The Obispeno Chumash indians: San Luis Obispo County's first environmentalists

Sharon L. Marks

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THE OBISPENO CHUMASH INDIANS:
SAN LUIS OBISPO COUNTY'S FIRST ENVIRONMENTALISTS

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education:
Environmental Education Option

by
Sharon L. Marks
March 2001
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March 2001

Approved by:

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ABSTRACT

The Obispeno Chumash was a group of Native Americans who lived in the coastal area of California. Their residence was from Point Estero in the north, south along the Pacific Ocean to the Santa Maria River, and bounded by the eastern edge of the Coast Range Mountains to the east.

The Obispeno Chumash Indians lived in this area for thousands of years. They respected and occasionally feared their environment. They managed both carefully and thoughtfully. Their environment provided them with food, clothing, homes, and tools. In a historical perspective, the geology, geography, and topography of the area are included. Human use and impact, both positive and negative are considered. The environment, including geography, climate, and vegetation is described to provide insight into its relationship to Chumash social organization and characteristics.

The Obispeno Chumash appear to have been a materially rich and complex group of hunters and gathers attuned to their world. Their use of advanced fishing abilities, use of double-bladed paddles, harpoons with slender foreshafts, sinew-backed bows, finely made wooden dishes and bowls, steatite dishes, bowls and other carved items, finely woven baskets, true beds on platforms, separate cubicles for sleeping, large earth covered ceremonial buildings, and shell money substantiate that their material culture was
more complex than most groups elsewhere in California. They were culturally rich with their own music, art, mythology, astronomy and rock paintings. Theirs was a healthy, plentiful and peaceful existence. As the world they knew changed, the life they knew disappeared.
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CHAPTER ONE
INTRODUCTION

The author was raised on what had been Obispeno Chumash land, in the township of Arroyo Grande, San Luis Obispo County, California. Much of the information contained herein was gleaned over the years through conversations with long-time residents, discussions with senior family members, lectures by and discussions with teachers, discussions with the docents while visiting the San Luis Obispo Mission, and by driving the roads, walking the streams and exploring the hills. Konrad and Gertrude Grieb, the author's great-grandparents, helped settle the area in the middle 1800s. Their experiences and memories have been passed down through generations. These experiences and memories were instrumental in my developing a fondness for the land and an appreciation of the Chumash Indians.

In reading the literature about the entire Chumash Indian group, I noticed that the Chumash living in the San Luis Obispo County were neglected. Little written information is available. What is available is scattered throughout a variety of texts, hence the large bibliography.

This group of Chumash Indians was large enough and well enough established to have a mission established in their midst. Their language set them apart from others in
the Chumash group. Father Serra from the Mission San Luis Obispo de Tolosa recognized this and named them the Obispeno Chumash after the mission.

My concern is with the interaction between nature and people. How did the Obispeno Chumash affect their surroundings and what was the outcome? Did changes occur in the environment when other people took over the care of the land?

Over the last 250 years, the Obispeno Chumash land has evolved from an ecologically green dominion under their stewardship to the present day where the area is noted for its mission, recreational value, wealth of opportunity, and a nuclear power plant located between Morro Bay and Point Buchon along the ocean.

Their many centuries of successful adaptation to life suggest that the group’s approach to land use demonstrated respect for the land and provided for sustainability. It appears to this author that:

- They left the earth as good or better than they found it.
- They took no more than they needed.
- They tried not to harm life, air, water, or soil and sustained biodiversity.
- They did not use resources faster than they were replenishable.
- They did not waste energy or mineral resources.
CHAPTER TWO
HISTORY

Distinctive cultures were developing adjacent to what is now called the Pacific Ocean on a large landmass 3,000 to 5,000 years ago. One group settled on an area of land along the southern coast of this landmass. A part of this group settled into the area encompassing the coast of what is now San Luis Obispo County, California. As they gave up their nomadic ways, they settled into the valleys and created villages (Hittell, 1885; Pavlik, Muick, Johnson & Popper, 1991; Rogers, 1929).

In the western part of the what is now the United States, before early man grouped into tribes (about 9,000 B.C.), there were unsettled bands of people who subsisted mostly by hunting animals such as deer, birds, fish, camel, bison, and horses. By 6,000 B.C., milling stones for grinding seeds came into use, which indicates more food was being collected from plants than had been previously. Around 3,000 B.C., food became more diversified and sources included both land and sea. Fishing as well as hunting and plant gathering broadened early man’s diet. By 2,000 B.C., the glaciers retreated as the climate warmed.

When the climate stabilized the necessity to roam diminished and villages began. Giant forests grew in abundance and people began to gather and eat more acorns in addition to seeds. With a stable food source, villages grew
larger. The village chiefs, with more people under their domination, became wealthy, and societies grew more complex. During this time, the Hokan language family (Appendix A) is thought to have predominated over much of this western landmass (Brown, 1985; Schwabacher, 1995).

It is thought by scientists that when people who spoke Hokan arrived in California, they shared a single culture. Time passed, circumstances varied, and a wide difference among Hokan speaking people developed over thousands of years, proving the language group's antiquity. The people adapted to their adopted land (Salcedo, 1999).

California geography caused a large Hokan speaking group, later called Chumash, to be separated into eight smaller groups. The word Chumash may have been derived from the word Michumash, which literally translated means makers of shell-bead money (Miller, 1988).

Each of the eight smaller groups of Chumash represented their linguistic regions (Kroeber, 1976). The Obispeno, Purisima, Barbareno, Ventureno groups were along the coast. The Cuyama, Inseno and Emigdiano were inland. The Santa Barbara Channel Island group was called Cruzeno.

The Obispeno were semi-isolated from the rest of the Chumash people by a range of mountains. Physically, they were included in the Chumash group, but they acted independently.
The language divisions or dialects of the Chumash were distinct but related by root words to the Pomo, Esselen, Yana sub-families, and the Salinan and Shastan divisions (Davis, 1966; Kroeber, 1976; Miller, 1988). The three main language divisions (all in the Iskoman sub-family) of the large Chumashan family are the Central language group, the Island language group, and the Obispeno language group. The Central group includes the Ventureno-Emigdiano language, the Barbareno language, the Ynezeno language and the Purisimeno language. The Island group included the Santa Cruz Island, Santa Rosa Island, Santa Miguel Island, and Anacapa Island. The Obispeno group stands alone and is from the Stishini division (Davis, 1966; Henshaw, 1976; Kroeber, 1976; Pinart, 1976). The Mission Padres assigned names to the groups and five of the groups reflected the names of the missions founded among them in later years. Father Serra from Mission San Luis Obispo de Tolosa named the area and people he found Obispeno Chumash. The Northern Chumash language and dialect, called Obispeno by Father Serra, was a distinctive and separate tongue from the rest of the Chumash group.
CHAPTER THREE
ENVIRONMENT

From the sea approach, the leading landmark in San Luis Bay is the mountain El Buchon, so named by the people because the chief of the village that lived along the shore had an enormous goiter. The mountain is cone-shaped and stands sharply apart from the mountain chain that parallels the coast.

There is a second cone-like, bald mountain named Mount Hasbrouck. It is in the Santa Lucia Range. From its summit, an Obispeno Chumash could see two-thirds of what is now San Luis Obispo County and much of what is now Santa Barbara county, as well as the limitless view over the broad Pacific Ocean. In the east and north could be seen what are now known as the San Jose and Salinas Valleys, the latter vanishing in a distant haze. Many hills, valleys, and mountain ranges could be seen in all directions (Stork, 1891).

You can stand on this mountain today and see the same geography as the Obispeno Chumash, yet the view is different. Paved roads, high-tension power lines, modern home construction, and train tracks crisscross the land. A nuclear power plant stands sentinel.
CHAPTER FOUR
GEOGRAPHY

The Obispeno Chumash coastal land had two distinctive sections. The first extended from the Santa Maria River to Point San Luis, making such an indentation as to form San Luis Obispo Bay. The second is where the irregular shoreline extends north from Point San Luis to Point Estero, where the Santa Lucia Range abuts the coast. These sections of land are now known as San Luis Obispo County.

The rising sea level during the last 11,000 years or so has caused an inland migration of the beaches, the formation of the Morro Bay sand spit, and the bluffs at Nipomo. An area similar to Morro Bay in the Arroyo Grande Creek area has been infilled with sediment from the creek, although some portions are still low-lying lakes (Chipping, 1987).

The ocean bordering the Chumash land is truly a peaceful sea, for the greater part of the year it is as calm as an inland lake. Almost everywhere a landing can be effected except in times of a storm. San Luis Obispo Bay is about 28 km in length, proceeding in a north-northwesterly direction from the mouth of the Santa Maria River. Oso Flaco is a few kilometers north of the Santa Maria River. Midway up the remaining beach, the Arroyo Grande Creek enters the Pacific Ocean after receiving the Pismo and
Arroyo Verde Creeks near its mouth. San Luis Creek enters at the northern bend of the land encircling the bay. Fresh water may be obtained at a small stream opening on the beach 0.8 km west of San Luis Creek. In the coarse sandstone bluff between these two creeks, gigantic fossil remains are found (Chipping, 1987). The majority of the offshore sediment and bottom composition along the coast of San Luis Obispo Bay is sand. The sand goes out from the beach into the Pacific Ocean for about 11.2 km, whereas at Point Sal, the sand only extends about 2 km into the Pacific Ocean.

