THE CABRILLO NATIONAL MONUMENT
A PHYSICAL AND CULTURAL OVERVIEW

By

Dr. James Robert Moriarty, III
University of San Diego
This work is dedicated to the memory of the Portuguese explorers

JUAN RODRIGUEZ CABRILLO

and

BARTOLOME FERRELO

Under conditions requiring the greatest courage and tenacity, they passed this way and left us a noble tradition.
Preface

The following study was done under the direction of the Western Regional Office of the United States Department of the Interior, National Park Service. Its purpose was to provide a detailed cultural and physical report on the Cabrillo National Monument. Special attention was directed to the description of original appearance and function of structure(s), as could be determined by inspection and documentation, where possible. In addition, discussion of potential historical importance or significance of structure(s) as historic resources, and a listing of references or research materials utilized in the preparation of List of Classified Structure Forms.

The report was to include, but not be limited to the following topics:

1) Describe the ecological zones, microenvironments and other environmental characteristics of the Monument area, with reference to the Monument in its regional context and to know changes of environmental qualities and characteristics.

2) Summarize the ethnographic knowledge about the Monument area and its environs with particular focus on the environmental adaptation and impact of historic peoples upon the natural environment of the Monument area.

3) Summarize past research regarding cultural, historic, and paleontological resources within and near the Monument, evaluating the resultant data and studies.
4) With specific reference to sites and structures of the Monument, summarize the historic role, function, and importance of the Monument area to local, regional, and national history.

5) Recommend future actions for productive research, protection, and preservation of resources as identified and described; determine if these resources may be eligible for the National Register of Historic Places.

The study was accomplished under Order #PX 8000 50817.

The principal work was conducted from July 1975 to April 1976.

Cabrillo National Monument occupies a small portion of the Point Loma peninsula. It shares, in general, with the surrounding area the same physical and cultural history. It has been the purpose of this study to provide as detailed a study as possible within the stipulated limits. Such a work relies heavily upon the available scientific and cultural studies. It is, in essence, therefore, a synthesis of the work of many people. The study has not attempted to provide data which does not bear directly upon the Point Loma and San Diego Bay vicinity. The rationale for this being that no data be presented that is not at least peripheral to physical environmental conditions within the boundaries of the Cabrillo National Monument. Additionally, cultural historical references also were selected which fell within the intent of the rationale. Naturally, some data has a more direct effect than others, however, all data utilized were carefully selected in order to provide continuity and authority
to the study.

Field studies were conducted for the purpose of checking and providing, where possible, new data relating to the geology, biology, archaeology, and classified structure history within the park area. This research has provided much new data and has suggested a number of approaches for continuing studies.

James Robert Moriarty

Dr. James Robert Moriarty, III
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CHAPTER I

ENVIRONMENTAL SETTING

Geology

Physical Setting and Surface Forming Materials

In order to show a more complete picture of the Point Loma area it is necessary to review, in general, a few of the principal characteristics of the inanimate physical environment of the broader area.

The greater part of San Diego County is a distinctly rugged granitic highland. The detailed topography of this mountainous region is very complex, the different ranges trending in many directions and enclosing many small valleys or basins at various altitudes; some of these contain considerable farming land, though none of them are very large.

The mountains increase in elevation with distance from the sea until fifty miles inland they terminate in crests six to seven thousand feet high. From these summits the descent of the eastern slope is very rapid, so repeating on a smaller scale the pattern of the Sierra Nevada.

Along the western margin lies a sharply defined coastal
VICTINITY MAP

Figure 1.
plain, consisting of a series of marine terraces sloping from the base of the range to the sea. These terraces, varying in width from 12 to 18 miles, are locally known as the Mesa. On the ocean side they terminate in a line of sea cliffs with the exception of San Diego and Mission Bays, where the cliffs give way to a narrow bay flat. Toward the mountains the upper part of the plain passes between and behind outlying isolated peaks of the range. These peaks extend below the Mesa and present the effect of partially buried topography (Artim 1971; Artim et al. 1971).

These terraces were formed beneath the sea by the force of wave erosion and deposition and then uplifted and subjected to stream erosion. The result is a series of benches with irregular surfaces varying in height from 20 to 500 feet in the region about the bay. The older and higher terraces near the mountains are severely dissected. The tops of these ridges are about 900 feet above the sea and rise to 1200 feet at the east where they join the crystalline rocks. As a result of the oscillations of the coast, streams have cut deep canyons through the Mesa which have, subsequently, been partly filled. The result is seen in wide flat bottomed valleys exhibited by such streams as the San Diego, Sweetwater, and San Dieguito Rivers. The major streams rising in the range flow roughly parallel to each other and at right angles to the ocean. The minor
Figure 2. Physiographic representation of San Diego and Imperial Counties showing the territory of the California Yumans and the four Ecological Systems.
streams with few exceptions rise on the Mesa and cut their way through short narrow canyons to the main streams. These are serious obstructions to transportation and have had an important role in the growth of the general coastal area.

Geologically, the region may be divided into the granite highlands of the eastern part of the unconsolidated and poorly consolidated materials of the coastal belt. Goodyear estimated that nine-tenths of the whole mass of the range is granite, varying largely in texture and to a considerable extent, also, in its mineralogical composition. The formations of the Mesa consist of conglomerate, sandstones, shales, and limestones, but owing to the proximity to the highland area from which nearly all the material has been derived, coarse deposits are present in large proportions. Some of the beds contain fossils which have been identified as Cretaceous, Tertiary and Pleistocent. The boundary between these two rock provinces is a sinuous line about fifteen miles inland (Goodyear 1888).

Although the geologic record in the Los Penasquitos and San Dieguito River Valleys begins approximately 100 million years ago in the lower Cretaceous, for the purposes of this study it will suffice to begin with the Eocene, at which time these valleys were most probably embayments, possibly estuaries, bays or lagoons. A series of sedimentary materials were deposited which are collectively known as the San
Dieguito group. They are the Del Mar Sandstones, the Torrey Sandstones, and the Rose Canyon Shales (Orr 1967: Interview).

The valleys contain no stratigraphic units representative of the Oligocene, Miocene, or Pliocene epochs. However, the record is resumed with the Pleistocene, which was characterized by fluctuations in the sea level (Carter 1957:3). These can be correlated with the presence of glaciers on land, and it is probable that the continental glacial advance resulted in a lowering of sea level. This enabled a large, flat floored valley to be dissected into the Torrey Sandstone. As the glaciers retreated and the sea level rose, it is probable that the valleys became small bays, abounding in sea life (Gunther 1964:64). Then began a long series of alternate periods of filling and erosion. Since the late pleistocene filling has been predominant, with only limited erosion occurring.

The alluvium, which at present overlays the Torrey Sandstone, varies in thickness from zero to twelve feet, and is composed primarily of course boulder conglomerate and gravel. However, there are two facies present. The channel facies represents a braided stream environment and consists principally of gravel, with lenses of conglomerate associated with clean, well-sorted coarse sand. The flood plain facies are associated with neanders and consists primarily of finer sediments, clays and silts,
which are poorly sorted, but better stratified.

Although the rising and lowering of sea level and the aggrading and degrading of the valleys indicate striking climatic adjustments in the geologic past, for the last 10,000 years it is thought that the climate has remained relatively similar to that of the present. There have, however, been noticeable variations in temperature and moisture levels, as evidenced by the "sedimentary unit size which indicates a flood interval of between forty and fifty years," (Orr 1967: Interview). This general similarity of climate suggests a corresponding broadscale similarity in the flora and fauna, although some adaptations, introductions, and extinctions of species probably did occur (Anderson 1962).

Among the largest of the minor coastal valleys and canyons of the San Diego area are Los Penasquitos Valley, San Dieguito Valley, Soledad Canyon, Rose Canyon, Tecolote Canyon, Las Chollas Valley, Paradise Valley, and Telegraph Canyon. With the exception of Los Penasquitos and San Dieguito Creeks, which begin in the highland area to the east, the streams forming these valleys are confined to the coastal region. In general, they occupy shallow, steep-walled valleys and, except for those that discharge into the coastal waters, are tributaries of the major water courses (McEven et al. 1976: In press).

A topographical characteristic of many of the coastal
valleys is their unevenness of wall slope. As stated by Emory:

Many of the stream valleys which have been cut into the San Diego Terrace are characterized by a peculiar asymmetrical cross-section. In general, the valley wall on the south of a stream (north-facing wall) is steeper than the wall on the north side (south-facing wall). This type of cross-section is most pronounced for valleys draining westward with a moderate gradient (Emory 1947:61).

A possible explanation for this can be found in the heavier vegetative growth on the north-facing valley walls, to less direct sun effect and the consequent better retention of available moisture. The heavier vegetative growth would certainly help retard erosion, and asymmetry would develop.

The drainage system of much of the San Diego area is distinctly dendritic, with a large number of intermittent, insequent streams carrying away the surface runoff. This drainage pattern may well be related to either the uniform resistance or the horizontal attitude of the sedimentary strata underlying the terrace terrain. An exception, however, is found in some of the shallow valleys cut into the Linda Vista Terrace where the streams have followed peculiar angular courses. An explanation for this has been found in the existence of several north-south trending ancient dune or beach ridges which have, to a large degree, deflected the normal
east-west drainage (Blane and Cleveland 1968).

The surface water, which would normally flow westward in the direction of the general slope of the terrace, was deflected to the north and to the south by the ridges until it was able to cut across them at right angles. Once established, the streams deepened their valleys in these places (U.S.G.S. 1919:34).

