NEW AMS DATING SEQUENCES FOR THE CHUMASH *VENTURENO* EARLY PERIOD: REVISITING THE QUESTION OF ANTIQUITY OF *VENTURENO* CHUMASH INLAND OCCUPATION

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The dating of sites within the Ventureno Chumash interior region has been robust for the Late Period, but less well represented for the Early and Middle Periods. This article presents initial results, including a suite of 20 dates, from three sites (Ven-852, -853, and -1029) in this region that document a well-established occupation sequence including evidence of occupation prior to 9000 cal/bp near the important Late Period ritual site of CA-VEN-632.

In the 1980s, amid the boom of housing development in interior Ventura County, a series of academic-affiliated surveys and cultural resource management projects in the Thousand Oaks area revealed a complex of sites that appeared to date to the Early Period, based upon artifact assemblages and bead sequencing evidence (King 1988; Greenwood 1987). Chronologies for the Venura region are partially based upon those created for the nearby Santa Barbara coast, but the two most common chronologies utilized were created by Chester D. King (1990) and Jon Erlandson (2015).

King's (1990) chronology was heavily based upon his bead typology which defined an Early Period from 7000 B.C.-A.D. 300 (1990). Erlandson's (2015) chronology relied not only on King's work, but also on more recent radiocarbon dates from the Santa Barbara coastline (1994; 2013). His chronology extended from 8000 RCYBP to 5000 RCYBP. Both chronologies did not utilize calibrated dates; however, in this article, we shall report dates in calibrated form. The extensive nature of Early Period sites was demonstrated by the list of sites compiled by Chester King (1990) for the inland region abutting the Santa Monica Mountains.

This article presents initial results from a re-evaluation of these purported Early Period sites to provide a more nuanced understanding of the antiquity of occupation in this interior region. The overall study includes accelerator mass spectrometer (AMS) dating and re-evaluation of existing collections including the use of other archaeometric methods of analysis including obsidian sourcing via portable X-ray fluorescence (XRF) and laboratory XRF at Missouri University Research Reactor (MURR); isotopic sourcing of *Olivella* spp. shell beads; paleosol dating; and map studies based on geopositioning satellite (GPS) measurements and geographic information systems (GIS) technology Shugar 2012). Materials from the sites used in this study are housed at the Ventura County Archaeological Society and the Stagecoach Inn Museum in Newbury Park.

The sites focused upon within the study grid (Figure 1) include: one very large (5,016.76 square meters site) on a large flood plain near a perennial drainage (Ven-1029); a smaller site interpreted as a lithic workshop (Ven-852); a closely adjoining habitation site (Ven-853); and other sites as noted on Table 1 (Greenwood et al. 1987). A literature review revealed most of the information about these likely Early Period sites was contained in technical reports on CRM investigations and conference proceedings. Indeed, the primary sources were Chester King's 2000 reports on the interior region surrounding the Santa Monica Mountains and other cultural resource management reports available at the South Central Coastal Information Center in Fullerton, California.

Three case study sites (CA-VEN-852, CA-VEN-853 and CA-VEN-1029) have been selected for this initial publication in order to demonstrate the geographical context of the sites, the suite of 20 dates recovered, and the new information gleaned from the paleoenvironmental cores drawn from the local creek within the study grid. The list of sites and reports included in this study are presented in Table 1.

Table 1. Study Grid of Sites: Early Complexes within a Two-mile Radius, 7.5-minute Quad.

