

**DEBATING CHANGING LATE HOLOCENE SUBSISTENCE STRATEGIES:
EVIDENCE FROM ANALOGIES BETWEEN CENTRAL BAJA CALIFORNIA
AND THE SANTA BARBARA BASIN REGION (CHANNEL ISLANDS)**

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The late Holocene port center of Campo Quintero on the central Baja California channel island of Cedros has demonstrated through faunal analysis some similar foraging trends to those patterns displayed on the northern Alta California Channel Islands, as well as intriguing analogues to the development of interaction trading spheres with their mainland counterparts across the Kellett Channel. This study reviews ethnographic evidence, the faunal data analyses, and selected local environmental proxies (in the article by Roman and Cordova) to offer hypotheses for both the similarities and the differences noted between two insular groups: the Huamalgueños and the Island Chumash.

The site of PAIC 36 is located on the southeast corner of the island of Isla Cedros, Baja California, Mexico, 23 km off the coast of Baja California. This island is considered a type of channel island, in the longitude 28.03° north and latitude 115.11° west in the northern hemisphere. Indigenous island dwellers from prehistoric times were labeled “Huamalgueños,” first described by Venegas (1979), and later by Des Lauriers (2005a) as “dwellers of the island of the fogs.” This review focuses on ethnographic evidence for maritime specialization in this Late Holocene society, with an emphasis on marine subsistence patterns.

The climate in the entire central Baja California Pacific region is labeled xeric, due to the presence of extremely low seasonal precipitation regimes (Hastings and Turner 1965). These have been documented to be as low as on average 56 mm annually in the Vizcaíno Desert region, across the channel from Cedros. Site PAIC 36 is located in the rain shadow of Mt. Cedros, rendering it less likely to receive precipitation (Des Lauriers 2005a). This site is terrestrially barren but abuts a highly productive marine zone in the embayment (Figure 1).

The site’s strategic importance is immediately apparent when examining the configuration of the coastline as well as the proximity to the mainland (Figure 2). Campo Quintero, the historic name for the site, is adjacent to the port location on the island that is closest to the mainland. Further, this coastal configuration supplies an exemplary spot for embarking boats on coastal fishing expeditions, as well as for shallow-bay fishing.

The placement of the site appears strategic in terms of protection and elevation. It is located on a high plateau which makes survey of the entire arroyo and valley around it possible, as well as providing a vantage point to sea. It also contains various rivulets of arroyo springs, which are perennial in their flow.

PAIC 36 is one of many sites identified as dating to the Late period (2500 rcybp to contact) in Baja California chronology. During the Terminal Late Holocene (A.D. 1100-1540), the population density of this site is estimated to have been over 10 times that of other sites either on the island or the mainland, based upon evidence obtained from Total Station Mapping (Des Lauriers 2005a). The earliest date from this site was 905 ±20 rcybp, and the latest, 365 ±20 rcybp (Des Lauriers 2005a). Stratigraphically associated charcoal and marine shell samples provided this dating.

Ethnographic references from the contact period suggest that during this Late period, this was a key trading center and port for interaction with the mainland (Aschmann 1974; Des Lauriers 2005a; Montané-Martí 1995; Venegas 1979). These reports include direct observations of Spanish explorers who



Figure 1. Site PAIC 36.

first encountered members of the Huamalgueño society, such as Taraval, Preciado, and others (Montané-Martí 1995), as well as reports generated by priests in response to the questionnaires issued by Father Miguel Venegas (Mathes 1979, 2006).

One of the earliest sources was the report of Ulloa's men, who first approached the island in 1540. Their report emphasizes that 1) there were numerous villages or bands on the island, and 2) the inhabitants were not welcoming in their response to the Spanish ships (Aschmann 1974; Montané-Martí 1995). In particular, it appears that these island dwellers were hostile to the visiting Spaniards, and came out to greet them with clubs and with bows and arrows (Des Lauriers 2005a).

