum 1978). A greater percentage of awls would be expected on the coast if indeed there was more use of basketry and netting there. However, the adjusted percentage of awls at Rising Glen was not that much greater than at Molpa: 5.5% compared with 4.1%. In fact, at the 95.0% level of confidence the confidence intervals overlap, indicating no significant difference in awls between the two sites. Perhaps awls were of similar importance at the two sites, but had different uses -- basketry and netting manufacture on the coast and fur-working inland. There is also some ethnographic evidence of awls used in pottery work and for removing acorns (Corum 1978).

One important element of Luiseno culture that cannot be adequately addressed at Rising Glen is the religious and ceremonial aspect of the people's lives. The presence of pictographs is one of the major criteria distinguishing San Luis Rey II from San Luis Rey I at inland sites. On the coast, however, suitable rocks for pictographs are rare. The coastal dwellers undoubtedly found substitutes to replace the role that pictographs played in the ceremonial lives of the mountain Luiseno. Or they moved to sites with bedrock to conduct ceremonial activities requiring rock painting. Again, the ethnographic literature does not address the ceremonial life of the coastal Luiseno. No crystals, wand inserts, or shaman's stones were identified at Rising Glen. However, ceremonial items were recovered at SDM-W-137

(SDi-4990) (Flower, Ike, and Roth 1977), just 200 m away. It may be that SDM-W-137 (SDi-4990) served as a ceremonial focus for inhabitants of the Rising Glen village complex.

As noted above, no faunal analysis was available from Molpa. At Rising Glen, almost 2700 g of bone were found, including jackrabbit, cottontail, an abundance of brushrabbit, deer, pinniped (fur seal-size), cetacean (porpoise-size and grey whale-size), sea otter, and 42 taxa of marine fish from a variety of habitats. Over 407,000 g of shell were recovered at Rising Glen, including more than 20 taxa. The most abundant species were Chione (C. undatella, C. fluctafraga, and C. californiensis), Aequipecten aequisulcatus, Donax gouldii, and Ostrea sp.

The faunal material from SDM-W-143/146 (SDi-5213 C&D) evidences a strong reliance on lagoon resources such as shellfish and finfish, as well as on small mammals. A few marine mammals are represented in the assemblage. Ross (1970) suggests at Ora-190 that beached sea mammals were probably encountered while gathering shellfish. This accounts for the presence of some sea mammal bone without an accompanying set of tools for sea mammal hunting. The archaeological record at Rising Glen documents that Buena Vista Lagoon and probably Agua Hedionda Lagoon were important resource bases from at least 2200 years ago through the founding of the missions.

DISCUSSION AND CONCLUSION

The ethnographic literature deals with the seasonal movement of the Luiseno between mountain summer villages and foothill winter villages. No mention is made of coastal villages and how they fit into the seasonal pattern. Based on climatic and floral data, Ross (1970) has hypothesized for Orange County that people moved between the foothills and mountains in summer and the coast or Newport Bay in the winter. However, seasonality studies at Rising Glen indicate that the site was occupied year round. Based on the relative numbers of juvenile, subadult, and adult rabbits (Lepus sp. and Syvilagus sp.) represented in the faunal assemblage, Reynolds suggested that small mammals, particularly brush rabbit, were taken mainly in January and February (Reynolds 1985). A seasonality study of otoliths indicates that fishing was done year-round, but primarily in summer and fall months (mid-May to mid-October) (Roeder 1985). No seasonality analysis was attempted with shellfish. But mammal bone and otoliths suggest that fish were a mainstay during one part of the year and small mammals during another (Cardenas and Robbins-Wade 1985). The importance of plant resources is inferred from the artifact assemblage. Task groups may have left the village for periods of time, but the site was

occupied by at least a few individuals all year.

In conclusion, the assemblages from Rising Glen and other coastal Luiseno sites differ significantly from that of Molpa, the San Luis Rey complex type site. The differences are a function of the different locations and subsistence strategies, as well as different site types. The ethnographic literature does not adequately address coastal Luiseno lifeways. A valid definition of a "Luiseno complex" and an understanding of these people must include data from the range of site types from both coastal and inland areas.