GRID OF SITES	SITE NUMBER	ESTIMATED PERIOD	ARCHIVES
Oakbrook Park	VEN-632	Late	VCAS
Lang Ranch	VEN-852*	Early	CSUF
Lang Ranch	VEN-853*	Early	CSUF
Lang Ranch	VEN-1029*	Early	CSUF
Lang Ranch	VEN-1023	Early	CSUF
Lang Ranch	VEN-1026	Early?	CSUF
Lang Ranch	VEN-1020	Late	CSUF
Lang Ranch	VEN-1022	Early?	CSUF
Lang Ranch	VEN-1025	Early?	CSUF
Lang Ranch	VEN-1027	Early	CSUF
Lang Ranch	VEN-1024	Early	CSUF
Oakbrook Park	VEN-792	Late	VCAS
Oakbrook Park	VEN-793	Late	VCAS
Oakbrook Park	VEN-794	Late	VCAS
Total	14 sites	Early-Late Periods	-

Note: Reports on file South Central Coastal Information Center, California State University, Fullerton and at Ventura County Archaeological Society archives; period estimates C. King and Parsons (2000: 53). * Sites focused upon for this study

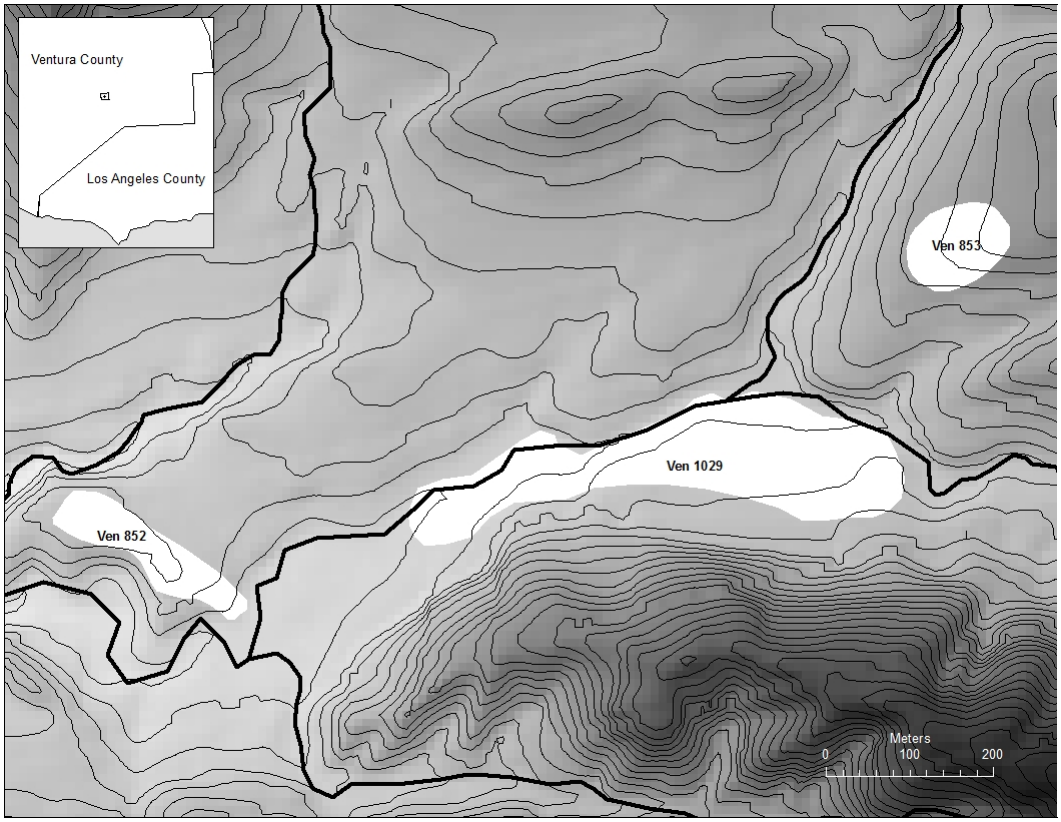

Figure 1. Sites within the Study Grid Area

STUDY CONTEXT

In the area now known as the Arroyo Conejo Open Space, a part of the Santa Monica Mountains National Recreation Area, many sites were proposed as Early Period occupations which were within easy walking distance to Lang Creek and Simi Peak. Lang Creek was revealed via geologic cores (Schmerling 2010) to be an intermittent to perennial source of water in the Early Holocene (Wilson: 2007), while Simi Peak offers a 360 degree viewshed of the Simi Hills (Conejo Open Space Conservation Agency 2015).