The Coast Mountain Range extends from Eureka to Lompoc. It comprises a system of low, roughly parallel ranges, strongly controlled by complex folding and faulting. Miocene strata predominate and in general, drainage parallels the structure. This range forms the eastern border of Obispeno Chumash land. The Obispeno territory was rolling and traversed by several ranges. The chief physical feature is the Santa Lucia Range, running almost parallel with the coast, dividing the land into two parts. From Estero Bay in the north, the San Luis Range extends about 32 km southeastward, 360-600 m high and parallel to the Santa Lucia Range. The San Luis and Arroyo Verde creeks cut through the San Luis Range. Between these ranges is a succession of detached buttes, with Mission and Bishop Peaks having the highest elevation at 450 m and
540 m (Robinson, 1957). The San Luis Range on the southeast gradually runs into low scattered hills, while on the northeast it terminates at Estero Point. Between the San Luis Range and the Pacific Ocean, the Irish Hills fill the land northwest to southeast between Point San Luis and Point Buchon (see Appendix B for topography map of area).

Westward to the Pacific Ocean from the Santa Lucia Range flow many small streams, some of which are the San Corcopero, Santa Rosa, Toro, Old Creek, San Luis, Arroyo Verde, Suey, Arroyo Grande, and others, besides their innumerable branches. These streams are marked by many fertile canyons, valleys, and hill lands. It is these mountains and streams that defined the territory of the Obisipo Chumash. The varied mountain ranges are the result of plate tectonics.

There are three main faults in this particular area. The first is the Huasna Fault. It runs northwest and southeast and is both a right lateral and a vertical dip-slip fault with the up-block on the northeast side. It connects with the second fault, the Oceanic Fault, in the Lopez Canyon and runs down Suey Creek. There have been many small earthquakes from the Huasna Fault and nearby Edna Fault. The third, the Edna Fault, trends to the west-northwest, follows the southwest side of the Edna Valley, and enters the Irish Hills south of Mine Hill. The Indian Knob Fault, a branch of the Edna Fault, runs from the
Indian Knob area of Pismo Creek westward to near the head of Squire Canyon. There it turns northwest to intersect with the Edna Fault, a little west of what is currently known as Highway 101 (Chipping, 1987; Donley, Allan, Caro, & Patton, 1979).

Earthquakes during fault movement opened up sources of raw materials for the Obispeno Chumash. The Obispeno Chumash knew local quarry locations. Several quarries in the Lopez Canyon area were the result of earthquake activity.

Raw materials with which to form tools and implements were readily available to the Obispeno Chumash. The Obispeno Chumash knew every rock outcrop within their territory. If any stone was of a variety that lent itself to making implements, they used it. The implements they created were sufficient proof of the efficiency of their prospecting. Their prospecting was limited to discovery of surface exposures while hunting, gathering food and firewood, or moving across country to another village.

Scores of asphaltum springs, dark-colored solid material consisting mainly of hydrocarbon mixtures, were known in the valleys and mountains. Price Canyon had the most extensive site of pure asphaltum on the Pacific Coast and continues today to produce asphaltum. Steatite (soapstone) ledges were found in the mountains near Arroyo Grande. There were many sulphur, iron, magnesium, and salt
springs in the Arroyo Grande area. The sulphur springs water at Newsom Springs was about 56 degrees C. The Obispeno used it to soothe their aching joints and it continues to be enjoyed today for the same reason (Heizer & Treganza, 1972).

The land the entire Chumash group lived on covered a large area. The land, known today as San Luis Obispo, Santa Barbara and Ventura counties, the Santa Barbara Channel Islands, the southwest corner of Kern county and the northwest corner of Los Angeles county, circumscribed some 18,130 square km. Included in this territory was about 322 km of coastline. Relative to most California tribes, their territory was vast. The Obispeno Chumash’s territory was about 4,800 square km, with about 88.5 km of shoreline.

It is difficult to determine population per square km, for the records kept by the mission listed only those who visited the mission. The Native Americans as a united group were not included in the early census reports until the early 1900s. In 1920, the population density for San Luis Obispo County was 73.1 persons per square km with 1.2% of the population American Indian (Jacobstein, 1999).

A valley and surrounding environs, now known as the Arroyo Grande Valley, made up a large part of the Obispeno geography. The soil was rich; the Mediterranean climate mild and a fresh water supply was ever present. The local environment provided such an abundance and variety of
materials that the Obispeno Chumash were able to go beyond survival and to develop a truly unique and fascinating culture (McCall & Perry, 1986).
CHAPTER FIVE

CLIMATE

The climate in the coastal range is an annual cycle of alternating soil moisture and draught. The temperature is less influential than rainfall in the savanna like environment of the coastal hills. Of more importance than precipitation and temperature are relative seasonal patterns of wet and dry, hot and cold.

The mild Mediterranean climate along the Pacific Ocean where the Obispeno Chumash lived provides a dry summer and early fall. The winter and early spring provide a surplus of moisture, which envelops the area. The average rainfall is about 53 cm a year. For more than 30 days a year, marine fog penetrates inland along the coast. The fog makes the area marine like with little difference in temperature. Little evapotranspiration occurs throughout the year, yielding pleasant winters and sunny summers (Stork, 1891).

The Coast Range Mountains exhibit an intermediate climate between the hot valley and the cool coast. There is no morning fog and the average temperature is greater than 22 degrees C (Stork, 1891). There is a distinct thermal belt lying between the altitudes of 30 meters and 180 meters of elevation, where the valleys slope toward the creeks or the ocean. All the lesser ridges of this region are above night frosts and delicate plants grow everywhere without danger. The sea breeze comes directly from the
ocean or is deflected by the hills. The prevailing wind is from the west, often causing foggy or hazy mornings (Robinson, 1957; Spurr, 1995; Stork, 1891).

The wet and dry, cold and hot Mediterranean climate provide the necessary ingredients for the oak savanna throughout the Obiseno Chumash area (Pavlik, et al., 1991).
CHAPTER SIX
VEGETATION

The oaks are scattered across the Santa Lucia Mountains and the Coast Range Mountains. The trees are far apart and appear scattered over the native grassland in a savanna climate. Chaparral thrives on the drier slopes and pockets of riparian forests thrive where moisture persists into summer months.

North of latitude 35 degrees, the Coast Range Mountains have a variety of environmental areas. Mixed forests, riparian woodlands, beaches, and open country provide a large variety of vegetation. There are several different types of oaks. In addition, laurel (*Umbellularia californica*), sycamore (*Platanus racemosa*), maple (*Acer macrophyllum*), alder (*Alnus sp.*), madrone (*Arbutus menziesii*), cottonwood (*Populus tremuloides*), (*Populus fremontii*), willow (*Salix sp.*), and pine (*Pinus sp.*) are trees frequently found in this area of the Santa Lucia Mountains and the Coast Range Mountains (Kavanagh, 1994).

A cross section of the area the Obispeno Chumash inhabited for thousands of years passes through grasslands, coastal sagebrush, oak woodland, chaparral and some saltbrush flat. The grasslands consist of California prairie bunch grass (*Scirpus sp.*), tule marsh (*Scirpus sp.*), sedge (*Carex sp.*), and coastal saltmarsh vegetation.
(Salicornia sp., Jaumea carnosa, Batis maritima, Triglochin maritimum, Suaeda californica, Limonium californicum, Distichlis spicata, Frankenia sp., Monanthochloa littoralis, Juncus acutus) (Clarke, 1977; Dawson & Foster, 1982).

Along the ocean, multiple communities of grasses and succulents lined the beaches with shrubs on the stabilized dunes. The sandy soil next to the ocean made a fragile base for plant growth that would take many decades to recover if destroyed by nature or from overuse. Dense grassland with coyote brush (Juniperus californica) grew near the coast (Clarke, 1977). In most places at its margins, the beach grassland community is graded into foothill woodland or oak woodland.

The southern oak forest grew on the Coast Range Mountains and Santa Lucia Mountains, and the sagebrush (Artemisia californica) of the north gave way to creosote bush (Larrea divaricata). The coastal sagebrush (Artemisia californica) contained a species of sage whose seeds were used as food by the Obispeno Chumash (Donley et al., 1979). The shrub formations were a combination of chaparral and coastal sagebrush. Scrub formation was mainly saltbush (Atriplex patula sp. Hastata), Scrub Oak (Quercus dumosa), and Leather Oak (Quercus durata). The Valley Oak (Quercus lobata), Blue Oak (Quercus douglasii), Black Oak (Quercus kelloggi), Coast Live Oak (Quercus agrifolia), and
Interior Live Oak (Quercus wislizenii) made up the oak/foothill woodland (Clarke, 1977; Pavlik, et al., 1991).

The chaparral around the oak groves included chamise (Adenostoma fasciculatum), California lilac (Ceanothus sp.), manzanita (Arctostaphylos sp.), sagebrush (Artemisia californica), coast buckwheat (Polygonaceae), and bush monkey flower (Mimulus fremontii). In spring a profusion of wildflowers, hedge nettles (Stachys rigida), and poison oak (Rhus diversiloba) were common plants that grew in the local chaparral (Clarke, 1977).

Oaks and oak communities produced a cornucopia of foods for wildlife, including acorns, leaves, twigs, sap, roots, and pollen. This cornucopia formed the basis of an elaborate food web, with herbivores eating the oak products, and carnivores eating the herbivores. Squirrels, gophers, and wood rats were typical consumers of acorns and, at one time, so were grizzly bears.

It was where rabbits and other small mammals and birds bred. The ecological characteristics of oaks and oak communities attracted and sustained mammal populations for several reasons. Dens and nests were often located in the chaparral. Raccoons and squirrels utilized cavities in standing trees, while deer mice and striped skunks resided beneath fallen trees and limbs. The understory shrubs helped conceal den sites, reduced exposure to harsh weather, and provided cover to escape predators.
The oak woodlands supported a higher density of animals than adjacent, non-oak communities and were attractive to predators. Large numbers of mule deer inhabited, attracted and sustained significant populations of mountain lions. The Obispeno Chumash added to their diet a richness of protein from the wildlife supported by the oak woodlands, and they left wildlife for the next day, season, or year to reproduce.

