

The History of the West San Fernando Valley Limestone Industry and the People that Operated It

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by Albert Knight

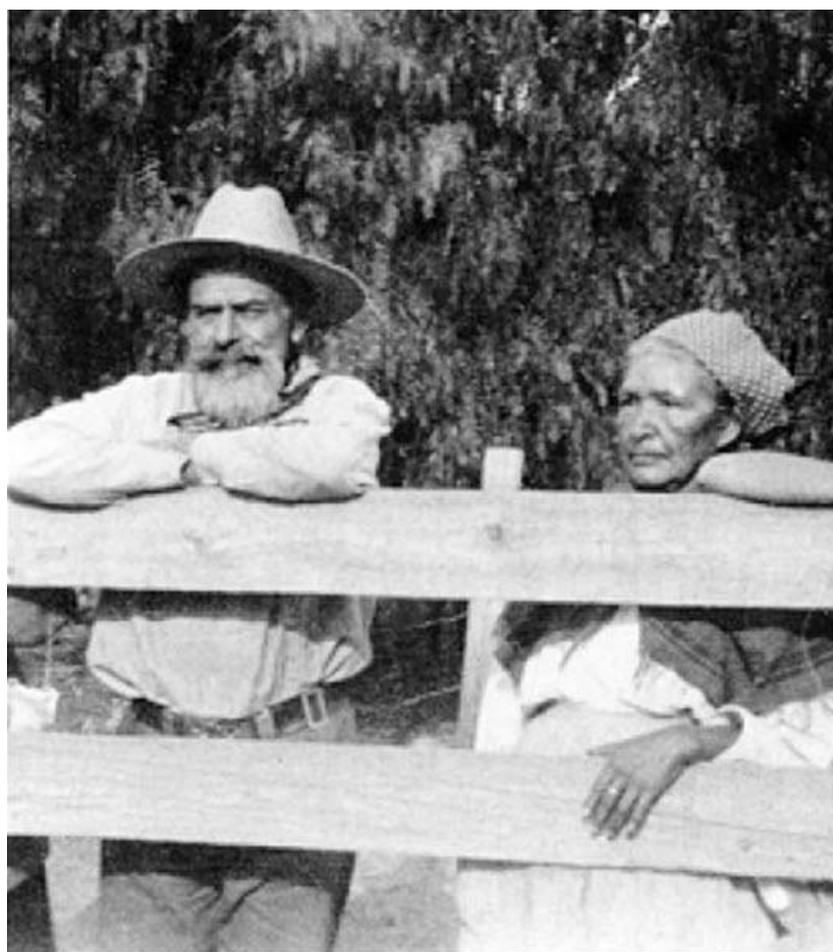


Figure 1
Juan and Juana Menendez

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Acknowledgements

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1. Introduction

During the years 2014-2016 the author was the field supervisor during the pre-construction grading at CA-LAN-254, an ancient village site, that was located in the west San Fernando Valley, at the mouth of Dayton Canyon, in Los Angeles County, California (note: "CA-LAN-" indicates a State of California listed archaeological or historic site in Los Angeles County; the number represents the order that the sites were added to the list). Although the main focus of that effort was the prehistoric village site, pre-construction grading uncovered the remains of an important historic site, CA-LAN-247H, which had been an important quicklime production source for, it is believed, the Mission San Fernando Rey de Espana, from as early as the first decade of the 19th Century. The author also performed research on the area and the subject in conjunction with the field work that was taking place during 2014-2016.

It appears then, that the Dayton Canyon kilns, as well as two other closely associated west San Fernando Valley lime-works, represent the oldest "industrial complex" in the west-central Los Angeles County/southeast Ventura County area. And the author believes that it is highly significant that our research (see Acknowledgements, below) shows that the people that operated the lime-works were largely members of a west San Fernando Valley Native American community, that had been living in the area when the Spanish arrived, and who continued to be identifiable as a distinct ethnic community, until at least the second decade of the 20th century. Given these facts, this report will provide a brief overview of the archaeological history of the west valley, will describe the ethnographically known Native American peoples of the region, and will review the history of the lime industry in general, before proceeding to describe and discuss the west valley lime industry itself, including especially the recent discoveries in Dayton Canyon. Note that this paper does not represent the "official" Dayton Canyon project report, which is the *Cultural Resources Monitoring Report, Sterling West Hills Development, Los Angeles County, California* (Smith, et al., 2017).

Dayton Canyon, the main focus of this report, and the other sites described in this report, are located at the interface of the eastern Simi Hills and the western San Fernando Valley. Most of the Simi Hills are in Ventura County, while the easternmost end is in Los Angeles County. The geology of the Simi Hills includes a wide variety of mostly marine sedimentary rock formations; the geology of the San Fernando Valley proper consists almost entirely of Quaternary alluvium.

The eastern, San Fernando Valley side, of the Simi Hills are the location of the several headwaters of the Los Angeles River; these include Dayton Canyon, Bell Canyon, Woolsey Canyon, and Box Canyon. All of these sources of water were important to Native Americans and regional wildlife. Indeed, it was the presence of these sources of water that made the area so hospitable. Plant communities in the area include coastal sage scrub, chaparral, oak woodland, mulefat scrub, freshwater marsh, salt marsh, southern coast live oak- riparian forest, southern willow scrub, baccharis scrub, coastal sage scrub, and native grasslands. The area was and continues to be part of an important wildlife corridor, that is home to numerous species of mammals, birds, and reptiles. This paper does not include a detailed discussion of area native faunal and floral resources. Numerous published and unpublished sources describe these resources. The most pertinent for the current discussion are those by Walker and Hudson (1993), Havens and Appleton (1997:488-492), and Timbrook (2007). Timbrook et al. (1993:139-143, Table 4.1) provides a list of Common Herbaceous Plants of Coastal Grasslands in Chumash Territory with Their Uses by California Indians, and Timbrook's 2007 ethnobotany lists dozens of native plants for the area. King and Parsons (2000:6-10) provide an excellent description of the animal and plant resources that were used by the Native Americans of the Simi Hills.

There were four important village complexes in this area (Figure 2). These closely associated villages existed long before the arrival of the Spanish, and as noted above, it was the people from these villages that built and operated the historic west San Fernando Valley lime-works. Therefore, this paper will discuss the prehistory and ethnography of the area, before proceeding to describe and discuss the area's historic lime industry. Note that what we now call the Simi Hills, which are west of the San Fernando Valley, were known to the Spanish and Mexicans as the *Sierra de Santa Susana*, and are so-described in historic references. The name was “floated” north by U.S. surveyors, early in the American Period, so that today the term “Santa Susana Mountains” refers to the mountains to the immediate north of the western San Fernando Valley.

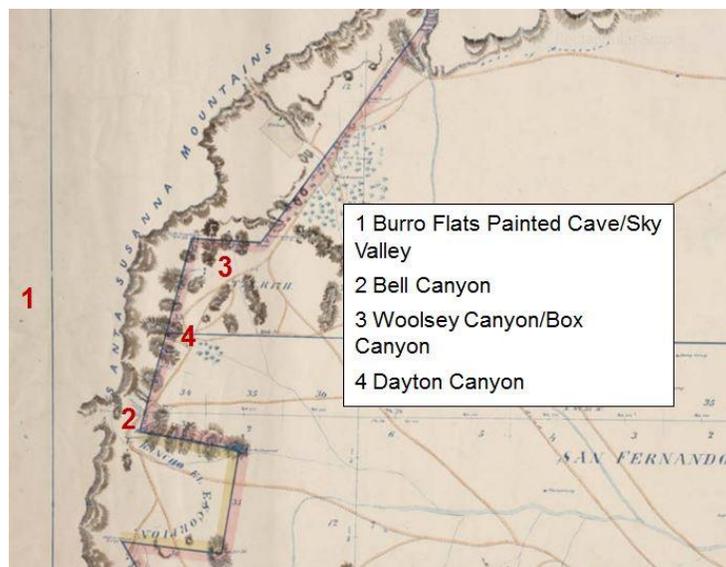


Figure 2
The Four West San Fernando Valley Village Sites

2. The Archaeological Record of the West San Fernando Valley

The most important village in the area under consideration here was located near Burro Flats, in eastern-most Ventura County. The other three villages, all of which were closely associated with the Burro Flats village and each other, were located at the mouths of the three largest canyons in the west valley, as listed above. The prehistory of all four of these villages will be summarized here; the history of the three Los Angeles County village sites will be discussed in detail below.

1- Burro Flats Painted Cave (State of California CA-VEN-1072, etc.)

The Burro Flats Painted Cave (hereafter BFPC) site is justly famous for its beautiful polychrome pictographs. The BFPC "main panel" (Locus 10) is especially interesting because it is one of only a few sites in Southern California that has such a lavish use of multiple colors and so much superimposition. It has been determined that there are at least three distinct layers of paintings (La Monk 1953). There is no known native name for this important site, but King and Parsons (2000:20) note that “The . . . settlement at Burro Flats contains evidence of residence during the period of mission recruitment but is not listed as a settlement in mission records. It was probably included as part of the Rancho El Escorpion settlement.”

During the early 1950s, the Archaeological Survey Association of Southern California (ASASC) performed extensive excavations near the center of the site. In 1959–1960, Charles Rozaire (Rozaire 1959:2–6) performed additional excavation work and recorded portions of the village as eleven "sites" (CA-VEN-151 through CA-VEN-161). In the mid-1960s, the well-known rock art researcher Campbell Grant recorded Locus 10 as his Ventura-4, and he determined that it had been created by the Ventureño (or Eastern) Chumash (Grant 1965:74–76, Plates 25 and 30). In 1973, Franklin Fenenga re-examined the village site, and described it as a single site (Fenenga 1973:6). Based on Fenenga's description, in 1975 the Ventura County Cultural Heritage Board nominated *Burro Flats Painted Cave* to the National Register of Historic Places (NRHP). However, note that this name is somewhat misleading, since BFPC itself is only one of the numerous loci within the 25 listed acres.

During the early 1990s, an additional four sites were listed within the 25 NRHP-listed acres; these were CA-VEN-1065, -1066, -1067, and -1068. Subsequently, at the request of the South Central Coastal Information Center (then at the University of California, Los Angeles), all 15 of the then-recorded sites (i.e., VEN-151-161 and VEN-1065-1068) were consolidated under one site number, CA-VEN-1072 (Knight 1995:11-12). The various archaeological investigations of this significant village site are summarized in Bryne (2012), Corbett et al., (2015) and in Knight (2012, 2016).

In 1916, and again in 1917, the anthropologist John P. Harrington (1884–1961; Figure 3) interviewed some of the most knowledgeable members of the local Native American community, as well as other knowledgeable area residents, including Charlie Bell. Note that not all of Harrington's consultants used the term *Burro Flats*; both the Fernandeano Setimo Moraga Lopez (Figure 4), and the Anglo-American settler Charlie Bell, for example, mentioned certain places in what they called *Los Escorpiones Canyon*



Figure 3
John Peabody Harrington

According to Harrington (1986:27; 106–117:4:1 to 117:5:7):

One mile or maybe a mile and a half up this Escorpiones canyon above Bell's house is a flat with a grove of encinos on it—where Indian rancheria used to be . . . Farther up is a place where the creek runs over flat rocks . . . There was also a pool there and Bell used to go up there often to bathe . . . The flat rock where the water runs over is full of mortar pits—is a bedrock mortar . . . Some are large and some are small . . . Old Indians told Bell that the women used to pound up acorns in these holes and by putting mud on the surface of the rock so as to form like a little wall [that] could conduct the water into the holes as desired and thus leach the meal right in the holes.

Given this information, it is clear that this statement refers to the BFPC village. In addition, some of the information that Harrington later (1917) collected from Juan Menendez specifically refers to Burro Flats (see below).

2- The Bell Canyon Sites (State of California CA-LAN-413, etc.)

The Eastern Chumash name for the village at Bell Canyon was *huwam* (Applegate 1975:30), which is now usually given as *Huwam*, while the Western Tongva (i.e. the Fernandeno) called it *Jacjauybit* (there are several alternate spellings for this village). For Spanish speakers, the native village, historic ranch, canyon, and general area were known as *Rancho El Escorpion*, or simply as *El Escorpion*, and later, after the establishment of *El Escorpion de las Salinas*, it was sometimes called *Escorpion Viejo* ("Old Escorpion"). According to some of Harrington's consultants, *El Escorpion* and *El Escorpion de las Salinas* may have been known collectively as *Los Escorpiones*. According to John Romani and other researchers, *Huwam* was the largest village in the west San Fernando Valley, and was important enough to be mentioned in the records of Mission San Fernando, Mission San Buenaventura, and Mission San Gabriel, which collectively list 76 baptisms for the village.

Huwam was partially excavated by archaeologists in 1978, prior to its destruction by area development. The archaeological deposit was 1 meter deep in places, and the site covered an area of some 6,000 square meters. Romani states that "Analysis of temporal . . . artifact types, specifically shell beads and projectile points, indicate a terminal middle, late to historic date of occupation . . ." (Romani 1978:1–2; Tartaglia and Romani 1978). Romani observed that 30 percent of the ecofactual material was marine shell and fishbones which, according to Romani, showed that the village had a close relationship with the regional capitol village at *Humaliwo*, on the coast, some ten miles to the south. According to San Fernando Mission registers (King 2000; 2011), *Huwam* also had close ties with the villages of *Momonga* (in Chatsworth), *Taapu* (in Simi Valley), and with *Talepop* (on Malibu Creek). Romani believed that *Huwam* was the host village for the regional *Kakunupmawa* (Winter Solstice) festival (Romani 1981; Romani et al., 1985, 1988). During the period of rule by Mexico, the area around the mouth of *El Escorpion* Canyon was granted to three Native American men by Pio Pico, the last Mexican governor.

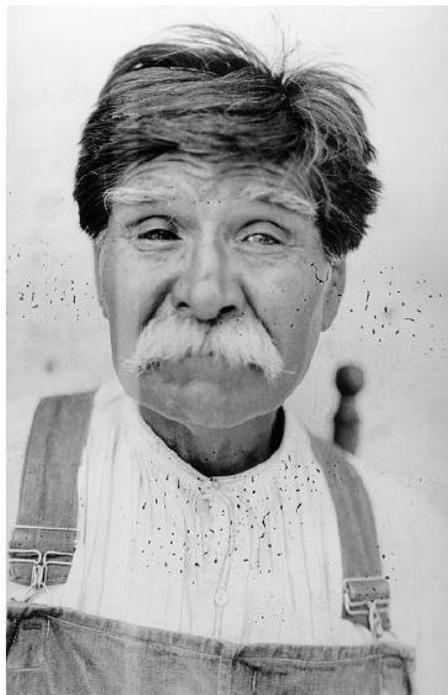


Figure 4
Setimo Moraga Lopez

3- The Lake Manor/Box Canyon Sites (State of California CA-VEN-148/149, etc.)