These discoveries from the inland region were characterized by their apparent proximity to Late Period sites, assessments based upon such considerations as: bead typologies (Gibson 1975, 1992; C. King 1978; L. King 1969); lithic tool typologies (Pence 1980); almost identical toolkits and lithic sourcing (Whitley 1980); and the universal presence of fused shale debitage as an indicator of post-A.D. 600 occupation (King 2000; Pence 1980).

In addition, the criteria for detection of possible Early Period sites came from observations of the original team leaders, including members of the University of California, Los Angeles (UCLA) Inland Chumash Survey (Clewlow et al. 1979); and key characteristics of Early Period sites as delineated by Chester King (2000) in his monograph on Santa Monica Mountains cultural sites. Such characteristics involved: proximity to a perennial water source; locations at ridge tops or protected areas from invaders; a view-scape of the immediate area; sites proximal to quarry locales or areas with other natural resources utilized in lithic production; close to shelter provided by tree cover; and adjacent to plant communities, oak communities, and berries among other utilized ecozones (C. King 1999; 2000)

The project study complex lies within one of these regions located on the broad undeveloped space of the Arroyo Conejo Open Space. In close proximity to this complex are more than 15 prehistoric sites; three of these are considered ritual sites from the Late Period: VEN-629, and the VEN-630 North and South site complexes (Pence 1980; Whitley et al. 1980; C. King 1999; 2000).

Of particular interest, the Late Period Medea Creek Site (LAN-243) is less than three miles southeast of this study complex, while the Late Period North Ranch and Wood Ranch site complexes are one mile south. In the western Simi Hills, there are 75 pre-European sites (C. King and Parsons 1999).

At the location of this study grid of sites, it was also noted that a small cemetery was located less than two miles from the grid (Chumash Indian Museum papers). These burials were removed by the Tribal authorities prior to development; the proximity to this grid location, though, does indicate its importance to the interior region.

The Early Period for Southern California *Chumash* occupation was defined by Chester King (2000) as ranging between ca. 7000 B.C.-A.D. 300. Erlandson (2013) differentiated the period further by designating 8000-5000 RCYBP as the Early Period. Both authors were referring to evidence that focused more on coastal *Barbareno* Chumash artifacts than inland *Ventureno* components. With the advent of increasingly accurate and inexpensive AMS dating techniques, more studies have clarified the evidence for early inland occupation, including those by Fitzgerald et al. (2005) for *Obispeno* inland sites, and *Inesino* occupational evidence from the Santa Ynez interior areas (Glassow et al. 2011). We are reporting here using calibrated dates, which are according to current convention.

This study seeks to expand the understanding of the range of occupations in the area immediately abutting the Santa Monica Mountains extending into the Ventura County interior, which is 31 miles from the coast. The original excavations in the study area were conducted in the 1980s by Ancient Enterprises under the direction of C. William Clewlow, by Greenwood and Associates directed by Roberta Greenwood, and by Chester D. King at Oakbrook Park and its environs (King 1988; Greenwood 1987; Maxwell: 1998). These projects amassed more than 150,000 artifacts (Maxwell: 1998: C. D. King: 1988 on file South Central Coast Archives at California State University at Fullerton). Table 1 presents the list of sites encompassed in the study and the location of documentation on these sites.

CASE STUDIES: VEN-853, VEN-852 AND VEN-1029

To clarify the context of the 14 sites within the study complex, three representative sites were chosen for initial AMS dating and evaluation of sources for obsidian. As this area has no nearby obsidian sources, this was seen as a crucial step towards identifying the possible antiquity of trade patterns at these locales. To date, over n=50 samples have been submitted from the three sites discussed in this report.

VEN-853: An Early Period Habitation Site

Site VEN-853 is characterized by location on a small ridge knoll; it contained extensive quartz and chert debitage. The midden component was accompanied by fire-altered rock, burnt shell, and burnt and unburnt small mammal remains (Greenwood 1987).