While these Pleistocene sandstone ridges have been considered the major factor in the development of this trellis-like drainage pattern, the presence or absence of the hard conglomerate of the Sweitzer formation and the relative resistance of underlying materials may also be important considerations (Milow and Ennis 1961:35-36).

In the eastern part of the terrace region, some broad, shallow valleys and low, subdued hills occur which are unlike the steep-sided v-shaped canyons cut by westward-flowing coastal streams. These valleys were possibly cut during the Pleistocene at a time when they did not have to cut very deeply in order to reach their base levels. Thus permitting greater development of lateral erosion resulting in wide valleys of low relief. They are not drained by major streams, but by a number of small intermittent streams that connect with the larger drainage systems.
military reservation, serviced by good roads maintained for the several installations present. Permission to work in the area was obtained from the Naval Electronics Laboratory, the United States Coast Guard, and the Department of the Interior (National Park Service, Western Region). The northern part of the peninsula is so densely populated that mapping and sampling were restricted to road cuts, partially covered slopes, new building sites, and uninhabited valleys.

Small areas are restricted by the military, and permission to enter could not be obtained, but this did not seriously affect the study. Also, access along the shoreline is the limited time that could be spent along the shore between tides.

**Land Use**

Land use is primarily residential in the northern sector, and in the west central portion of Point Loma the Point Loma College occupies approximately fifty acres. Various military and governmental agencies control the entire southern portion of the peninsula. In 1860, the United States Army erected Fort Rosecrans on the peninsula for the protection of the settlers, and the area has been occupied by the military continuously since that time.

The United States Navy built fuel and ammunition storage facilities on Point Loma for servicing the Fleet.
in San Diego Bay. Presently, installations are being erected along the eastern shore of Point Loma for atomic submarines and similar naval vessels. Naval Electronics Laboratory is on Point Loma and most of their varied activities are in restricted areas. The Department of the Interior has erected a salt-water conversion installation, and the City of San Diego is constructing a sewage disposal facility.

A National Cemetery and the Cabrillo National Monument are also present, as well as two lighthouses which are attended by the United States Coast Guard. The "so-called Spanish lighthouse" has been restored and dedicated as a National Monument, attracting large numbers of tourists to the area.

Physical Features

Point Loma is a peninsula bordered by nearly vertical sea cliffs on the west and south, and on the east as far as Ballast Point. Two distinct wave-cut terraces are prominent topographic features and occur within limited ranges of elevation. The most pronounced terraces, the youngest, extend along all of the western and northern side, as well as the southeast portion of the peninsula.

The topographic expression of the area is related to the network of northeast-southwest and northwest-
southeast trending faults and fracture patterns which control the drainage pattern of the peninsula. Intermittent streams formed by the runoff from the occasional rains have dissected the area to form a series of youthful v-shaped valleys. Relief is 430 feet near the southern tip of Point Loma, gradually diminishing northward to the vicinity of Mission Bay.

Point Loma is in a semi-arid region with an average annual rainfall of less than 10 inches. Temperatures are mild, with summer highs generally ranging between 70°F and 79°F; summer low temperatures are approximately 58°F to 62°F. The winter temperatures range from an average high of 66°F to an average low of 50°F (California Division of Mines 1952).

**Geomorphology**

The Point Loma area is in the early youthful stage of the fluvial cycle of erosion. The terraces show initial sharp dissection by seasonal streams in runoff valleys. Further evidence for the determination of the age of the area can be seen in the stream cross sections which exhibit the typical v-shaped profile. Stream gradients are steep to vertical, downcutting is dominant, and the area is undergoing rapid dissection (California Division of Mines 1892).
Marine Cycle

The irregular shoreline, the absence of offshore bars, presence of high, steep, wave-cut cliffs, and the many stacks, sea caves, and sharp headlands along the margins of Point Loma indicate a shoreline of submergence in the early youth state (Johnson 1925). Moreover, it is classed as a secondary mature coastline using the classification of Shepard (1948). However, the presence of the wave-cut marine terraces at the top and on the lower slopes of the peninsula indicates that the area is also one of emergence. Therefore, by the criteria mentioned above, the shoreline must be classed as compound (Eidermiller and Finch 1969).

Most of the sea caves of the seaward shoreline are the direct result of faulting and incompetency of the fracture zones of the formation exposed along the coast. Normally, the sea caves have an arched roof with a smaller opening in the face of the cliff, opening into a rotunda (Pipkin 1955), and many of the more mature caves have collapsed roofs and are much larger.

Stacks investigated at low tide display an intersecting fracture pattern nearly at right angles to one another. These zones of weakness permitted and abetted the development of the erosional remnants. Erosion and cutting of the parent rock of the shoreline was accelerated along the fractures or weaker zones by the hydraulic action of
the water, which tended to disrupt blocks of rock from the cliff face. The irregular shoreline of the seaward margin of Point Loma can be attributed to the wave erosion of the rock in the less resistant fault and fracture zones. Erosional fractures, such as storm terraces or benches, have two different water levels.

Landslides and slump features are common in the Point Loma area. Steep slopes, unconsolidated surface material, and occasional heavy rains, coupled with the activities of man, have led to appreciable mass movement. The United States Navy ammunition and fuel depot is built on a huge slump area on the eastern side of Point Loma. Heavy watering of the National Cemetery immediately above the west of the slump probably contributed to this feature. Several smaller slump areas were noted, the most prominent of which was one north of Fort Rosecrans, and another at the extreme south end of the peninsula (Bock and Schmidt 1961; Eckel 1958).
In 1885, Mormon settlers developed a coal mine in the terrace on the west side of Point Loma, which produced coal from the upper member of the Chico Formation for a limited period of time, and was, subsequently, abandoned (Hertlein and Grant 1944; Carsola 1959). Lignite is exposed in the cliffs nearby, and it is possible that this was the material which was exploited.

Sand and gravel from the formations of the area could be used for local road construction; however, the greatest economic value of the peninsula is for military purposes and other governmental enterprises. A further economic possibility is for the construction of residential developments.

The author believes that ground water possibilities are very poor in the Point Loma region. Low rainfall, lack of adequate aquifers, and the problem of salt water intrusion present a dismal prospect for future developments. Ellis and Lee (1919) investigated ground water possibilities on the peninsula; they, also, reported unfavorable conditions for the occurrence of ground water (California Department of Water Resources 1967).

Previous reports have all been unfavorable for the production of commercial oil or gas in the Point Loma area. From a study of the available information and investigation of the regional structure the author does not necessarily
Table 1. Log of well on pueblo lot 146, Point Loma, San Diego County, Calif.

[Begun Aug. 18, 1900; completed Mar. 18, 1901. Authority, Katherine Tingley, Owner.

Elevation of mouth of well, 255.88 feet above high tide.

<table>
<thead>
<tr>
<th>Thickness</th>
<th>Depth</th>
<th>Thickness</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Diego formation:</td>
<td></td>
<td>Eocene--Continued.</td>
<td></td>
</tr>
<tr>
<td>Surface Clay</td>
<td>3 Feet</td>
<td>Feet</td>
<td>Water-bearing sand, good water</td>
</tr>
<tr>
<td>&quot;Hardpan&quot;</td>
<td>5</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Sandy clay</td>
<td>22</td>
<td>30</td>
<td>Dark-blue shale</td>
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<tr>
<td>Water-bearing sand</td>
<td>10</td>
<td>40</td>
<td>Water-bearing sand</td>
</tr>
<tr>
<td>Sandy shale and dry sand</td>
<td>20</td>
<td>60</td>
<td>Dark-blue shale</td>
</tr>
<tr>
<td>Sandy Shale</td>
<td>40</td>
<td>100</td>
<td>gold colors</td>
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<tr>
<td>Sand</td>
<td>6</td>
<td>106</td>
<td>White Quartz from pan-</td>
</tr>
<tr>
<td>Eocene:</td>
<td></td>
<td>Blue granite ning.</td>
<td>2</td>
</tr>
<tr>
<td>Dark-blue shale</td>
<td>48</td>
<td>190</td>
<td>Light-blue shale</td>
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<tr>
<td>Water-bearing sand</td>
<td>2</td>
<td>192</td>
<td>Alternate shale and sand</td>
</tr>
<tr>
<td>Dark-blue shale</td>
<td>8</td>
<td>200</td>
<td>Light-blue shale</td>
</tr>
<tr>
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<td>Water-bearing sand</td>
</tr>
<tr>
<td>Dark-blue shale</td>
<td>58</td>
<td>260</td>
<td>Light-blue shale</td>
</tr>
<tr>
<td>Whitish clay</td>
<td>1</td>
<td>261</td>
<td>Water-bearing gravel and sand</td>
</tr>
<tr>
<td>Coal</td>
<td>1</td>
<td>262</td>
<td>Shale, gravel, and Clay</td>
</tr>
<tr>
<td>&quot;Ore&quot;</td>
<td>3</td>
<td>265</td>
<td></td>
</tr>
</tbody>
</table>

Diameter of well, 6 inches, 0 to 40 feet; 5 inches, 40 to 400 feet. Water level, 253 feet below surface, or 2.88 feet above high tide. Estimated yield, 35,000 gallons daily if all water-bearing strata are used.
concur with these findings. Reasons for the location of previous wells in the general area are not known, and to the writer's knowledge, only one well was drilled after study and with geologic and scientific control. If professional geologists were employed, it was after drilling commenced (Peterson and Gaskil 1966).