Vizcaino, in his 1632 memorial of his trip up the west coast of Baja California, states, ...we further pursued our journey until we reached Cedros Island, which was recognized by everyone. On it there were some wild and warlike Indians who did not wish us to be where we were, and who threatened us and by signs gave us to know that we should leave the locality [Ashmann 1974:178].

The reports from Venegas offer specifics regarding descriptions of both the subsistence activities noted on Cedros Island as well as native customs regarding ritual, apparel, child raising, and gender-attributed tasks (Venegas 1979).



Figure 2. Isla Cedros and adjacent areas.

Cardinal among these observations is the conclusion by the priest that the men were in fact “lazy,” as they did not work more than a few hours a day in order to obtain foodstuffs (Des Lauriers 2005a; Venegas 1979). Further, the priests often lamented the practice of allowing the women to perform the majority of food preparation as well as procurement tasks, the tools of which are described in some detail in Venegas’ monograph: “the women’s personal possessions include a great net and a basket or tray that they form...of the roots of their *mezcales*, that due to their material qualities are more flexible and durable” (Des Lauriers and Garcia Des Lauriers 2006:133).

Women and children were often cited as primary gatherers of plant materials and also of shell and other near-shore species (Aschmann 1974; Venegas 1979). At site PAIC 36, foraging would potentially have included areas near the site which contained agave groves, and the rocky intertidal zone which was a close walk away (Des Lauriers 2005a).

The men had the personal possessions of “their bow and arrow, a net, and a shell that serves as a cup with which to drink” (Des Lauriers and Garcia Des Lauriers 2006:133). The nets mentioned here were also described by Venegas as the same nets utilized for capture of pelagic fish while on the unique Cedros watercraft, the *canoas*.

Venegas also discussed the presence of this innovative marine-related technology on the island. *Canoas* transported men out to sea for fishing expeditions, thus enhancing the area available for

exploitation and the types of marine prey for capture. These seafaring men from Cedros were described by this priest as expert specialists at net fishing, spear fishing, and marine navigation. (See Des Lauriers 2005b for an exhaustive treatment of this topic.)

According to eyewitness reports from Taraval as reported by Venegas, men were the primary marine “hunters,” thus corresponding to the oft-cited maxim for hunter-gatherer societies that implied that males procure the highest-rated food sources (see Broughton 1999; Winterhalder 1987).

Additionally, numerous maritime technological artifacts have been recovered from sites on coastal areas of Cedros, including remnants of cordage, harpoon tools, and an incomplete hull of a *canoa* (Des Lauriers 2005b).

In Venegas’ reports, a certain mainland village (*AnaWa*) is mentioned as one that hosted families when they journeyed the 23 km to the peninsula (Venegas 1979:408). The inferred connections between the island people and their mainland counterparts strongly suggest to various scholars that there were bonds of marriage, trade exchange, and possibly shared participation in rituals as well as kin inter-alliances forged from proximity and shared language (Aschmann 1974; Des Lauriers 2005a; Venegas 1979).

Although not many Cedros Island archaeological sites surveyed to date were as close to the mainland, Des Lauriers (2005a:371) also hypothesizes that “the Campo Quintero populations could theoretically have engaged in direct contact year round.” It should be stressed, however, that according to reports concerning mainland sites from Ritter (2009; Ritter and Payen 1992), the Central Desert people of the mainland were more likely to have had contact during seasonal rounds to the coast.

Venegas writes that “those of *AnaWa* had commerce and kinship with the islanders of an island close to the mainland, that is the second of those that have now been discovered” (Venegas 1979:390).

Thus, less than “six degrees of separation” may have connected the mainlanders to Campo Quintero, at least those from the port now called Punta Eugenia on the Baja California Pacific coast. The priest reports:

They are ultimately of the same language...and because of this form part of the same nation. Because of this they are very similar to the Californians [mainland inhabitants] in many things or styles, such as the fact that the woman carries the burden of all the work, in collecting seeds and fruits as well as in preparing them [Des Lauriers and Garcia Des Lauriers 2006:140].