This site contained *Olivella biplicata* beads at the surface as well as levels between 50 and 60 cm. Between 60 and 70 cm deep, small mammal bone fragments, barnacle shell fragments and *M. californianus* shell fragments were recovered in context with a limestone millingslab frag (Greenwood 1987). Fragments of *M. californianus* and small bone extend to a depth of 80 cm below surface in most of the units.

Most shell at this location was *M. californianus* – 93% via weight. The variety of shell did include, however, a few examples of *O. biplicata* spire-lopped shells, interpreted as beads in preparation. Table 2 presents new radiocarbon results that demonstrate the antiquity of the site as well as the clear demonstration of use of *O. biplicata* shell at this early time period, either in a possible curated state (old shell problem) or as utilized shell during that time. (Rick et al. 2005). The suite of dates appears well aligned to appropriate chronology for the period.

Extensive ground squirrel tracings were found at this site; the lowest levels of 90-100 cm contained rocks and cobbles above the sterile layer (Greenwood 1987). Based upon the recent cores drawn at Lang Creek 100 feet to the west, there was potentially a north-south perennial drainage water source (Wilson: 2007; Greenwood 1987).

This site is located less than 800 meters from VEN-852 which the original investigator considered it a lithic workshop (Greenwood 1987). She proposed that it constituted a habitation area for the workshop and that it provided access to water, a view shed of the periphery on the ridge top, and proximity to the lithic production area.

The dating for this site is on-going, but the results to date (20 dates) clearly demonstrate evidence of Early Period components. These dates range from an outlier of calibrated 9757 BCE - 9361 BCE to 407-236 BCE, the earliest calibrated date from these sites.

The obsidian debitage from the site was sourced via XRF and Instrumental Neutron Activation Analysis by MURR and found to originate from the West Sugar Loaf component of the Coso Range (Glascock, personal communication 2016). These small (less than 2 cm width diameter) pieces of debitage were obtained from levels 0-10 cm and 40-50 cm, respectively. Other levels containing obsidian included Unit R, in which a partial biface was also sourced to the same location.

Overall, 50 samples were tested by MURR for the three sites reported here. These initial results which source the majority of the samples to the Coso range reveal that long distance trade was also taking place during a very early time period in the interior *Ventureno* region.

VEN-852: A Lithic Workshop

This site, excavated in 1987, showed minimal disturbance from cattle and horse grazing. As stated, it is 800 m north of the ridge top-situated VEN-853. The site is fully exposed and the slope is between zero and nine degrees to the southeast (Greenwood: 1987). The Lang Creek, again, is adjacent to the base of the ridge thus supplying at least an intermittent if not perennial source of water as indicated by core evaluations (Strauss: 2006). Greenwood suggested that during the rainy season, the stream provided a reliable source of fresh water during the winter season (Greenwood 1987).

Table 2. AMS Radiocarbon Dates from Selected Units at VEN-852 and VEN-1029.