The eastward dipping beds of Point Lorna and the reversal of dip or westerly dip of the beds offshore (Moore 1957), showing closure to the north or a fault trap produced by the Mission Valley fault, together with the southward gentle plunging anticlinal axis offshore, seem an intriguing possibility. All deep wells in the region show a sediment cover of over 5,000 feet, and a show of hydrocarbons was noted in most wells (Miller 1935:1535-1562).

The sediment east of and on Point Loma may represent a course continental facies of the basin, and the finer facies of higher organic content for source beds could be expected offshore to the west. All of the wells, with but one exception, were drilled to the east of the Rose Canyon fault. The Borderland Exploration Company #1, which was drilled to a depth of 5,101 feet (Hertlein and Grant 1944), is to the west of the Rose Canyon fault and is possibly located in the Mission Valley fault zone. Perhaps a well drilled farther south and offshore to the west would produce different results in the area (Emery
Paleontology

The coastal area is underlain by sedimentary rocks mostly deposited by retreating seas. The gently dipping strata in the coastal area contain fossils of the Cretaceous through Pliocene periods (70,000,000 to 1,000,000 years ago). These rocks contain fossil shells found nowhere else in the United States. Eocene sandstone has yielded the remains of fishes, amphibians, birds and early mammals that lived here fifty million years ago. In addition to providing a rich source of fossils, the sedimentary rocks themselves provided a history of the changing environment in which the strata were formed (Flint 1954:5).

The study identified no important vertebrate fossil site requiring immediate protection. Vertebrate fossil sites fall into a special category in regard to protection. The best sites are those that are exposed by construction activities and local contractors have been very cooperative with the concerned paleontologists. The vertebrate fossils revealed by the slower, natural erosion have long been exposed to weathering just beneath the surface and are of poorer quality (Fairbanks 1893).
Climate and Rainfall

The climate of the San Diego region varies considerably with the elevation above sea level and distance from the coast. Statistics may be obtained from official government weather reports, so that here it will be necessary only to give such general facts as might have a bearing upon weathering and the other processes of erosion. The coastal region has an equable, temperate, dry climate with moderate precipitation occurring chiefly between the months of October and April. At San Diego the average annual rainfall is about 10 inches.

All of the mesa region described in this report is within this coastal belt of semi-aridity. The higher mountains of central and eastern San Diego County have a heavier rainfall and much less equable climate, with a noticeably greater diurnal and seasonal range of temperatures in winter nor oppressively hot days in summer, but the higher mountains to the east frequently receive a few inches of snowfall during winter, and during summer the temperature, in some of the valleys, occasionally reaches 100°F. The higher ridges and peaks act as a trap for the eastward drifting rainstorms and a precipitation of over 40 inches per year occurs on the western slopes of such mountains as the Cuyamacas and Palomar. A rainfall of over 20 inches per year occurs throughout a north-south belt within the heart of the higher elevations. Ellis and Lee have assembled
The beautiful upper valley of San Diego, including El Cajon, was monopolized by the mission fathers from the time of the earliest settlement. The military were compelled to look for areas in the region suitable to their needs. The elevations on Presidio Hill and Point Loma were ideally suited to the accomplishment of their principal purpose. This was outlined by the Spanish Crown and was principally directed toward the aggressive possession of the harbor and its natural facilities for Spain (Bolton 1930).

Point Loma, California, is a roughly rectangular southward projecting peninsula that forms the northern and western margins of San Diego Bay. A search of the geologic literature revealed that mainly reconnaissance-type studies of the area had been carried out, or that Point Loma was briefly mentioned as part of the large San Diego region. Point Loma has been neglected in the studies that cover the otherwise well-known southern California coastal area. A detailed geologic investigation of the sediments and microfauna of Point Loma was selected by the writer in an attempt to delineate the extent of Cretaceous outcrops, and to ascertain the environment of deposition and ecology represented.

Point Loma adjoins the western boundary of the City of San Diego and is bordered by the Pacific Ocean on the west, Mission Bay on the north, and, in part, by San Diego Bay on the east. The southern portion of the area is a
Figure 4. Total mean annual temperature in Southern California.
The contours are in degrees Fahrenheit.
(U.S. Department of Commerce 1959:30-33; 1969 Summary).
considerable data on precipitation in San Diego County to which the reader is referred for more information.

Temperature and moisture are highly significant to life forms. It determines where specific kinds of plants can be grown. More importantly, climate ultimately determines, either directly or indirectly, parks and recreational activities (Ellis and Lee 1919:317).

The Point Loma land climate is dominated by ocean conditions. There are narrow day-night and seasonal temperature changes and humidity is generally high. Summer fog is characteristic, usually occurring every night and dissipating during the morning hours. The maritime area is confined to low ground, rarely extending above 300 to 400 feet elevation (Hubbs 1957:25-261; 1958; 1961:519-526).

Throughout the Cabrillo National Monument the average annual temperature is in the low 60's (Fahrenheit). Rainfall is concentrated in the November to April period and infrequent precipitation occurs during the summer. The strongest winds usually occur during the occasional storms that cross the area during winter (Gunn 1887; Lynch 1931).
Figure 5. Total mean annual rainfall in Southern California. The contours are in numbers of inches.
**Point Loma Marine Environment**

There are no definite boundaries describing the relationship of man to the coastal environment and the living creatures of the sea. Although the sea as a resource serves man in aesthetic, recreational and economic functions, it plays a more important role than providing these obvious human benefits.

The ocean influences vegetation and related wildlife environments. Marine and coastal plant communities determine associated animals, while offshore waters and the tidelands attract and guide 90 percent of the West Coast's migratory birds. The Point Loma shore is now a familiar place to many, and its fascinating biota are receiving a great deal of interest. While many believe that the ocean is a limitless resource, few recognize the activities that are destroying it. The ocean is only one link in a highly interrelated coastal environment (Hertlein and Grant 1944; 1954).

Today, all levels of government are recognizing that the coastal environment is a limited and unique resource that should be saved and managed.

**Bottom Habitats**

The coastal bottom habitats off Point Loma are divided by two general substrate environments--rock and sand. The Continental Shelf is a submarine plain adjacent to the coast, varying in width from 1 to 9 miles and ending at the continental
Figure 6. CHART OF OFFSHORE AREA
slope. The substrate is a base of mud, sand, rock, or organic material. These habitats existing along the San Diego coastline have been mapped in detailed substrate charts (See Figure 6). In addition to classification as sand or rock strata, nearshore marine environments can be further divided into environments under the direct influence of the tides. The subtidal zone is that area on or near the bottom from the lower limits of the low tide zone to the 200 foot contour where large dark-brown algae or other seaweeds dominate. Two animals typical of this zone are the Purple Sea Urchin and the Green Sea Anemone.

**Tidal Habitats**

The tidal zone is the area of the coastline that is inundated during high tides and exposed during periods of low tides. Populations of the California Spiny Lobster have increased in this zone because the turbulent tidal surge prevents commercial lobster fishermen from setting traps in this area (J. Bradshaw 1976: Interview). The upper portion of the subtidal zone is transitional area between the tidal zone with its dominant tidal surge and the Giant Kelp zone where the effect of tidal surge is lessened by water depth. This lower zone begins near the thirty foot depth. Because the surge is strong in the upper subtidal zone, the brown algae population is relatively
small. A gradual transition into this seaweed community is noted with first smaller, then larger species of seaweed, and finally Giant Kelp, a golden brown seaweed easily seen from the elevated shore.

The subtidal environment is a stable zone where changes in salinity or effects of pollution are not easily detected. Destruction of the subtidal rocky substrate by sand encroachment may be the greatest threat to this habitat. If the rocks are covered with sand, free-moving organisms will leave, and sessile (permanently attached) organisms will die from being covered by the sand and/or from the increased sand load in the water. Adult algae will continue their existence until they die, but juveniles will be unable to find a suitable substrate to live and will not replace the adults. The Giant Kelp community is composed of characteristic populations of biota (plants and animals) that live in association with it. For example, the Kelp provides a home for minute organisms that small fish eat. In turn, both the Kelp and the small fish are eaten by larger fish, birds, or crustaceans. The food web continues when these small species become the prey of sea mammals. Giant Kelp is a perennial plant, grows anchored to a stable substrate by holdfasts, and extends to the surface. The bouyant fronds spread horizontally along the surface of the water for 20 feet or more. When the fronds of many plants extend over the surface, a canopy is created.
that prevents much of the light from penetrating the water. The community typically covers rocky substrates in depths of 20 feet to 130 feet.

As light available for photosynthesis decreases, algae communities begin to thin. The animals that live on the bottom (benthic fauna) begin to decrease in size due to decreased food supply (Hubbs 1955:54).

These sessile or stationary organisms are found among the Kelp fronds or on the ocean bottom and include sponges, corals, and worms. Mobile or free-moving organisms such as small fish, sea urchins, and abalones feed upon the Kelp.

The sea urchin has a greater impact upon the Kelp, for unlike the abalone which feeds upon the fronds, the sea urchin eats the holdfasts, thereby, causing the plant to drift away.