Social organization may have proceeded along clan lines, if the reports from Taraval are accurate (Montané-Martí 1995; Venegas 1979:408). He suggests that there were at least three clans on the island; during the historical period these were labeled “*gremios*.”

Towards the Terminal Late Holocene, additionally, prior to the exodus of the Huamalgueños from the island after contact, there were reports of much inter-clan rivalry (Venegas 1979). Venegas alludes to this tendency as one of repeated hostility.

In the late period, archaeological evidence from the island supports the claim that Late Holocene habitation sites had certain commonalities: they were located on elevated marine terraces, the defensible positions included a “fall-away” on steep cliffs or arroyos, they contained reliable perennial water sources, and many were adjacent to coves or bays which would allow docking of watercraft.

Of special interest, Ulloa described numerous types of raw materials that were stored by the inhabitants of Cedros, possibly to buffer against potential food procurement shortages (Montané-Martí 1995). These included ubiquitous fish products, including fish paste and fish jerky; mariner’s equipment; and stores of other foodstuffs. The wood for the Cedros *canoa* was also opportunistically procured from large pieces of driftwood that floated down from the California coast into the Bay of Vizcaíno (Venegas 1979).

Venegas asserts that fish resources were readily accessible to island inhabitants: “it goes without saying that they have fish....In addition to fishing, they have the aid of the terrestrial animals that they hunt in order to feed themselves with the meat” (Des Lauriers and Garcia Des Lauriers 2006:132). The most prevalent terrestrial mammal that was exploited on the island was the Cedros mule deer; also procured were wild hares and gopher rats (*Neotoma* spp.), as well as avian species. However, the faunal analysis from PAIC 36 testifies to the diminished proportions of terrestrial fauna during the Late Holocene period.

Ulloa reported that the islanders stored sea mammal hides in quantity, and in fact the Spanish expedition looted some of this booty (Montané-Martí 1995:238). These hides appear to have been initially processed on the western side of the island near a seal rookery at PAIC 38 and PAIC 45 (Des Lauriers 2005a). Aschmann (1974) suggested that the hides were traded for perishable goods from the mainland, a theory which is not universally accepted.

Ethnographic reports mention some of the maritime subsistence strategies, including dried fish preparation and storing of fish paste for use during leaner months (Venegas 1979). Archaeologists working with Alta California Late Holocene sites have noted that this is one of many storage practices which can serve as vital components of exchange networks among simple chiefdoms (Gamble 2005, 2008; Kennett 2005; Kennett and Kennett 2000; Raab et al. 2009; Yesner 1983). Bailey and Parkington (1988:6) asserted that “shellfood, because of its perennial availability, provides an ideal buffer during periods of food shortage.” Perennial availability in this case refers to the dried version of fish product, which may be utilized year-round.

One may also hypothesize that the maritime specialists of Cedros could potentially utilize the fish paste or “jerky” as a potential trade item, specifically targeting mainlanders who were not reported to be as adept in refining the fish products for use during lean seasons (Venegas 1979).

Due to the presence of certain archaeological signatures, i.e., obsidian from Valle del Azufre on the mainland, we can infer that the transfer of other goods was occurring (Des Lauriers 2005a; Shackley 2004).

Venegas also described reliance on *Pitahaya* spp. for various uses on the island: “instead of bread, they use the mescales, which are here much more juicy than the mansos of California” (Venegas 1979:114). He also specifically referred to abalone procurement: “along the shore are found, among other shells, some of the azure kind, of a most exquisite beauty. In this sea, likewise are seen whales, which the Indians often kill with harpoons” (Venegas 1979).

He also described the houses as pole-and-thatch, and archaeological remains from PAIC 36 do appear to confirm this as remnants of sea grass, cordage, and wood were found in the vicinity of house floors (Des Lauriers 2005a).