UNIT	CATALOG	LEVEL (CM)	MATERIAL	LAB CODE	RADIOCARBON AGE, 1Σ	CALIBRATED RANGE, 2Σ
VEN-852						
	101-39	Surface	*Haliotis*	D-AMS 015487	4824±32	3296 BCE-2335 BCE
	109-48	Surface	*Haliotis*	D-AMS 015488	5211±32	3670 BCE-2860 BCE
VEN-853						
	26		Bone	D-AMS 008450	2558±31	805 BCE-552 BCE
1	W1/S30		Shell	Beta-20794	6690±130	5871 BCE-5375 BCE
	58	0-10	Shell	D-AMS 011285	7283±38	6225 BCE-6066 BCE
	89	0-10	*Olivella*	D-AMS 012628	7357±32	6356 BCE-6090 BCE
STP 9	N0/E0		Shell	Beta-20795	7610±110	6657 BCE-6234 BCE
	25		*Olivella*	D-AMS 013829	7678±38	6595 BCE-6455 BCE
	68		Shell	D-AMS 013830	8766±45	8165 BCE-7610 BCE
VEN-1029						
5	507	50-60	Charcoal	D-AMS 016258	2198±21	360 BCE-199 BCE
5	543	70-80	Charcoal	D-AMS 016249	2225±30	380 BCE-203 BCE
5	536	60-70	Charcoal	D-AMS 016259	2407±29	733 BCE-401 BCE
5	552	90-100	Charcoal	D-AMS 016251	2449±24	752 BCE-412 BCE
5	547	80-90	Charcoal	D-AMS 016250	2530±29	796 BCE-544 BCE
7		90-100	Charcoal	D-AMS 019336	2302±27	407 BCE-236 BCE
7		100-110	Charcoal	D-AMS 019337	2477±35	773 BCE-431 BCE
7		70-80	Charcoal	D-AMS 019335	3412±32	1870 BCE-1626 BCE
7	655	90-100	Charcoal	D-AMS 011287	10011±36	9757 BCE-9361 BCE
N	1617	100-110	Shell	D-AMS 015573	3227±34	1207 BCE-335 BCE
N	1255	60-70	Shell	D-AMS 015572	3836±26	1928 BCE-1036 BCE

The majority of lithic debitage consists of quartzite, chalcedony, and chert (Greenwood 1987). Although there are quartzite veins in the region, they are not within the immediate area. Instead, the rocky outcrops abound with banded chert, sandstone, and granitic forms.

AMS dating is proceeding at this site, which original investigators thought would not yield appropriate samples. Shell samples were small in size and not frequently recovered from this site. Also, the original investigators posited that given the large amount of debitage and lithics without extensive evidence of faunal remains, fire altered rock or shell remains, that this site was a lithic workshop for the adjacent CA-VEN-853.

In fact, we have recovered a number of samples which are not the ubiquitous *M. californianus,* but actually *Halitotis rufrescens*, often thought to be a key faunal indicator of the Middle period when found in midden context (Glassow 2005). Table 2 presents AMS dates received to date.

When the areas of Lang Ranch and Oakbrook Park, as part of Arroyo Conejo Open Space, were first inventoried in a UCLA survey (1979), C. King wrote that "artifacts found in the vicinity of these sites indicate an area or zone of concentrated activities" (C. King: 1984).

R. Greenwood considered the Ven-852-853 sites to be related, as they demonstrated almost continuous deposits from one site to the other; and at higher levels to show evidence of Late period exploitation of fused shale (Greenwood: 1987). Thus, the case studies within our site grid seem to suggest not only Late Period occupation, but an antiquity of utilization of sites within the area beginning at an early phase.

VEN-1029: An "Extensively Used Habitation Area"

On a large floodplain near the perennial drainage of Lang Creek, at the south side of the drainage, VEN-1029 presents as a site with a "large amount of fire cracked rock, very well developed midden" (Gothar: 1990:1). The site is not far from VEN-853 and VEN-852 (see Figure 2). Figure 1 presents the site and units that have been subject to reanalysis to date.

The site area is over 5,100 square meters, and the final depth of the units was 150 centimeters below surface. Over 32 units were excavated at this site. Features include a semi-intact hearth with almost continuous strata of carbon and fire-cracked rock associated with midden deposits. Rodent disturbance is widespread in the darker midden areas, and exposure at this site is open with some tree shelter. Of note, the slope is level surrounded by the ridgetops wherein VEN-852, VEN-853 and other sites were located (C. King 1988).

Dating at this site was initially performed to establish some definitions of temporal occupation duration during the Early Period. As dating proceeded, the team determined that it was appropriate to continue with dating protocols for specific units which contained profuse fire altered rock combined with the midden residue and charcoal. Thus, ultimately at least three levels were dated in Unit 5, Unit N and Unit 7, and are listed in Table 2.

As predicted, the lowest levels of VEN-1029 are very early (King 1999). Throughout the levels that are still being dated, there is charcoal interspersed with *M. californianus*. In order to decrease the likelihood of dating curated or old shell, a protocol was established to delineate shell dating to those species that were least likely to be labeled "decorative" based on ethnographic indications (Rick et al., 1992). In other words, only economic shell species were dated.