As foods reached their season and were harvested, others were taken up in turn. The Obispeno were very conscious of their environment. They went out into the countryside to gather different kinds of greens, fruits, seeds, and nuts. They harvested plant resources in such a way that the plants continually thrived in the same locations. They understood plant-use cycles. An important rule to them was to not take everything; to harvest only what was needed for yearly needs. Whole plants were left to ensure next year's harvest (Merchant, 1998). Few plants, however, were as important to them as the oaks.

Acorns (nuts) are the most widely recognized food resource identified with oaks. They are a seasonal high-energy food, rich in carbohydrates and fats. Depending on the species, acorns contain up to 18% fat, 6% protein, and 68% carbohydrate, as well as water, minerals, and fiber. In comparison, modern varieties of corn and wheat have 2% fat, 10% protein, and 75% carbohydrate. Acorns are good sources
of vitamins A and C, calcium, magnesium, phosphorus, potassium, sulfur, and many essential amino acids. In addition to the acorns, the bark, roots, wood, small branches, and oak galls were part of the usable natural resource base (Clarke, 1977; Pavlik, et al., 1991).

Acorn foods sustained many diverse Indian cultures that evolved and thrived among the woodlands for centuries. Widely available, nutritious, and fairly reliable from year to year, the acorn was a dietary staple in most of California.

The Obispeno Chumash knew that oak communities were rich in bear, deer, and other wildlife that thrived on the acorns and lingered within the deep shade. It is not surprising that oaks were revered by the Obispeno Chumash, held sacred in elaborate acorn ceremonies, and depicted as symbols of fertility, strength, and oneness with the earth. Solemn offerings of acorns or acorn meal were commonly made during religious ceremonies (Hudson & Blackburn, 1982; Pavlik, et al., 1991).

Acorns ripen in late summer and fall, depending on the species. In groves with more than one oak species, the harvest may have lasted from August to November. Because different species produce bumper crops during different years (Appendix C), diverse oak woodlands or forests rarely experience a year without acorns (Pavlik, et al., 1991).
Acorns store well because their hull protects the enclosed seed from desiccation and deterioration. An acorn cached in a nest, burrow, granary, or other protected site could remain edible until the next harvest.

The Coast Live Oak (*Quercus agrifolia*) is a low growing evergreen tree. It has a dense, hemispherical crown with a trunk divided into crooked, wide, spreading limbs that sometimes touch or trail along the ground. Although tolerant of salt spray, the Coast Live Oak (*Quercus agrifolia*) is not found in close proximity to the coast. It prefers the well-drained soil found in the coastal plains and protected bluffs (Pavlik, et al., 1991).

The Blue Oak (*Quercus douglasii*) borders the wide prairie belt. Blue Oaks (*Quercus douglasii*) numbered in the millions; however they are highly prized for their wood and most have been cut. The remaining Blue Oaks (*Quercus douglasii*) are scattered in a sea of grasses and herbs, forming distinctive savanna vegetation in the foothills. The savanna was inhabited by herds of deer and other native grazers as well as predators such as mountain lion and coyote. California’s Blue Oak savannas have been called the Pacific Coast version of Africa’s Serengeti Plain (Pavlik, et al., 1991).

The Black Oak (*Quercus kelloggi*) is found in diverse communities of conifers and other broadleaf trees. Its acorns are considered the best tasting of all the acorns.
The Obispeno preferred its acorns because they stored well and mush or pudding made from them thickened readily. Black Oak (*Quercus kelloggii*) trees were found in the Chumash area just west of what is now San Luis Obispo.

The Valley Oak (*Quercus lobata*) grows at least one ridge away from the coastal fog zone in valleys that are cool and wet in the winter, hot and dry in the summer. This oak contributes to dense riparian forests, open foothill woodlands, and river valley savannas and tends to have large crops every other year (Pavlik, et al., 1991).

So important were acorns to the Obispeno that their entire year was built around them. Acorn harvest marked the beginning of their calendar year. Winter counted as so many months after acorn harvest and summer was counted by the number of months before the next acorn harvest. Since some acorns tasted better than others did, the tastiest ones were collected first. If harvest of the favorite acorns was poor some years, then less tasty acorns had to be eaten all winter long.

Acorns were gathered in the fall. Women carried large woven baskets to put the acorns in. Young boys climbed the oak trees to shake acorns free from the branches. The Obispeno men used long poles to shake the heavily laden branches. The acorn harvest lasted from several weeks to several months. The Obispeno left many acorns on the ground to provide for reforestation and to feed other animals.
dependent on the acorn as part of their food supply (Pavlik, et al., 1991).

A typical family could harvest the crop of an average-size coast live oak in a day and reap about 63 kg of acorns. This was about one-fifth of what each person would consume annually. It is estimated that one family of four would eat from 1,200 kg to 1,500 kg of acorn flour in a year. In a year of plenty, families gathered a surplus in order to cover short crops during less productive years. Members of the village who did not participate in the acorn harvest were not helped or given acorns and were forced to rely upon relatives in another village (Pavlik, et al., 1991).

There were times when roughness of the sea, cold or rain, prevented the Obispeno from foraging. Storehouses were used for food items. Most of a family’s harvest was dried and stored for use during the rest of the year. Non-perishable foods such as seeds, nuts, dried meat, fish and shellfish of various kinds were stored in large baskets. Up to about 1000 kg of acorns were stored by each family. Acorns were spread in the sun or suspended in baskets above the rising heat of a low fire to hasten drying. The dried acorns were stored in large baskets called granaries and placed on platforms in storage houses. Some of the storage houses were built on stilts to thwart hungry animals (Emanuels, 1994).
The Obispeno developed a delicate balance with the environment. They depended on a diverse and varied range of food. The land had limited food production capacity and the population of people, as well as other animals, was determined by the availability of food, yet all had plenty.
CHAPTER SEVEN
SOCIAL ORGANIZATION

Throughout their known history, the eight Chumash groups were usually at peace. However, there were rivalries among the eight groups and other Native American Tribes. Disputes were settled by having a ritual battle where arrows were lobbed or by burning down rival villages. However these battles were rare and the majority of the time the chiefs settled disputes peacefully (McCall & Perry, 1986, 1991).

The Obispeno chief, whose social rank was derived from wealth, enjoyed influence and honor. Offerings of food, goods, beads, and shell money were made to the chief (Kroeber, 1976). Ordinarily, the Obispeno chief had more than one wife and had the right to divorce (Heizer, 1963).

The chief and assistants led a village. Sometimes a particularly effective chief would have authority over several villages, but the chief was by no means all-powerful. Each village had its own Wot (chief), a man or woman who served as leader and moral authority for the village. The Wot had an assistant, a Paha. The Paha acted as master of ceremonies at festivals and gatherings. The Ksen were messengers who traveled from place to place to make announcements and gather news for the Wot. In a sense, the Ksen were the eyes and ears of the chief (Librado, 1977; Miller, 1988).
The Obispeno society was divided into three classes: upper, middle, lower. About one-quarter of the population was in the upper class. This included chiefs, shamen, canoe owners, craft specialists, and members of the 'Antap cult. The 'Antap were advisors to the Wot and performed the rituals (Librado, 1977; Miller, 1988).

The middle class, 'emechesh, included about one-half of the people. These people were hunters, gathers, fishermen and general workers. The remaining people were considered lower class: poor people, social outcasts, lazy and unproductive people, and even some outlaws (Librado, 1977; Miller, 1988; Stork, 1891).
CHAPTER EIGHT
SOCIAL GEOGRAPHIC BOUNDARIES

The Obispeno Chumash community holdings had definite, though unsurveyed, boundaries. Traditional and natural landmarks marked the boundaries. A divide, a ridge, a rock, occasionally a stream, creek, or a river, perhaps an especially big tree or clump of trees served this purpose. Each of the objects had its own name and was taught to all in the village (Miller, 1988). Their holdings comprised the watershed for the creeks now known as Arroyo Grande Creek, Pismo Creek, Morro Creek, Santa Rosa Creek, San Luis Obispo Creek, Suey Creek, Nipomo Creek, Alva Paul Creek, Chorro Creek, and all their tributaries and the west side of the watershed area of the Santa Maria River. On the whole, the boundary surrounded a large watershed area (Behens, 1999; Brower, 1996; Eargle, 1986, 2000; Robinson, 1957).

The basic units of Obispeno society were independent towns and villages. Each village had certain fishing, hunting, and collecting areas. Some areas could take days to get to; others were nearby. One such area was the Ranchero del Boyle de las Indias, a temporary village in the Lopez Canyon area used for collecting seeds and nuts (personal knowledge).

The fundamental unit of life was the family in the village setting. The Obispeno villages were similar in plan, but varied greatly in size. A small village contained
approximately 200 to 500 people; however most consisted of less than 1,000 individuals. In almost every case the villages were located on a bluff above the mouth of a stream. The stream furnished fresh water. Willow (Salix sp.) trees along the stream provided poles for constructing dome-shaped houses. Sources of food were nearby or within a day’s walk (Clarke, 1977; McCall & Perry, 1986).

Villages were composed of groupings of thatched beehive-looking dome houses, arranged in straggling rows sometimes with a lane between two rows. Some Obispeno houses had a diameter of 4-6 meters and a height of 2.3-3.5 meters. They accommodated 8 to 10 people. Some reached up to 15.25 meters in diameter. These houses accommodated as many as 40-50 people of an extended family who chose to live together (Miller, 1988).

Other structures in the village included a temescal, a silivi̱k, and an open-air ceremonial enclosure. The temescals were semi-subterranean earth covered huts used by men and occasionally women. The temescals ranged in size from large to small and formed a conspicuous feature in every village. They were used to cleanse the body and mask the human scent. Rocks were heated in a fire and then placed in the temescal, until the temescal was extremely hot.