Carnivores feed on live animal tissue and scavengers feed upon dead animal tissue or organic material. Many of the carnivores in the community feed upon the sessile filter feeders. These are the organisms that sift out plant and animal plankton. Grazers are the organisms that feed upon plants. These are found in the Giant Kelp fronds. Others feed upon the sessile filter feeders and grazers of the bottom, and the scavengers feed on that which falls to the bottom. The intermediate carnivores are small fishes, sea urchins, crustaceans, and worms.
The larger carnivores including larger fishes, mammals, sea birds and starfishes prey upon the intermediate carnivores. Man has probably altered the Giant Kelp community by dumping waste products into the ocean. In a California State Water Quality Control Board study (Publication No. 26), kelp losses were observed within beds near sewage outfalls off southern Point Loma and Palos Verdes Peninsula. However, since factors involved in these disappearances are still unclear, the exact effects of human and industrial waste products upon the Giant Kelp community are yet unknown.

The coast of Point Loma is visited by several species of marine mammals, including whales, dolphins, sea lions, and seals. The Gray Whale migrates southward past our shores in the winter months enroute to Baja California. These huge mammals range from 40 to 50 feet in length and weigh up to 35 tons. Gray Whales are filter feeders.

The Pacific Black Fish, a large porpoise (up to 18 feet), are frequently seen offshore. For unknown reasons, they may strand themselves (albeit infrequently), as one did at Mission Beach in December 1969. Several dolphin species are frequently seen offshore, depending on the distance from the land, these are the Bottle-nose, Common Dolphin, and the Pacific White-sided Dolphin.

The California Sea Lion breeds on the Channel Islands off the coast of California and other islands off Baja
California. The Harbor Seal, a medium-sized (about 5 feet long), yellow-spotted, brown seal, may be seen lounging on harbor buoys in San Diego Bay or on nearby islands. Northern Elephant Seals occasionally approach the beaches.

Beach Habitats

The beaches of the Monument provide habitats which shelter a wide variety of animal life; characteristic species include the crustaceans, worms, shrimp, crabs and clams. In the past, visitors to the beach have taken advantage of low tide and taken many marine specimens needlessly. A marked reduction of intertidal flora and fauna resulted. Today, idle collecting of organisms from state beaches is illegal.

Point Loma's open beaches, exposed to surf, support limited but highly specialized flora and fauna. Although seldom seen, animals live in the sand either within and above the tide lines or underneath seaweed lying on the beach. Organisms in these habitats generally are not as varied as those of the rocky shore (Hinton 1969:1-15).

Eel Grass beds provide an environment for the young of spawning fish and food for waterfowl. This aquatic marine plant also provides food and shelter to crustaceans and mollusks that are the pry of shore and wading birds.

Mud flats are inhabited by fauna which have adapted
to cope with the problems of respiration, food getting, and lack of suitable firm attachment sites. In the mud flat environment there exists an abundance of works, clams, and snails. Snails, slugs, clams, and worms can also be found on the surface. Burrowing animals of the substratum include clams, worms, crabs and shrimp.

The quiet water areas of sand, with little or no vegetation, constitute the region of the sand flat. This habitat results from the absence of wave action and has substratum that is safe enough for burrowing animals, but presents no problems of suffocation.

At low tide the sand flat inhabitants can burrow deeper for protection against drying winds or sunlight. These invertebrates depend upon the tides for food because the sand flat, as compared to the mud flat, contains little organic food.

Transition Zone

The environment above the berm or shore is classified as the transition zone. This is the upper edge of the beach, above the direct influence of tidal water, which grades into typical coastal scrub or chaparral vegetation including Chamise, Toyon, Yucca and Scrub Oak. This environment of coastal bluffs and hills comprises the upland zone. Areas of riprap (broken rock) found in jetties
and elevated banks provide shelter for small fish and crustaceans such as lobsters, crabs, and rock lice. Rock scallops, mussels, and barnacles attach themselves to rocky shores (Kroeber 1957:233-241).

**Beach and Water Conditions**

The shoreline of Point Loma has highly diverse natural forms. Water-carved caves, chaparral topped bluffs, rocky shores and sandy beaches that are constantly changing due to the ceaseless forces of tides, waves and currents.

These oceanic motions are constantly bringing oxygen down to the sea's living biota and nutrients up from the ocean floor. These movements also enable the use of the Pacific Ocean for the assimilation and dispersion of sewage effluent (liquid wastes). Such waste disposal influences water quality. This is a serious consideration in the maintenance of the complex ecosystems of nearshore coastal environment off Point Loma.

The principal sources of Point Loma beach material are the sea cliffs that provide unconsolidated material that has been eroded by waves. This detritus or organic sediment is made up of fragments and skeletons of plants and animals, and unconsolidated, deposits that are eroded by wave action (U.S. Army Corp of Engineers, 1966).

The nearshore currents are very important in moving
this sediment along the coast. The material carried along the beach by wave-generated circulation is called littoral or shoreline drift (Inman 1954). The littoral or shore sediment can be transported along the foreshore in a zigzag path by the upwash and backwash of obliquely approaching waves, or it can be held in suspension by the turbulence of breaking waves and moved along the surf zone by long-shore currents (Moore 1957:17).

In addition to longshore movement of sediment, there is an onshore/offshore current that varies with the seasons. Beaches can suffer attrition as sand is moved offshore in winter, but sand is normally returned to the beach during the summer (Lough 1968).

Water Environment Pollution

The term "water quality" is a widely used expression which has a very broad meaning. Desirable characteristics of water vary with its intended use (i.e., commercial, industrial or recreational). The marine hydrosphere (ocean) off Point Loma must be maintained at sufficient quality to provide for the wildlife and fulfill man's associated social, physical and psychological needs. Not only must water be free of disease causing organisms and substances that can cause adverse physiological effects, it must be aesthetically acceptable (Mathewson 1972).

The most common system of water pollution control in
southern California consists of a system of sewers and waste treatment plants. Sewerage systems receive waste water flow from homes, businesses and industries and deliver it to treatment plants which make it fit to discharge into streams and the ocean, or for man's reuse (Water Resources Engineers, Inc., 1970). Sewage dumped into the ocean is partially decomposed naturally by dilution and natural bacterial action. Fortunately, the ocean waters rarely become eutrophic, even in the vicinity of sewage outfalls. The reasons for this are good mixing and the strong oxidation capability of most sea water (Metropolitan Sewerage System 1972).

The institution of the Point Lorna ocean outfall has provided the necessary solution to sewage problems of the area. Cabrillo Monument public facilities are, therefore, adequately serviced and may, if future needs require, be expanded without detrimental effect on the water environment. In effect no danger of pollution in the nearshore waters of Point Loma exists, or is likely, at the present (Hausenbuiller 1971; Gorden 1974; Gosewisch 1963).

Biology

Plant Communities on Point Loma

The surf-beaten rocky beaches, shores, and sea cliffs around Point Loma outline a narrow strip between low tide and shoreline where sands and rocks are often wet or damp.
The characteristic plants of this region are (Dawson 1966):

Surf grasses (*Phyllospadix torreyi*, *P. scouleri*), Sea Lettuce (*Ulva lactuca*), and numerous other marine plants.

On the small sandy beaches of limited area with high humidity, frequent fogs, and low summer rainfall the characteristic plants are:

Low or prostrate, often succulent woody, perennials, Shore Sandbur (*Franseria chamissonis bipinnatisecta*), White-leafed Saltbush (*Atriplex leucophylla*), ice-plants (*Pseudotsuga macrocarpa*), White Alder (*Alnus rhombifolia*), Bigleaf Maple (*Acer macrophyllum*), Western Sycamore (*Platanus racemosa*), Western Redbud (*Cercis occidentalis*), Black Cottonwood (*Populus trichocarpa*), Fremont Cottonwood (*Populus fremontii*), Willows (*Salix spp.*).

The slopes of Point Loma, which rise rather abruptly, are chaparral covered to a large extent. Here the characteristic plants are:

The writer recognizes that all of these plants are not present today. Man has removed or destroyed some as noted in the section on reports of a forest on Point Lorna. The plants noted, however, are characteristic in similar coastal environments and, therefore, they have been included.

In 1850 the botanist, Charles C. Parry, collected *Agave shawii* and *Bergerocactus emoryi* at the initial boundary monument as part of the Mexican Boundary Survey. The area thus became the type locality for the two species. *Agave shawii* is known from only one other locality in the United States, the sea bluffs of Point Loma on the south-western side of the Point Loma College Campus (Jepson 1963: 1-15).

**Animal Communities on Point Loma**

Vegetation is a critical link in the ecological processes that maintain natural conditions for animals and provide wildlife habitats. Point Loma is no exception to this rule. The characteristic animals of the coastal scrub and chaparral communities are:

**Mammals** - California Ground Squirrel (*Citellus beecheyi*), Nimble Kangaroo Rat (*Dipodomys agilis*), Desert Wood Rat (*Neotoma lepida*), California Mouse (*Peromyscus californicus*), Short-eared Pocket Mouse (*Perognathus fallax*) (Los Angeles County southward), Mule Deer (*Odocoileus hemionus*), Coyote (*Canis latrans*), Gray Fox (*Urocyon cinereoargenteus*), Bobcat (*Lynx rufus*), Brush Rabbit (*Sylvilagus bachmanni*), Dusky-footed
Birds - Costa's Hummingbird (Calypte costae), Cactus Wren (Campylorhynchus brunneicapillus), Lazuli Bunting (Passerina amoena), Wrentit (Chamaea fasciata), Brown Towhee (Pipilo fuscus), Sage Sparrow (Amphispiza belli), Rufous-crowned Sparrow (Aimophila ruficeps), Mountain Quail (Oreortyx pictus), Scrub Jay (Aphelocoma coerulescens), Poor-Will (Phalaenoptilus nuttallii), Bewick's Wren (Thryomanes bewickii), California Thrasher (Toxostoma redivivum), Rufous-sided Towhee (Pipilo erythrophthalmus), Orange-crowned Warbler (Vermivora celata).