The units which have, to date, been most extensively tested represent the sites with intact hearth remains, flotation and multiple screenings of soil samples with ¼ to 1/8" mesh, fish bone residue, and charcoal to 100-110 cm. In particular, Unit 5 was tested through sequential levels (see Table 2).

Table 2 demonstrates that Unit 5, located on a small knoll overlooking the perennial drainage of Lang Creek, has extensive evidence for Middle Horizon occupancy; however, a few feet away, Unit 7 reveals dating from .1870 BCE-1026 BCE and in lower levels, 9757 BCE-9361 BCE at two sigma range dating on charcoal- not far from that knoll (Neissner: personal communication 2015).

A broad temporal range of occupancy is clearly demonstrated to a fine degree in this site. With units on the periphery of the site boundaries testing to 1928 BCE-1036 BCE (Unit N) and 896-544 BCE (Unit 5) at two sigma range, there is obviously an extensive range of dates that testify to repeated usage of this locale. Thus, in terms of longevity of usage, or revisitation as camp locales, we may evaluate these units with some confidence as repeated-use occupational areas (Gothar: 1990).

With 32 units dug during the original excavation, the potential for full disclosure of the breadth of occupation at the site is within our reach. Certain caveats should be reviewed, however, prior to the rendering of interpretations of this data.

Caveats for Interpretation

The Lang Creek cores demonstrate clearly the evidence for historic as well as prehistoric "land flow" of various types, the key factors being liquefaction, faulting and bioturbation of the region (Wilson: 2007). Liquefaction is well known in this region, as it has been studied extensively by the USGS in order to better understand the impact of the earthquake forces that previously and currently occurred in the area

(Weber: 1984). The USGS notes that in addition to the potential for the land to "liquefy" due to the high presence of sand in the soil components, the fault lines that occur in the area contribute to a high degree of potential land, and subsoil, movement (Geologic Map of California 2010: California Geologic Survey).

As the Lang Creek cores demonstrate, this is not a new phenomenon in the area. The presence of soil movement and faulting is noted by evidence of an ancient landslide just to the south of the sites; this occurred approximately 12,000 years ago, although Weber reports that evidence suggests it occurred earlier at about 18,000 years ago (Weber 1984). The composition of the soil in this region being from fine sand to sandy loam to silty clay loam, there is a consistently high potential for destruction of any stratigraphic integrity to the levels (King et al. 1988).

Fault lines are also being constantly revised as new smaller faults are discovered. In this region, the faults extend out into the farthest reaches of the Oxnard Plain, with the Simi/Santa Rosa and Boney Mountain faults being proximal to the site grid (Geologic Map of California 2010: California Geologic Survey). The Lang Creek cores confirm the presence of faulting via evidence of significant soil movement and abrupt intrusions and extrusions of geological layers for millennia in this area (Wilson: 2007).

Finally, bioturbation is a constant factor in the area. It has long been noted that the presence of ground squirrels (*Spermophylis beecheyi*), mice (*Reithrodontymys megalotis*) and other rodents significantly alter the integrity of stratigraphy throughout mainland California (Erlandson 1984; King et al. 2004).

Thus, with all these dynamic forces exerted on stratigraphic integrity, it is no surprise that some higher- level results are reported as radiocarbon dating earlier than lower levels. Indeed, with the extent of geologic forces noted in this area, it may be difficult to make more than general statements about the temporal periods of occupation. One method that has been employed in our study is to utilize those units with the association of fire altered rock, burnt shell and mammal bone, and charcoal residue in order to optimize testing procedures. As noted previously, certain units in each of the case study sites have provided such contextual elements. The results on these units with such associations provide the most optimal evidence for temporal periods of occupation.