REFERENCES CITED

- Bean, Lowell John, and Florence C. Shipek
 1978 Luiseno. In Handbook of North American Indians, vol. 8, California, edited by Robert F. Heizer, pp. 550-563. William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.
- Binford, Lewis R.
 1972 Contemporary Model Building; Paradigms and the Current State of Paleolithic Research. In Models in Archaeology, edited by D.L. Clarke. Methuen, London.
- Boscana, Geronimo
 1947 Chinigchinich A Historical Account of the Origin, Customs, and Traditions of the Indians at the Missionary Establishment of St. Juan Capistrano, Alta-California, translated by Alfred Robinson. Biobooks, Oakland.
- Cardenas, D. Sean, and Mary Robbins-Wade
 1985 An Archaeological Investigation of SDM-W-143/146: An Unique Coastal Luiseno Occupation Site in Carlsbad, California. RBR & Associates, Inc., San Diego.
- Carrico, Richard L.
 1977 Portola's 1769 Expedition and Coastal Native Villages of San Diego County. The Journal of California Anthropology 4(1):30-41.
- 1983 Letter to Stan Landess, Regarding Preliminary Draft Report, Archaeological Testing at W-143/146, Carlsbad, California.
- Chace, Paul G.
 1980 Dating the Obsidian Trade in San Diego: Evidence From the Nelson Site. San Diego County Archaeological Society Newsletter 8(5).
- Corum, Joyce M.
 1978 A Summary Description of Luiseno Material Culture. In Archaeological Test Excavations in Moosa Canyon San Diego County, California. California Department of Transportation, Sacramento.
- Crabtree, Don E., and E.L. Davis
 1968 Experimental Manufacture of Wooden

Implements with Tools of Flaked Stone.
Science 159(3813):426-428.

Cuero, Delfina

1970 The Autobiography of Delfina Cuero A Diegueno Indian, as told to Florence Shipek. Malki Museum Press, Morongo Indian Reservation.

Dominici, Debra Ann

1984 Calibration of the Obsidian Butte Hydration Rate and Its Implications Regarding Late Prehistoric Exchange. Unpublished Master's thesis, Department of Anthropology, San Diego State University.

Ericson, Jonathon E.

1977 Prehistoric Exchange Systems in California: The Results of Obsidian Dating and Tracing. Unpublished Ph.D. dissertation, Department of Anthropology, University of California, Los Angeles.

Flower, Douglas M., Darcy Ike, and Linda Roth

1977 Archaeological Investigations at W-137 (SDI-4990) Carlsbad, California (preliminary draft). Flower, Ike, and Roth, San Diego.

Gallegos, Dennis R.

1987 A Review and Synthesis of Environmental and Cultural Material for the Batiquitos Lagoon Region. In San Dieguito -- La Jolla: Chronology and Controversy, pp.23-34. San Diego County Archaeological Society, San Diego.

King, Chester

1974 The Explanation of Differences and Similarities Among Beads Used in Prehistoric and Early Historic California. In Antap: California Indian Political and Economic Organization, edited by Lowell Bean and Thomas King, pp. 77-92. Ballena Anthropological Papers Number 2, Ramona.

Kroeber, A.L.

1925 Handbook of the Indians of California. Bureau of American Ethnology Bulletin 78. Smithsonian Institution, Washington, D.C.

Luomala, Katherine

1978 Tipai and Ipai. In Handbook of North American Indians, vol. 8, California, edited

by Robert F. Heizer, pp. 592-609. William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Meighan, Clement W.

1954 A Late Complex in Southern California Prehistory. Southwestern Journal of Anthropology 10:215-227.

Moriarty, James R.

1966 Cultural Phase Divisions Suggested By Typological Change Coordinated with Stratigraphically Controlled Radiocarbon Dating in San Diego. Anthropological Journal of Canada 4(4):20-30.

Reynolds, Richard L.