The people using the temescal would enter and place a covering over the door to keep the heat in the structure.
While inside, they would occasionally pour water from a vessel already in the temescal to aid the sweating process. They would scrape themselves with a spatula while sweating profusely to cleanse their skin of dirt. Sometimes green leaves or branches were added to produce a fragrant atmosphere and to aid in masking the human scent. After sweating, the Obispeno would leave the temescal and plunge into the ocean, a nearby lake, or stream. Religious ceremonies may have been held in the temescals (McCall & Perry, 1986; Miller, 1988).

The siliyik was a sacred enclosure within the ceremonial ground. It was a semicircular area surrounded by a high fence of tule mat in which the priests and shamen conducted religious rituals and ceremonies. The audience sat around campfires outside the siliyik sheltered by a large windbreak enclosure of tule mats and watched ritualistic dances (McCall & Perry, 1986; Miller, 1988).

Villages grew until they loosely coalesced into a sort of prehistoric extensive urban area resulting from the expansion of several villages but retaining their separate identities (Miller, 1988). Life centered around the household in the village and many of the daily activities performed there.
CHAPTER NINE

FOOD

Rivers and creeks were full of fish. Abundant and diverse wild plants were utilized as food and medicine. Food was brought to the village site to be prepared and then consumed. The excess was put into storage (McCall & Perry, 1991).

The primary plant food, acorns, came from oak trees. Acorns were removed from granaries (storage baskets), hulled, and prepared for cooking as needed. Each family usually stored and processed its own acorns. If an industrious family did not have enough acorns to sustain themselves, the Wot could ask for donations of acorns on their behalf (Miller, 1988).

The women made acorn meal, often preparing enough food for several days. The acorns were hit with a stone hammer on an anvil or flat stone and the shells were peeled from the acorns. The reddish, papery skin that covered the kernel was removed. The raw kernels were then ready for processing into flour. Occasionally the raw kernels were roasted on hot stones before pounding. Stone mortars and pestles were used to pound the shelled acorn nutmeat into flour or meal (Miller, 1988).

Acorn meal was versatile and could be used to make a wide variety of foods, but acorns themselves were seldom eaten raw as they contained bitter, unpalatable tannins.
Whether roasted for eating or cooked in soup, mush, or bread, the acorns had to be leached of their tannins prior to consumption.

Acorn nutmeats readily give up their tannins to large amounts of running water. To accomplish this in a short period of time, the pulverized acorn nutmeats were sifted and mixed with water to form a paste. The paste was then spread in a sandy basin built on top of the ground. The basin could be more than a meter in diameter and was sometimes lined with leaves or pine needles. The leaching of the acorn meal required as many as ten applications of water. Water was added to form a shallow layer over the paste. This was done carefully to avoid disturbing the sandy bottom of the basin. The water was often poured through conifer boughs, which minimized agitation as it flowed into the basin. Hours later as the coffee-colored seepage gradually turned clear, gray-pink flour was left behind. A less labor-intensive way of doing the leaching was to bury the hulled nuts in the mud of a swamp or next to a spring for a year (Miller, 1988; Pavlik, et al., 1991).

After the acorn meal had been leached, it was mixed with water in a waterproof basket until it had the consistency of fairly thick soup. Then hot stones were dropped into the container and constantly moved about with sticks causing the mixture to boil. Cooked, it had the
consistency of a thick, bland, mush. Acorn mush was eaten in some form daily. It was usually eaten accompanied by meat, fish, or wild fruit. The health and longevity of the Obispeno Chumash Indians have been attributed to their diet (Pavlik, et al., 1991).

The Obispeno augmented the staple acorns with shellfish, clams, mussels, abalone, crabs and crayfish, fish, waterfowl, sea lions, dolphins, and occasionally washed up whales. Fishing was more productive in winter and spring. Seines, dip nets, and hook and line were used in fishing. If more meat than was needed was obtained, the excess was sun dried. Smoking was not used to preserve food (Schwabacher, 1995; Stork, 1891).

Hunting was more productive in the summer and fall. The men hunted mule deer with bow and arrows. Quail and rabbits were hunted with throwing sticks, and other small game using snares and deadfalls. Ducks and geese were trapped in the marshy area and caught by hand. Small animals were sometimes hunted in the brush, however they were easy prey when flushed from the brush. Although larger game animals were dressed, some smaller animals such as rodents were pulverized and roasted in their skins. Game meat was eaten raw, dried, boiled or roasted. The Obispeno Indians did not hunt the golden grizzly bear, because the bears were difficult to kill. Many bears lived in what is
now called Los Osos Canyon (Schwabacher, 1995; Squibb, 1968; Stork, 1891).

When the Obispeno Chumash wished to vary their diet, there were grasshoppers, angleworms, caterpillars, beetle grubs, and bee, hornet and yellow-jacket larvae to eat. Pinion nuts, (Pinus sp.), cherries, (Prunus ilicifolia), walnuts (Juglans californica) and a variety of roots, bulbs, seeds, and berries were gathered. Wild red onion (Allium haematochiton), squaw root (Perideridia gaillarderi), morel mushrooms (Morchella esculenta), puffball mushrooms (Lycoperdon perlatum), tree fungi and seaweed added seasonings and changes in flavors to the Obispeno diet (Clarke, 1977).

The seeds of the black sage (Salvia sp.) were nutritious. After the seeds were sufficiently roasted, they were ground to a powder for use in pinole (hard baked cakes flavored with spices, meat or berries), mush, or eaten dry (Schwabacher, 1995). Other small seeds of grasses and sunflowers were prepared in the same way as the black sage. Earth ovens were used to roast acorn bread, pinole, Spanish bayonet cabbage (Caulanthus inflatus) onion like bulbs, brodiaea (Dichelostemma pulchella), and the flower stalk of chaparral yucca (Yucca whipplei). They ate the roots and young shoots of both cattail (Typha latifolia) and rush (Scirpus robustus). Pinion nuts (Pinus sp.) and walnuts (Juglans californica) were gathered on inland mountains.
The nuts were lightly toasted in the shell and stored for later use (Barrows, 1968; Clarke, 1977).

The Obispeno Chumash made two types of mush in addition to acorn mush. One type was of wild cherry pits (Prunus ilicifolia). The pits had to be boiled for hours in a steatite (soapstone) pot. The water was changed several times to remove the bitter cyanide. The soft pits were then mashed like potatoes or refried beans. The second was a thin gruel of cattail (Typha latifolia) pollen (Clarke, 1977; McCall & Perry, 1990; Miller, 1988).

In the early spring, succulent green shoots of watercress (Nasturtium officinale), wild mint (Mentha arvensis), miners’ lettuce (Claytonia perfoliata), and clover (Phalaris tuberosa var. stenoptera) were available. Later in the year, fruits such as toyon (Heteromeles arbutifolia), elderberry (Sambucus mexicana), blackberry (Rubus ursinus), strawberry (Fragaria vesca sp. Californica), coffeefberry (Simmondsia chinensis), prickly pear cactus (Opuntia basilaris), and manzanita (Arctoslaphylos sp.) were collected and eaten (Clarke, 1977; McCall & Perry, 1991).

Tea was used as a drink or for medicinal purposes. The Obispeno used elderberry flowers (Sambucus mexicana), sage (Salvia sp.), wild rose hips (Rosa californica), and willow (Salix sp.) for tea. Each was soaked individually in pots
of water. The water was then heated to make tea (Clarke, 1977).

A sugar or honeydew like substance was made from the sticky, sweet deposit left by aphids and scale insects on the stems of the large wild carrisa grass, a type of wheat (Agrophron trachycaulum) (Crampton, 1974). The honeydew dried into crystals on the grass stems. The grass was cut and the crystals were shaken off into a basket. Next, the crystals were pressed into balls like lumps of maple sugar and added to food, eaten plain, or stored. The Obispeno Chumash ate little or no salt (Schwabacher, 1995).
The Obispeno's clothing was very simple due to the mild Mediterranean like climate. The men wore no clothing. They often had a wooden-handled knife of flint fastened in their hair and a sweat stick or implements for making fire attached to their waist by net or string. When the weather was cold, they wore an animal skin wrapped around their hips.

Some men had the septum of their nose pierced. All men had their ears perforated with one large hole in each earlobe. They wore a little cane, similar to a horn and as thick as the little finger, in each hole and carried powder made of wild tobacco there (Schwabacher, 1995).

They wore their hair very long, tied up with long strings interwoven in the hair and ornamented with decorations of bone, flint, and wood (McCall & Perry, 1986).

The men had some facial hair. If they chose to be smooth-faced, they used a pair of clamshells or large oyster shells, still fastened together on one side by nature, which opened and closed to extract facial hair. They extracted the hairs on their face one at a time by the root, as though pulling with modern day tweezers (Brown, 1985; Priestley, 1937).
The men were light skinned, trim, stood straight, and had extraordinary strength. They could stride along for a mile carrying a very heavy weight. They were marvelous runners. The girls and women were unusually attractive and friendly. They had lively, bright black eyes and were not shy (Stork, 1891).

The women wore double aprons of grass, suspended from the waist. The front part was smaller and overlapped by a larger one behind. Each blade of grass was weighted down by a small pinch of asphalt. When deerskins were available, the aprons were made of buckskin with a fringe along the bottom (Paterek, 1994).

The women’s hair was worn in bangs. It was cut short and combed forward. It was trimmed daily by singeing it, hair by hair, with a piece of pine bark so that no single hair protruded or stick up. Side locks were worn but the rest of the hair was worn loose, slicked down on top (Orr, 1956).

The women had a neat and graceful appearance. They wore small skull basket caps to protect their forehead from the cords of the heavy carrying nets and baskets they put on their heads (McCall & Perry, 1986; Miller, 1988).

The small children were generally completely naked in good weather (Orr, 1956).

Footwear was usually a sock made of a single piece of dressed deerskin and sewed up the front and back. Moccasins
were worn only on special occasions, such as war expeditions and long trips (Miller, 1988).