DISCUSSION

Various predictions previously made regarding ecological and geomorphic changes during the Early Holocene in this area may be interpreted via these dating results. Porcasi et al. (1999) stated that at 10,000 years BP, the coastline of the Mugu area, as well as the Oxnard Plain, was significantly closer to Santarosae in the Channel Islands than later in that Period. Indeed, the assertion by C. King and others that the earlier period of the Early Holocene was less hot and dry may have contributed to the interior occupations that are confirmed here (C. King 1978; Jones et al. 2007).

As previously stated, the Mugu area was part of the greater Calleguas Watershed; it provided a lagoon to creek trailway in which the Mugu Lagoon provided access to estuarine shell, and a vista via the border of the Santa Monica Mountains into the Arroyo Conejo tributary, which was a major drainage- and which intersected with the stream at Lang Creek via this Arroyo (CCWM 2007). The possibility that early inhabitants utilized this "creek corridor" should not be overlooked.

The presence of various marine shell species at our interior sites which were from the Mugu coastal region is evidence, in and of itself, of utilization of these types of corridors over this time period (Greenwood et al. 1986). Further, the ethnohistoric record of trail systems utilized throughout the Santa Monica Mountains region suggest that early Spanish explorers in the 1700s utilized the routes that were most congenial to the local Chumash for venturing in to the Interior (Bolton 1927). Indeed, Fray Crespi reports that on January 12-13, 1770, they took a shortcut over and area which is now interpreted as the Conejo Grade, through the Conejo Valley (Ibid).

One can make some assertions about the local Early Period ecosystems based upon the core data from the Lang Creek testing, as well as paleogeographical reconstructions from the United States Geological Survey. The waterways corridors represented by the Calleguas Creek Watershed, which extended via tributaries to the Arroyo Conejo and on to the Lang Creek provided an avenue for indigenous exploration as well as watering sites for such key food sources as mule deer and rabbits (C. King 2000; 1987; Clewlow et al. 1980). The creeks which ran throughout the Watershed were not significantly altered until the process of damming was initiated in the late 1880's (Calleguas Watershed Management 2004).

These 'creek scapes' would have allowed access to either intermittent or perennial water supply during key episodes of the later portion of the Early Holocene when drier, warmer climate did prevail (C. King 1978).

As viewed on Table 2 for CA-VEN-1029, there is ample evidence to assert that occupation did indeed occur during the Early Holocene period as defined by Erlandson (2013) as this site is proximal to other sites which are now being dated to the Early-Middle period, there may be earlier dates on proximal sites.

In terms of the evidence of the outlier result of Ven-1029-655 (655 is the sample number), there are other dates reported on the Central Coast preceding 7,000 RCYBP (Jones and Klar 2007). Additional dating is ongoing and future publications will integrate those results in order to clarify this interpretation.

The evidence for early occupation also exists for CA-VEN 852 and -852 as noted in Table 2. The preponderance of dating results suggests occupation at least as early as 5,000 RCYBP. As Greenwood originally proposed that these sites were synchronous temporally, we may find more support for that hypothesis once dating of all levels has been completed.

The presence of Millingstone Horizon sites in various parts of California was well documented since the early 1950's when the first syntheses of California archaeology appeared (Wallace 1955; Chartkoff 1984). The definitive milling tools found at our sites, as well as others, prompted researchers to assign them to specific Early periods, as they were known to precede the general use of mortar and pestle, and they were clearly associated with such features as milling tools and key plant processing tools (C. King 1991; Erlandson 2013).

Further the locations of the sites in this area meet the criteria for Early period locations: on defensive ridge tops, within walking distance to water supply, 360-degree-wide view-scapes of the adjacent territory; proximal to plant and lithic resources, with cave sites nearby (Erlandson 2013; King 1978). All of the sites listed within this study area meet these expectations.

As R. Greenwood stated that for VEN-852-853, "These data support the earlier conclusion that the area may have been a peripheral locus of generalized activity, probably associated with a more permanent site locality" (Greenwood 1987: 21). That permanent site locality may have been VEN-1029, which has evidence of occupation both prior to and after the chronology demonstrated at the VEN-852-853 sites.