Reptiles - Western Fence Lizard (Sceloporus occidentalis), Striped Racer (Masticophis lateralis), Western Rattlesnake (Crotalus viridis), Southern Alligator Lizard (Gerrhonotus multicarinatus), Coast Horned Lizard (Phrynosoma coronatum).

Invertebrates - Ringlet (Coenonympha tullia), Common Checkspot (Euphydryas onalcedona), Leanira Checkerspot (Meliteea leanira), Bramble Hairstreak (Calophrys dumetorum), Mormon Metalmark (Apodemia mormo), Ceanothus Silk Moth (Platysamia euryalus), another silk moth (Saturnia walterorum), Gray Hairstreak (Strymon adenostomatis), Hedge-Row Hairstreak (Strymon saepium), Arota Copper (Lycaena arota), Callippe Fritillary (Speyeria callippe), a Flat-headed Borer or Buprestid (Acmaeodera mariposa), California Timema (Timema californica) (Fitch 1953:1-102).

An ecological system is an intricate system of interrelated processes, an interplay between the non-living inorganic and organic substances and the living biota (flora and fauna of a region). In assessing the effects of future development on this ecological system, all variables within the system or
**TABLE: 2.**

**NESTING HABITS AND HABITATS OF RARE, ENDANGERED AND UNIQUE BIRDS OF SAN DIEGO COUNTY**

<table>
<thead>
<tr>
<th>Species</th>
<th>Nesting Habitat (Notes)</th>
<th>Feeding Habitat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light-footed clapper rail</td>
<td>Salicornia salt marsh, Tia Juana Estuary, South Bay, Mission Bay, Penasquitos³, present at Buena Vista 1970</td>
<td>Killifish, line shore crabs, topsmelt.</td>
</tr>
<tr>
<td>California least tern</td>
<td>Sandy beach or slit (bay) fill.</td>
<td>Tia Juana Estuary, South San Diego Bay, Mission Bay, Los Penasquitos, Del Mar, San Elijo.</td>
</tr>
<tr>
<td>California black rail</td>
<td>Salt/fresh marsh.</td>
<td>South San Diego Bay (may be extinct).</td>
</tr>
<tr>
<td>Elegant tern (unique)</td>
<td>Salt pond dikes (South San Diego Bay). (Only U.S. nesting grounds.)</td>
<td>Mud flat, lagoon, inshore.</td>
</tr>
<tr>
<td>Belding's savannah sparrow</td>
<td>Dry areas of Salicornia salt marsh.</td>
<td>Bay anchovy, surf perches.</td>
</tr>
<tr>
<td>Brandt's cormorant</td>
<td>Offshore islands (previously La Jolla Cliffs).</td>
<td>Salt flies, kelp flies, plant buds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Anchovy, hake, flounders, bass, croakers, surf perches, toad-fishes.</td>
</tr>
</tbody>
</table>

1. Species in danger of extinction because of limited habitat.
2. Species limited to 15 colonies nesting in California.
3. This species has a greater potential for sport and commercial fishing.
"ecosystem" need to be considered, not merely the locations of particular biota (Craig 1971:71-80).

Consequently, an attempt has been made to present as complete an overview of the Cabrillo National Monument's plant and animal communities as possible. All of the species that can be logically considered to have lived in the area of the peninsula have been included. Future developments in the preservation and establishment of plant and animal communities should consider not only those species presently existing, but, also, those no longer present (Jensen 1947; North 1971; Reish 1972; Resources Agency 1972).

Chaparral

Chaparral is the predominant land cover in San Diego County. It covers 1,600,000 acres. It is a valuable resource, providing ground cover to protect the watershed and prevent soil erosion, provide habitat and forage for wildlife, and attractive recreation areas for humans (Munz 1935; 1949; 1959; 1974; Close 1970).

At the same time the chaparral presents complimentary disadvantages. When it grows too old and thick, it does not provide suitable food for either wildlife or cattle. In some cases chaparral does not allow growth of grass and other shrubs, and does not provide as much protection from soil erosion. Mature chaparral often uses large amounts of water, studies having shown that groundwater levels improve in areas where brush has been thinned or cleared.
### COMMON COASTAL ZONE FLORA

<table>
<thead>
<tr>
<th>Common Salt Marsh Plants</th>
<th>Common Coastal Strand/Transition-Zone Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sea felt (Enteromorpha intestianalis)</td>
<td>Torrey sea-blight (Suaeda torreyana)</td>
</tr>
<tr>
<td>Sea lettuce (Ulva sp.)</td>
<td>Golden bush (Haplopappus venetus)</td>
</tr>
<tr>
<td>Eel grass (Zostera marina)</td>
<td>Chaparral broom (Baccharis arrothroides)</td>
</tr>
<tr>
<td>Cord grass (Spartia foliosa)</td>
<td>Sea fig (Mesembryanthemum chilense)</td>
</tr>
<tr>
<td>Annual Pickleweed (Salicornia bigelovii)</td>
<td>Ice Plant (M. crystallinum)</td>
</tr>
<tr>
<td>Pickleweed (Salicornia virginica)</td>
<td></td>
</tr>
<tr>
<td>Batis (Batis maritina)</td>
<td></td>
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<tr>
<td>Arrow grass (Triglochin maritina)</td>
<td></td>
</tr>
<tr>
<td>Alkali heath (Frankenia grandifolia)</td>
<td></td>
</tr>
<tr>
<td>California sea-blight (Suaeda californica)</td>
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</tr>
<tr>
<td>Marsh lavender (Limonium californium)</td>
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</tr>
<tr>
<td>Saltmarsh grass (Distichlis spicata)</td>
<td></td>
</tr>
<tr>
<td>Jaumea (Jaumea cornosa)</td>
<td></td>
</tr>
<tr>
<td>Glasswort (Salicornia subterminalis)</td>
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</tr>
<tr>
<td>Salt cedar (Monanthochloe literalis)</td>
<td></td>
</tr>
<tr>
<td>Watson salt bush (Atriplex watsonii)</td>
<td></td>
</tr>
<tr>
<td>Common Brackish Water Plants</td>
<td></td>
</tr>
<tr>
<td>California bulrush (Scirpus californicus)</td>
<td></td>
</tr>
<tr>
<td>Broad-leafed cattail (Typha latifolia)</td>
<td></td>
</tr>
<tr>
<td>Brass bottons (Cotula coronopifolia)</td>
<td></td>
</tr>
<tr>
<td>Rabbit's foot grass (Polypogon monspeliensis)</td>
<td></td>
</tr>
<tr>
<td>Curly-leaf dock (Rumex crispus)</td>
<td></td>
</tr>
</tbody>
</table>

### Common Fresh Water Marsh Plants

- Spiny rush (Juncus acutus)
- Bulrush (Scirpus sp.)
- Duckweed (Lemma sp.)
- Pondweed (Potamogeton pectinatus)
- Willow (Salix sp.)
- Cattail (Typha latifolia)

### Common Raparian/Streamside Plants

- Blue elderberry (Sambucus coerulea)
- Oak (Quercus sp.)
- California sycamore (Platanus racemosa)
- Willow (Salix sp.)

### Coastal Sage/Chaparral Plants
## TABLE: 4.

### ENDANGERED AVIAN SPECIES OF OCEAN AND TIDELAND HABITATS

<table>
<thead>
<tr>
<th>Species</th>
<th>Habitat</th>
<th>Protective Measures Taken</th>
</tr>
</thead>
<tbody>
<tr>
<td>California brown pelican (Pelecanus occidentalis californicus)</td>
<td>Nests in offshore islands, feeds offshore.</td>
<td>Protected.</td>
</tr>
<tr>
<td>American peregrine falcon (Falcon peregrinus anatum)</td>
<td>Nests in rocky cliffs of Coronado Islands.</td>
<td>Inportation, transportation and possession of all hawks and owls without permit from the Department of Fish and Game are prohibited.</td>
</tr>
<tr>
<td>Light-footed clapper rail (Pallus longirostris levipes)</td>
<td>Salt marsh.</td>
<td>Fully protected bird under State law.</td>
</tr>
<tr>
<td>California black rail (Laterallus jamaicensis coturniculus)</td>
<td>Fresh/brackish marsh.</td>
<td>Fully protected bird under State law.</td>
</tr>
<tr>
<td>California least tern (Sterna albifrons browni)</td>
<td>Nests on coastal strand/sandy flats; feeds in offshore, bays and lagoons.</td>
<td>Fully protected under State law; Santa Margarita River Tern Sanctuary established on Camp Pendleton Marine Base; Buena Vista Lagoon Ecological Reserve established by the State; nesting habitat developed by San Diego Cetacean Society at Mission Bay.</td>
</tr>
</tbody>
</table>
Thick chaparral cover is no longer attractive as a recreation area, since humans cannot force their way through it, and, most important, it becomes an extreme fire hazard (National Academy of Science 1970).

Many of the plant species which make up our chaparral reach almost explosive potential when overmature. Historical records appear to indicate that burning from time to time is an inherent characteristic of chaparral, allowing the brush to recycle itself in a natural manner. Protection from fire on Point Loma has prevented this natural process, and has allowed much of the chaparral to reach an overmature and decadent stage. It no longer goes through its natural cycle (Nelson 1930:14-15; Wells 1971:86-89).