That Campo Quintero was a trade center can also be verified by the presence at that site of the most diverse array of lithics, and the most abundant supply of obsidian found anywhere on the island (Des Lauriers 2005a; Shackley 2004). As ethnographic reports indicate that face painting with ochre was common on the island, and there is no identifiable source of that material except on the mainland, this provides additional evidence of links of trade at the very least (Aschmann 1974; Venegas 1979). Ritual preparations described for mainland dwellers at *AnaWa* and other peninsular locations were similar to those practiced on the island according to Venegas (1979). This provides another line of evidence for close cultural collaboration between the islanders and the peninsula (Aschmann 1974; Des Lauriers 2005a; Venegas 1979).

Eyewitness accounts maintain that numerous passengers could also travel on the specialty watercraft that navigated from Cedros to the mainland and back (Venegas 1979). Venegas reports accounts of many men fitting into the small *canoas*.

Features of the island that may have rendered it attractive to those who were in search of perennial water sources during a purportedly drier Late Holocene were described by Venegas:

In that small space of the island, there are up to four or five *arroyos*, in addition to other springs and water sources. Moreover, to find that many water sources in California [the mainland], one must walk many leagues. The waters of these *arroyos*, and those of the springs are of excellent quality. Aside from these, there are various wells, which are so well distributed that there were three landings for the *balzas*, each with its own fresh-water well [Des Lauriers and Garcia Des Lauriers 2006:131].

It should be noted that additional water generally was procured both by mainlanders and Cedros islanders by utilizing the pulp of the agave, or through the fruits of the *Pitahaya* spp. (Aschmann 1974).

The presence of a good water supply especially close to the site of PAIC 36 would have proven very attractive to mainlanders who were searching for reliable water sources during the Late Holocene. As some of the dates from the site fall squarely into the period labeled the Medieval Climatic Anomaly (MCA) (ca. A.D. 900-1300), this would correlate with the noted population expansion extrapolated via the Total Station Map.

The reports of men hunting sea mammals and other pinnipeds is confirmed by this manuscript, which describes the technique of capture:

Since these [otters] sleep in the sea close to the beach with their feet skyward, to hunt them, the Indians trap them while they sleep. They go into the water, knock them on the head with a stick, and with a line of cordage drag them to the beach already dead...They also have many species of mollusks on their beaches, principally the blue ones [abalone]...the Indians appreciate them more than the pearl oysters, since in each blue shell they find more to eat [Des Lauriers and Garcia Des Lauriers 2006:132].

This ethnographic documentation supplies another line of evidence for preferential procurement of *Haliotis* spp., which is also documented from other Early-Middle Holocene sites on the island (Des Lauriers 2005a; Des Lauriers and Garcia Des Lauriers 2006; Roman 2010).

In an expansion of his description of “customs, religion, and heathen rituals,” Venegas notes regarding the islanders and the mainlanders, “they are ultimately of the same language, although with much variation, and because of this form part of the same nation....In this those of Trinidad [Cedros] seem like the most northerly groups, that are all one nation” (Des Lauriers and Garcia Des Lauriers 2006:140). He further asserts that their cosmology indicated that “they all came from a great land that is called idelgatá. Concurring in this belief are all those of one coast, as well as the other, those of the mainland as well as those of the island” (Des Lauriers and Garcia Des Lauriers 2006:141).

Was there evidence of hereditary ranking in this society? Venegas alerts us that

...they were all under the rule of one, who was he who came as leader of the north. He they obeyed and served, and after him, his successors were always governors of the island, as if by right....He who was their governor was also their priest, or wizard...in each clan there was a *capitán* for its government [Des Lauriers and Garcia Des Lauriers 2006:141].

This passage seems to indicate some type of ranking that may have involved hereditary privileges.

Chiefs or leaders were regularly allocated portions of the most prized resources, according to this report. Often this accompanied certain ritual feasts or ceremonial practices, as the shamans were noted by Baegert as one group that frequently received the first and best portions of foods and other goods (Baegert 1982).