In terms of the regional geographical context, Late Period villages that straddled the Oxnard Plain and the Conejo corridor were purportedly strategically placed to provide "regional interfaces" for sites from this period (Perry et al. 2011: 78). The new radiocarbon dating results suggests that our interior sites, located close to the Oxnard Plain and abutting the Santa Monica Mountains region, were utilized from a very early point in time extending up to and in to the Late Period (C. King 1988; 2000; 2011).

Many scholars of south and central California archaeology attest to the types of evidence that suggested repeated usage of certain locales. We now have bead sequences that are being consistently confirmed by radiocarbon dating that supports the early usage of interior regions as well as those on the coast (Jones and Klar 2007; Glassow et al. 2011; Erlandson 2013). The importance of our new suite of dates, however, is that it extends the antiquity of occupation into the Ventureno interior region of Southern California.

As bead typologies were increasingly shown to be associated with specific temporal periods, there was also an attempt to date the time of span of particular artifact types from a site (Gibson 1975; C. King 1991a; L. King 1983). Radiocarbon dating has been pivotal in discerning the relationship between bead sequences, tool types, and dating of sites (Fitzgerald et al. 2005; Glassow 2011). AMS dates now provide evidence for antiquity of *Olivella* spp. shell bead trade: "recovery of these examples from inland contexts indicates low-level exchange between resident populations of the coast and the southwestern Great Basin by at least 10,300-10,000 cal B.P." (Fitzgerald et al. 2005).

As the sites in the study area have numerous examples of *Olivella* spire-lopped beads, a bead type that began early in time, and the beads from our sites have now been radiocarbon dated to the Early Period, we are supporting these assertions. In addition, the matrix tested included charcoal, shell remains and faunal remains, associated with fire altered rock and hearth residues in various Units, including Unit 5.

Additionally, these results provide concrete evidence of broader regional interaction (both in terms of shell beads and obsidian) with the actual dating ranges of occupations within this inland region (Shugar et al. 2012).

In the 2007 publication *California Prehistory: Colonization, Culture and Complexity*, the map indicating extant radiocarbon confirmed Terminal Pleistocene and very Early Holocene sites in California but did not include a single site from within the Ventureno region (Erlandson et al. 2007:58). This was based upon data available at that time.

Now, we are able to add specific sites and contextual information to this data base, and assert that sites dating to this time span were indeed located proximal to the Santa Monica Mountains, and they indicate a broad range of repeated visitations, if not lengthy occupations. Jones and Klar (2007:63) discussed evidence for early human occupation across the breadth of California and stated "findings from the past two decades include reasonably secure radiocarbon determinations from charcoal and marine shell beads that indicate human occupation between 9,000 and 8.000 cal B.C." (2007: 63). The continued investigation into the collections from our study area, initially excavated in the 1980s should reveal a greater depth and nuanced understanding of the antiquity of occupation within this region.

ACKNOWLEDGEMENTS

I am grateful to the staff of the Stagecoach Museum, including Don Morris, RPA (Retired), curator; and Sandra Hildebrandt, former Director; at the Chumash Interpretive Center, Graywolf, Curator and Alfred Mazza, Director; and at the Ventura County Archaeological Society, Robert Lopez, RPA, Curator. Volunteers who assisted in review and photography of artifacts from these collections included Phyllis Harris, Bill Huber, Michelle LaPointe, and Suzanne Wilkinson. The obsidian sourcing was conducted by Dr. Jeffrey R. Ferguson at Missouri University Research Reactor Archaeometry Lab, under the auspices of NSF grant #1415403. All maps and calibrations were performed by Gary Boyd, RPA using the OxCal 4.2 program (Bronk Ramsey 2009) and shell samples were calibrated using the Marine13 calibration curve; all other samples utilized the Intcal.13 curve (Reimer et al. 2013). Local marine reservoir offset (delta R) was 283+/-172 years, calculated from the work of Holmquist et al. 2015).

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