The most important site in this area is called the Chatsworth Lake Manor Site, or more simply, the Lake Manor Site (CA-VEN-148/149). The site includes a small polychrome "main panel," that is smaller than the main panel at BFPC, and includes some of the same motifs (e.g., a white raked anthropomorph and red and white dots). In fact, the two main panels look so similar that it is difficult to not think that they were made by one or more of the same people. It is perhaps more than a coincidence that two of Odon Chihuya's daughters (see below) and their families lived at these two sites (i.e., Espiritu at *Rancho El Escorpion*, and Maria Delores at *El Escorpion de las Salinas*). Given this, one cannot help but wonder if Odon and his offspring were the ceremonial caretakers of these two spiritually important places (Knight 2016:31–34). It is also an interesting coincidence that BFPC and the Lake Manor site (i.e., the CA-VEN-148 portion) were both recorded and excavated by Charles Rozaire in 1960.

The sites in the Lake Manor area are important due to their association with the Pierre Domec family, as discussed below. Briefly, it should be noted that Harrington and his consultants Juan Jose Olivos (Figure 5), and Juan and Juana Menendez (Figure 1) visited the area and recorded information about it. Harrington noted that "Although he [Juan Menendez] did not [know] the Ventureño name of that rancheria [in Spanish it] was *El Escorpion de las Salinas* . . . We walked up the arroyo which comes down from the Santa Susana Mountains [i.e., from Chatsworth Peak] . . . We crossed the arroyo bed just downstream from a spring and waterbox for cattle and on the other side crossed a small and nice flat . . . a short distance beyond the flat we reached a locality of great boulders . . . on the cave-like wall of one we found . . . Indian paintings . . . Menendez called my attention to fragments of bone and shell, also of flint and arrowheads on the surface of the ground

...” (Harrington 1986:34–35; 151:3:5 to 152:1:9). The rock art is illustrated in Sanberg et al. (1978:33, 36, Figures 3, 4, and 6), Knight (1997:111, 129, 255), and Johnson (2006:41, Figures 23–24).



Figure 5
Jose Juan Olivos at the Ruins of One of the
Domec Adobes at El Escorpion de las Salinas

4- The Dayton Canyon Sites (State of California CA-LAN-254, etc.)

Dayton Canyon is located approximately midway between *Rancho El Escorpion* (today's Bell Canyon) and *El Escorpion de las Salinas* (today's Chatsworth Lake Manor). We do not know if there was a specific Native American name for this canyon; it may have been considered to have been part of *Sitiptip*, since the salt marsh is close at hand. Charlie Bell used the term *Los Escorpiones*, which seems to refer to both of these areas- in other words, roughly the area that belonged, legally or otherwise, to Odon Chihuya, his descendents, and their families. Previous to 2015, few people were aware that significant archaeological sites (CA-LAN-247H, CA-LAN-254, etc.) were present at Dayton Canyon.

CA-LAN-254, a prehistoric village site on the north side of the mouth of Dayton Canyon, is described in detail in Bissel (1989), Gregory (2000), Smith, et al., (2017), and SWCA Environmental Consultants (2008). During excavations in 2001, 159 features were excavated. 120 of these were "burned rock features," and 39 were burials; of these, 29 were adults, two were adolescents, and two were children. Most of the burials were in poor condition or fragmentary; almost all were flexed, with only one being fully extended. Many were on their right sides, and there was no consistent orientation. Although the work was performed with care, there was no evidence of cremations, and the SWCA report states that the method of internment was "similar to Chumash" internment practices. Note that after being carefully examined by osteological experts, all of the burials were reinterred by the Native American community, in a permanently secure location.

The findings of the scientific examination of a selection of the burials were of interest. The earliest burial was dated to ca. 3360 BC, while the most recent burial dated to ca. 350 AD. Mitochondrial DNA was recovered from seven individuals. Of these, two individuals belonged to haplogroup A (and were therefore Chumash), three individuals belonged to haplogroup B (and were therefore from an Uto-Aztecan language group), one individual belonged to haplogroup C, zero individuals belonged to haplogroup D, and one individual belonged haplogroup X- a rare ancient type. The fact that, despite the differences in haplogroup types, all of the burials were "similar to Chumash" burials, suggests that whatever their ethnicity, and whatever language they spoke, the people of this village were all culturally Chumash. The SWCA report also notes that 25 pieces of obsidian were sourced; all but one piece came from the West Sugarloaf source in the Coso Mountains, and one piece was from the Casa Diablo source (both of these source-areas are in east-central California). Importantly, especially for the current discussion, the burial dates, and the dates determined from the "burnt rock features," show that there was no discernible occupational hiatus-CA-LAN-254 was therefore probably actively used for some 5,000 years.

Because of the considerable amount of archaeological work that has been done at the Dayton Canyon village site since 1989, it is now the best studied site, at least in terms of the availability of well researched written reports, in the western San Fernando Valley. One of the key findings about this site is that its presence "fills in" the area between the villages at Bell Canyon and at Woolsey Canyon/Box Canyon, and confirms information that Harrington collected from his consultants, who told Harrington that there was a semi-continuous series of village sites, across the entire eastern Simi Hills/western San Fernando Valley area.

3. The Ethnohistoric Record of the West San Fernando Valley

The ethnographic and historic records, from the period since the *entrada* of the Spanish in Southern California (by sea in 1542 and by land in 1769), show that the western San Fernando Valley was part of a *Chumash Interaction Sphere* (Hudson and Blackburn 1979, 1983), and that *Humaliwo* (Malibu) was the principal regional village. Many, if not all, of the villages in this region (i.e. southeastern Ventura County and portions of western Los Angeles County) were bi-ethnic and bilingual. Johnson (2006:7) provides a list of the Chumash, Tongva, and Spanish names for most of these villages. Note that many discussions of the natives of the San Fernando Valley describe them as Fernandeno, and as being essentially the same as their close ethnolinguistic relatives, the *Gabrielino* (e.g. Bean and Smith 1978:538-549; McCawley 1996; Johnson 2006). But although they spoke languages derived from a common origin, they were distinct populations and they will be described as such here.

Languages belonging to the *Chumashan Language Family* were spoken along the entire coast of south-central California, from central San Luis Obispo County, south to and including all of mainland and insular Santa Barbara County, Ventura County, and western Los Angeles County, inland to the edge of the San Joaquin Valley. Although the *Chumashan Languages* were once considered to belong to the *Hokan Language Family*, modern research has shown that *Chumashan* is a linguistic isolate, with a deep antiquity, of many thousands of years (Golla 2007:71-82 2011:240-241). The term *Ventureño Chumash* or just *Ventureño*, has long been used to describe the easternmost Chumashan tribe. In 1978, the anthropologist Campbell Grant introduced the term "Eastern Coastal Chumash" as an alternative term for *Ventureno Chumash* (Grant 1978a; 1978b). Unfortunately, Grant's term has not gained wide usage; using *Eastern Coastal Chumash*, or more simply *Eastern Chumash*, helps make it clear that not all of the Eastern Chumash became historically associated with Mission San Buenaventura (and therefore *Ventureno*). In fact, the majority of the

southeastern-most eastern Chumash became associated with Mission San Fernando (and became what could be called *Chumash-Fernandeno*). This paper uses *Eastern Chumash*, for the most-part, with the understanding that it is these southeastern-most Chumash (i.e. the Chumash-Fernandeno) that are being discussed, except when quoting pre-existing references, or in certain places for the sake of clarity.

The eastern neighbors of the Eastern Chumash are now usually referred to as the “*Tongva*.” The Tongva language belongs to the Uto-Aztecan Language Family, which consists of two broad divisions; these are the southern “Aztecan” division and the northern “Uto”, or Ute, division. The Aztecan division is found mostly in Mexico and, to a much lesser degree, in the southwestern United States. The Ute division (i.e., Northern Uto-Aztecan) is found entirely in the United States, and is divided into at least three, and perhaps four, language families. These include the *Hopic*, *Tubatulabic*, *Numic* (or *Shoshonean*), and *Takic* language families. Chester King has introduced the term *Western Tongva*, in preference to the term *Fernandeno*. King (2000, 2011) notes that “The registers of San Gabriel and San Fernando Mission indicate that the Tongva of the Santa Monica Mountains were members of a distinct Western Tongva group. The people in this group have few marriages with people who lived east of the Los Angeles River drainage . . . Men’s names with Chumash suffixes are present at many Western Tongva villages.”

The Spanish name “*Gabrielino*”, which has fallen out of favor, first appeared in a report describing the Native Americans of the Los Angeles area, in 1876. *Gabrielino* was used for many years and is widely recognized, but the exact meaning is not well defined. In the broadest sense, it refers to all of the Native Americans that became associated with Mission San Gabriel, including the Eastern Tongva, as well as many Cahuilla and Serrano people.

Alfred Kroeber began his chapter on the *Gabrielino* (1925:620–635) by briefly describing the *Fernandeno*, but he quickly subsumed them to the *Gabrielino* (i.e. to the Eastern Tongva), and many people continue to do today. There were clearly some distinctions, however, even if the two groups shared a common ancestry. In 1916, for example, Setimo Lopez told Harrington that “The *Fernandeno* language was close to *Gabrielino*—many words were the same, others were absolutely different” (Harrington 1986). Like the historical term *Gabrielino*, the exact meaning of *Fernandeno* is somewhat misleading, because there is no specific way to distinguish between the prehistoric *Fernandeno* (Western Tongva), who lived in a fairly small area in the San Fernando Valley, and the *Historical Fernandeno*, which includes all or parts of five different tribes, including essentially all of the *Tataviam*, from the Santa Clara Valley to the north, and *Kitanemuk* from the western Mojave Desert, and the (already cited) southeastern-most Eastern Chumash.

The material culture of the Chumash and the Tongva was similar in many ways. Both groups made and used similar types of plank canoes, which were known nowhere else in North America. Shared material traits, however, were not necessarily the same across the entire range of these peoples territories. Hudson and Blackburn note that “The basketry of the *Fernandeno*, for example, appears to us in many ways to be intermediate in form between the basketry of the Chumash and that of the *Gabrielino* proper, and to comprise an amalgam of traits that reflects the geographical location of the group. Some design elements (such as the presence and placement of a principal band) are essentially Chumashan, while other attributes (such as the binding under the fag ends of stitches in the so-called ‘Mission’ stitch) are typical of the *Gabrielino*” (Hudson and Blackburn 1983:31).

The Chumash of the Santa Barbara Channel and surrounding region lived in villages large and small, which were organized into multi-village polities that often controlled relatively large geographical areas. Blackburn (1975:12–13) notes the following:

The political organization of the Chumash achieved a complexity surprising even for California. The primary political unit was the village, presided over by the *Wot* or chief, whose duties included caring for visitors and the poor, furnishing ceremonial property and personnel for fiestas and other ceremonies, and representing the village on such occasions . . . Chumash villages were linked in a number of loose federations that might possibly have been coterminous with . . . dialect groupings . . . these federations may have been based on kinship relationships between the *Wots* of the component villages, on membership in the ?antap cult, or both. They seem to have been organized around a principal village (Malibu, Mugu, Santa Barbara, Dos Pueblos, etc.) whose *Wot* was recognized as having some degree of authority over the villages in the confederation.

According to Timbrook et al. (1993:120): “. . . the Santa Barbara Channel coast is regarded as a cultural climax area [that included] . . . a very large, sedentary population with a complex social, political, economic, and religious organization and a high development of material culture and the arts supported by a hunting, gathering, and fishing subsistence base.” The eastern Simi Hills are located at the southeastern edge of this cultural area. Trade relationships among mainland coastal, island, and inland groups were well developed. Island Chumash traded beads, shell, fish, otter and seal skins, steatite, chert bifaces, baskets, and other goods. In return, they would receive acorns, pine nuts, chia sage, deer and rabbit skins, bows and arrows, serpentine bowls, and obsidian from the people that lived on the mainland.

As noted above, one of the main reasons that we know so much about the native peoples of the west San Fernando Valley, is because of the research done there by John Peabody Harrington. Harrington, whose main expertise was linguistics, was hired by the Smithsonian Institution as an ethnographer in 1914, and over the following decades Harrington would become *the* expert on the Chumash. During the course of his research, Harrington interviewed several locally knowledgeable native people, some of which have already been mentioned. These included Jose Juan Olivos (1858–1936), Setino Moraga Lopez (1844–1930), Fernando Librado (1839–1915), and Juan Antonio Manuel Menendez (1867–1924) and his wife Juana Menendez. Harrington also interviewed the Anglo-American Charlie Bell, the son of old-timer Horace Bell. Harrington’s then-wife Carobeth (Tucker) Harrington also interviewed Juan and Juana during this period (Laird 1975, 1982).

Fernando Librado (Figure 6) is best known for his contributions to the ethnohistory of the Santa Barbara County and Ventura County areas (Librado 1979, 1981). His knowledge, however, extended to a broader area, including the Malibu Coast and adjacent inland areas. Fernandño was one of the few local Native Americans that understood something about the regional context—the political relationships between villages—before the arrival of the Spanish. Librado, for example, told Harrington that the “San Fernando [Valley] . . . belonged to the Humaliwo . . . Humaliwo was . . . on the coast, and all of the San Fernando Indians were called Humaliwo because of it.” Corbett et al. (2015:15–17) noted that “It is important not to confuse Fernando’s concept . . . with current tribal entities . . . He made no distinction based on ethnic or linguistic differences, instead suggesting sociopolitical unification under the Humaliwo chief as the binding agent. In other accounts, Librado further elaborated on the connection, stating, for example, that the people at Humaliwo spoke a dialect of Ventureño, while acknowledging that some spoke a Takic language” (this would be *Western Tongva*, or *Fernandño*). King (2011:386) notes that “This indicates that the Chief of Malibu had jurisdiction over Tujunga and the other San Fernando Valley settlements as well as the Santa Monica

Mountains east of Mugu, the capitol of the central Chumash . . ." (i.e., of the *Lulapin Province*). According to Johnson (1997:79) "*Humaliwo* was linked by kinship with the coastal towns of *Sumo* [Zuma], *Loxostox'ni* (Lojostogni), *Lisiqishi* (Lisichi), and *Muwu* (Mugu); with the interior towns *Hipuk* (Ypuc) and *Ta'lopop* (Talepop) . . ." (also see Whitley and Simon 1979:149–174). Librado was confirming comments made by another Chumash consultant during the 19th century, Juan Pico, who stated that "the Maligo (Malibu) Indians living about halfway between Point Mugu and Santa Monica belonged to another nation and were governed by another great chief (not the Mugu chief) who lived in that town, but had jurisdiction over the tribes living eastwardly along the coast" (Bowers 1897).