In terms of specialty groups, chiefs or leaders of a *canoa* were described as having amazing knowledge of seafaring practices, and one may assume that some ordering of rank was associated with the distribution of booty from their voyages (Venegas 1979). Whether or not hereditary lineages were established based upon access to specialized craft or seafaring knowledge is not evident from the ethnographies (Venegas 1979). One hopes that the archaeological evidence from the xeric area of central Baja California and Cedros Island will provide us with more maritime artifacts in order to supplement the dating of the progression of this maritime technology.

In one sense, the comments offered by Ames (1994, 2002) on the multiple factors that correlate technology to relative levels of societal complexity in maritime collector groups are relevant. Analyses of transport technology should consider such variables as the “universality” (how much access is afforded to the average community member), extent of freight capacities, the distances and speed the watercraft can tolerate, and the relative skills of the crews and the dangers that impact decision-making when group transport is considered (Ames 2002:25).

LIVING ON THE EDGE: TRANSITIONAL ZONES ON THE PACIFIC COAST

Site PAIC 36 represents a type of “transitional ecological zone” in that terrestrially the site is primarily arid, with little plant material and minimal abundance of terrestrial mammals on which to forage, at the same time that it is positioned adjacent to an enormously productive marine rocky intertidal zone (Des Lauriers 2005a; Turner et al. 2003). In this zone, it is asserted that the abutting ecological zones contain starkly different foraging choices vis-à-vis one another (Bailey and Parkington 1988; Turner et al. 2003). In particular, Turner and colleagues (2003) have postulated that this type of choice abundance is a spur to more complex and innovative strategies for social organization, technology, and trade exchange.

Bailey and Parkington (1988:1) assert that this study of coastal areas offers several advantages to archaeologists: “They are a classic illustration of the ecological concept of an ecotone: a boundary zone at the junction of two major ecosystems, which combines some of the characteristics of each, as well as developing unique characteristics of its own which are a product of the zone of overlap”.

Voorhies (2004:2) notes that coastal populations “form an integral component of both the terrestrial and the aquatic ecosystems.” Jones (1985:531), in discussing Arawak Island Late Holocene adaptations noted in their diet, asserts that “there is no escaping the simple fact that people living in such areas have available to them a wider range of potential food organisms than those living deep in ecologically homogeneous areas.” We can surely envision a similar scenario for those choosing to settle -- even on a temporary basis -- at Campo Quintero, with the fairly barren terrestrial habitat only including *Agave* spp. and a reliable water supply, yet abutting the highly productive marine zone at the nearby shoreline. Evidence for the extraordinary productivity from this marine zone is provided in the article by Roman and Cordova in this issue of the *Proceedings*.

According to Turner et al. (2003), this type of transitional zone places the inhabitants in a highly stimulating environment, wherein numerous challenges emerge from living “on the edge.” They argue that “cultural transition areas” encompass “an increase in cultural capital and resilience by providing a wider range of ecological knowledge and wisdom on which to draw, especially in times of stress and change” (Turner et al. 2003:439). We argue that the purportedly close-knit relationship between the Huamalgueños and the mainlanders, who were at least occasional trading partners and extended family members (per Venegas’ report), and their geographic proximity to one another across navigable waters, simulates such an “ecological and cultural transition zone.”

First, two very different ecological zones abut each other at Campo Quintero and across at the mainland. Second, two cultural groups regularly interacted and were separated by the regularly (or, in

Table 1. PAIC 36 predominant species by unit and layer.