1985 Faunal Analysis, Attachment H of An Archaeological Investigation of SDM-W-143/146: An Unique Coastal Luiseno Occupation Site in Carlsbad, California, by D. Sean Cardenas and Mary Robbins-Wade. RBR & Associates, Inc., San Diego.

Roeder, Mark A.

1985 Fish Remains, Primarily Vertebrae, From a Coastal Luiseno Site (SDM-W-143) on Mount Kelly, Carlsbad, San Diego County, California. In An Archaeological Investigation of SDM-W-143/146: An Unique Coastal Luiseno Occupation Site in Carlsbad, California, by D. Sean Cardenas and Mary Robbins-Wade. RBR & Associates, Inc., San Diego.

Rogers, Malcolm J.

1929 Unpublished field notes. On file, San Diego Museum of Man.

Ross, Lester A.

1969 The Irvine Complex: A Late Prehistoric Horizon Archaeological Complex for the Newport Bay Area, California. Unpublished Master's thesis, Department of Anthropology, Washington State University, Pullman.

1970 4-Ora-190: A Descriptive Site Report of a Late Prehistoric Horizon Site in Orange County, California. Pacific Coast Archaeological Society Quarterly 6(2):1-135.

- Salls, Roy A.
 1985 The Scraper Plane: a Functional Interpretation. Journal of Field Archaeology 12:99-106.
- True, D.L.
 1980 The Pauma Complex in Northern San Diego County: 1978. The Journal of New World Archaeology 3(4):1-39.
- True, D.L., and Eleanor Beemer
 1982 Two Milling Stone Inventories from Northern San Diego County, California. Journal of California and Great Basin Anthropology 4(2):233-261.
- True, D.L., C.W. Meighan, and Harvey Crew
 1974 Archaeological Investigations at Molpa, San Diego County, California. University of California Publications in Anthropology II, Berkeley.
- White, Raymond C.
 1963 Luiseno Social Organization. University of California Publications in American Archaeology and Ethnology 48(2):91-194. University of California Press, Berkeley and Los Angeles.

TABLE 2
SDM-W-143/146
RADIOCARBON DATES

Lab Number	Unit/Level	Date (BP)	Comments
Beta-13119	3/40-50	450 \pm 70	
Beta-13120	3/60-70	440 \pm 70 ¹	
Beta-13121	3/110-120	1390 \pm 70	
Beta-13122	3/180-190	2190 \pm 90	
Beta-13123	3/180-190	2830 \pm 70	shell
Beta-13124	8/40-50	1360 \pm 90	
Beta-13125	14/30-40	910 \pm 100 ¹	
Beta-13126	17/70-80	Modern	
Beta-13127	18/90-110	730 \pm 70	
Beta-13128	20/110-120	1140 \pm 70	

¹ Associated with analyzed obsidian

TABLE 3

ORA-190
OBSIDIAN HYDRATION MEASUREMENTS

Excavation Unit	Excavation Level (inches)	Hydration Thickness (microns)
G-29	0-6	2.6
C-3	0-6	6.2
O-29	0-6	6.8
O-29	0-6	7.5
M-37	6-12	3.7
B-3	12-18	7.1
Unknown	12-18	4.8