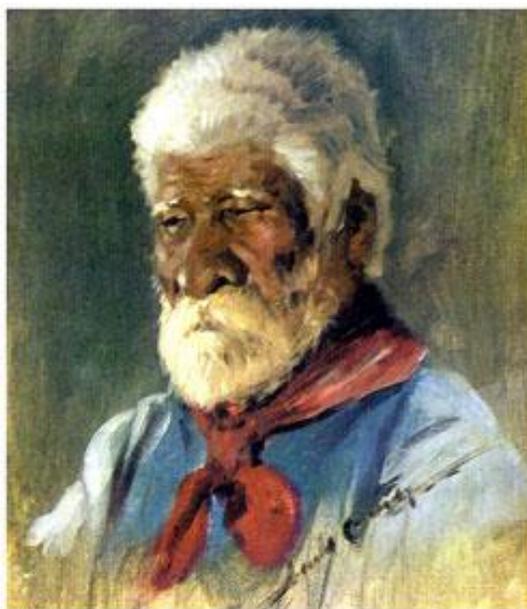


Figure 6
Fernando Librado

According to Hudson and Underhay (1978:30), "As one of Harrington's Kitanemuk consultants explained some of the relationships between various groups as follows: ' . . . the religion of the yivar [siliyik] was the custom at Ventura and of the Castec [interior Ventureño] people, and of the Fernandeno . . . and [the] Gabrielino. Also of the people of Santa Barbara and Santa Inez . . . But it . . . was not the custom of the Tulereno . . . They had other customs . . . The Kitanemuk understood it, but did not practice it . . . It was not the custom of the Serrano . . . It was at Ventura and reached to San Gabriel—it was very strong at San Gabriel . . . The Gabrielino sang their long verses . . . in Ventureño Chumash'" (also see Librado 1981:17–28, 31, 39–42). Guests traveled to the host villages for important ceremonial occasions, often from a long-distance. Blackburn notes that "An important Ventureño Chumash fiesta, for example, might be attended by sizeable numbers of people from as far away as Gaviota or the Santa Inez Valley, as far east as Malibu or the San Fernando Valley, and as far north as Tejon, while performances by Yokuts dancers were not uncommon . . ." (Blackburn 1974:100). Because of this regional system, the west valley community was ceremonially connected to a wide range of villages, long before the arrival of the Spanish.

Speaking of the situation in late 19th century, from the perspective of *Rancho El Escorpion* (Bell Canyon), Cohen (1989:21–22) noted:

To the north, where Orcutt Ranch Center and the empty Chatsworth Reservoir are today, Joaquin Romero and Pierre Domec continued as squatters on Rancho Ex-Mission San Fernando, and the new owners in the later part of the 1870s were not as indulgent towards them as Andres Pico had been . . . The New Escorpion ranch [i.e., *El Escorpion de las Salinas*], where Pierre Domec lived with Maria Dolores Odon and their three daughters, overlapped a northern corner of Rancho Ex-Mission San Fernando, and in 1877 the owners of the 56,000-acre north portion of the valley, Charles Maclay and George Porter, brought suit against Domec and his Indian relatives . . . old Jose Odon . . . explained that he was the selfsame Indian who had occupied this land since 1836 and his right to live [t]here was written into Pio Pico's 1846 sale of the San Fernando Ranch to Eulogio de Celis . . . The oldtimers of Escorpion Viejo made their final U.S. Census appearance in 1880 . . . the imaginary boundaries of the New Escorpion faded with the departure of Odon, Joaquin Romero, and Pierre Domec. Part of the New Escorpion became [part of the] Chatsworth Park townsite, part would later become Chatsworth Reservoir, and the western edge awaited homesteaders such as . . . Charles Woolsey, and Clyde Dayton.

Even so, as discussed below, members of the old community were still living in nearby Calabasas, and native descendants lived elsewhere in the valley. Note, for example, that Max Knapp told Bob Edberg that “. . . when the Spanish and Mexicans came to the valley . . . the Indians caught smallpox, and therefore scattered in all directions, leaving the Chatsworth Reservoir area (Edberg 1977). The Chatsworth reservoir area being *Sitiptip/El Escorpion de las Salinas*.

During their 1916 tour of the west valley, Harrington and Setimo Moraga Lopez visited Charlie Bell at *Rancho El Escorpion* (which would soon be known as “Bell Canyon”), where they discussed the local history with him. Harrington noted (1986:26; 106–117:1) that Bell “. . . has had several old Indians work for him.” This comments confirms that members of the old Native American community were still active in the west valley at the beginning of the 20th century. Harrington noted that “Mr. Bell says that every stream that comes down from the mountains north of his place had a rancheria at its mouth” (Harrington 1986:27; 106–117:9-1). Although Bell did not use the term Burro Flats, some of his comments are definitely describing it as being in what he called *Los Escorpiones Canyon* (Harrington 1986:27; 106–117:4:1). Of features in the upper canyon described by Bell, Harrington reports (1986:27; 106–117:4:1 to 106–117:5:7) that:

One mile or maybe a mile and a half up this Escorpiones canyon above Bell's house is a flat with a grove of encinos on it—where Indian rancheria used to be . . . Farther up is a place where the creek runs over flat rocks . . . There was also a pool there and Bell used to go up there often to bathe . . . The flat rock where the water runs over is full of mortar pits . . . Some are large and some are small . . . Old Indians told Bell that the women used to pound up acorns in these holes and by putting mud on the surface of the rock so as to form like a little wall could conduct the water into the holes as desired and thus leach the meal right in the holes . . .

As noted above, in 1916 Harrington also visited the west valley with Jose Juan Olivas, whose mother was Chumash and whose father was Western Tongva. Johnson (2006:27; Figure 5 here) shows Juan at the ruins of the Domec adobes, at *El Escorpion de las Salinas*. Olivas told Harrington that the Chumash name for the *Escorpion de las Salinas* area was *Sitiptip*, but he did not provide a translation (Johnson 2006:31, Table 8). In the *Barbareno Chumash* language *tip* means salt, and *Tiptip* means “much salt”; as a place-name *Tiptip*, refers to Goleta Slough (Applegate 1975:44). If

this is the case, then it is likely that the word “Sitiptip” refers to the salt marsh at the west end of today’s Chatsworth Reservoir, and the general area around it. If so, this suggests that the Spanish term “El Escorpion de las Salinas” is a translation-combination of the Spanish term for Bell Canyon (*El Escorpion*) and the Spanish translation of the native term for the Chatsworth Lake Manor area (*las Salinas*).

In 1917, Harrington interviewed Juan and Juana Menendez (Figure 1). On this trip, Harrington was accompanied by his wife Carobeth Tucker Harrington (later Carobeth Laird), and by another Native American named Manuel (Harrington 1986:33; 106–151:1:1). This person was probably Manuel de los Santos, from the San Manuel Reservation; John Johnson states that Carobeth’s notes from that period mention going on field trips with Manuel (personal communication 2016). Carobeth subsequently visited Juan and Juana at their home in Calabasas several times (Laird 1975:91–97). Juan Antonio Manuel Menendez was the grandson of Odon Chihuya (aka Jose Odon), one of the original grantees of Rancho Escorpion, and he was the son of Odon’s daughter Maria del Espiritu Santo (aka Espiritu Chihuya de Leonis), who eventually became the wife of Miguel Leonis, the *Basque Grande* who acquired and managed almost the entire Calabasas/El Escorpion area like a medieval fief (Juan’s family genealogy is described in detail in Johnson 1997:265–270). Juan was descended from the west valley chiefly lineage. His grandfather—Odon—had been the principal grantee of the *Rancho El Escorpion* Mexican land grant. Johnson (1997:260) notes “. . . evidence indicates that some of these applicants were representing a wider group of families. To a certain extent these segments of the larger mission community appear to have been continuations of earlier sociopolitical groups. For example, some of those living at *Rancho El Escorpion* were descended from people who had lived there before going to the mission [San Fernando] . . .” During Harrington’s 1917 visit, Juan confirmed Charlie Bell’s 1916 comments on the several west valley villages, by stating that “. . . one long rancheria extended from where we were [probably northwest of Chatsworth Reservoir, at the time the statement was made] a couple of miles to the southwest . . . and that fragments of shell . . . are picked up in this whole stretch.”

The lime processing operations in the northwest San Fernando Valley are known to have been managed by the French immigrant Pierre Domec, who established himself and his part-Native American family, at *El Escorpion de las Salinas*, and they eventually owned at least one kiln, and had three adobe houses and a barn. The family, and their business partners, also had a house and a bakery at the Plaza in downtown Los Angeles. As noted above, Domec had established his relationship with this community by marrying Maria Dolores, one of the three daughters of Odon Chihuya, the principal grantee of the *Rancho El Escorpion*. Maria Dolores was the older sister of the well-known Espiritu, the wife of Miguel Leonis. Thus, the family was already established in the area when the United States acquired California. The 1850 United States census listed 89 Indians living in the *El Escorpion* area, and many of these people were family members. The 1860 census notes that Pierre’s and Maria’s and daughter, then seven, also lived with them at that time (Bob Edberg, personal communication 2015). According to Bob Edberg, “By 1861 (as reflected by a parcel map), and perhaps as early as 1849 (as referenced in an 1891 court case with Pierre Domec living at an Indian camp in Santa Susana), Odon’s [oldest] daughter Marcelina and son Bernabel [also] lived at an adobe settlement [close-by] La Calera, within today’s Chatsworth Reservoir.” According to Ray Vincent, of the Chatsworth Historic Society, “Pierre Domec was identified as a limeburner in the 1860 census, and his 1861 and 1865 parcel maps included . . . *La Calera*. By 1871 Pierre Domec had moved his adobe (or had built a new one) slightly [to the] north . . .” (personal communication 2015).

Juan’s mother Espiritu and her family were among those who lost their lands to the new settlers. After the death of Miguel Leonis, Espiritu had to fight extended legal battles to retain her

property. Put simply, because she was a Native American and a woman, an attempt was made to cheat her out of her property, and she had to litigate the issue to prove that she had been legally married to Leonis, in order to inherit. Although she prevailed, shortly before her death in 1906, she did not have the money to pay her legal fees, so her lawyer, the well-known Horace Bell, became the new owner of *El Escorpion*. The old community remained in place, however, at least in part, until the beginning of the 20th Century, and Juan and Juana, and others, were still living in the area when Harrington visited. In 1917, one of the places that Juan mentioned to Harrington was what he called the *Portrero de los Burros*. Burro Flats was, in those days, not accessible to vehicles, and generally difficult of access, and so Harrington recorded Juan's comments about the culturally important uplands, but he never visited the place in person. Juan's comments are some of the very few direct statements, from any Native American, that specifically mention Burro Flats.

It is again important to recall that Juan's maternal grandfather Odon had been the principal grantee of *El Escorpion*. History shows that Odon was not just the head of his household, but also the leader of the native west valley community (Johnson 1997:269). In fact, although it was relatively small, Rancho El Escorpion was still a legally distinct piece of property, and it continued to be one of three focal points of the west San Fernando valley Native American community (the other two being the Domec ranch at *El Escorpion de las Salinas*, and the Leonis ranch at Calabasas). After the death of Juan's father, Juan's mother Espiritu had married *El Basque Grande*, Miguel Leonis, and during the mid-to-late 19th century they together dominated events in the west valley and adjacent parts of the Santa Monica Mountains (note: Leonis' certainly was an interesting character; for an especially creative and entertaining "tall tale" version of his life and times, see Bell (1930:181–193). When Espiritu passed away in 1906, Juan would have become one of the principal leader of the old community—a position that he would have held at the time of Harrington's 1917 visit. Few other people, if any, would have been better qualified to teach Harrington about the native history of the area. In later years Carobeth wrote (Laird 1975:91) that "There was a greatly respected couple who lived in a little narrow two-storied adobe house at Calabasas . . . They were always addressed as 'Don' and 'Doña' . . . they seemed to be very prosperous, very secure". Carobeth also used the honorific "Don Juan" in a 1982 letter to Bob Edberg, where she states "I recall vividly the dramatic way in which Don Juan told . . . the [Kh]Ra'wiyawi story." Carobeth was in her 80s by the time that she exchanged letters with Edberg, and she was by-then a noted expert on the Chemehuevi people of the Colorado River area, and she was well-regarded as an anthropologist in her own right. Carobeth would not have used the honorific titles had Juan and Juana not been entitled to them; Carobeth noted that "All of my visits to the house at Calabasas were enriching experiences" (Laird 1975:97).

Of all of Harrington's native consultants, it is Juan and Juana that are the most important for local history. Juan and Juana, like several of his other consultants, provided Harrington with the native and Spanish names of many places in the west valley. But they also recounted some of the few known (now) Native American myths for the area. The Eastern Chumash/Western Tongva version of the *Khra'wiyawi* story that they provided, for example, contains much more information about the west valley than the version which was recorded by Hugo Reid, in 1852. Also, the locally important *Gavilan was Chief of the Village Where Coyote Lived* story is found nowhere else, and it is *Gavilan* that slays *Munits*, the evil shaman that resided at *Huwam*. This story clearly demonstrates that there were significant cultural interactions between the villages from Malibu, on the coast, inland through the entire San Fernando Valley, to as far inland as the village of Tujunga, in the northeast corner of the valley, at least during the ethnohistoric period.

4. Overview of the Historic Lime Industry

Having reviewed the situation of the Native American community at the time of the Spanish *entrada*, we can note that their first visit to the San Fernando Valley was in 1769, when Gaspar de Portolá led an overland expedition from the newly established settlement at San Diego, north to Monterey Bay. This *entrada* was the beginning of the Euro-American colonization of the San Fernando Valley area. The Spanish advanced their frontier north from Mexico because they perceived a threat to their sphere of influence along the west coast of North America. The Russians by then had taken control of much of Alaska, and they were in the process of exploring to the south, and looking to colonize the California coast (Gibson 2013; Hudson and Bates 2015). In response, the government of New Spain (i.e., Mexico) instructed Portolá to take sufficient men and equipment, and to establish a presidio (fort) at Monterey Bay; this new city of Monterey eventually became the Spanish, and later the Mexican, capitol of Alta California.

The Portolá expedition entered the San Fernando Valley via an Indian trail that crossed what eventually became known as Sepulveda Pass, and they camped at a native village by a large warm spring, which can still be seen at today's Los Encinos State Historic Park. Portolá named the area *El Valle del Encinos* (The Valley of the Oaks). Not quite 30 years later, after the founding of Mission San Fernando, the name was changed to what it is today—the San Fernando Valley. From Encino, the expedition went north and entered the Santa Clara Valley via what later became known as San Fernando Pass. After the American conquest, this became Fremont Pass, and later still it became known as Newhall Pass, the name we continue to use today. In 1797, Mission San Fernando Rey was established in the north-central part of the valley. Although primary documents are lacking, it is generally believed that one or more of the west valley lime works, perhaps including those at Dayton Canyon, were soon established to provide quicklime for use during the construction of the mission buildings. If this is correct, some or all of the lime processing operations in the west San Fernando Valley constitute the first non-agricultural industry in the west-central Los Angeles County/southeast Ventura County area.

Life in most of Alta California remained essentially unchanged after Mexico gained its independence from Spain in 1821. In 1845, a decade after Mexico's decision to secularize the missions, three local Native Americans received a grant of ownership for *Rancho El Escorpión* as discussed above. Just a few years later, in February of 1848, as a result of the Mexican-American War, California was formally annexed by the United States. Very few norteamericano (American) settlers migrated to the western San Fernando Valley during the next few decades, and the ethnicity of the population likely remained as it had been . . . a *mélange* of Native American, French, French-Basque, and Mexican. This west valley Native American/mixed-race community can be identified in the United States census records for 1860, 1870, and 1880, and well-known members of the community were important consultants for the anthropologist John P Harrington from 1914 to 1917.

This community has never been identified and discussed in detail before. Therefore, before proceeding to discuss the west valley lime works, and the kilns in Dayton Canyon in particular, it is appropriate to provide a brief overview of the history of the production of lime, the products that are made from lime, and their many uses. Indeed, although most people today are unaware of the fact, lime-based construction materials, especially cement, have been of fundamental importance in the history of western civilization, from at least the time of the Roman Republic (cement was independently invented in Mesoamerica too). Recall, for example, that although the Greeks built some very impressive buildings and structures (e.g. the Parthenon), they were limited to what they

could "stack." It was the Romans, using Roman cement, who built aqueducts, for example, some of which are still in use some 2,000 years later.