SPECIES	UNIT	LAYER	WEIGHT (G)
<i>Earliest layer</i>			
<i>Stenoplax conspicua</i>	1	C	85.8
<i>Acanthina</i> spp.	1	C	28.4
<i>Turbo fluctuoso</i>	1	C	11.9
<i>Tegula gallina</i>	1	C	6.2
<i>Fissurella volcano</i>	1	C	4.0
<i>B2-B1 dated 905 ±35 rcybp to 365 ±35 rcybp</i>			
<i>Stenoplax conspicua</i>	1	B2	566.1
<i>Acanthina</i> spp.	1	B2	146.8
<i>Tegula gallina</i>	1	B2	83.8
<i>H. cracherodii</i>	1	B2	69.0
<i>Turbo fluctuoso</i>	1	B2	51.1
<i>Tivela stultorum</i>	1	B2	13.0

Sources: laboratory analysis by Cordova, Gilby, and Roman in 2005 and by Roman in 2007.

inclement weather, irregularly) permeable barrier of the channel between them. This, as Turner et al. (2003) assert, could produce increased cultural capital and resilience among the specialist maritime collector society at PAIC 36. The evidence may be evaluated by analysis of PAIC 36 subsistence strategies, examples of “social storage” (Gamble 2005), as well as the evidence from the site of buffering mechanisms that were invoked during periods of environmental stress.

One additional example of a tertiary strategy to buffer against purported changing abundances of prey items during the MCA at the nearby rocky intertidal zone of PAIC 36 was more intensive procurement of a familiar but less preferred shell taxon from earlier time periods. That species, the chiton, offered much-needed calories and, in some chiton species, mineral supplementation for women and children (Erlandson 1988; Roman 2010; notes from the 2008 conference of the Western Society of Malacology).

Another strategy inferred from the faunal evidence was the practice of dietary extensification in the increased procurement of a wide variety of pelagic species and sea mammals with the more advanced technology available in the *Cedros canoa* (Des Lauriers 2005b).

Finally, in an attempt to buffer against potential losses, the Late Holocene population at Campo Quintero adopted a more intensive practice of storing furs, a prestige commodity that could be traded for foodstuffs and may have been desirable for those living in the cold Vizcaíno Desert area during the winter. These may have served as precious exchange items which, in fact, were “looted” by Ulloa’s men upon their arrival in 1540 (Des Lauriers 2005a).

In fact, all of these strategies would require the skills of maritime specialists, utilizing advanced weapon technology and hunting skills which represent one aspect of cultural capital and resilience (Turner et al. 2003; Yesner 1984, 1987).

Buffering mechanisms at this site would also include, as previously mentioned, changing diet breadth of shell utilized during the MCA (Roman 2010). It is possible to detect changing procurement patterns based upon evolving compositions of shell abundances from the earliest layers in the Mid-Late Holocene to the Terminal Late Holocene (Table 1).

The change in abundance which is most striking is the reversal of relative percentages of *Haliotis* spp. and *Mytilus californianus* from their great relative abundances in Early and Middle Holocene midden analyses to deflated numbers by the Terminal late Holocene (Des Lauriers 2005a; Roman 2010). Despite the obvious preference for abalone reflected not only in ethnographic report but also midden analysis

from the island from Early through Middle Holocene, the ratios are drastically reduced or inverted (Des Lauriers 2005a).

Also not present in great abundance in the latest Terminal period was *Ostrea* spp. (Roman 2010). When one considers the evidence from intersite comparisons, as well as intra-site comparisons, the data from Level C, the oldest level, versus B2 and B1 definitely represent changing diet breadth. Moreover, these data do not incorporate the issues of expanded procurement of pelagic fish and sea mammals, which did occur during the Late Holocene at PAIC 36 (Des Lauriers 2005a).

We can suggest at least these inferences: either local preferences for shell species changed; or environmental perturbations may have caused a change in sea surface temperature (SST), and impacted the types of shell available (see Roman and Cordova in this issue); or the predominance of chiton in these data analyses represents actual “bait middens” as suggested by contemporary ethnography from central Baja California (Des Lauriers 2005a); or the trash disposal methods were altered for this location for some reason (Bertsch 2009). As a recent report has highlighted, the resurgence of using chiton as “luxury seafood” in contemporary Acapulco suggests that food preferences may have changed may continue to be viable (Olea de la Cruz et al. 2010).