True chaparral is one of the types of a plant formation which occurs in several widely separated parts of the world. The formation is known to plant ecologists as sclerophyllous woodland. It may be described (though not defined) as a mixed forest of stunted trees, and is the result of peculiar climatic conditions. As one of the intermediate forms between a flourishing forest and a desert, it represents a sort of balance between certain environmental extremes. At this balance the growth is dwarfed, and the full-grown trees attain only the dimensions of brush, even low brush.

The dwarfing of tree growth results from deficiency of moisture and one or more other conditions, such as excessive transpiration, barren soil, high altitude, and wind. As
we advance into high latitudes or climb to corresponding altitudes, the trees diminish in stature, until we find only struggling procumbent or bushy forms of the most cold-enduring species of trees--species which, at lower latitudes or altitudes, were of good forest size. A similar phenomenon is observed as we advance toward regions of desert conditions, but the result is a dwarf forest of an entirely different kind (Sudworth 1908:40-42; Yocum 1965).

Inasmuch as each species of tree has a given set of moisture and temperature conditions under which it does best, the composition of any forest--and the composition determines the type--varies both these conditions. Leaving out of account, for the immediate purpose of this discussion, such other factors as soil constituents and soil structure, it is easy to see that any given set of climatic conditions will exclude from the forest all but a certain number of species, which are capable of competing with each other under given conditions (Stewart 1951:317-320).

The combination of conditions in parts of southern California results in a selection of certain species to form a dwarf forest which, on the one hand, leaves out the species generally characteristic of northern latitudes, and, on the other hand, the distinctively tropical vegetation. It includes neither the species characteristic of Canada nor those characteristics of the lowlands of Mexico. It is, therefore, differentiated, both from the dwarf growth of
high mountains and from the mesquite and other dwarf forms of vegetation which extend into the United States from the subtropical areas. Some of the species which make up this type of forest are found, it is true, widely distributed throughout the western United States, but wherever they are found, it is within their limits of moisture and temperature.

**Historical Records of Past Forest Conditions in the Chaparral Region**

The fact that chaparral often forms an almost perfect miniature of typical woodlands of the temperate zones naturally suggests that the dwarf trees are the stunted survivors of full-sized forests which once covered the same area. In substantiation of this view citations have been made from the accounts of early explorers, as establishing the fact that when the white men first reached the coast of southern California they found a full-grown forest in possession where the chaparral now flourishes. No such change, however, could have occurred unless a radical change of climate had taken place. It is certain that the climate of southern California has not changed radically within historically recent times. Moreover, then the historical records which have come down from the period of exploration are examined closely, they give evidence of a condition similar to that which now exists (U.S. Forest Service 1972; Black 1968).
The Forest on Point Lorna

Controversy long has raged as to whether or not Point Lorna was once heavily wooded. As noted before, the first Pacific explorer to put foot on what is now American soil was Juan Rodriguez Cabrillo, a Portuguese navigator in the service of Spain, he entered what is now San Diego Harbor on September 28, 1542, and landed at Point Lorna. The narrative of his voyage describes "groves resembling silk-cotton trees except it is hardwood." He also found "thick and tall trees which the sea brought ashore." Cabrillo remained only six days in the harbor and makes no further mention of trees (Mills 1958:29; Uri 1970).

On November 10, 1602, Don Sebastian Viscajno arrived in the harbor, and on the following day organized a party to land on Point Lorna and "survey a forest of tall and straight oaks and other trees." The forest must have covered all of Point Lorna, since it is described as being "three leagues long and one-half league wide."

Pursuing here his scientific investigations, Viscajno ordered a survey of the harbor, and called it: "... the best in the whole South Sea; for, besides being protected on all sides and having good anchorage, it is in latitude 33 1/2 degrees." The survey of the harbor was immediately undertaken, as Viscajno was bent on obtaining exact information as far as it was possible with the facilities at his command, and he was able to leave several maps which
constituted a very valuable contribution to the geographical knowledge of the time (Waldron 1966).

On the day after his arrival the Captain General organized a party "to survey a forest lying on the Northwest side of the Bay" (Point Loma). The party was in charge of Ensign Alarcon, and included Captain Pequero, Father Antonio de la Ascension, and eight soldiers, "... to go and examine a mountain (Point Loma) which protects this harbor from the northwest wind ... They found much live oak timber and other trees ..."

The identity of the spot with Point Loma is further confirmed by the report that "the high ground commanded a view of the whole harbor, which appeared spacious, convenient, and well-sheltered," and by the further statement that "to the Northwest of the wood is another harbor," which doubtless refers to False Bay. The forest is described as bordering on San Diego Bay and its dimensions were given. Quite naturally the presence of a forest on the slopes and top of Point Loma in 1602 is a matter of unique interest, in view of the fact that nothing of the sort is found there today. The Indians say that these trees were live oaks, and that they were afterwards destroyed by fire (Smyth 1908:33-35). The Franciscan missionaries who came to California in 1796 said that the site of San Diego was covered with trees. Certain maps made by the early cartographers show Punta de los Arboles (Point of Trees),
at a location immediately north of San Diego. It is here that the rare pine, *Pinus torreyana*, was discovered growing near the ocean, and it is the only region along this portion of the coast where conifers approach the shore. The name given would indicate that the early navigators did not commonly find trees along the coast, and that Punta de los Arboles was an exception worthy of mention upon the maps. There is no projection of the shoreline to warrant the title "point." The place is shown upon more recent maps as "Pine Hill." This cannot, however, be a valid argument as Point Loma had been named earlier because of its view rather than for its natural cover. Vila called it *Vallado* because it had the appearance of a stockade which might suggest rather dense trees on the heights.

The English navigator, Captain George Vancouver, who, on November 27, 1793, visited San Diego Harbor and said of Point Loma that "some bushes grew in it, but no trees of large size."

Charles Dana, in his "Two Years Before the Mast," said that in 1834 Point Loma was covered with trees, but afterwards in his diary said that he had been mistaken and that they were only bushes. He and his comrades seem to have grubbed out "mangel roots," a kind of firewood that for a hundred years was supplied to San Diego residents. The chief source of mangel roots was Point Loma.
It appears that the young sailor simply overlooked the trees on the heights and to the north and east. In addition, his use of the term "sizable trees" are an indication of the presence of trees, although in size and extent they would have looked fairly insignificant to a man who knew the forests of his New England home. There is much support for this interpretation (Baker 1972).

In an article published in the San Diego Daily World, June 12, 1873, the following information was attributed to a sea captain:

The Gipsy yesterday brought into port Captain Bogart. In a conversation with that gentleman some very interesting reminiscences were developed. Captain Bogart first visited San Diego in the Black Warrior in 1834, 39 years ago.

In those days the hills about the Playa, and indeed all around San Diego, were covered with a thick growth of oak, such as is found in the Julian mountains now. This was the case, to a very great extent, when Captain Bogart came to San Diego in 1852, as the agent of the Pacific Mail S. S. Co.

He ascribes the destruction of this timber to its liberal use by the native population, and by the crews of vessels trading for hides, in their tanning operations.

He can remember the time when the whole flat, where the race-course is, was covered with a dense willow growth. His memory also goes back to the days when Rose's Canyon, clear to Captain Johnson's, at Penasquitos, was covered with a liberal forest growth. The tanning operations of the venerable Mr. Rose are responsible for much of this disappearance of timber. We asked Captain Bogart how he accounted for the fact that there were no reminders of the forest growth at the Playa. He replied that he
had occasion to cut a road to the Playa once, and came across many stumps. Captain Bogart's accounts agree with the narratives of the old Missionaries, who say that when they came here, nearly a hundred years ago, the site of San Diego was covered with a forest.

There are a number of diaries written by the early military at San Diego who mention the use of firewood from trees on Point Loma. It appears that most of the useful wood was removed by the middle 1850's. Ephriam W. Morse said:

Many years ago I saw in the possession of the late Mr. Ensworth of San Diego, a piece of an old book in the Spanish language which gave an account of Viscaíno's visit to, and his survey of, the Bay of San Diego in 1602. It had neither title-page nor date; consequently I do not know its author. It is stated that at the time of Viscaíno's visit there was quite a large grove of oak trees on the slope of the hill on the north side of the bay and flat now known as Roseville, and extending around the point towards the North Bay, which is now called False Bay, and that the valley of the San Diego River from opposite where Old Town now stands, as far up as could be seen from the top of the hill, was a dense willow grove, and that at high tide the waters of the North and South Bays met. It further stated that while the bay was being surveyed, the sailors went up the point of the hill (I suppose about where Judge Robinson was buried) and sat under the oak trees, and washed and mended their clothes.

Smyth's *History of San Diego* (1908), pp. 33-35 quotes several local writers, among them Miss Margaret MacGregor, an early settler:

There is no doubt that Point Loma was covered with trees. There are now old stumps in the
ground there, charred by fire, and the Indians said there was once a heavy forest there, but that it was destroyed by fire. They were live oak stumps. They were not very large — about the same as the other trees on the Point. I would not call it timber. There was a good deal of it — the Point was covered with it.

Andrew Cassidy thought that there was no doubt that Point Loma was once quite heavily wooded, but that the Spaniards exaggerated the size of the trees:

This is probably the case, for the early tales of their explorations are notoriously full of such exaggeration. The disappearance of the forest in the manner described by Captain Bogart, or by fire, is entirely probable, and is only another instance of the familiar process by which the natural resources of the West have been wasted.