Body painting of both sexes was practiced extensively. Distinctive designs enabled members of different villages to be distinguished from one another. The Obispeno men and women painted stripes of red, black, and white on their faces and arms. The women painted their upper bodies with red ochre to prevent sunburn (Miller, 1988).
CHAPTER ELEVEN

SHELTER

The Obispeno houses were highly advanced. They had four unique features setting them apart from all other Native American houses. Their houses had windows, were partitioned into rooms with woven rush mats hung from the ceiling to separate family sleeping quarters, had raised frame beds were filled with rushes and covered with tule mats, and the children slept under the raised beds.

Houses were built by placing a series of willow poles in a circle; a walking pace apart. The poles were bent over at the top to be joined by fiber or sinew. Crosspieces of willow poles or smaller saplings were attached parallel to the ground in a similar manner to the upright frame (McCall & Perry, 1986; Miller, 1988; Schwabacher, 1995).

Large bundles of green bulrush (Scirpus robustus) thatching, about 15 cm thick, were draped over the horizontal crosspieces and fastened to prevent the wind from blowing them away (Clarke, 1977). Starting at the bottom and working toward the top, each layer fell over the one below like shingles and kept the rain out. A space along one side was left open for a window. A hide covered the opening when the weather warranted it. The bottom layer was affixed with the thick part of the stem next to the ground to give added stability to the wall. The rest were put on with the thick part of the stalk upright. A hole was
left open at the top of the house for ventilation, light, and smoke. In rainy weather it was covered with a skin (Miller, 1988).

A rolled mat served as a pillow. Coverings for sleeping were of woven mats or hides. Reed mats were used as floor coverings. A broom made from split spiny rush stalks (*Juncus acutus*), was used to keep the mats clean (Dawson & Foster, 1982). Each house had a fire pit in the center for heat or cooking in bad weather. A fire was kept going in the house 24 hours a day to eliminate the need to make a new one. In fine weather, cooking was done outside (McCall & Perry, 1991).
CHAPTER TWELVE

RELIGION

Among the Obispeno, the Sun and the Earth were the basis for the 'Antap religion. 'Antap was a society whose members were primarily tribal leaders, doctors, astrologers, singers, and dancers - those who had wealth and power. Their wealth and positions were usually hereditary (Librado, 1977). By means of a lunar calendar, (Appendix D), members of the 'Antap society set the schedule for important ceremonies to renew the work, especially at harvest time and the winter solstice. Society members presided at ceremonies where the Sun was worshipped as a threatening male deity and Wind, Rain, and Fire as female deities. The powerful deities were somehow connected to the power and wealth of the 'Antap's members (Miller, 1988).

Within the village there was some specialization. Everyone did his or her share of hunting and gathering. Social classes and specialists existed. There were the hereditary aristocracy of the chiefs, the captain-owners of canoes who formed a separate and prestigious group, skilled craftsmen, and religious functionaries, shamen, medicine men and the 'Antap society. But it was the shamen who held the greatest power. They used secret ritual practices and knowledge to tap the supernatural powers around them (Miller, 1988).
Shamen received their spirit power from gods, monsters, or heavenly phenomena, such as a constellation in the sky. The weather shaman was believed to control rain. The weather shaman placed several plummet-shaped charmstones in a circle, blew smoke over them, and chanted. The fact that the Obispreno Chumash had a weather shaman was an indication that the idea of no rain or drought was a terror to the people (Miller, 1988).

The medical shaman cured the sick through use of herbs, chants, charmstones, and a tube used for sucking out the cause of illness. The primary function of a medical shaman was to remove foreign objects that caused the sickness from the body of a patient, but cures were also influenced by such actions as singing, dancing, manipulation of body, and use of medicinal herbs.

The Chumash wisely used herbs and certain plants in order to maintain good health. Many centuries of warding off maladies taught them which vegetation to turn to.

When nature's remedies failed them, the Chumash called their medical shaman for treatment. When someone was ill, the shaman brewed tree bark or plant leaves into a strong tea. Dried herbs were pounded into a fine powder. When the powder(s) were mixed with a little water, the mixture(s) were taken orally or put on a wound as a poultice. The medicine man boiled other herbs with animal fat and applied
them like salves to wounds, swellings, or sore spots (Hofsinde, 1966).

Oak trees were very useful. They provided shelter and homes to wildlife, food, and medicines to humans. Products from the trees were used to treat many ailments. The Obispeno had concerns about their body. They found that the acorn in its various states relieved concerns about these problems. Bitter tannins were extracted from acorns, oak bark, and insect galls in the oak branches in order to treat a variety of ailments. Eating large quantities of acorns was an effective treatment for many of their ailments, including bowel irregularity, dropsy, fistula, dizziness, and intermittent fevers (Miller, 1988).

All shamen were capable of either beneficial or harmful acts, and many diseases were considered caused by bad shamen. Shamen who did not cure the patient or who used their power for evil were likely to be killed.

When a person died, the body was buried. This involved a number of rituals performed by a shaman. A wake of sorts was performed in the siliyik. Dancing, singing and a large fire took place at night. The body was then carried to the cemetery.

A cemetery was a sacred place, and was often set to one side of a village on a slight rise. One large Obispeno cemetery was found on such a hill facing the ocean in the town of Arroyo Grande, SLO-Dig 297. This particular
cemetery was originally marked with stone slabs, probably from the sandstone quarry in Lopez Canyon (Chipping, 1987). Graves were marked with wooden planks, poles, stone slabs, or whale rib bones. Male graves were marked with hair from the deceased, female graves were marked with a favorite basket (Miller, 1988). The Obispeno were alone among their neighbors in the custom of burying the dead. The custom must have been very ancient since skeletons are as abundant in the Obispeno area as they are rare in adjoining non-Chumash territories.

The Obispeno Chumash buried their dead face down in a flexed position in a distinct cemetery gravesite near the center of the village (Appendix E). They were buried with their valuables. Their name could not be spoken, at least not until formally given to a living person later on.

Ceremonies were considered important to maintain balance in power. The 'Antap forecast weather and decided on the celebrations and ceremonies. The two most important ceremonies honored the Earth and Sun. If the Obispeno did not treat the Earth and Sun with respect, they might be allowed to starve. They believed that the Earth was the source and mother of all food, and so showed their appreciation of the Earth and Sun through ceremonies. Two lesser ceremonies were for the bear and coyote. Other ceremonies were for those who died, weddings, and the initiation of a chief. For these occasions men and women
painted themselves with paint made from stone and clay (Hoffman, 1967).

In Hutash, the Earth ceremony, the Obispeno worshipped the Earth for giving them the source of food. It was a feast of thanksgiving in the late summer. This feast lasted five or six days and people came from far away. During the feast they enjoyed games, gambling, trading and food. There was a special ceremonial area where singing and dancing took place. During the Earth ceremony, two men played special whistles and were hidden from the view of others. Besides their ritual importance, ceremonies were also a social time for feasting and renewing ties with neighboring villages and other tribal groups (Taylor & Sturtevant, 1991). The Obispeno Chumash were known for their gifts to guests of fresh foods including seeds, pinole, fish, cresses (*Nasturtium officinale*), celery (*Apium graveolens*), amaranth (*Amaranthus retroflexus*), wild rose (*Rosa californica*), and fresh venison (Clarke, 1911).

In the Winter Solstice ceremony, the Sun was honored, as was the Earth in the Hutash Ceremony. There were two differences in this ceremony. The first difference was that all debts for the year were paid. A second was that the Obispeno were trying to call back the Sun to the Earth so that the seasons could continue (Hofman, 1967).

In a third ceremony performed at what is now known as Point San Luis, the swordfish was honored. Dancing was done
in a feathered costume and special headdress featuring the swordfish. During the final moments an offering of feathers, beads, and tobacco was thrown into the ocean to the swordfish (Heizer, 1963).

The Obispeno were intensely interested in and aware of the movements of their environs. Many of the rituals were intimately linked to the heavens above. They closely followed the phases of the Moon as well as the rising, setting and declination of the Sun (Hudson & Underhay, 1978).

The Obispeno Chumash astrologers recognized patterns in stars, organized them into a series of constellations, and created star maps. These maps were used to determine the Sun's position by means of observations of the star patterns on the eastern horizon just before dawn, or on the western horizon just after sunset. Thus they came to know which constellations were rising or setting with the Sun, and therefore the Sun's position on the ecliptic (Monroe & Williamson, 1987).

Obispeno Chumash calculations placed the period of lunations at 30 with 12 lunations grouped into a year totaling 360 days (Blackburn, 1975). No doubt, these lunar cycles were of considerable importance to the Obispeno Chumash. They coincided with the tides, the habits of many animals and plants. Seasonal changes, such as the rainy month, the month of sprouting of vegetation, and the month
of drought, were also fixed to these cycles. In addition, the menstrual period of women, and the length of human pregnancy were counted in moons (Librado, 1977).

It was the 'Antap who were respected and feared by the common people for their starlore. The Obispeno kept careful watch on the heavens in order to track the seasons and divine the weather. They watched Pleiades, a constellation, for calendar information, and the North Star, the star that never moves. Hunter-gatherers responded to the seasonal rhythms of the food supply, so they watched the sky for indications of the progress of the year. Winter solstice was the most crucial moment, for it coincided with the season of genuine scarcity and risk. Even in the forgiving climate of the south central coast, winter meant the world was dormant.
CHAPTER THIRTEEN

TOOLS

There were special activity areas within the village where tools and artifacts were made. The Obispeno Chumash used various materials such as steatite, serpentine, chert, obsidian, sandstone, grass, seashells, animal hides, wood, and bone (Schwabacher, 1995).