Cement, which is of such importance, is made from limestone, which is a sedimentary rock composed of the minerals calcite and aragonite (i.e., calcium carbonate), and is largely made of skeletal fragments of marine organisms including corals and diatoms, and shell materials from larger marine organisms. Limestones of various types make up about 10 percent of all the sedimentary rocks on the earth, and they are found in almost all parts of the world. Any type of calcareous rock can be processed to make lime. The process was well known to the ancients; the Roman architect Marcus Vitruvius Pollio published the first description in his *De Architectura Libri Decem* (The Books on Architecture, Chapter V, Of Lime), in about 25 BCE (Egenhoff 1952:10, 13). In time, "In addition to its qualities as a soil additive and stabilizer, quicklime was used in . . . making glass, manufacturing paper, tanning leather, and treating raw sewage" (Gossard 2007:28).

Limestone was one of the few mineral resources widely used in Spanish California. Egenhoff (1952:181) recounts that:

Newcomb, in *The Old Mission Churches and Historic Houses of California*, makes the following comments about the mineral materials used in construction of the missions: "Although California as an American State has within her boundaries vast resources in the way of building materials, the California of Spanish days had a comparatively meager supply of good building material. Especially this was true of stone of durable quality . . . Usually . . . the stones used were those nearest the site of the proposed structure, and consisted of granite boulders, taken from the washes, volcanic stones from the near-by foothills, chalkstone, limestone, and sandstone . . . Lime was made either by burning limestone, which, although not of the best quality, was obtainable, or by burning sea-shells, of which there was a never failing supply. Since all walls, inside and out, were kept whitewashed, lime was necessary at all times . . ."

Costello also notes (1977:22) that:

Lime was an essential material in Spanish California and its products are evident at all missions, presidios, and pueblos of the period. As a hydraulic cement, it was used in the construction of elaborate dams, aqueducts, and other water-related structures; lime mortar was used in stone construction; lime plaster protected the adobe buildings from weather; white wash made from 'lime milk' sealed plaster surfaces and provided a base for decorative pigments; lime was used in the processing of cattle hides (the largest export of Alta California); and quicklime is essential in reconstituting dried corn for eating.

Although most people think of California's missions in terms of only the church buildings themselves, much more was involved. The layout of each mission complex, while having many things in common, varied with location, largely based on the local terrain and the available resources. According to Engelhardt (1927:12-24), once a suitable location was identified, "The first temporary buildings erected . . . were mostly of palisades, that is, of poles set in the ground close together and usually plastered with mud." When first established, Mission Santa Clara was described as being built ". . . of palisade construction, mud-plastered with flat roof." Mission Santa Barbara was described as ". . . enclosed with poles and mud-plastered with roof of grass." In 1814, the Padres at La Purisima reported, "There have been built such structures as a mission must have temporarily . . . all of palisades . . . and a church of forked poles walled in with adobe, which holds all the people". *Arundo donax*, today a wide-spread invasive plant, was imported for use as roof

thatching, *ramadas*, fencing, and for shade, since few of the native plants were suitable. Once the new settlement was safely established, the real building could begin. “The making of adobes was probably the first step toward permanent building to which the Padres gave their attention.” These sun-cured mud, straw, and when available cow-dung “bricks” were used for the construction of substantial walls for the first structures (Webb 1952:100). The mission complex to-be would eventually include not just the church itself, but also many other types of buildings.

Quicklime was so important that it was being produced in the San Fernando Valley even prior to the founding of Mission San Fernando. According to Friar Vicente de Santa Maria, who led the exploration party that searched for a place to establish a new mission midway between Mission San Gabriel and Mission San Buenaventura (Engelhardt 1927:5):

On the 19th [1795] we left Calabazas . . . going on the camino real as far as Encino Valley [San Fernando Valley], we went to explore the place where the alcalde of the pueblo [Los Angeles], Francisco Reyes, had his rancho . . . We arrived there at nine in the morning . . . We found the place quite suitable for a mission, because it has much water, much humid land, and also limestone; for we came upon a party of gentiles [Native Americans] who were finishing a kiln for burning lime which they had already heaped up. Stone for the foundation of the building is nearby.

Fr. Santa Maria's statement shows that in 1795, over a year before the mission was established, at least some limestone had already been stockpiled, and a kiln was being built on site to produce quicklime. Due to the limited ability to transport heavy loads, it is likely that this first quarry must have been relatively close at hand, as was the case elsewhere. For example, Mission San Jose's historic records state, “. . . there are in the neighborhood of the mission chalk-hills, an excellent brick-earth, so that most of their buildings are of brick . . .” (Jean-Francois Galaup de la Perouse, as cited in Egenhoff 1952:169). Planning was not arbitrary or haphazard. According to Hector (1999): “The California mission buildings were constructed following architectural guidelines provided to the Franciscan fathers. The previously mentioned work by Marcus Vitruvius Pollio, on the basics of construction using stone, wood, and clay, was translated into Spanish in 1787, and it was referenced in mission documents found at Mission Santa Barbara, Mission San Gabriel, Mission San Miguel, and others . . .” Books like Pollio's, “. . . ensured consistency in design, pattern, and construction; following the instructions in these books provided the fathers with sturdy, useful buildings that [in some cases] have lasted centuries” (Hector 1999).

Friar Santa Maria's scouting for a suitable place for a new mission was standard procedure—suitable locations were limited to those where the necessary natural resources were available on site or close at hand. These places had to be identified, for only then could the work and the workers be organized effectively. A description of the beginnings of Mission Santa Barbara, from Duhaut-Cilly's *Account of California in the Years 1827-1828*, can be found in Egenhoff 1952:171), as follows:

Here . . . everything is in the rough, even to the men, and the first care of the builder has been to form his workmen. Out of the mere earth he has to make bricks and tiles; to cut immense trees, far away, and to bring them, by physical strength, over roads marked out expressly across ravines and precipices; to gather, at great expense, on the seashore, shells to make into lime; finally, everything, to the most trifling, connected with this edifice, has cost preliminary labors, which must have increased the difficulty very much. Where seashells were not available, limestone quarrying was required.

As was the case everywhere, all of Mission San Fernando's new buildings and structures required an initial coating of lime, and additional coats had to be applied periodically, so as to maintain a water-tight covering. Engelhardt (1927:5, 12-24) specifically mentions several buildings and structures that required coats of lime. These include: the main mission building itself, multiple granaries, a room 6 varas (17 feet) square, to be used for various purposes, a weaving room, store rooms, and a house for the padres. In 1801, more structures were added, including an apartment for the girls and single women and six houses assigned to the guards. In 1804, "Separate little houses of adobe, to the number of 70, were built for as many neophyte families"; the permanent main church, which took two years to build, was completed in 1806 (ibid. 1927:16). Engelhardt also mentions another structure for keeping the equipment for the pack mules, a dam built of masonry and an aqueduct, which carried the spring water from the dam to the mission, a new house for the Fathers, a corridor that connected the padres' quarters with the church, an additional reservoir, a new house for the mayordomos, a soap factory, and 40 more houses for neophyte families.

Engelhardt notes that various improvements were made to many of the buildings and structures in the following years, and there would eventually be guest rooms, rooms for various crafts, a blacksmith facility and (at some of the missions), pottery shops, cisterns, settling basins, wells, and fountains, and a *lavanderia* (laundry). Other specialized structures may have also existed. Mission Santa Barbara, for example, is even known to have had a *pozolera*. This was a small kitchen specifically dedicated to the production of *pozole*, a hearty stew with various vegetables and a bit of pork on-the-bone, when it was available (one must assume that there was more than one version of this dish, depending on what was available ingredient-wise, and on who would be doing the dining). Other similar outside kitchens were undoubtedly present at some of the other missions. The amount of lime needed for the construction of the buildings at and in support of Mission San Fernando was probably large enough so that multiple sources of limestone were required, if only for a short period. Thus, stories of processed lime being brought from as far away as the western San Fernando Valley are certainly plausible.

Before proceeding to a general discussion of the lime industry, it is necessary to point out that there is a difference between types of kilns used for lime processing and kilns used for making tiles. The former can be identified by associating the presence of many large to small pieces of fragmented whitish limestone, while the later can be identified by the presence of reddish tile wasters (i.e., broken pieces of red tile). In the case of the Dayton Canyon and the other known western San Fernando Valley kilns, no red wasters are present, while pieces of crushed lime are clearly present. Note also that processed lime could be transported relatively easily—it does not break (although the containers that it was transported in could break). During the period under discussion here, sun-dried tile products were not strong enough to be transported any great distance. The kilns where tile products were made would, of necessity, have been relatively close to where the tiles were going to be used (Note that some ornate specialty tiles were imported from Mexico, especially for use in churches, for decorative purposes).

There are two types of kilns: pot kilns, which are also known as batch or intermittent kilns (Figure 7) and continuous kilns. Pot kilns, the older and simpler type, are named for their shape, and need to be unloaded and reloaded following each firing. All of the west valley kilns are pot kilns. The choice of location for and the method of construction of the kilns were important, because "limerock expands slightly during the early stages of firing, putting stress on kiln walls. One way that kiln builders addressed the need for strong walls was to situate the kiln against a hillside. This provided support for the back wall and sometimes all or parts of the end walls. Sometimes kiln waste or other material was piled against an end wall to help brace it . . . Kilns were usually located

downhill from the quarries and arranged so that rock from the quarry could be delivered by wagon, cart, or ore car” (Perry et al. 2007:25).

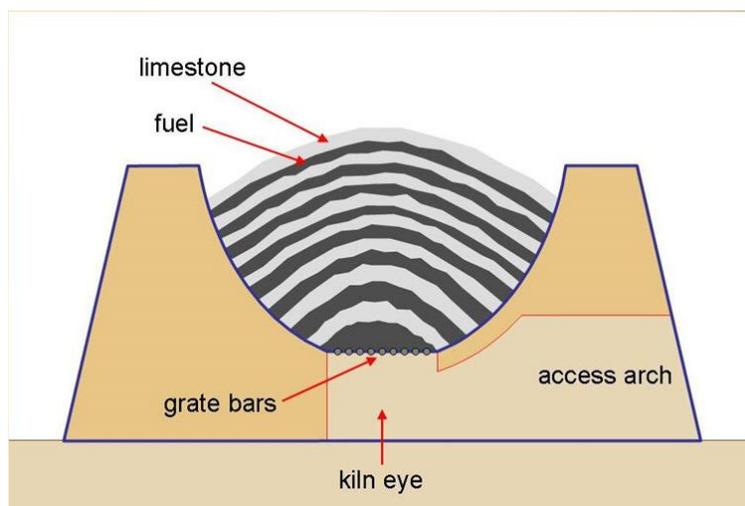


Figure 7
Cross-Section of Typical Pot-Kiln

As noted above, field stone, river cobbles, quarried rock, or any combination of durable material had to be available for all adobe foundations. Otherwise, moisture in the ground would travel up the adobe walls and the structure would become unstable. A careful examination of the footing of any adobe structure is a lesson in geology. Is the material available on site, or did it have to be brought there from a distance? In the days when there were very few ways to move large amounts of heavy material, the ox-drawn *carreta* being the largest vehicle in use, it was important to have essential raw materials close at hand. If quality stone was available in areas where *carretas* could not go, the rock had to be moved by people. Webb notes that “Millions of stones, some large and some small, were collected and carted or carried in nets, sometimes from miles away, to the spot where they were needed” (Webb 1952:83). Only when all of the building materials that were needed were in place, would construction proceed: “With the stones collected for the foundations, the adobes made, and timbers brought from the mountains or the near-by countryside and prepared for use, it remained to secure lime for mortar and for the foundations and for plastering and whitewashing the buildings. Lime kilns were constructed of adobe bricks and, whenever possible, were built against a hillside to permit easy dumping of limestone, raw lime, or sea-shells into the kiln from above” (Webb 1952:106). Webb also and cites Mr. F.E. Green, author of “The San Diego Old Mission Dam and Irrigation System,” which was published in 1933, on construction methods, who says:

A bottle shaped opening was dug in the hillside from seven to fifteen feet in depth and eight to five feet in diameter, with the top and bottom slightly contracted, and sometimes curbed with brick or stones around the top, and rarely all the way to the bottom. The preparation of a kiln for a run required that a full supply of the necessary amount of raw lime material for one firing should be gathered and sorted for culls, and all of this material be brought to the top of the kiln. Then the kiln was filled with alternate layers of fuel and lime-rock and fired, adding more fuel if necessary to obtain the desired temperature. From two to five days would be required in the burning and cooling process.

Although all of the missions had many things in common, there were many individual differences in the way they were laid out and built. For example, Susan Hector (1999) noted that :

In his study of the San Diego dam and water system, Mr. Green located the ruins of eight kilns along the aqueduct line. There are the remains of a kiln in the hillside of the garden . . . at San Luis Rey Mission. Ruins of several are to be seen at Rancho del Escorpion, estancia of Mission San Fernando. At the later place the adobes lining the kilns have become vitreous through the great heat generated in the burning of the lime. Without doubt similar kilns were operated at all of the missions for lime was a prerequisite for building. And there were numerous deposits of lime, limestone, or sea-shells within reach of all.

What then exactly is lime, or more precisely, *quicklime*? According to a Wikipedia article on lime kilns:

A lime kiln is used to produce quicklime through the calcination of limestone (calcium carbonate) . . . Because it is so readily made by heating limestone, lime must have been known from the earliest times, and all the early civilizations used it in building mortars and as a stabilizer in mud renders and floors . . . The earliest descriptions of lime kilns differ little from those used for small-scale manufacture a century ago. The common feature of early kilns was an egg-shaped chamber, with an air inlet at the base . . . Limestone was crushed (often by hand) to fairly uniform 20–60 mm (1 to 2.5 inch) lumps—fine stone was rejected. Successive dome-shaped layers of limestone and wood . . . were built up in the kiln . . . When loading was complete, the kiln was kindled at the bottom, and the fire gradually spread upwards through the charge. When burnt through, the lime was cooled and raked out through the base. Only lump stone could be used, because the charge needed to ‘breathe’ during firing. This also limited the size of kilns and explains why pre-industrial age kilns were all much the same size. Above a certain diameter, the half-burned charge [was] likely to collapse under its own weight, extinguishing the fire . . . Typically the kiln took a day to load, three days to fire, two days to cool and a day to unload, so a one-week turnaround was normal.

The kilns were often constructed in batteries of at least two, one being fired while the other was cooling and being emptied. A glossary of lime industry terms can be found in *Lime Kiln Legacies: The History of the Lime Industry in Santa Cruz County* (Perry et al. 2007:206–210). Perry, et al. 2007:1) note that:

Lime is generally made by heating limestone . . . to over 1,640° F. This drives carbon dioxide from the rock, leaving behind lime. Pure lime is white, caustic, lighter in weight than the original rock, and reacts violently with water. It has many uses, but its principal historic use was for making mortar and plaster. When mixed with water and sand, it will adhere to stone and brick. The process of making lime has been known for thousands of years . . . In Turkey, archaeologists have discovered lime mortar dating back seven thousand years . . . The ancient Romans and the Mayans perfected the use of lime mortar on a truly grand scale, making stone buildings, roads, and monuments.