From Ross 1969:41

TABLE 4

COMPARISON OF MOLPA AND SDM-W-143/146

Artifact Type	SDi-308 (Molpa)		% Minus Ceramics	SDM-W- 143/146		% Minus Ceramics
	No.	%		No.	%	
Unclassified groundstone	-			9	(2.81)	(4.97)
Manos	88	(2.45)	(11.01)	42	(13.13)	(23.20)
Pestles	8	(0.22)	(1.00)	2	(0.63)	(1.10)
Basin metates	18	(0.50)	(2.25)	9	(2.81)	(4.97)
Slab metates				2	(0.63)	(1.10)
Mortars	9	(0.25)	(1.13)	1	(0.31)	(0.55)
Edge ground cobble	1	(0.03)	(0.13)	-		
Groundstone ball				1	(0.31)	(0.55)
Scrapers	17	(0.47)	(2.13)	34	(10.63)	(18.78)
Utilized scrapers	-			16	(5.00)	(8.84)
Scraper plane/scrapers	-			5	(1.56)	(2.76)
Scraper planes	2	(0.06)	(0.25)	6	(1.88)	(3.31)
Choppers	1	(0.03)	(0.13)	13	(4.06)	(7.18)
Chopper/hammers	-			4	(1.25)	(2.21)
Hammers	7	(0.20)	(0.88)	2	(0.63)	(1.10)
Hammer grinders	2	(0.06)	(0.25)	-		
Scraper/perforators	-			1	(0.31)	(0.55)
Projectile points	423	(11.79)	(52.94)	2	(0.63)	(1.10)
Irregular flake knives	1	(.03)	(0.13)	1	(0.31)	(0.55)
Utilized flake knives	1	(.03)	(0.13)	1	(0.31)	(0.55)
Knife fragments	72	(2.01)	(9.01)	1	(0.31)	(0.55)
Unclassified tool fragment	-			1	(0.31)	(0.55)
Bifacial flake-based preforms	-			3	(0.94)	(1.66)
Worked flakes	59	(1.64)	(7.38)	-		
Ceramics - sherds	2774	(77.33)		138	(43.13)	
Ceramics - other	14	(.39)		1	(0.31)	

TABLE 4 (continued)

Artifact Type	SDi-308 (Molpa)		% Minus Ceramics	SDM-W- 143/146		% Minus Ceramics
	No.	%		No.	%	
Bone Artifacts						
Awls	33	(.92)	(4.13)	10	(3.13)	(5.52)
Ornamental	1	(.03)	(0.13)	1	(0.31)	(0.55)
Other	25	(.70)	(3.13)	4	(1.25)	(2.76)
Shell						
Beads	16	(.45)	(2.00)	10	(3.13)	(5.52)
Pendants	3	(.08)	(0.38)	-		
Smoothing stone	1	(.03)	(0.13)	-		
Paint stone	1	(.03)	(0.13)	-		
Crystals	2	(.06)	(0.25)	-		
Wand insert	1	(.03)	(0.13)	-		
Historic						
Knives (steel)	2	(.06)	(0.25)	-		
Trade beads	2	(.06)	(0.25)	-		
China/glass	3	(.08)	(0.38)	-		
Total	3587	(100.00)		320	(100.00)	

TABLE 5
ORA-190 ASSEMBLAGE

Artifact Type	Number	%
Manos	41	(9.3)
Pestles	3	(0.7)
Metates	17	(3.9)
Edge ground cobble	1	(0.2)
Scrapers	5	(1.2)
Utilized scrapers	95	(21.6)
Uniface	1	(0.2)
Gravers	3	(0.7)
Choppers	8	(1.8)
Hammerstones	71	(16.1)
Projectile points	25	(5.7)
Utilized knives	3	(0.7)
Knives	9	(2.0)
Drills	5	(1.1)
Arrowshaft straightener	1	(0.2)
Saw	1	(0.2)
Clay pipe	1	(0.2)
Bone Artifacts		
Awls	10	(2.4)
Flat tools	7	(1.6)
Bulbous tools	2	(0.5)
Gorge	1	(0.2)
Composite tool	1	(0.2)
Worked bone	12	(2.8)
Shell Artifacts		
Beads	22	(5.2)
Fishhooks	2	(0.5)
Fishhook blanks	1	(0.2)
Shell scraper	1	(0.2)
Abalone dish	1	(0.2)
Abalone pendant	1	(0.2)
Abalone discs	2	(0.5)
Shell rattles	10	(2.4)
Steatite pendant	1	(0.2)
Sandstone dish	1	(0.2)
Incised stones	6	(1.4)
Incised/sharpened stones	5	(1.2)
Sharpening stones	13	(3.1)

TABLE 5 (continued)

Artifact Type	Number	%
Grooved stones	2	(0.5)
"Spindle whorls"	3	(0.7)
Charmstone	1	(0.2)
Tarring pebbles	3	(0.7)
Asphaltum-covered rocks	4	(0.9)
Asphaltum	14	(3.3)
Ochre	7	(1.6)
Total	423	(100.0)