Arrowheads were made from local stone such as the flint from the outcroppings at Mussel Point north of Point Sal, where a small prehistoric quarry may still be observed (Chipping, 1987; Robinson, 1959). Chert and obsidian were made into drills, scrapers, choppers, chisel-like flint tools, projectile points and knives (Appendix F). These tools were made by pressure flaking and were extremely sharp. People used the tools for domestic skills, fishing, and hunting. Slings, curved rabbit hunting sticks, sinew-backed bows and cane arrows, and harpoons with slender hardwood foreshafts and bone or stone points, were their weapons. The points were triangular or laurel leaf shaped with tangs. Many had notched and rounded bases. They were inserted into wood handles and glued with asphaltum (Miller, 1988).

Beautifully formed polished globular pots were made out of steatite. Heat spreads evenly through steatite, making it a good choice for cooking pots and flat frying pans. Steatite was also carved into stone images of
animals, birds, and fish (Lee, 1981). Sandstone was made into drinking implements and bowls. The natural holes in abalone shells were filled with asphaltum, and then the shells were used as bowls. Wooden bowls and plates of different forms and sizes were skillfully made by hand. The wooden dishes were as well crafted as those made by machine, according to early explorers’ journals (Hudson, 1977). Wooden trays, boxes and ladles were made of oak or alder. Finely decorated coiled baskets were made, including water bottles. The insides of many baskets were sealed with asphaltum.

Willow (Salix sp.), cattail (Typha sp.), tule (Scirpus sp.), grasses, and other fibers were gathered in the summer to make baskets and cordage. Baskets were made using the coiled method and were strong, lightweight and versatile. From cookware to tools to containers with symbols rich with meaning, baskets met almost any need. Cordage was made from separate plant fibers twisted together into a single, long, twisted string or rope. Cordage was used for sewing, tying, making nets, bags, snares, and fishing lines (McCall & Perry, 1990).

Animal bones were carved into many different types of useful and ornamental objects such as hairpins, beads, needles, awls for basket making, wedges and gouges for woodworking, flakers to make stone tools, fishhooks, and whistles and flutes.
An unusual variety of shell ornaments, tools, and implements with shell inlaid by means of asphaltum characterized their homes and burial grounds. In addition to fine handcrafted tools, pots and baskets, the Obispo Chumash were known for their highly imaginative and abstract rock paintings (McCall & Perry, 1990; Miller, 1988).
CHAPTER FOURTEEN

ART

California is blessed today with the largest number of examples of painting, carving, and chipping on rocks than any of the other states. The Chumash did some of the most spectacular rock art paintings in the period from 500 B.C. to 1500 A.D. The Obispeno were known for their highly imaginative and abstract rock paintings, which were probably produced in connection with religious ceremonies (Eargle, 1986; Gibson, 1990; Grant, 1965; Hudson & Underhay, 1978).

Rock paintings or pictograph sites were placed near sites of permanent water, in most cases in the natural cavities found in large rock formations (Hofsinde, 1959). They chose to paint in caves hidden away by brush and foliage. Some of the Obispeno pictographs are found deep in worn crevices out of the reach of wind and water (Eargle, 1986; Gibson, 1990; Grant, 1965; Hudson & Underhay, 1978).

Rock art sites occur in Obispeno territory as far north as San Simeon, though overall less frequently than in the southern parts of the Chumash territory. The rock art sites occur mostly in the Cuyama and Emigdiano areas, away from the immediate coast, apart from large or permanent villages, and suggest ritual or special purpose activities (Eargle, 1986; Gibson, 1990; Grant, 1965; Hudson & Underhay, 1978).
There is a large site, known as Painted Rock in the Cuyama Chumash area. This is the only rock formation in a flat dry area and resembles a large amphitheater in arrangement. The site holds 45 distinct paintings. Some figures include humans with elbows bent and palms raised. The figures appear as though they are dancing. There is a tomol with four people in it. Turtles, bears and rattlesnakes along with the mythical Coyote and Lizard are seen. There is one pictograph of a red snake that wanders in and out of the cracks in one rock face panel. The site, close to the Obispeno and Yokut territory, was used as a meeting or gathering place for Obispeno Chumash and others (personal knowledge) and as a meeting place for local animal life (Eargle, 1986; Gibson, 1990; Grant, 1965; Hudson & Underhay, 1978).

Geometric patterns and monstrous animals cover whole rock walls, especially in the most highly scenic, remote, and craggy areas. There were five basic symbols for fertility, water, and rain. The rock paintings represented different concepts and ideas. Beautiful sun-like circles and curved, curious lines split at both ends adorn cave walls. Thousands of pictures have been found run together or overlapped in many sites, though no one knows why (Hudson, 1982).

The colors chosen for rock paintings came from the landscape around them. Brilliant reds, blues, white,
yellow, cream, and black were used to create huge symbolic designs. The Obispeno made red, purple and orange paints from iron oxides, white from diatomaceous earth, yellow from limonite, blue and green from serpentine, black from pure manganese, charcoal or burnt graphite. They used the juice of milkweed (*Asclepias californica*), water, white of birds’ eggs, and oil from the *Chillicothe* plant as a binder and to add permanence to their painting (Clarke, 1977; Salcedo, 1999).

Paint cups were made from stone, fish bones, or shell. Rocks were ground into very small pieces and then formed into cakes. The ground rock was pulverized as needed and mixed with water to make paint. Paintbrushes were made of soap root (*Chlorogalum pomeridianum*), frayed fibers of yucca plants (*Yucca whipplei*), or animal tails (Clarke, 1977; McCall & Perry, 1991; Miller, 1988; Salcedo, 1999).

The Obispeno Chumash revered the rock paintings of their ancestors. Many of these sacred sites have been lost over the years due to vandalism and construction.
CHAPTER FIFTEEN

TRANSPORTATION

The Obispeno Chumash were mariners. They used bulrush/tule (*Juncus sp.*), to make their canoes. The Obispeno cut green tule and spread it to dry. After a few days, when partially dry, the leaves were taken up and formed into bundles, the length of which depended on the size of the boat to be made. The bundle that formed the bottom of the canoe was much larger than the other bundles. A willow pole ran the length of each bundle to add strength to the body of the canoe. Bundles were tied together at the stern and prow to form a raised point, and then tied to the bottom bundle along its length. There was no seat in the bulrush canoe. The outside of the canoe was coated with tar (asphaltum) to add buoyancy and prevent rot. It took them about three days to construct a canoe (Clarke, 1977; Hudson, Timbrook & Rempe, 1978).

This canoe was bulky, but lightweight and easily carried overhead. When properly cared for, it was versatile and durable. The canoe was propelled with either a double bladed wooden paddle or by lying in a prone position and using the arms. The canoe was used mainly for near-shore fishing in the natural harbors and bays.
CHAPTER SIXTEEN
LEISURE

The Obispeno Chumash believed in the power of all living things. In the effort to move closer to the source of power in nature, they imitated or tried to become a strong part of the natural world around them (Orr, 1994). Dancing and songs were the very heart and soul of life of the Obispeno. Most dances were interwoven into daily life. Many dances were ceremonial in character and were symbolic; some were more pageant than dance.

Singing was done in unison. Words were very important in Indian songs, but very few words were used in any song. The Obispeno knew the meaning of the song, yet used only two or three key words to tell the story. The subjects of their songs included love, mourning, power, morals and religion. There were lullabies and children’s songs. Many songs were sung by two or more persons during festival dances and were acted to tell a story or were sung as an invocation to the spiritual world. Music was provided with rattles, flutes, whistles, musical bows, and bullroarers. The Obispeno had no drums, but they did have percussion instruments. Tap sticks, split stick clappers and rattles of various types provided the beat. Woods used to make these instruments included ash, box elder, sumac, and hickory. Rattles were fashioned from gourds, turtle shells,
deer hoofs, seedpods, and other containers (McCall & Perry, 1991).

The materials for musical instruments were recycled environmental products that provided pleasure to the user and the listener. It is not unusual to find rattles made of rawhide, pottery, or basketry in excavated village sites.

Each village had a playing field. This smooth level area was big enough for the children to play games of kickball, shinny, hoop-and-pole, and cat’s cradle. The playing field sometimes had a low wall built around it.

Gambling games were played. The men constantly wagered shell money, which they kept strung around their topknots. A favorite game for the men was the ancient game of hiding a stick behind the back and having the opponent guess which hand held the stick. A favorite game with the women was the dice game. Dice were made of snail shells or halves of wild walnut shells (Juglans californica) filled with asphalt in which shell counters were inlaid. Peon, a gambling game with sticks, was extremely popular with both men and women (Clarke, 1977; Macfarlan & Macfarlan, 1958; McCall & Perry, 1991).

Storytelling was popular. Few animal tales or legends have survived. Those that did featured Coyote, the inevitable trickster.
CHAPTER SEVENTEEN

TRADE

The character and habits of the Obispeno Chumash differed considerably from that of other Californian Indians. The Obispeno were friendly, exhibited great affluence and had an abundance of food. The Obispeno had a large supply of seafood in addition to the plant or vegetable products that formed the usual subsistence of other California Indians.

The Obispeno economy was self-sufficient in most respects. However, there was a good deal of trade in locally scarce commodities such as obsidian and pinon nuts (Pinus sp.) Most commodities were traded from tribe to neighboring tribe. They had two systems of trade: bartering or trading and selling goods for money (Schwabacher, 1995).

The Obispenos traded with the Yokuts who lived in the area now known as the San Joaquin valley. The Obispeno supplied the Yokuts with fish, asphaltum, white clay, and shells from abalone, clams, limpets, and periwinkles. The Obispeno received grasshoppers, buckskins, saltgrass, pottery, honeydew, obsidian, tobacco, and seeds from the Yokuts. The Obispenos supplied shell ornaments, wooden dishes, and steatite vessels to the Salinans who lived to the north of the Obispeno Chumash along the ocean. The Obispeno traded shell beads, dried fish, steatite, asphaltum, and sea otter furs to the interior, receiving
deerskins, pinon nuts, and grasshoppers in return (Miller, 1988).