The instructions provided by Marcus Vitruvius Pollio in 25 BCE (mentioned previously and cited in Egenhoff) were still valid at the beginning of the 19th Century. As Pollio tells us (Webb 1952:13):

Having treated of the different sorts of sand, we proceed to an explanation of the nature of lime, which is burnt from white stone or flint. That which is of a close and hard texture is better for building walls; as that which is more porous is better for plastering. When slaked for making mortar, if pit sand be used, three parts of sand are mixed with one of lime. If river or sea sand be made use of, two parts of sand are given to one of lime, which will be found a proper proportion. If to river or sea sand, potsherds ground and passed through a sieve, in proportion to one third part, be added, the mortar will be better for use.

The use of limestone was eventually superseded by the invention of Portland cement. Perry et al. (2007:2) mention that “Like lime, Portland cement is made by firing limestone or marble in a kiln. It differs, however, in that the rock is pulverized first and several other ingredients, such as silica, iron, and alumina, are mixed with it before firing.”

Pollio's distinction between material that is “close and hard” vs. that which is “more porous,” and the resulting nuances in the usefulness of the finished products from different sources, raises an interesting question. As discussed here, there were at least three producing kilns (or groups of kilns) in the west San Fernando Valley, and several others in other parts of the valley. There are a number of plausible reasons for this, one of which might be that variations in the parent material resulted in differences in usefulness of the final product(s). For example, during the late 1930s, the quarry face at Bell Canyon still existed and was accessible, and even a casual examination shows that there were differences in the quality of the parent bedrock.

As to the use of the processed lime itself, Webb (1952:107–108) states the following: Regarding the process of plastering, it appears that walls exposed to winter's rains and winds were usually protected with a coat of lime plaster, which old Mexican workers say was prepared by mixing three or four parts of lime to one of sand with water. Later, when the mission cactus hedges were thriving, the huge leaf-slabs were cut off, placed in a barrel, chopped up, and, with water added, left to soak for several days. Then the liquid was poured off and used to mix both plaster and whitewash, adding, it is claimed, to the adhesive and water repellent qualities of both. Interior walls and others not exposed to the ravages of storms were often finished with a mud plaster and then whitewashed. One Mexican worker, versed in the old ways, said that whitewash was sometimes prepared by mixing lime with goat's milk and adding a little salt. Experiments made by the writer proved that the use of milk and salt did indeed produce a soft, smooth whitewash that did not easily rub off. Moreover, it provided an excellent surface for mural decoration.

The production of quicklime included numerous associated tasks. First, after a good source of lime was located, the kilns had to be built (Perry, et al. 2007:25, 28; see Perry et al. 2007:23–41 for other details about the construction of lime kilns):

Most of the lime kilns were constructed of limerock . . . the stones vary from one foot to five feet in maximum dimension with the largest stones weighing between one and two tons . . . At some kilns the stones are rather rough and show little shaping. At other sites . . . the stones were shaped . . . Gaps between the large stones were filled with brick and small pieces of limerock. The process of filling in between the larger stones is called chinking. At first, it seems odd that a kiln could be made of the same rock that was being made into lime, but limerock needs air space around it in order to be calcified. The fire would, at most, convert only the inner two or three inches of the walls into lime.

In order to be processed, the raw limestone had to be reduced to the required size; the chunks needed to be in the 25–50 cm size range. After the material was sufficiently reduced, the resulting chunks of rock had to be transported (usually a short distance) to where they would be processed (Webb 1952:83). A lot of oak, or other wood, was needed to fire the kilns, and the fuel would have to be brought from an ever increasing distance, as the closer sources were used up. The kilns had to be properly loaded, and after the firing, they had to be emptied; the large amounts of residual wood ash had to be continually moved away from the work area (large piles of wood ash were clearly visible at Dayton Canyon in 2015, some 100 years after operations there ceased). According to Perry et al. (2007:25, 23) the process of making lime was very hard work: “The men spent most of their time either hauling rock or hauling wood . . . One of the toughest jobs . . . was unloading the kilns . . . The lime was so hot and they’d just let it cool enough so it wouldn’t burn the barrel. It was necessary to pack the product immediately, because processed lime has a short shelf life [and therefore] it was better to have several small kilns.”

It is also necessary to consider the logistics of getting the processed lime to where it would be used. Perry et al. (2007:16) notes: “Because lime is much lighter in weight than the rock it is made from, it was easier to haul lime than rock. Consequently, kilns were usually located close to the source of the calcium carbonate.” In the early days of the west valley operations, simple *carretas* would have been used (Figure 8). Because of their very limited load capacity, it is obvious that at least several of these would have been needed to move any appreciable amount of product.



Figure 8
Facsimile Carreta at Mission La Purisima

In time, wagons of increasing size would have replaced the *carretas*. Perry et al.,(2007:135-136) in describing the lime works in Santa Cruz, note the following:

Through most of the 1800s, the first step in getting the lime to market was to haul it by wagon . . . Some of these wagons were custom built and were huge. In 1856 Davis and Jordan used wagons capable of hauling five tons of lime in a single load. By the fall of 1857, eight tons were being hauled in a wagon pulled by four horses. By July of 1858 Davis and Jordan had a wagon that could haul and estimated twenty tons. A local newspaper stated

that 'One hundred forty barrels of lime is the ordinary load conveyed from the kilns . . . [the biggest wagon] . . . carries as much in one day as ten ordinary wagons.' This wonder of engineering, including the ox-team that pulled it, 'stretched out over fifty or sixty yards' and had wheels 'seven and a half feet in diameter,' a bed 'ten-by-thirty foot,' and weighed '30,000 pounds before it was even loaded.'

Unfortunately, there are no specifics like this for the west valley operations; one chronicler noted simply, "Carrying the . . . building materials is the work of the drovers with their oxen and the muleteers with their mules" (Egenhoff 1952:159).

Making barrels to transport and store the quicklime was also an important part of the industry and increased in importance as production increased. In the case of the area considered here, there was a cooperage at El Zapo (the Toad), which is in the foothills about one mile south of Bell Canyon. Bob Edberg cited historic sources that show that "There were some Frenchmen making barrels there, and that the place was apparently a cooperage My guess is that these were being made for transporting and storing lime, although why there was one located away from Dayton Canyon is not clear to me" (Bob Edberg, personal communication, 2015). Barrels may have also been made at other places in the west valley, perhaps even at Dayton Canyon, given that there is still a considerable amount of oak woodland in the area, even today. Given the above, it is clear that the presence of the old lime kilns at Dayton Canyon have broad environmental and social implications. The west San Fernando Valley Oak Woodland certainly would have been negatively impacted by the operations of the lime works.

5. The West San Fernando Valley Lime Industry

As noted above, in 1795, Friar Vicente de Santa Maria reported that lime was being processed in the north-central San Fernando Valley, at the location where Mission San Fernando would soon be established. It is unfortunate that we do not know the source of the limestone. It is reasonable to assume that the original source was somewhere near the mission, but we have no definitive information. We do know, however, that there are multiple sources of suitable limestone in the west valley, and we do have some historic information that indicate this may have been the source of much of the quicklime that was used during the construction of the mission. These sources are the large deposits of limestone in the southeastern most Simi Hills, which are dissected by several steep east-flowing drainages, especially Bell Canyon and Dayton Canyon, and, to a lesser degree, Woolsey Canyon (Dibblee 1992; Sage 1971). Significant limestone processing operations would eventually be established at the mouths of all three of these canyons (Figure 9), which were, interestingly enough, the same places where the largest west valley Native American communities had existed for thousands of years (compare Figure 2 and Figure 9). There are several historic records concerning the lime works in both Bell Canyon and Woolsey Canyon, but the kilns at Dayton Canyon, in the center of the prime area for quality limestone bedrock, have never been described in detail. This section of the report will describe and discuss all three of these operations, both in terms of the important lime industry itself, but also because of the importance of the historic west valley Native American/mixed race community that operated them.

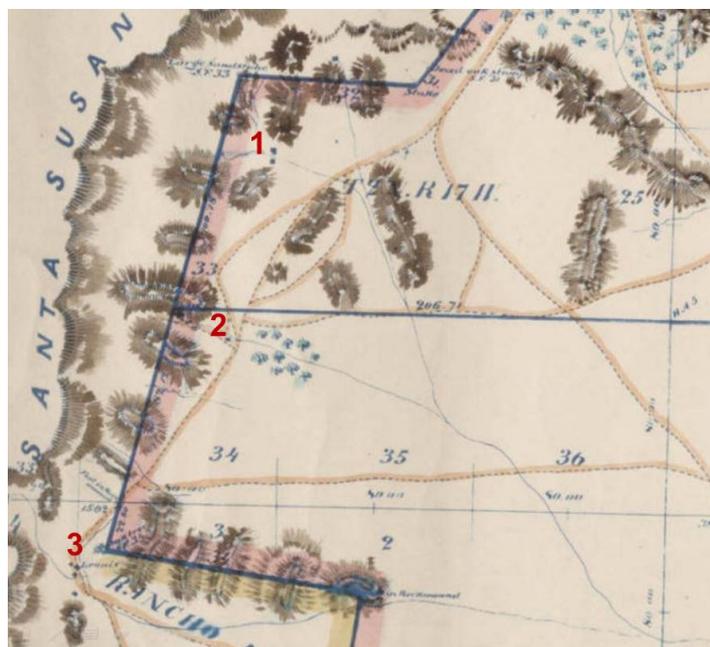


Figure 9
West San Fernando Valley Lime Works Locations at
(1) Woolsey Canyon, (2) Dayton Canyon, (3) Bell Canyon

Note that the dimensions for the west valley lime kilns, as they have been previously described, are limited to the kiln structures themselves. On paper, this makes the sites/activity areas appear smaller, and therefore less important, than they actually were. Components that have never been previously described, include the source-quarries, the staging areas and work areas, areas with barns, stables and/or corrals for oxen, horses and other equines, any facilities for equipment storage, the ash fields (which are especially noticeable at Dayton Canyon), the access routes, and the oak groves and other wood sources, both for fuel for the kilns, and for barrels to hold the processed lime. In specific reference to the CA-LAN-247H kilns at Dayton Canyon, for example, the site (i.e. the kilns) were recorded as occupying an area “ca. 10 by 30 yards.” Field observations made in 2015, however, show that the site as a whole, including the ash-field, covered an area of at least several acres.

The description of the three operations that are pertinent to the discussion here will begin with the two best known places: Bell Canyon and Woolsey/Box Canyon, and will continue with a description of those at Dayton Canyon.

The Bell Canyon Kilns (State of California CA-LAN-783H)

Although the Bell Canyon kilns are fairly well-known to local historians, the general public is not aware of their existence (Figure 10). Although they are located in publicly accessible open-space, and are adjacent to a public hiking trail, they are not marked or signed in any way, and almost everyone that walks by them is unaware of their presence. Over the years the kilns have gradually been buried by alluvium, which washes in from the hillside above, and from the adjacent creek. As of 2017, only small portions of the one of the walls are still exposed (Figure 11).



Figure 10
Mouth of Bell Canyon Kiln in 1987

It is possible that the kilns at Bell Canyon are the oldest in the west-valley, due to their presence at *Rancho El Escorpion*. The historic *Rancho El Escorpion* grant, as discussed above, is important because it was one of the few grants that were made to local Native American people. The native village at the mouth of the canyon, had long been an important place when the grant was made, and the area would continue to be the principal focus of the west valley Native American/mixed race community well into the early 20th century. By the late 19th century, *Rancho El Escorpion*, including the lime operation, was owned by the French-Basque immigrant Miguel Leonis, who became part of the old community by marrying Espiritu, the youngest of Odon Chihuya's three daughters. And Espiritu, by a previous marriage, was the mother of Juan Menendez, who was one of JP Harrington's most important native consultants in 1917.



Figure 11
Portion of Kiln Wall in 2017

There were once several historical buildings and structures at *El Escorpion*. According to Bob Edberg's interviews of Max Knapp, a "... dam, an old adobe very close to it, and the limekiln upstream were all constructed and operated by the Spanish at Mission San Fernando, with Indian labor, of course. This is what Max [Knapp] had heard from the oldtime Mexicans and halfbreeds living at the Leonis Adobe ... The dam was low, constructed of flagstone cemented together with a crude lime mortar, obtained presumably from the old limekiln ... his brother [Frank Knapp] told him that the dam also had little spillways at each side made out of roof tiles!" (Edberg 1977). In addition to the specific comments about the kilns, the statement shows that someone who was providing an oral history of the area, in the late 1970s, could remember knowing members of the old part-native community (the "Mexicans and half-breeds"). Edberg also notes that "The old timers at the Leonis Adobe said that the limekilns in Bell Canyon, Dayton Canyon and the Chatsworth Reservoir were used to burn lime for the Mission San Fernando ... The [Bell Canyon] dam was built a short distance below the limekiln in order to catch the water ..." (Edberg 1977: 1-2).

The archaeological Site Record for CA-LAN-783H states that it "... encompasses a horizontal area of 800 square meters and has a maximum vertical depth of 80 cm. Historic artifacts, primarily square nails, were recovered from this site during the test excavations ... it is presently impossible to determine an accurate date for the construction and/or operation of the kiln. The kiln may have been built during the Spanish occupation of California for the production of lime mortar for mission construction. However, the kiln may have been built in the early 1800's for the production of lime mortar for the construction of the Rancho El Escorpion adobe structures" (Tartaglia and Romani 1978:5-6).

Rancho El Escorpion was already well-known by the time that California was acquired by the United States, for according to Cohen (1989:23): "Near the close of 1860 . . . a party of Easterners arrived in town on a scientific mission, and in February of 1861 their guide brought them to the San Fernando Valley where they camped on the Scorpion Ranch and hiked in what they were told were the Scorpion Hills." This was part of a group of geologists that belonged to the Josiah D. Whitney Expedition, which was mapping much of California at the time (Mount Whitney, the highest peak in the lower 48, was named for him). Whitney himself was not with the party, which was led by William H. Brewer. On February 18, 1861, Brewer and his party camped for several days and explored the canyon and surrounding hills (Brewer 2003:45-46).

The Woolsey Canyon/Box Canyon Kilns (State of California CA-LAN-651H)

The surviving *El Escorpion de las Salinas* kiln is known as *La Calera*. It is the best known, and in theory the best protected, of the west San Fernando Valley lime kilns, and can easily be seen by the public from nearby Valley Circle Boulevard, if one knows where to park and where to look (Figure 12). *La Calera* has several official designations, including State of California # CA-LAN-651H. *La Calera* is also listed as California Historical Landmark No. 911, and it is listed as City of Los Angeles Historic-Cultural Monument No. 141. This kiln was very well built, and it is made from local hand-hewn sandstone and native rock; the walls are some four feet thick. It is about 20 feet in diameter (outer edge to outer edge), and was at one time perhaps 20 feet deep.



Figure 12
Ruins of La Calera in 2015

As noted above, the senior member of the *El Escorpion de las Salinas* community was French immigrant Pierre Domec (1820–1883), who began his life in Southern California in 1844, as a cooper (barrel maker) for Jean-Louis Vignes. Vignes was the first commercial wine-maker in Los

Angeles (Los Angeles Union Station, on Vignes Street, occupies much of his old winery today). Pierre Domec and Maria Delores Domec, and their extended family, eventually built three adobe houses and a barn, and Pierre operated at least one, and possibly two, kilns at *El Escorpion de las Salinas*, and two or three kilns at Dayton Canyon. The Domec's also owned a house and a bakery next to the Plaza Church in downtown Los Angeles: "In 1849 he is with Maria at *El Escorpion [de las Salinas]*, and their daughter, who is born in 1854; The 1860 Census also places him at *El Escorpion de las Salinas*, while another document has him owning the building at Los Angeles Plaza (Ray Vincent, personal communication 2017).