This strategy of incorporating “buffering mechanisms” may have operated regardless of exact causation: the chiton can survive cooler SST and was found in smaller quantities from Early Holocene middens on Cedros, suggesting previous familiarity with this species. When other species may have become depleted due to either environmental or anthropogenic pressures, the utilization of this “stand-by staple” surely represents a buffering strategy (King 1991).

Des Lauriers cautions, though, that due to small sample size, the predominance of chiton “cannot be confidently interpreted as evidence for high resource stress” (Des Lauriers 2005a:260). Certainly, more extensive sampling will render more definitive conclusions.

Size of species is also at issue in this changing pattern: in the earliest level C of PAIC 36, the size or width of the plates (valves) of one abundant chiton species, *Stenoplax conspicua*, often exceeds 4-5 cm (Roman 2010). In the later stages, though, size rarely exceeds 2.0-3.5 cm. Hypotheses regarding types of procurement -- plucking or stripping -- which may have impacted these size variations are also being explored (Roman 2010).

In attempting to develop a coherent theoretical explanation for changing species abundance found in a Malibu, California, site, Botkin (1980:126) hypothesized that

...the archaeological record should show that the species first exploited will be those with the lowest procurement time, and shifts in species will reflect changes in relative procurement costs...continued human predation will result in decreased age/size structure of prey population, thereby decreasing the size of individual prey available for exploitation.

We argue that this criterion was followed by the Huamalguenos of PAIC 36 at the southeast coast. Initially, the very accessible species of abalone, oyster, limpet, and mussel were procured. The requirements of time for procurement as well as time for food processing were minimal for these species.

By the Late Holocene, prey choice selection changes and size of prey changes appear to reflect a mechanism similar to that cited by Botkin. As probability ratios from the Early to Middle Holocene suggest low likelihood for chiton procurement, any noticeable variation from the pattern surely suggests that first-line choices were not in adequate supply to “optimally forage” for these species (for Alta California analogies, see Glassow 1992, 1993; Jones 1985:518).

These are a few of the lines of evidence that bolster the assumption that multiple subsistence changes occurred in the Late Holocene at PAIC 36, all of which required cultural capital and resilience. Cultural capital included maritime skill specialization, planning strategies such as storage capacity, a

specialist collector's familiarity with the varying ranges of both shell and pelagic species, and a close relationship with mainland tribes for social and economic exchange to provide buffers in leaner times. Perhaps resilience may be demonstrated also in willingness to utilize other, less preferred types of prey (such as chiton) in order to nutritionally support the needs of the women and children of the locale (Des Lauriers 2005a; Roman 2010).

COMPARISONS TO ALTA CALIFORNIA

Arnold and Bernard (2005:109) asserted that the development of advanced hereditary chiefdoms was concomitant to the flourishing of maritime trade networks between the Channel Islands and the mainland. Des Lauriers (2005a) suggested that the impetus for innovation involves the consideration of "having somewhere to travel to."

Parallels between the Alta California Channel Islands and their relationships with the mainland and the Cedros scenario appear to be justified. We have reported the documentation from such sources as Venegas, Taraval, and others who noted the trade relationships between the Huamalgueños and the probable central mainland dwellers, the Cochimí. Des Lauriers hypothesizes that the turbulence of seasonal waters in the Kellett Channel near Cedros may have deterred travel during certain seasons (which offers another rationale for extended stays of travelers/relatives at the densely populated site of PAIC 36). This may have accounted for fluctuations of routine social exchanges and trade between the two groups. But the evidence is clear that the obsidian originated from the mainland and has been discovered in multiple areas on Cedros; further, the extensive supply of fish paste, fish jerky, and furs stored on the island suggest that at least three "specialty items" were stockpiled for seasonal use as well as trading purposes (Venegas 1979).

There was a relatively smaller percentage of population living on Cedros versus the 2,000-3,000 inhabitants estimated to have lived on the northern Channel Islands (Gamble 2008; Kennett et al. 2000). Aschmann's (1967) estimate of the population on Cedros just prior to contact was 800-1,200 people. Des Lauriers suggests the estimate should be higher, at around 1,500 people.