The Chumash, by their extensive trading and use of money, were prosperous. Their major trade routes foreshadowed the most important elements of the present interstate highway system in California. They used Lopez Canyon as one of their highways for travel and commerce between the Obispeno settlements and those in the Central Valley. After many years of trading, the Indian foot trails were worn deep along the hillsides and canyons (personal experience). Their trails linked them directly to their neighbors all around them and with other tribes as far away as the Mojave Desert near the Colorado River. The amount of goods traded was substantial (Miller, 1988). Distribution of foods within Obispeno Chumash territory and trade of money and manufactured goods with neighbors and farther peoples seems to have been vital to the Obispeno Chumash life.

Archaeologists tell us that by 1000 A.D. a monetary system developed based upon shell beads made from the Pismo clam. This shell money was traded all over central California and became a standard of currency for those areas of California that did not employ dentalia. It is thought that the Obispeno furnished the bulk of the money for those living in what is now Central California. They
were known as the bead and seashell traders from the coast (Kroeber, 1976).

The Obispeno measured lengths of strung clamshell beads and pinon nuts around tattoo marks on the edge of a hand or lower arm of the trader to determine the value of length. A house was three strings of beads, a fishing place was one to three strings, and land with acorn bearing oak trees one to five strings. A basket hat was used to measure volume of shelled acorns, chia, and other seeds. Paint pigment and wild tobacco were made into uniform lumps (McCall & Perry, 1986).
CHAPTER EIGHTEEN

CHANGE

The Obispeno way of life was based on respect for the earth, plants, and animals that they used for food. Unfortunately, that way of life proved to be very fragile when a new group of people arrived who had quite different plans for the Obispeno homeland.

The Spanish mission in Obispeno Chumash territory, San Luis Obispo de Tolosa, was established in 1772. This was the first mission set up to help protect the Spanish trade route across the Pacific Ocean to the Philippine Islands in the entire Chumash land.

The Spaniards imposed the autocratic ways of 18th-century Spain on an Indian culture unchanged since the Stone Age. In a 60-year period, they induced the Obispeno Chumash to leave behind their stone tools and weapons, their nakedness, their tribal identities, and their abundant natural foodstuffs.

The Obispeno probably came to the mission at first to trade for European goods. The priest may have assumed that his presence would be enough to convince the Obispeno to give up their traditions and become Christians. When the priest saw that this was not to be the case, a campaign was begun and carried out by the military, to capture as many Obispeno as they could and force the them to live and work in the mission (Gibson, 1990).
When the Obispeno were brought to the mission, they were forced to give up their traditional practices for those of Spanish society. They were taught trades that would assist the priest and soldiers in the daily operation of the mission. The tasks included farming, caring for animals, pottery making, weaving, iron working, masonry, and irrigation. The Obispeno provided almost all of the labor required to construct and maintain the Spanish mission. The priest and soldiers served as manager and instructors and performed little actual labor (Gibson, 1990).

Regulations of the priests were very different from those that the Obispeno had been used to. The most striking of these was the segregation of unmarried Obispeno men and women when they reached the age of 11. They ate and slept in separate quarters. The women were forced to sleep in a building that was kept locked throughout the night (Gibson, 1990).

The food that the Obispeno were forced to eat was not as good as what they were used to eating. They were usually fed the same thing—atole—at virtually every meal. Occasionally they were given meat and fish. Sometimes the Obispeno were allowed to go home to visit. While there they would hunt and fish and supplement their diet (Gibson, 1990).
From independent, free-circulating hunters, gatherers, and fishermen, the Obispeño Chumash became slaves, confined within the mission compound and impressed into labor details (Lyngheim, 1990). From nature worshippers they were converted into neophytes, nominal Christians capable of celebrating the Mass but without comprehending its meaning.

By the early 18th century, the Obispeño Chumash were completely missionized and converted to Christianized peasantry. Most of their native villages were abandoned and population had declined sharply due to disease, general despondency, and separation of men and women. In 1810-1820, there were about 1,000 known Obispeño Chumash at the San Luis Obispo de Tolosa Mission and by 1820-1830 this population declined to about 400 (Robinson, 1957).

Missionization meant destruction. Forced into slave labor and fed thin seed gruel while the Spanish lived on wine and meat, the Obispeño had no immunity to the white man's diseases (Miller, 1988; Schwabacher, 1995). Measles, smallpox and syphilis were killers.

Soldiers, whom the padres were unable or unwilling to control, looted and killed as they chose (Brandon, 1987). Many Obispeño never adapted to mission life and some that did rebelled against the strict discipline. Some Obispeño continually escaped to the hills. Finally, conquered and totally dispirited, the Obispeño resorted to suicide and
In 1821, after about 60 years in the Obispeño Chumash area, Mexico declared its independence from Spain. The protecting Spanish central authority was removed. Local oligarchies were given political power. Lack of money and supplies seriously disrupted the mission system. The Mexican occupation forces arrived (Behens, 1999; Brower, 1996; Gibson, 1991; Lyngheim, 1990).

Tensions between the Obispeño Chumash and the soldiers stationed at the mission flared. A revolt occurred in 1824. Additional troops arrived and the Obispeño Chumash rebels were forced to surrender. Deeply discouraged by the worsening course of events, they passively accepted their dependent condition.

Mission lands were expropriated in 1833 and given out as private ranches during the next decade, while Anglo trappers explored overland routes into what had been Chumash territory. The missions fell into ruins. This essentially ended the mission culture.

The military establishment on which the mission had relied and the small settlements that grew up in proximity to the fort and mission formed the nucleus of a small but growing Spanish-Mexican population. These establishments and settlements had a natural interest in opening Mission
lands to private exploitation (Behens, 1999; Brower, 1996; Gibson, 1991; Lyngheim, 1990).

Distribution of former mission (originally Obispeno Chumash) lands to private ranchers reduced missionized Obispeno to destitution. The epidemics continued. Most of the Obispeno Chumash people were forced to seek jobs as domestic servants and cowboys on the big ranches.

Soon other events occurred which continued the disruption of Obispeno Chumash life. California became a territory of the United States. Gold was discovered in California. Many new settlers came to the central coast region to farm, and as cattle buyers and merchants. More newcomers arrived after California became a state in 1850. This large influx of newcomers made life very difficult for the Obispeno Chumash. Because the laws at that time did not protect them, white settlers could force the Chumash off their own land (Behens, 1999; Brower, 1996; Gibson, 1991; Lyngheim, 1990).

Racist views of Indians were widespread. Many whites believed that Indians were either wild savages to be destroyed or inferior beings. The Obispeno Chumash were laughed at, pitied, and called "diggers," (McCall & Perry, 1986, p. 16; Schwabacher, 1995, p. 68) a term still used today in the area when relating to the Chumash.

This was a time of great sadness for the remaining Obispeno Chumash. They were harassed and victimized until
they fled their homes and their few remaining village communities. Families became scattered and were afraid to admit their heritage. The children learned to speak Spanish and English instead of the Obispeño Chumash language. It was difficult for them to get jobs; many lived in extreme poverty. Thus, the once prosperous and dignified Obispeño Chumash people became outcasts in their own land during a period of less than 100 years. The mission population continued to fall prey to epidemic disease, and 1910 left only 1% of the Obispeño Chumash population (Behens, 1999; Brower, 1996; Gibson, 1991; Lyngheim, 1990).

In the late 1970s, less than 50 Chumash descendants lived on a small Indian Trust Land of 100 acres near Santa Inez, Santa Barbara County, California. An unknown number of others have been assimilated into the general population of southern California. At the end of the 1970s, the Chumash Indian Trust Land for the entire Chumash nation, outside the Santa Inez Mission, had 69 people living on it (Behens, 1999; Brower, 1996; Gibson, 1991; Lyngheim, 1990).

Today after having their culture nearly extinguished, the Chumash are a proud people. Their dances, songs, crafts, and stories are being revived. There are about 320 Chumash from the entire Chumash area now living on the Indian Trust Land. The registered increase has come by a growing tendency to take pride in Chumash Indian ancestry (Brandon, 1987).
In the 1980s the Indian Trust Land became known as the Santa Ynez Reservation. Nearly 2,000 people have sought enrollment in the tribe, claiming Chumash descent (Ciment, 1996).

"Once there were more than 20,000 Chumash inhabiting the West Coast of California, between Malibu and San Luis Obispo. That was only 200 years ago, yet today anthropologists say there is not one pure-blooded Chumash left!" (Anonymous, 1991, p. 22).
CHAPTER NINETEEN

CHANGE OVER TIME

The Obispeno Chumash was a culture whose main preoccupation was with their environment. In every way they showed themselves wiser in the ways of their environment, than their present-day successors who have destroyed or at best ignored the natural plant and animal resources of this incredibly rich coast.

The Obispeno Chumash had a different kind of insight. Long centuries of successful adaptation to life in this area leads one to believe that the Obispeno’s approach to land use was far more sophisticated than was once suspected. There was realm, pattern and scale to human use that was suited to wild places, accessible through the ancient knowledge of their elders’ ancestors.

They harvested resources in such a way that plants continually thrived in the same locations. They understood plant-use cycles. An important rule was to not take everything. Plants and animals were honored through human use. This fact reinforced the feeling that plants, animals and humans all belonged to a place.

Outside the cultivated and urbanized large valleys, the wild landscape has persisted with remarkable tenacity. Except where destroyed by urbanization and cultivation, the most marked change in it since the advent of the missionization in the late 18th century has been the
naturalization of some European species of plants, particularly certain grasses that are now extremely abundant.