In 1916, in speaking of *La Calera*, Charlie Bell told Harrington that "Lime pits of the Mission were there" (Harrington 1986:27, 106–117:9:3). Bell also told Harrington that "Lime from La Calera was used in Los Angeles even after the Santa Cruz lime began to be brought in" (1986:28, 106–117:9:5) and, concerning the fate of the lime industry, that "Finally the Tehachapi lime was granted such low rates by the railroads that all competition was precluded" (1986:28, 106–117:9:6). From this, it appears that the west valley lime industry existed, and would have been an important potential source of employment for many people in the west valley, from sometime after 1800 until perhaps the beginning of World War I, when large amounts of lime from Tehachapi became available.

La Calera was examined and partially excavated by archaeologists from California State University Northridge in the early 1970s (Briuer 1975). According to White et al. (2008:17):

The oldest finds from the archaeological excavations are supportive of the hypothetical early date for the calera. These finds include four beads and four stone tools thought to relate to the Indian labor operating the kiln. Two of the beads are Venetian glass trade-beads while two others are traditional marine shell beads . . . A clay pipe stem found in a unit near the kiln represents the only European artifact which could date to the late 18th or early 19th century. The great majority of the finds appeared to date to the late 19th or early 20th century when [a] farm was in operation. Many came from fill in the calera itself.

At some point, during the early 1970s, the front half of La Calera was destroyed by someone using a back-hoe, as can be seen in Figure 12. This was very unfortunate, since the door at the front of a limekiln is the most interesting in terms of construction, as seen in Figure 10. The remaining half of the kiln remained intact and sometime later, according to Treend (1974):

The ruins of the Chatsworth Calera . . . were brought to the attention of the public by Helen Treend, an environmental quality commissioner [for the City of Los Angeles], who had heard about the kiln from Max Knapp of Chatsworth, a "Valley pioneer stone mason." The presence of the kiln was also known to other residents of the west San Fernando Valley: "William Orcutt, a renowned geologist/paleontologist . . . wrote of the milestone outcrops near his ranch. He believed these outcrops to be of especially good quality for lime production. Local legend . . . has it that the circular limestone structures, characteristically put into the sides of hills in Dayton Canyon and at LAN-651 (Chatsworth Calera site), are indeed Spanish period kilns operated by Indian laborers for building the mission at San Fernando.

In 1927, the new American residents renamed the northern part of *El Escorpion de las Salinas* "Chatsworth Lake Manor," and the southwestern part, to as far south as Dayton Canyon, became known as "Lakeside Park." According to Ray Vincent of the Chatsworth Historic Society, members of the Domec family continued to live in the Lake Manor/*El Escorpion de las Salinas* area until at least as recently as the 1950s (personal communication 2015). The author has been told by

local residents that a couple of descendents from the old community were still living in the community as recently as the end of the 20th Century, but the author has no proof of that, or not, at this time.

The Dayton Canyon Kilns (State of California CA-LAN-247H)

The Dayton Canyon lime kilns probably date from some time “. . . during the mid-19th Century, or perhaps even earlier. They may or may not have supplied processed lime for the Mission San Fernando complex” (White et al. 2008:15). For this reason and others, it is important to carefully consider the lime kilns identified at Dayton Canyon in 2015 as potentially being significant in terms of regional history. It needs to be pointed out that many of the French and French-Basque immigrants that inter-married with the old native community were well-versed in lime production. It is very likely that, even if the initial development of the west valley lime industry was intended to provide product to Mission San Fernando Rey, etc., the industry did not develop as a viable commercial enterprise until the arrival of Pierra Domec, Miguel Leonis, and other post and non-Spanish immigrants, during the Mexican Period (i.e., in the early-middle 19th century).

Bob Edberg provided the following comments: “I believe that Domec was a principal in the operation of the lime kilns (3 or more) located at the mouth of Dayton Canyon. He had associates, including Charles Liboubain and Jose Mascarel. Liboubain probably operated the kilns and Mascarel handled cooerage and distribution/sales in Los Angeles. It seems like lime burning in the west San Fernando Valley was a fairly large scale operation centered at Dayton Canyon. The Dayton Canyon lime kilns constituted an industry that was instrumental in building the infrastructure (brick and mortar buildings) of the expanding L.A. Pueblo/City in the 1840s–1860s time period. Jose Mascarel can specifically be identified with Dayton Canyon and the lime works there. The ‘House of Mascarel’ identified at the mouth of Dayton Canyon on an 1865 map (Figure 13), may not be a residence, but was perhaps the cooerage that had to be associated with the lime burning operation at Dayton.” As a side note, it should be mentioned that Jose Mascarel was the Mayor of Los Angeles in 1865. And Pierre Vignes chartered the ship with Mascarel as Captain of the ship to bring Pierre Domec and other Frenchman to San Pedro in 1844 to work for him at the Pueblo de los Angeles (Bob Edberg, personal communication 2015)

The west valley lime industry apparently produced, or had the potential to produce, enough revenue to become a contentious issue because, in 1863, Andres Pico sued Pierre Domec for refusing to pay rent on Pico’s property on the south side of Dayton Canyon. Domec’s family, through his wife Maria Delores and her father Odon Chihuya, had probably been mining lime at Dayton Canyon before Andres Pico acquired the southern half of the San Fernando Valley in 1853. The subsequent 1863 east-west property line, however, followed today’s Roscoe Boulevard, which meant that the good limestone deposits on the south side of the canyon belonged to Pico. Domec, whether he had been active there first or not, apparently agreed to lease that area from Pico, but never paid, so Pico sued (Los Angeles County Superior Court case #00988). Domec was out-classed: Andres Pico was the brother of the last Mexican governor of California, Pio Pico. Andres had commanded Mexican-Californian cavalry in the Mexican-American War, and he was the victor of the Battle of San Pascual, in San Diego County- one of the few times that Mexican arms had been successful during the war. After the United States acquired California, Andres became one of California’s first State Assemblymen and, in 1858, Governor John B. Weller appointed him a Brigadier General in the California State Militia, the predecessor of the National Guard. Andres Pico became a United States Senator for California in 1861, and was in office when he sued Domec, who lost the case and (in 1866) had to pay Pico \$300.00.

The considerable kiln operations at Dayton Canyon, whoever the owner or owners, must have had a significant impact to the environment of the lower canyon and immediately surrounding area. Large areas of chaparral had to have been cleared to gain access to the lime deposits and to create work and loading areas and roads, and a constant supply of oak was needed to fire the kilns. Indeed, some of the earliest west valley roads may have been cleared and leveled to create viable access routes for the heavy loads of processed lime and firewood, carried by the various carts and wagons that serviced the operations.

The Dayton Canyon kilns were originally recorded in 1963 by Nordstrom, whose Site Record has very minimal information, is poorly drawn, and has no datum. But the map does show the relative location of the kilns near the mouth of the canyon, and it notes “3 kilns used for roof tiles” in an area of approximately “10 by 30 yards.” There is no indication as to why the kilns were considered to be to produce roof tiles since (in 2015) no tile wasters were observed (wasters are broken pieces of tile; their presence would show that terra cotta products had been manufactured there). The 1963 site record describes the two larger kilns as being approximately 12 feet in diameter (interior dimensions), with the third kiln being slightly smaller; associated facilities included an old road track and a work area adjacent to the kilns. The 1963 record also notes that “Limb scars in oak indicate 2-3 periods of usage,” but no specifics as to how this conclusion was reached are provided. It is possible that this comment refers to some of the information included on the historic marker in Orcutt Park (see following).

A 1978 Site Record Supplement by Bob Edberg, states that the kilns were “probably built by the Padres of Mission San Fernando,” and that they are “Probably very well preserved! Due to rapid dumping on top of kilns.” Edberg’s comment here is important, because it shows that the lower canyon was being actively used as a private trash dump at that time. This situation was confirmed in a letter from Los Angeles 12th District City Councilman Robert M. Wilkinson, to Carl S. Dentzel, the President of the City of Los Angeles Cultural Heritage Board, of the Municipal Arts Department, in which Wilkinson noted “. . . the Dayton Canyon site is being destroyed by the dumping of debris and last August it was reported only a small portion of the structure was still visible” (February 18, 1975). Wilkenson added that “On behalf of many local residents, it is requested your Board consider these sites as historical monuments” (note: this request was for both *La Calera*, which was made into a City of Los Angeles Cultural-Historic Monument, and for the Dayton Canyon kilns, which were not). The trash eventually completely covered and therefore concealed the kilns in the lower canyon, and this was a major contributing factor in their near-destruction in 2015.

In 1989 RMW Paleo Associates examined the lower canyon and created a Site Record Supplement for CA-LAN-247H Unfortunately, their map location for the kilns was in the upper canyon, which does not correspond to the previously mapped location. The RMW report states that “The three kilns described in previous work [by Bob Edberg] could not be relocated in April 1989. Apparently, the kilns were destroyed during construction of horse ranches now in the area” (Bissel 1989). The 1989 RMW survey report also states that LAN-247H had been destroyed, and it states that “The surviving historic deposits are all apparently related to the sheep herding industry and are expected to have a low order of significance” (Bissel 1989:ii). No additional comments on what was being referring to in this regard (fences? shepherders gear? Shepherd’s wagons?) is provided. This is unfortunate, because there is very little available information on this subject, for the area. Any description of any facilities related to that practice would have been of interest; knowing more about the subject would give us a fuller understanding of the old west San Fernando Valley community and their activities.

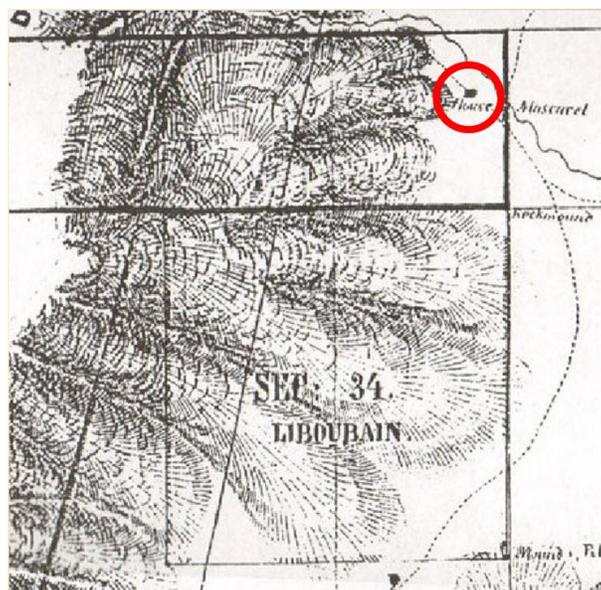


Figure 13
Location of "House of Mascarel"

By the end of the 19th century, the old community was being submerged by the newly arriving Americans. Pio Pico, the last major Mexican property owner in the valley, had sold his valley holdings to *norteamericanos* by the early 1870s, and the new owners and innumerable squatters frequently did not recognize the property rights of the old community. In the case of Dayton Canyon, we know that in 1908, Clyde Dayton acquired title to 138 acres in the lower canyon, and he later acquired parts of the upper canyon. The Los Angeles County Assessor identified most of the canyon as not having been part of a legally recognized (by the United States) land grant (Gregory 2000:1). In other words, Dayton Canyon was west and outside of the Ex-Mission San Fernando grant, southeast of the Rancho Simi grant, and north of the Rancho El Escorpion grant; therefore, the old owners did not own the canyon, and it was available for homesteading. Gregory provides a complete list of American-period Dayton Canyon property owners, and a list of "Improvements on Dayton Canyon Property Found in Assessor's Historical Records" for Los Angeles County (Gregory 2000:6). According to this list, Clyde Dayton (1910) and Henry Elliott (1916) are the first two area property owners whose improvements to their properties were officially registered with Los Angeles County.

By the first part of the 20th Century, other Anglo-American settlers like Dayton were establishing themselves in the west valley. The vast majority of the immigrants were farmers, and it is unlikely that many of them had any role in the operation of the west valley kilns, but we do not know for sure. It is certainly possible, for people in those days did still know how important lime is, and some of the members of the new citizenry seem to have understood the importance of the old kilns, even as they fell out of use. There are no indicators that Clyde Dayton had anything to do with the kilns or their operation; he was a bee-keeper, and popularly known as the Red Ripe Honey Man, who could often be seen pushing a wheelbarrow full of jars of honey for sale through local communities. The *Owensmouth Gazette*, a local paper, sometimes printed his offbeat theories of nutrition; for example, he touted honey as a health builder, because of its "molecular value," and thought that foods needed to be colorful to be healthy. Dayton and his second wife, Lulu, were recluses, and they were "regarded dubiously by some of the settlers" (Catherine Mulholland, in

Gregory 2000:1). In a spectacular crime that was never solved, both Mr. and Mrs. Dayton were “burned to a crisp” in a fire at their home site in April 1922; it was never determined if they had been shot dead first, or if it was murder-suicide, and if so, who killed who (Van Nuys News XI:7 in Gregory 2000:2).

Sometime during the early 20th century, Dayton Canyon became the first place where an auto road was built from the San Fernando Valley, so as to access the Simi Hills. The route was called the Dayton Canyon Motorway, and it was probably established once automobiles that were tough enough and powerful enough to climb and traverse steep hills were available. Marcia Silvernale McGillis, whose family co-owned Sky Valley Ranch (the western part of the later Santa Susana Field Laboratory), and Orrin Sage Jr., whose family owned Sage Ranch (today’s Sage Park), both recalled their families using the Dayton Canyon Motorway to access their ranches, as recently as the late 1940s, prior to the construction of Woolsey Canyon Road. The Motorway began at the intersection of today’s Valley Circle Boulevard and Roscoe Boulevard. It went west, up Dayton Canyon, to the north fork of the canyon. From here it went up the north fork of the canyon, until it reached Woolsey Canyon Road; it generally followed that route (still the existing route) all the way to the Albertson Motorway, on Sage Ranch, at crest of the Simi Hills. Current development plan calls for the old Motorway to become a public hiking and equestrian trail.

The most famous person to have lived at Dayton Canyon was William Warren Orcutt (1869–1942), who established his 210-acre *Rancho Sombra del Roble* (“Ranch in the Shade of the Oak”) on the creek, in the Oak Woodland a short distance from the mouth of the canyon, in 1917. Orcutt was a very well-known geologist and oilman, and was eventually known as the “Dean of the Petroleum Geologists” (see Orcutt 1926). In time, Orcutt became one of the most important people in the then-young Union Oil Company and, while working in Los Angeles in 1901, Orcutt became the person that first realized the scientific importance of the extensive late Pleistocene fossil-beds at Rancho La Brea (i.e., the La Brea Tar-Pits). Although the details concerning Orcutt’s ranch and career are beyond the scope of this report, it should be noted that the Orcutt Ranch buildings are a mixture of Spanish Colonial Revival and Mission Revival Style buildings, plus a couple of generic American ranch/farm barns and out buildings. According to Catherine Mulholland (1987:152), Mrs. Orcutt eventually became the “Grande Dame” of the new town of Owensmouth, which had a population of 202 in 1917, the year the Orcutt family arrived, and the year the short-lived town was annexed to the City of Los Angeles.