Five different genera of chaparral may have attained, on Point Loma, a height of ten feet, with dense and spreading crowns. These genera are *Adenostoma*, *Rhus*, *Eriodictyon*, *Ceanothus*, and *Heteromeles* (Berryman 1974).

On the whole early records seem to show that the conifers approached this portion of the coast at only one point, as they do today; that trees, probably cottonwood, oak, and possibly sycamore, were growing on Point Loma and the site of San Diego, though these have since been destroyed and the chaparral has taken possession of the areas, and that chaparral and treeless areas prevailed generally along the coast, as they do today (Arnold 1957:210-318).

**Summary**
It is important it be recognized that the foregoing statements regarding unique geological and biological features, including morphological and paleontological elements, presuppose that other like discoveries can be made within the boundaries of the National Monument. As a consequence, further detailed work by qualified scientists in a variety of natural science disciplines could add enormously to the data already known. The presence of such features will provide for an enlarged interpretative aspect and excite interest from both the scientific, as well as the lay public.
CHAPTER II

A SYNTHESIS OF THE
PREHISTORIC CULTURE HISTORY OF
SAN DIEGO COUNTY, CALIFORNIA

Introduction

Radiocarbon dating, supported by archaeological evidence, has shown that San Diego County has been inhabited for at least 11,000 years before the present. The date of 11,000 is an extrapolation based on the 9,000 year dates taken from the three separate sites within the county (Moriarty 1967:553-555; Bada 1974:791-793).

Three separate cultural horizons for San Diego County are represented in the literature. These are the Paleo-Indian Horizon, the Early Archaic Horizon, and the Late Archaic Horizon. The three stages are represented by distinct differences in tool kits, land use patterns and environmental exploitation.

Considerable information has been discovered in the last thirty years which indicates that the Paleo-Indian Horizon may extend back much further than previously believed. Excavations in Buchanan Canyon, San Diego, in 1973,
resulted in the discovery of an artifact assemblage representing a much earlier horizon than had previously been reported. So far this material represents the best of the newly developing information as readily identifiable artifacts were recovered from this site (Moriarty and Minshall 1974:10-14).

The most recent data indicating a very old date for the earliest inhabitants of San Diego County is based on the new method of dating. A date of 48,000 years B.P. on the skeletal material taken from the area of the Del Mar Site is proposed. This data, however, is presently suspect, also. The Buchanan Canyon Early Horizon material, being undated, will not be included in this report.

Prehistoric Origins and Cultural Setting

As the last glacial period came to a close, the basins and lakes began to rapidly retreat in southeastern California. This caused the destruction of the living environment of the hunting-gathering groups in that region. These people migrated to the wetter areas toward the west in coastal San Diego County. They found it difficult to pursue a living with their generalized tools and their adaptation to a lakeshore habitat, as they were culturally and technologically out of balance with their new environment. It is no accident that the type site of this complex, the San Dieguito, along with many of their lesser sites, are near the banks of several streams that cross the gently sloping coastal plains

Although the San Dieguito were hunters, their generalized tool assemblage suggests that they may also have subsisted on familiar plant foods found in stream valleys along the coast (Moriarty 1969). Evidence from the Harris Site suggests that plant foods were not the only form of protein gathered for subsistence. Warren states that at the Harris Site, we have the first San Dieguito midden found that contains marine shell.

As an explanation of this unusual occurrence the following solution is presented. The site was a very late San Dieguito III site, coincident with an extremely arid period. It is suggested that during this period game became very scarce and that the San Dieguito people were compelled to overcome their traditional avoidance of shellfish in order to supplement their normal diet with it to some extent (Warren 1966:12).

The post-glacial chronology can be subdivided into three major periods, according to a consensus of most archaeologists: the Anathermal, the Altithermal, and the Medithermal. Absolute dates vary from author to author, but the most probable interpretation would place the Anathermal somewhere between 11,000 B.P. at the end of the Wisconsin glaciation, and 8,000 B.P., at which point the Altithermal period begins (Daugherty 1962:144-150; Butler 1962). It is the Anathermal period in which the San Dieguito culture flourished.

According to Butler, previous to the Anathermal period, there was a time of cool and moist climate, which he terms
Period I (Butler 1962). Directly following Period I, around 11,000 B.P., the Anathermal or Period II occurred with its increasing warmth and dryness, followed by Period III, or the Altithermal, around 8,000 B.P., a climate of maximum warmth and dryness.

An analysis of pollen samples from the Anathermal period arranged into a temporal sequence show fluctuations in the percentages of arboreal and non-arboreal species (Moriarty 1969:8). Pinon pine represents the majority of the arboreal pollen, with Juniper the second most abundant, particularly in the samples dating 10,000 to 12,000 B.P. Thus, even in the late Pleistocene Pinon and Juniper were the dominant forest species of the Great Basin, for both were adapted to a semi-arid environment.

The fauna associated with this semi-arid climate, such as deer, elk, and bighorn sheep, were probably not numerous; thus, while the Early Playa-Flake people (San Diequito) undoubtedly hunted them, their probable scarcity suggests that they were not the major source of food (Moriarty 1969:12-18). A major food source, along with the pine nut, would have been the semi-aquatic and moisture-loving plants growing on the wet and shallowly inundated fringes of the lakes and streams. Waterfowl and fresh water mussels may have also added protein to the Paleo-Indians' diet.

Donnan states that the early hunting horizon (San Diequito Complex) encompassed a variety of ecological zones (Donnan 1964:1-27). Besides the lake shores or playas,
sites near water holes, streams, and even on the tops of mesas and ridges were found in the desert region. Originally, this cultural tradition was probably adapted to forest and grassland environments, following a hunting, fishing, gathering pattern in which big mammals were of considerable importance, and supplemented by small game, fish, and fowl (Warren 1967:168-185). According to Wallace, the Lake Mojave implements are designed for the chase and related activities, such as butchering and scraping hides, thus supporting the conclusion that subsistence patterning relied on the hunting of large game (Wallace 1962:72-80). As mentioned earlier, evidence at the Harris Site suggests that the gathering of shellfish was also part of the subsistence pattern of the coastal manifestation of the San Dieguito Complex.

Settlement patterns may be interpolated from the subsistence aspects of the complex, as mentioned by Moriarty and Warren. Since the bones of these animals do not seem numerous in the site, it is suggested that they were hunted from camps in the hinterland, and only the desired parts of the animals were brought to the site. Wallace states that the exceptional circumstances of the local environment may have permitted these people to maintain fixed residences during a good portion of the year.

Although the San Dieguito type site is located geographically in a river valley, the majority of San Dieguito sites are located on mesas and ridges, generally lacking
midden and heavily eroded. A small population is suggested in inference from the relative number of artifacts per site and, also, in that the sites themselves are somewhat rare. Lack of midden also suggests that either the population was small or makes possible inferences about ecological adaptation and subsistence patterns.

Some interesting points are hypothesized by Davis in her summary of the Paleo-Indians of the Lake Mojave area, a complex directly related to the San Dieguito Complex (Davis 1974:1-19). Several points included under the Late Paleo-Indian Phase dating from 10,000 to 8,500 B.P. (Western Lithic Co-tradition) are as follows:

1. These people may have been descendants of the Middle Paleo-Indians (12,000 to 10,500 B.P.), and their technological heirs.

2. The bands had to range higher into mountains and foothills.

3. Family bands become larger, but remain the basic social and work units. (In the Middle Paleo-Indian Phase, these small bands probably did not exceed 25-30 souls of all ages, and the bands seem to have broken up into family units in camp).

4. Throwing javelins (and probably atlatls) replaced stabbing spears, as animal targets and hunting technology changed.

5. The people continued to use pounding/grinding rocks of unspecialized kinds. That is, they were used only occasionally; were used for many purposes; and regularized, patterned motions had not yet evolved for milling tasks.

6. People began camping beside streams.
7. There was more hunting of small animals and birds. (For the Middle Paleo-Indian Phase, successful hunting of large mammals was undoubtedly supplemented with birds, rabbits, rats, insects, and greens, pollen, flowers, fruit, berries, nuts, roots, and tubers in season).

8. Bones were smashed for marrow and juice.

9. The total population increased in size as the range was expanded, but probably did not exceed one person per thirty square miles.

10. Migrations probably became seasonal and encampments were of longer duration than those of Middle Paleo-Indians.

11. Late Paleo-Indian social life was probably similar to that of their ancestors with few exceptions. Seasonal transhumance may have been determined by gathering customs of the women since big animals were becoming scarce. Use of pounding/grinding rocks for food processing began to become more specialized.

12. It is possible that new language stocks were now represented in the area. (For the Middle Paleo-Indian Phase, the possible stock was some form of Proto-Hokan). (Davis 1974:11-15).

The linguistic data for southern California suggest some interesting speculations about the temporal and cultural affiliations of Early Playa-Flake peoples by Moriarty. The conclusion he reached, that these peoples were probably speakers of ancestral Hokan languages, is much the same conclusion that Davis reached. Glottochronology suggests that the Hokan languages are the oldest in the area, and the only other language stock represented in southern California is Uto-Aztecan. Moriarty concludes evidence strongly implies a possible relationship of Early Playa-Flake Complex peoples to the linguistic groupings ethnographically known for the
California area.