Most of the lowland vegetation communities - California grassland, coastal sagebrush and oak woodland - have been altered through grazing, farming, and urbanization. The natural habitat of the Obispeno Chumash cannot be thought of strictly as a pristine setting unmodified by people.

The Arroyo Grande Valley remains very fertile. No portion of the Pacific Coast exceeds the dark black soil in richness. At one point in the late 1940s or early 1950s, the valley supplied one-third of the nation with celery. The climate is excellent. The valley's irrigation water supply comes from the aquifer; wells pump the water up and out (personal knowledge).

The drinking water came from wells until about 30 years ago when Lopez creek was dammed. Water from the dammed creek filled Lopez Canyon and covered many Chumash archaeological sites. Lopez Lake now supplies the water for the populated areas (personal knowledge).

Several of the streams in the area were at one time well stocked with native trout and salmon that were easily caught. Dams now control the streams. Streams where fresh water flowed yearlong and fish reproduced are now dry. Many
streams are polluted, therefore not viable for fish, other water dependent creatures, or plants (personal knowledge).

The pioneers had their greatest impact, however, as woodland was cleared for agriculture and later for the development of rapidly spreading cities. In the early part of the twentieth century, the Black Oak (*Quercus kelloggii*) was cut down by Europeans to make car axles. Tree parts not used were left to rot. Until the 1960s the Black Oak (*Quercus kelloggii*) was treated as a weed, poisoned and girdled to kill it off. But admittedly, neither the Obispeno nor the pioneers altered the face of the landscape in comparison to the transformations of the same area brought about by modern 20th-century industrial society (Clarke, 1977; Pavlik, 1991).

Many of these changes occur along the traceable portions of the routes that were used by the Obispeno Chumash. When the Spanish explorers came to what they called Alta California in the 1760s, they followed the same well-worn trails, but now on horseback. Years later, in the 1800s and 1900s, many of the new railroads and paved roads used the same Indian trail system. The modern highways 101, 1, 126, 399, 166, and other modern numbered routes followed the trade routes. Some of the old trails remain today as county roads or hiking trails. They were too steep and the countryside too rugged for trains and fast highways (Stob, 1986).
Concrete and glass buildings and the asphalt impedimenta of modern cities now occupy many of their village sites. On the coast, agriculture, military activities, trade, transportation, tourism, oil, and various activities subsidiary to these, support modern habitation. The nuclear power plant along the coast supplies power to thousands of people, furthering modernized industrial society (personal knowledge).

The Obispeno's use of mineral resources made no appreciable impression on the earth's supply. This is completely contrary to our own system of ownership, which is stimulated by expectation of economic gain, the discovery and development of ore and petroleum deposits.

Extensive commercial fishing of the sea is a thing of the past, primarily because of the depletion of resources. Pismo Beach got its name from the tar on the beach. The Pismo clams, once so abundant they were like cobbles in the sand, are vastly depleted. Today, many areas of the beaches in San Luis Obispo County are closed to gathering clams, the number of clams gatherable has been reduced, and a minimum harvestable size limit imposed in an attempt to preserve the remaining resource. Abalone gathering seasons have been closed (personal knowledge).

The delicate environmental balance of the sand dunes is being destroyed. Off-road vehicle and dune buggy use is destroying the vegetation, silky beach pea (Lathyrus sp.),
morning glory (*Calystegia* sp.), sand verbena (*Arovin* sp.). These plants helped stabilize the sand dunes, and provided homes for small creatures (Clarke, 1977). As a result of the dunes destabilizing, the sand is moving eastward without replenishment from the west (U. S. Army Corps of Engineers, 1985). The sand is also being eroded into the ocean adding to the relationship of the rise in the sea-land rise. It is an important concern as the beach narrows and sand erosion becomes more extensive and severe over time. This coupled with the eastward movement of the dunes shortens the life span of that particular environment and ecosystem (Goudie, 1994).

Selective predation on various species has had an effect on ecological balance. At least 60 of California’s land mammal species utilize oak landscapes for food or cover. From the demure insectivorous moles to the imposing, carnivorous grizzly bears, oak communities were brimming with fur-bearing creatures when the first Europeans arrived. Many of these species were trapped, hunted, poisoned, and some driven to extinction. The fates of large, roving mammals such as elk and mountain lions are still uncertain as oak-dominated habitats vital to their survival continue to shrink and disappear as a result of land development.

The golden grizzly bear was once widespread in California’s oak landscapes. It was especially prominent in
the Los Osos Canyon. This fierce and adaptable omnivore commanded the respect and awe of the Obispeno Chumash, with whom it coexisted for thousands of years. By the early 1920s, less than 150 years after the arrival of the first Spanish colonists, all of California’s grizzlies had been exterminated by relentless hunting and trapping. Today, the golden grizzly bear is no more (Robinson, 1957; Squibb, 1968).

Tribute has been given to the Obispeno Chumash by the Board of Geographic Names, United States Department of Interior, through the approval of the name of Chumash Peak for a mountain located about two miles north-northwest of San Luis Obispo. Respect continues to grow for California’s previous inhabitants who were able to live in harmony with their environment for thousands of years.

In spite of industrialization and urbanization, it is plowing and pastoralism which are responsible for many of the environmental problems and which cause widespread problems of water pollution, habitat changes and soil salinization.

The complexity, frequency and magnitude of impacts on the environment continue to increase because of steeply rising population levels and increase in per capita consumption.

The increasing income, leisure and ease of communication have generated a strong demand for recreation
Recreation and tourism have created the following environmental consequences:

1. Soil compacting by increased foot traffic.
2. Nutrients added to soil at campsites by pets and people.
3. Erosion by off-road vehicles and footpaths.
4. Dune reactivation by trampling.
5. Vegetation changes due to trampling and collecting.
6. Habitats destroyed by cutting trails and clearing campsites.
7. Pollution of lakes and inland waterways by gasoline discharge from outboard motors and human waste.
8. Disturbance of wildlife by proximity of persons and by hunting, fishing and shooting.

Humans have imposed many undesirable and often unexpected changes in the environment. Humans have the capacity to modify the rate of such changes or to reverse the changes.

The Obispeño Chumash developed a highly sophisticated set of principles for living in concert with the existing ecosystem. They lived in harmony with their environment and were subject to the same natural controls as those of the animals to lived there. Can we say the same?
"All things by immortal power
    near or far
    hiddenly
To each other linked are,
That thou canst not stir a flower
Without troubling of a star."

Frances Thompson (Bernarde, 1970, p. 1)
APPENDIX A: HOKAN LANGUAGE FAMILY

A. Northern California sub-family

1. Palaihnihan division (Achomawi, Atsugewi)
2. Shastan division (Shasta, Kahutineruk, [New River Shasta], Okwanuchu)
3. Karok division (Karok)

B. Yana sub-family

1. Yana division
2. Yahi division

C. Pomoan sub-family

1. Pomo division

D. Esselen sub-family

1. Esselen division

E. Iskoman sub-family

1. Salinan division
2. Stishini division (Obispeno)
3. Chumash division (Davis, 1966; Kroeber, 1976)

A. Chumashan division

1. Central group
   a. Ventureno-Emigdiano language
   b. Barbareno language
   c. Ynezeno language
   d. Purisimeno language

2. Island Chumash language
APPENDIX B: TOPOGRAPHY: SAN LUIS OBISPO COUNTY

Topography Map of San Luis Obispo County
Looking west to Pacific Ocean from foothills of Coast Range Mountains.

Looking east from foothills of Coast Range Mountains.

Photos: Sharon Marks
APPENDIX C: ACORNS IN PROFILE

Black Oak
(Quercus kelloggii)

Blue Oak
(Quercus douglasii)

Valley Oak
(Quercus lobata)

Coast Live Oak
(Quercus agrifolia)

Interior Live Oak
(Quercus wislizenii)

Scale = 100%  Drawings by Allison Atwill
<table>
<thead>
<tr>
<th>NAME</th>
<th>PRODUCTION OF ACORNS</th>
<th>GOOD YIELD YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valley Oak</td>
<td>227 kg per tree</td>
<td>1 out of 3</td>
</tr>
<tr>
<td>Blue Oak</td>
<td>73 kg per tree</td>
<td>1 out of 3</td>
</tr>
<tr>
<td>Coast Live Oak</td>
<td>45 kg per tree</td>
<td>1 out of 2</td>
</tr>
<tr>
<td>Interior Live Oak</td>
<td>114 kg per tree</td>
<td>1 out of 2</td>
</tr>
</tbody>
</table>

The average kilograms of acorns produced per tree varied. The Valley Oak was the most prolific with 227 kg of acorns per tree, producing a good crop only one out of every three years. The Coast Live Oak was the least proficient producer, producing 45 kg of acorns only one out of two years. In the years not named, the yield of acorns produced was less.

The high fat content makes the acorn superior to most grains in caloric value: 2,265 calories per pound compared to 1,497 calories per pound for wheat (Baumhoff, 1963).
APPENDIX D: OBISPENO CHUMASH CALENDAR

January  Month of Datura
February  Month when things begin to grow (rain)
March    Month of spring
April    Month when flowers are in bloom
May      Month when carrizo is abundant
June     Month when things are divided in half
July     Month when everything blows away
August   Month of fiesta
September Month when those that are dry come down
October  Month of great canoe builder
November Month when rain keeps us indoors
December Month when the sun brilliance begins

(Blackburn, 1975)
SLO-297 Dig, Grieb property, Arroyo Grande. Bones carbon dated to 3,000 years ago. Photo: Marge Bennett
APPENDIX F: PROJECTILE POINTS, MIXED MATERIALS

Projectile Points found in Arroyo Grande, CA

Projectile points showing pressure flaking marks.
Photos: Dean Grieb
Heavy lines show major interregional trade routes; light lines show local trade routes; dotted lines represent inferred routes (Davis, 1966).

Scale: 1:8,000,000
BIBLIOGRAPHY


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