The grounds of *Rancho Sombra del Roble* were (and still largely are) planted with extensive fruit orchards, rose gardens, and other specialty gardens, and all of these are linked by a number of nicely constructed and attractive walk ways. The ranch even has its own shrine to the Madonna. Orcutt used the ranch, in part, as an experimental botanic garden, and many exotic trees, shrubs, and flowers were planted. The citrus orchard that Orcutt planted is now one of the last two citrus orchards in the San Fernando Valley (a small grove also still exists on the campus of California State University, Northridge). Although most of the ranch was eventually sold off and the area was developed as single-family housing, in 1965, the remaining undeveloped 24 acres of *Rancho Sombra del Roble* were designated as Los Angeles Historical-Cultural Monument No. 31; William had passed away many years earlier, but Mrs. Orcutt still lived in the ranch house. The following year, the City of Los Angeles purchased the entire remaining 24 acres, and the ranch became the beautiful Los Angeles City Park that it is today.

All of this is pertinent because one of Orcutt’s many interests was California History. Orcutt was, at times, a member of the Board of Directors of the Southern California Historical Society, and we know that Orcutt, a geologist, was interested in the nearby Dayton Canyon lime-kiln operations.

The facilities and quarries that were present at the time that Orcutt established *Rancho Sombra del Roble* would have been available for him to examine at his leisure. It therefore seems quite possible that Orcutt was one of the people, if not the person, that initiated the effort to preserve the local kilns and give the former operations the historical recognition that they deserved. Indeed, a historical marker in his honor was established on the grounds of Orcutt Ranch by the Historical Society of Southern California, on October 2, 1948, as a part of the celebration of the California Centennial. The marker specifically mentions the Dayton Canyon kilns and associates them with Mission San Fernando Rey (Figure 14); a dozen or more large pieces of vitrified sand from the kilns are stacked next to the historic marker. It can also be noted that Orcutt used quite a bit of lime to coat and protect his house and some of the other ranch buildings; it is possible that that Orcutt used lime from Dayton Canyon—indeed, he may have been the last to do so. The 1797 -1806 date on the plaque in Orcutt Park identifies the building period as 1- from the original founding of the Mission complex in general, but prior to the erection of permanent buildings and structures, and more specifically to 2- the beginning of the period of construction of the permanent abode, lime-covered, church and associated buildings, etc.



Figure 14

Old Mission Lime Kilns Historic Marker in Orcutt Park

The preservation effort that Orcutt and/or others initiated generated several public get-togethers in support of a preservation effort, and some of the publicity supports the idea that the west valley kilns had originally been associated with Mission San Fernando. For example, an article in the *Van Nuys News* (October 28, 1927) reported on a large community picnic at Lakeside Park (which was the new American name for the southwestern part of El Escorpion de las Salinas). The *News* noted that "The west end of the Valley is rich in historical lore and the barbeque was held . . . to give Native Sons an opportunity to inspect numerous landmarks which they have undertaken to preserve and permanently mark, including several kilns used by the padres in the construction of San Fernando Mission." Orcutt's new *Rancho Sombra del Roble* is close at hand, and it is not impossible that the ranch itself was the venue for the picnic, although neither Orcutt nor his ranch are specifically mentioned.

The significance of the old kilns was again acknowledged in a *Van Nuys News* article (November 8, 1927) which had the headline: "Native Sons Deeded Land Where Old Lime Kilns of Padres Days Stood":

As the first definite step in the work of the history and landmarks committee of the Native Sons in San Fernando Valley, Cahuenga parlor this week announced a gift of a park site in Grover's Lakeside Park back of Chatsworth Lake, which includes two of the old lime kilns used by the Spanish padres who built the San Fernando Mission. The Native Sons will probably recommend that the site be deeded to the city as a park.

R.L. Grover has laid out [the] site so that it will have some frontage on the new Circle drive that will skirt the west end of the Valley from Calabasas to Chatsworth. He has already begun the work of cleaning out the debris from the old lime kilns, preparatory to their restoration as planned by the Native Sons. The two lime kilns are in a fair state of preservation, and the old trail is still visible which the Indians trod in bringing the lime rock from the hillside to the kilns.

A subsequent *Van Nuys News* article (May 7, 1929) announced plans for a "barbeque-fiesta", also to be held at Lakeside Park. The article noted that "The lime kilns are located in a grove of oaks just off of the proposed Valley Circle boulevard, and the park as planned will have an entrance from the new highway. The kilns are in an excellent state of preservation." Of this comment, it can be noted that the Dayton Canyon kilns were "in a grove of oaks," whereas the kilns at La Calera are in a (now) open field, so again, it sounds like and seems likely that this particular event was held at Dayton Canyon- either at the kiln area itself, or perhaps at Orcutt's ranch.

Another *Van Nuys News* article (May 14, 1929) makes a similar statement and again mentions "... several of the ancient lime kilns . . ." in the Lakeside Park area. It is also of some interest that the same article mentions that "Mr. Hadley stressed the fact that the barbeque was strictly a stag affair." Given that 1929 was during the time of prohibition in the United States, we wonder if the comment on "a stag affair" is a circumlocution which indicates that illegal alcoholic beverages would be available. It is also possible that, given the relative isolation of the Dayton Canyon area at the time, there may have been a moonshine operation somewhere in the canyon.

As to the phasing out of the lime-works, mining technology had changed to a considerable degree during the 19th century, the period when the west valley lime industry was active. Elsewhere, the picks and shovels, and ox or horse-drawn wagons, that were in use early in the century had been replaced with drilling equipment that created sets of deep holes that were filled with TNT, which when set-off, shattered large areas of bedrock; large tracked steam-engine

excavators were then used to load the rubble into dump-trucks, which carried the loads to industrial sized kilns for processing. Transportation was also better, and by the end of the century product was moved by trucks on new or newly improved roads, and in some cases by railroad (e.g., from the Monolith cement plant, in Tehachapi Valley, north of Los Angeles). But none of these advances happened in the west valley, so far as we know. The fact that the old Native American/mixed race community was not at all prosperous was certainly a contributing factor: simply put, Odon's descendants and their families, and the late 19th century community in general, would have lacked the funds for major capital investments in equipment like steam shovels and trucks.

It is possible that the west valley works were doomed anyway; perhaps the lime deposits were examined by geologists for possible development and found wanting, we do not know. Maybe someone decided that the deposits were too small to develop, or that they would be difficult to work, and the potential return would not repay the investment. Maybe the quality of the parent material was not suitable for modern uses. Regardless of the reasons, "Finally the Tehachapi lime was granted such low rates by the railroads that all competition was precluded" (Harrington 1986:28; 106-117:9:6). So an era came to an end in the west valley; the last time local lime that was processed may have been used at William Orcutt's new estate, just outside the mouth of the canyon.

Of the Dayton Canyon itself, we know that after operations ceased, the canyon was used for a variety of activities. Clyde Dayton, for example, was a bee keeper, and the 1989 RMW Paleo report mentions sheep-keeping facilities in the lower canyon. It also know (Orrin Sage, personal communication 2016) that cattle ranching took place in the area, and that at least some equines were present. But, unfortunately, we know very little about what specific activities took place in the canyon during the middle of the 20th Century, although topographic maps for the area suggest that at least two or three houses were built in the canyon during that period. By 2015, when the development of residential housing began in Dayton Canyon, only a very few people were aware that multiple limekilns were present. Although probably once a locally important place, both prehistorically and historically, most of the Dayton Canyon area had by then been private property for many years. As such, any memory of the existence of the lime-works was for the most part lost, with the exception of the little-known historic marker in Orcutt Park. And most unfortunately, sometime during the 1950s or 1960s, the people that owned the lower part of the canyon began using it as a for-fee dump, and this continued, to an unknown degree, probably intermittently, for 20-25 years. Because of this, the entire lower canyon became buried in several feet of trash, garbage, and building/structure rubble.

Although all of this rubble, debris, and residual garbage may have "capped" the lime-works, and in a way "protected it" for a time, the trash also effectively hid the historical deposits from the view of the site monitors and other project personal, and so at least 2/3 of one kiln (Feature A, to the left of the two people in Figure 15) was bull-dozed and destroyed during project mass-grading, as was almost all of a second kiln (Feature B, between the three people in Figure 15).



Figure 15
Remains of Dayton Canyon Kilns in 2015

The 1963 Site Record by Nordstrom describes the two large kilns as being approximately 12 feet in diameter (interior dimensions), and it describes a third kiln as being “slightly smaller,” with all three kilns being in the same area (i.e. in the lower canyon). Unfortunately, only two kilns were observed in 2015, and there is no way to account for the discrepancy; the third kiln (we do not know if it was large or small) may have been destroyed in the past, or it may have been completely destroyed in 2015. After they were uncovered, it was possible to determine that the Dayton Canyon kilns were built on the south bank of the lower drainage, at the point where the drainage widens out and enters the valley proper. Kilns are always positioned so that they can be loaded from the top and cleared out from the bottom. Given this fact, the door-opening part of perhaps both of the kilns should be extant, in the south-side creek bank, which has not been graded away. An archaeological examination of this remaining part of the kiln would undoubtedly tell us a great deal about how they were built, and perhaps when.



Figure 16
Remains of Dayton Canyon Kiln Feature A in 2015

It is important to note that when RMW Paleo examined the Dayton Canyon area in 1989, they reported that they did not find CA-LAN-247H at its recorded location in the lower canyon, saying “The three kilns described in previous work could not be relocated . . . Apparently, the kilns were destroyed during construction of horse ranches now in the area”; their survey report also states that LAN-247H had been destroyed (Bissel 1989:ii). Strangely then, their Site Report Supplement includes a map of “CA-LAN-247H,” which shows kilns near the junction of the main canyon with the north fork of the canyon, some ¼ mile from Nordstrom's 1963 map location. It is possible that this apparent discrepancy reflects the fact that there had been two sets of kilns at Dayton Canyon- one in the lower canyon (Nordstrom's CA-LAN-247H) and one in mid-canyon. The distribution of the ash fields that were observed during grading in 2015 supports the suggestion that there was more than one set of kilns. Figure 17 shows what remains of the ash fields west of CA-LAN-247H, and a second ash-field, up-canyon, can be seen in the lower right 1/4 of the upper left 1/4 of the Figure; this second ash-field was quite evident in the field. A close-up of the ash field derived from Feature A, following exposure by grading, can be seen in Figure 18.



Figure 17
Ash Fields Associated with CA-LAN-247H Feature A at Right of Photo;
Second Ash-field, Up-canyon, Visible in Upper Left of Photo



Figure 18
Close-up of Ash Field with Lime Residue
West of Feature A

Now having three separate kilns to consider, we can see that one very obvious distinction between the kilns at Bell Canyon (Figures 10 and 11) and *La Calera* (Figure 12) on one hand, and the kilns at Dayton Canyon, on the other, is the difference in construction methods. The kilns at Bell Canyon and *La Calera* are relatively well-built out of native field and native hewn stone. The Dayton Canyon kilns, however, were not constructed from hand-hewn stone, except at the base. Instead, it appears that a pit had been dug, a solid base was built, and then the rest of the pit was simply lined with (crushed) limestone rock, which was fired so as to cause it to vitrify, and form a lining (Figure 19). This may have taken place during early firings, or the kiln may have been formed and fired so as to fix and secure the walls, prior to its being put into service. Clearly the surviving Bell Canyon kiln and the surviving kiln at *La Calera* are more similar to each other than they are to the kilns at Dayton Canyon. A large ash-field was present at Dayton Canyon, but any ash-fields that may have existed at Bell Canyon and at *La Calera* were mostly graded away years ago, although in fact, the little limestone debris at *La Calera* does not look very much like the ash at Dayton Canyon. It is possible that the difference in appearance of these two examples reflects nothing more than difference stages in processing. But it is also possible that different products were being made, perhaps a thinner product intended for use as plaster at Dayton Canyon, and a thicker product intended for use as mortar at *La Calera*.



Figure 19
Vitrified Kiln Wall at Dayton Canyon

In conclusion it can be said that the historical lime works at Dayton Canyon, Bell Canyon, and at *La Calera*, are the physical remains of what was once a very important part of the economic development of the modern San Fernando Valley region. The now mostly forgotten people that helped established and operate them did much good work. The Mission San Fernando complex, the various local ranches, and old downtown Los Angeles, all grew and prospered in part because of the lime industry and the people- in this case a Native American/mixed race community- that mined, processed, and made a finished product, that was used by essentially everyone in the region, to one degree or another. These people, and the industry itself, deserve to be remembered and honored.

It is a well-known fact that the Spanish, Mexican, and American ranches and other settlements were frequently established at Native American villages, in part to take advantage of the same resources, especially sources of water, that had first attracted Native Americans, but also because there was a ready supply of labor (i.e. the natives) at those places. The primary reason that the three west San Fernando Valley lime-works were established where they were established is obviously because it was those three places where useable and accessible limestone deposits were located. It is also obvious, in this case, that the presence of the west San Fernando Valley Native American community, provided a ready source of labor for the lime-works.

Although there is a un-numbered historical marked that commemorates the west San Fernando Valley lime-works, specifically that at Dayton Canyon, in Orcutt Park, the historic marker is all but hidden away in one of the more remote corners of the park. This author suggests that a new and publically accessible historic marker be placed in the new park-to-be at Dayton Canyon, as a part of the mitigation for the destruction of the prehistoric village site and most of the old lime kilns, so that the public can be educated and otherwise informed about the old lime industry- without which the development of the San Fernando Valley and surrounding area would have been much more difficult and taken much longer- and the important contributions made by the Native American people that lived in the area for thousands of years.

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References Cited

Applegate, Richard

1975 An Index of Chumash Placenames. *Papers on the Chumash*. San Luis Obispo County Archaeological Society Occasional Paper 9:21-46. Paso Robles, California. .

Bean, L. J., and Charles R. Smith

1978 Gabrielino. In *Handbook of North American Indians, California*, Volume 8, Robert F. Heizer (editor), pp. 538-549. Smithsonian Institution, Washington D. C.

Bissell, Ronald M.

1989 Cultural Resources Reconnaissance of The Dayton Canyon Parcel, Los Angeles County, California. On file South Central Coastal Information Center, Department of Anthropology, California State University Fullerton (hereafter SCCIC CSUF).

Blackburn, Thomas C.

1974 Ceremonial Integration and Social Interaction in Aboriginal California. In: *?Antap: California Indian Political and Economic Organization*, Lowell J. Bean and Thomas F. King, editors. Ballena Press.

1975 *December's Child, A Book of Chumash Oral Narratives*. University of California Press. Bowers, Stephen

Bowers, Stephen

1879 The Santa Barbara Indians. Unpublished manuscript. Los Angeles Southwest Museum Library.

Brewer, William H.

2003 *Up and Down California in 1860-1864 - The Journal of William H. Brewer*, Fourth Edition, with Maps. University of California Press, Berkeley.

Briuer, Frederick L.

1975 Preliminary Report of Archaeological Excavations at the Chatsworth Reservoir Kiln Site (4 LAN-651). Unpublished report, on file Department of Anthropology, California State University, Northridge.