But the maritime specialists of Cedros who may have initially only crossed over to the lagoon areas at Vizcaíno Bay to expand their prey capture could easily have increased their trip frequency in clement weather, as has been amply noted in reports of Chumash interaction (Gamble 2008; Johnson 2006).

Unfortunately, by the time we have Taraval's records (transmitted by Venegas), the population on Cedros in the mid-1700s had dwindled to a few hundred people (Aschmann 1967; Des Lauriers 2005a). These unfortunates met their end when they were enticed to the mainland and succumbed to disease brought by recurrent visits of Europeans to the Baja California peninsular area (Crosby 1994; Preston 1996).

According to Aschmann (1967:166-167), "a smallpox epidemic had preceded the first mission contacts with the population of Cedros Island, and had wiped out three-fourths of those Indians before the missionaries ever saw them."

We do not yet have enough archaeological data on comparative sites from the Late Period on Cedros to generate statements about the validity of the hypotheses of increasing social bonds and trade relationships that may have existed between the island and the mainland. Despite numerous ethnographic reports of close ties, minimal burial remains have been discovered, with consequently little ability to generalize about trends noted in mortuary remains. The most important evidence for trade interactions between the two areas is currently the sourced remains of obsidian from the mainland (Des Lauriers 2005a; Shackley 2004).

SUMMARY

Other similarities noted between the Chumash “interaction sphere” of island to mainland and the Cedros scenario include: the possibility of elite control over the exchange patterns and control over types of “currency” established (Venegas 1979); the creation of guilds or groups of related (often kin-related) members of a society who specialized in certain activities (Ames 1994; Arnold 1991; Des Lauriers 2005a; Roman 2010); the evidence, such as it is, for social ties between island and mainland (Arnold 1991; Gamble 2005); increased population densities of the maritime collector society (Ames 2002; Yesner 1984); insularity as a type of catalyst for technological innovation (Ames 2002; Des Lauriers 2005a; Erlandson 2001; Erlandson and Jones 2002); evidence of maritime specialization skills demonstrated in ethnographic reports and archaeological evidence (Des Lauriers 2006; Jones 1991; Jones et al. 2004); and extensive storage techniques to buffer shortfalls in production (Gamble 2005, 2008).

This brief review of this society of Late Holocene maritime collectors demonstrates a mix of advanced types of technology with possible hereditary lineages of chiefdoms combined with egalitarian practices during the Early to Middle Holocene periods (Des Lauriers 2005a). If Huamalgueño society had not been truncated in its development, perhaps stronger parallels to the Late Holocene-early protohistoric Chumash example would have emerged.

The picture that emerges of Isla Cedros is one of more maritime specialization than their mainland counterparts (Des Lauriers 2005a; Ritter and Payen 1992; Venegas 1979). Additionally, given all the factors that we have discussed, we cannot discount the possibility that the island society of Cedros provided a location for those traveling further to the outer islands of San Benito, or between Isla Natividad and the mainland. (Natividad was, and is, a bird rookery.) Investigation into possible interaction between Cedros and Isla Natividad is currently being proposed by Roman (2010).

This island environment was part of an “ecological edge,” as has been demonstrated in this discussion.

It is *cultural* knowledge, acquired, exchanged, and passed on across cultural edges and temporally down through generations, that has provided people with an understanding of the importance of ecological edges and has allowed them not only to take full advantage of ecological edges but also to create and extend ecological edges for their own benefit [Turner et al. 2003: 457].

We believe we have demonstrated the unique resilience of the Huamalgueños in their island environment and have also demonstrated that comparisons between this situation and the interaction spheres of the Late Holocene Channel Islands Chumash bear further examination.

ACKNOWLEDGEMENTS

The data review of this presentation benefited from the feedback of Dr. Michael Love and Dr. Sabina Magliocco. This study would not have been possible without the continuing work of Dr. Matthew Des Lauriers on Isla Cedros, Baja California, Mexico.

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