Cohen, Chester G.

1989 *El Escorpion - From Indian Village to Los Angeles Park*. Periday Co., Woodland Hills, California.

Corbett, Ray and Richard B. Guttenberg

2014 Phase I Archaeological Survey Santa Susana Field Laboratory Area I, Area III, and Southern Undeveloped Land, Ventura County, California. Prepared for the Boeing Company. Prepared by John Minch and Associates, Mission Viejo, California. On file at SCCIC CSUF.

Corbett, Ray, Richard B. Guttenberg, and Devlin A. Gandy

2015 Phase I Archaeological Survey Santa Susana Field Laboratory Area II and Lox Area I. Prepared for CH2M Hill, Denver, Colorado. Prepared by John Minch and Associates, Mission Viejo, California. On file at SCCIC CSUF.

- Corbett, Ray, Richard Guttenberg, and Albert Knight
 2012 Final Report, Cultural Resource Compliance and Monitoring Results for USEPA's Radiological Study of the Santa Susana Field Laboratory Area IV and Northern Buffer Zone. Prepared by John Minch and Associates, Mission Viejo, California. On file SCCIC CSUF.
- Costello, Julia G.
 1977 Lime Processing in Spanish California. *Pacific Coast Archaeological Society Quarterly* 13(3):22-32.
- Dibblee, Thomas W., Jr.
 1992 Geologic Map of the Calabasas Quadrangle, Los Angeles and Ventura Counties, California. Dibblee Geological Foundation, Santa Barbara.
- Edberg, Bob
 1977 Interviews with Max Knapp. On file Chatsworth Historic Society; on file Leonis Adobe Association.
- Egenhoff, Elisabeth L.
 1952 *Fabricas- A Collection of Pictures and Statements on the Mineral Materials Used in Building in California prior to 1850*. Assembled by Elizabeth L. Egenhoff As A Supplement to the California Journal of Mines and Geology for April 1951. State of California, Department of Natural Resources, Division of Mines.
- Engelhardt, Zephyrin, Fr. O.F.M
 1927 *San Fernando Rey, the Mission of the Valley*. Franciscan Herald Press, Chicago, Illinois.
- Fenenga, Franklin
 1973 An Archaeological Survey of the Area of Air Force Plant 57, Coca Test Area, Santa Susana Field Laboratory, Ventura County, California. On file SCCIC CSUF.
- Gibson, James R.
 2013 *California Through Russian Eyes 1806-1848*. The Arthur H. Clark Company. Norman, Oklahoma.
- Golla, Victor
 2007 Linguistic Prehistory. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 71-82. Altamira Press, New York.
 2011 California Indian Languages. University of California Press. Berkeley, California.
- Gossard, Gloria Hine
 2007 *Images of America, Tehachapi*. Arcadia Publishing, Charleston, South Carolina.
- Grant, Campbell
 1965 *The Rock Paintings of the Chumash*. University of California Press, Berkeley.
 1978a Chumash: Introduction. In *Handbook of North American Indians: California*. Robert F. Heizer, editor, Volume 8, pp.505-508. Smithsonian Institution, Washington D.C.
 1978b Eastern Coastal Chumash. In *Handbook of North American Indians: California*. Robert F. Heizer, editor, Volume 8, pp.509-519. Smithsonian Institution, Washington D.C.

Gregory, Timothy

- 2000 Summary of the Historical Resources in the Dayton Canyon Project Area. Appendix C in Maxon (2000): Evaluative Cultural Resources Investigations for the Dayton Canyon Estates Development Project, Los Angeles County, California. Report submitted to the U.S. Army Corps of Engineers, Los Angeles District Office.

Harrington, John Peabody

- 1986 *J.P. Harrington's Field Notes: Fernandeano, Reel #106*. Data entry and Coding by L. Woodward under coordination of M. Macri for the J.P. Harrington Database Project. Sponsored by the Native American Language Center, University of California Davis, Scientific Resource Surveys, Inc.

Havens, Patricia and Bill Appleton

- 1997 *Simi Valley, A Journey Through Time*. Simi Valley Historical Society and Museum, City of Simi Valley.

Hector, Susan M.

- 1999 Mission Masonry at Rancho Guajome Adobe. *The Journal of San Diego History, San Diego Historical Society Quarterly* 45(4). San Diego.

Hudson, Travis, and Craig Bates

- 2015 *Treasures from Native California*. Edited by Thomas Blackburn and John R. Johnson. Left Coast Press, Inc. Walnut Creek, California.

Hudson, Travis and Thomas C. Blackburn

- 1979 *The Material Culture of the Chumash Interaction Sphere, Volume I: Food Procurement and Transportation*. Ballena Press Anthropological Papers Number 25, Editor Thomas C. Blackburn. A Ballena Press / Santa Barbara Museum of Natural History Cooperative Publication.
- 1983 *The Material Culture of the Chumash Interaction Sphere, Volume II: Food Preparation and Shelter*. Ballena Press Anthropological Papers Number 27, Editor Thomas C. Blackburn. A Ballena Press / Santa Barbara Museum of Natural History Cooperative Publication.

Hudson, Travis and Ernest Underhay

- 1978 *Crystals in the Sky: An Intellectual Odyssey Involving Chumash Astronomy, Cosmology and Rock Art*. Ballena Press Anthropological Papers 10. Ballena Press and the Santa Barbara Museum of Natural History.

Johnson, John

- 1997 The Indians of Mission San Fernando. In *Mission San Fernando Rey de Espana 1797-1997, A Bicentennial Tribute*. Southern California Quarterly LXXIX(3):249-290. Historical Society of Southern California Los Angeles, California.
- 2006 Ethnohistoric Overview for the Santa Susana Pass State Historical Park Cultural Resources Inventory Project. Prepared for Southern Service Center State of California Department of Parks and Recreation, by Department of Anthropology Santa Barbara Museum of Natural History, Santa Barbara. Available on-line at Santa Susana Pass State Historic Park - General Plan.

King, Chester

- 2000 *Native American Indian Cultural Sites in the Santa Monica Mountains*. Prepared for the Santa Monica Mountains and Seashore Foundation, by Topanga Anthropological Consultants, Topanga, California. Prepared by Topanga Anthropological Consultants, Topanga, California. Prepared for the Santa Monica Mountains and Seashore Foundation....with the National Park Service Pacific West Region, Santa Monica Mountains National Recreation Area.
- 2011 Overview of the History of American Indians in the Santa Monica Mountains. Unpublished manuscript on file National Park Service, Santa Monica Mountains National Recreation Area. Available on-line at Academia.edu.

King, Chester and Jeff Parsons

- 2000 Malu'liwini - Archaeological Record of Settlement and Activity in the Simi Hills. Confidential Archaeological Report Not for Public Distribution. Prepared by Topanga Anthropological Consultants. For the Santa Monica Mountains and Seashore Foundation. On file National Park Service, Santa Monica Mountains National Recreation Area. On file SCCIC CSUF.

King, Chester, and John R. Johnson

- 1999 The Chumash Social Political Groups in the Santa Monica Mountains. In, *Cultural Affiliations and Lineal descent of Chumash Peoples in the Channel Islands and the Santa Monica Mountains, Volume 1*, pp. 67-92. Prepared for Archaeology and Ethnography Program, National Park Service.

Knight, Albert

- 1995 Recent Investigations at Burro Flats (CA-VEN-1072), Ventura County, California. *Society for California Archaeology Newsletter* 29(5):11-12.
- 1997 The Rock Art of Los Angeles County, California. Unpublished manuscript on file SCCIC CSUF. On file Santa Barbara Museum of Natural History Department of Anthropology.
- 2001 *Rock Art of the Santa Monica and the Santa Susana Mountains*. Unpublished manuscript on file SCCIC CSUF.
- 2012 Three Chumash Style Pictograph Sites in Fernandeano Territory. *Society for California Archaeology Proceedings, Volume 26*, pp. 1-16.
- 2016 Sky Valley Ethnographic History. For Santa Ynez Band of Chumash Indians. Unpublished manuscript on file SCCIC CSUF.

Kroeber, Alfred J.

- 1925 *Handbook of the Indians of California*. Reprinted by Dover Publications, Inc. New York.

Laird, Carobeth

- 1975 *Encounter With an Angry God: Recollections of My Life With John Peabody Harrington*. Malki Museum press, Morongo Indian reservation, Banning, California.
- 1982 Letter to Bob Edberg. In possession of Bob Edberg and the author.

La Monk, Charles S.

- 1953 Pictograph Cave at Burro Flats. *Archaeological Survey Association of Southern California Newsletter* 1(2):8-9.

Librado, Fernando

- 1979 *Breath of the Sun: Life in Early California, as told by a Chumash Indian, Fernando Librado, to John P. Harrington*. Co-published by the Malki Museum Press and the Ventura County Historical Society.

1981 *The Eye of the Flute - Chumash Traditional History and Ritual as Told by Fernando Librado Kitsepawit to John P. Harrington*. Edited with Notes by Travis Hudson, Thomas Blackburn, Rosario Curletti, and Janice Timbrook. Illustrated by Campbell Grant. The Santa Barbara Bicentennial Historical Series Number Four. Malki Museum Press, Banning, California; Santa Barbara Museum of Natural History, Santa Barbara, California.

McCawley, William

1996 *The First Angelinos, The Gabrielino Indians of Los Angeles*. A Malki Museum Press/Ballena Press Cooperative Publication, Banning; Novato.

Mulholland, Catherine

1987 *The Owensmouth Baby- The Making of a San Fernando Town*. Santa Susana Press, Northridge, California.

Orcutt, William Warren

1926 *Early Days in the California Fields*.

Perry, Frank A., and Robert W. Piwarzyk, Michael D. Luther, Alverda Orlando, Allan Milho, and Sierra L. Perry

2007 *Lime Kiln Legacies, the History of the Lime Industry in Santa Cruz County*. The Fred D. McPherson Jr. Publications Fund of The Museum of Art & History at the McPherson Center, Santa Cruz, California.

Reid, Hugo

1852 *Los Angeles County Indians*. *Los Angeles Star* 1(41)-2(11) 21 February-24 July. (Reprinted, *The Indians of Los Angeles County*, Hugo Reid's letters of 1852, edited and annotated by Robert F. Heizer. Southwest Museum, Los Angeles, 1968).

Romani, John F.

1978 *Assessment of the Cultural Resources Located on 280 Acres of Land in Bell Canyon, California (The Bell Canyon Site Complex)*. On file SCCIC CSUF.

1981 *Astronomy and Social Integration: An Examination of Astronomy in a Hunter Gatherer Society*. Master's Thesis in Anthropology, California State University, Northridge. On file California State University Northridge. On file SCCIC CSUF.

Romani, John, Gwen Romani and Dan Larson

1985 *Astronomical Investigations at Burro Flats: Aspects of Ceremonialism at a Chumash/Gabrielino Rock Art and Habitation Site*. In: *Earth and Sky: Papers from the Northridge Conference on Archaeoastronomy*, edited by Arlene Benson and Tom Hoskinson, pp. 93-107. Slo'w Press. Thousand Oaks, California.

Romani, John, Daniel Larson, Gwen Romani and Arlene Benson

1988 *Astronomy, Myth, and Ritual in the West San Fernando Valley*. In *Visions of the Sky: Archaeological and Ethnological Studies of California Indian Astronomy*, pp. 109-134. Robert A. Schiffman (editor). Coyote Press Archives of California Prehistory, No. 16. Salinas, CA.

Rozaire, Charles

1959 *Pictographs at Burro Flats*. *Ventura County Archaeology Society Quarterly* 4(2):2-6.

Sage, Orrin G.

1971 Geology of the Eastern Portion of the "Chico" Formation, Simi Hills, California. Master's Thesis in Geology, University of California Santa Barbara.

Sanberg, Delmer Jr., Dana Bleitz-Sanberg, Frank Bleitz, and Edith Bleitz

1978 Two Rock Art Sites in the San Fernando Valley: VEN-149 and LAN-357. *Journal of New World Archaeology* 2(4):28-39. University of California Los Angeles.

Smith, David, Melissa Macias, and Patrick Maxon

2017 Cultural Resources Monitoring Report, Sterling West Hills Development, Los Angeles County, California. Prepared by Psomas, for David Alpern, Centex Homes, Mission Viejo, California. Report on file SCCIC CSUF.

Sutton, Mark Q.

2009 People and Language: Defining the Takic Expansion into Southern California. *Pacific Coast Archaeology Society Quarterly* 41(2 & 3):31-93.

2010 The Del Rey Tradition and Its Place in the Prehistory of Southern California. *Pacific Coast Archaeological Society Quarterly*, Vol. 44, No. 2, pp. 1-54.

SWCA Environmental Consultants

2008 Data Recovery Excavation of the Dayton Canyon Site (CA-LAN-254), West Hills, Los Angeles County, California. Prepared for Centex Homes, LA/Ventura Division, and United States Army Corps of Engineers, Los Angeles District. SWCA Cultural Resources Report No. 2008-101. On file SCCIC CSUF.

Tartaglia, Louis, and Romani, John F.

1978 Assessment of the Cultural Resources Located on 280 Acres of Land in Bell Canyon, California (the Bell Canyon Site Complex), LAN-413, -416, -783, -784, -792, -793, -511, -900. On file Northridge Archaeological Research Center, California State University, Northridge. On file SCCIC CSUF.

Timbrook, Jan

2007 *Chumash Ethnobotany: Plant knowledge Among the Chumash People of Southern California*. With botanical watercolors by Chris Chapman. Santa Barbara Museum of Natural History, Santa Barbara, California. Heyday, Berkeley, California.

Timbrook, Jan and John R Johnson, and David D. Earle

1993 Vegetation Burning by the Chumash. In: *Before the Wilderness, Environmental Management by Native Californian*. Compiled and edited by Thomas C. Blackburn and Kat Anderson, pp. 117-149. Ballena Press.

Treend, Helen

1974 Orcutt Ranch Park. Unpublished manuscript.

Van Nuys News

1922 Death of Clyde and Lulu Dayton. April.

1927 Native Sons Deeded Land Where Old Lime Kilns of Padres Stood. November 8.

1929 Barbeque-Fiesta at Lakeside Park. May 7.

1928 Stag BBQ at Lakeside Park. May 14.

Walker, Phillip L. and Travis Hudson

1993 *Chumash Healing: Changing Health and Medical Practices in An American Indian Society*. Malki Museum Press. Banning, California.

Webb, Edith Buckland

1952 *Indian Life at the Old Missions*. University of Nebraska Press. Lincoln and London.

White, Robert S., and Laura S. White and David M. Van Horn

2008 A Cultural resources Study for the Proposed Wetland Riparian Restoration Program at Chatsworth Reservoir, Chatsworth, Los Angeles County. Prepared by John Minch and Associates, Santa Barbara, California. prepared for Dave Hauser, General Manager, Browning Ferris Industries of California, Inc., Sylmar, California.

Whitley, David S., and Joseph M. Simon

1979 The Organization Structure of the Lulapin and Humaliwo and Conclusions for Oak Park. In *The Archaeology of Oak Park, Ventura County, California*. Vol. 3, ed. by C. William Clewlow and David S. Whitley. Institute of Archaeology Monograph, no. 11, Los Angeles: Institute of Archaeology, University of California, pp. 149-174.