According to Davis, in her description of the Middle Paleo-Indian Phase, and Late Paleo-Indian Phase, social arrangements probably included patrilateral band affiliation and lifelong sibling bonds of work and reliance. There probably were matrilateral ties of responsibility for the very young and for matri-orphans also. Social arrangements as related to the subsistence patterns included possible male selection of migration time and route; male hunting of large animals, but gathering and the snaring of small game done mostly by women and children; and division of labor and of equipment between the sexes. Hypothesized rituals include Rites of Passage for both sexes and magical control of a precarious environment, with burial rites including placation of the dead and interment in shallow graves.

Indications of cultural change, migration, contact, and development for the San Dieguito Complex can best be viewed from the varying hypotheses in the archaeological literature. Suggestions of migration can be interpolated from Meighan's (1965:709-720) discussion of Pacific Coast archaeology, stating that traveling on foot, early man probably found the Cascade-Sierra Nevada ranges impassable in winter and poor in plants and game in the summer. The probable original route of settlement in North America is generally considered to have passed east of these mountains across ice-free land, then through the river valleys to the West Coast and around the southern end of the Sierra Nevada.
to southern California. These early cultures have been proven to have been pre-milling stone, but there seems to be no convincing argument for the hypothesis of a "pre-projectile point" horizon.

Moriarty suggests that the immediate successor of the Early Playa-Flake Complex in the inland areas (desert) is the Pinto Industry, dated to have begun about 7,000 to 8,000 B.P. The main difference between the Early Playa-Flake Complex and the Pinto Industry appears to be a wider variety of points which constitute a larger percentage of the lithic assemblage and the presence of milling stones. The successors of the coastal manifestation of the Early Playa-Flake Complex would be the La Jolla, a marine-oriented complex which also utilized milling stones.

The San Dieguito Complex is considered a pattern in the Western Lithic Co-tradition. As early as 10,000 B.P., a series of related lithic industries existed in the Great Basin and throughout the desert, south coastal and peninsular California. These industries may have persisted for several thousand years without substantial change, but as change accelerated (probably due to changing environment) and other influences invaded the area, highly stylized artifacts were altered and replaced. Only a substratum of core tools, choppers, chopping tools and a predominance of side-struck or at least ovate flakes remained unchanged.

The general lithic assemblage from west of the Cascade-Nevada ranges differs in detail from the forms found in the
Great Basin and Southwest. According to Meighan (Meighan 1965), early hunting horizons of the interior are typified by fluted points of the Clovis-Folsom tradition, whereas early hunting traditions of the western mountains and coast are typified by bi-point and leaf-shaped projectile points, such as those of the San Dieguito Complex. While there has been found no association of West Coast assemblages with the bones of Pleistocene animals like that of the interior traditions, there is evidence of a possible combining of traits as patterned in the tool assemblages.

At Ventana Cave in western Arizona, Haury (Haury 1950: 531-537) interprets the Ventana Complex as representative of the meeting and combining of elements from the High Plains Folsom Culture and the San Dieguito I Complex of the Lower Colorado River Basin. New evidence supporting this conclusion has been recently discovered, indicating that a Middle Paleo-Indian Phase, dated 12,000 to 10,500 B.P. shows evidence of special lanceolate tips for stabbing spears, of which many are fluted. This phase is termed the Fluting Co-tradition, and precedes the Western Lithic Co-tradition (Begole 1975: Personal communication).

This is the first evidence of a fluting tradition west of the Cascade-Nevada Range, and it is suggested that these people had a preference for hunting large herd animals including mammoth and bison by special hunting practices such as drives into bogs. As Davis noted for the Western Lithic Co-tradition, in the north and east, influence from the
Great Plains can be recognized in the skill of pressure flaking of point/knives reminiscent of Plains forms and to the south Mexican influence is suggested in the greater number of bi-points and Lerma-like point/knives.

In summary, the San Diequito Complex is probably a regional expression of a non-Desert Culture western tradition which migrated from northwest of San Diego County and represents an older, as yet undefined, cultural stratum that is present throughout a large part of North America. These people had adapted to the northern environment, following a hunting, fishing, gathering pattern, and as these ecological zones changed, migrated south along the Sierra Nevada and Peninsular ranges into the Great Basin and the Lake Mojave and Colorado deserts. Here they found an environment similar to that of the Northwest and eventually reached the Pacific Coast following adjacent ecozones with their generalized hunting and gathering assemblages. It, therefore, is best defined as a pre-Desert Culture.

It should be noted that this western tradition is distinct from the Plains Tradition, and was probably adapted to forest and grassland environments as it may have been when it crossed the Bering landbridge. Many local adaptations to the changing environment were developed by these hunter-collectors, and the original similarities of their lithic technology became obscured by new inventions and were eventually replaced by the tools of the Archaic Stage of the Desert Tradition, the Milling Stone Horizon.
The conclusion emerging from all this evidence is that in the late Pleistocene, especially during the terminal stages of the Wisconsin glaciation, southeastern California was arid, though precipitation was somewhat greater than now. It was enough to fill many now dry basins with substantial lakes and to spread vast forests of Pinon and Juniper. This precipitation increase was not enough, however, to take the region out of the category of desert or steppe. The significant increase in surface water in the area at this time was due to the filling of lake systems with run-off from the nearby high mountains, especially the high ranges on the western border of the Basin (Moriarty 1969:9).

Early in the 1950's Dr. George Carter began to speculate that the La Jolla Complex was far older than indicated by the radiocarbon dates taken on coastal sites. There appeared, to most archaeologists, to be little evidence to support these speculations. Some thirty years have now elapsed and the accumulation of data in that interval now points to the probability that an early form of the La Jolla complex (probably represented by the Buchanan Canyon discoveries) did occupy the western San Diego region. Consequently, the San Dieguito Complex is viewed as a cultural intrusion which after a period of adjustment amalgamated with the marine orientation phase of the coastal La Jolla. Most of the recent evidence, supported by the growing number of radiocarbon dates, is lending greater and greater credence to this hypothesis.

Three cultures are known to have occupied sites in San Diego County for at least 9,000 years (Hubbs 1965:66-117; Moriarty 1966:20-30). The earliest was a Pre-Desert or Paleo-Indian Culture called the San Dieguito. At the present time two theories have been generated to deal with their origins.
Figure 7. Probable routes of migration into Southern California of the Pre-Desert, Hunting and Gathering Complex ca. 11,000 B.P. - 8,000 B.P.
Moriarty, Warren, and Meighan suggest that such an origin was started in the Great Basin area and then moved into southern California between 10,000 and 11,000 years ago (Moriarty 1961:1-20; Warren et al. 1961:238-246; Warren 1968:1-14; Meighan 1965:709-720). E. L. Davis, on the other hand, suggests that this beginning started from a diffusion of people from the intermontane lakes region of California (Davis 1974: Personal communication). The San Dieguito occupation occurred during a period of fairly rapid sea level advance (Shepard 1964:574-576; Curray 1965:723-733). The earliest identifiable San Dieguito material found along the present coast is well into a transition phase, from which the Desert or Milling Culture known as the La Jolla (Rogers 1939:1-75; 1958:1-23) is believed to have evolved.

The San Dieguito hunted and gathered the deserts and coastal regions from approximately 14,000 B.P. to 5,000 B.P. (Rogers 1966:10-22; Warren and True 1961:217-223). The basic economic pattern was one of regional and seasonal transhumance (Davis 1963:202-212). Malcolm Rogers first described these people as the Scraper Makers (Rogers 1929:454-467). This is because the plano-convex scraper is often the most prevalent tool in their kit. Other tools found in their basic kit included: long-leaf shaped points, crescents, knives, and choppers. As indicated above, their's was a hunting and gathering way of life. If they gathered seeds it was as a primary food source because, as yet, no milling
Figure 8. Inferred distribution of Milling Stone Complex (i.e., desert culture) and corresponding Hokan linguistic boundary ca. 7,500 B.P.-4,000 B.P. probable direction of Culture Complex and Linguistic thrust.
equipment has been found on their sites. There is little evidence that they were exclusively big game hunters, rather it has been suggested that the climate was sufficiently dry in San Diego to limit that form of exploitation (Moriarty 1969:2-18). It is felt by this writer that the San Dieguito were primarily gatherers and hunting played a secondary role in their subsistence pattern.

The San Dieguito Complex has been broken down into three phases: the San Dieguito I, the San Dieguito II and the San Dieguito III. San Dieguito I is found only in the deserts and the eastern reaches of San Diego County. San Dieguito II and III are found from the coast to the Sonora Desert. The major differences between these three phases is in the tool technology and the make-up of their basic tool kit.

Apparent changes in the environment (Warren et al. 1961:1-106) and unknown cultural factors led to cultural change in this horizon. The intrusion of cultural elements from the desert to the coast (Campbell et al. 1935:3-5) and the rising of sea stands of the coast (Fairbridge 1958:471-472) led to the Early Archaic Horizon. Various desert tradition peoples (Wallace 1962:172-180) formed large population centers around coastal outlets and lagoons (Warren et al. 1961:1-106). This pattern is known as the La Jolla aspect.

This transition from the Paleo-Indian Horizon to the Early Archaic Horizon is not as easily understood along the coast. As yet, there are two defined complexes in this area:
Figure 9. Direction of culture influences following period of major sea level transgression ca. 4,000 B.P.-3,000 B.P.
the coastal La Jolla Complex (Rogers 1966:3-20) and the inland, foothill Pauma Complex (True 1958:225-263). These complexes differ in the environment that was exploited. Along the coast, that environment had a readily exploitable marine population. This included the various shellfish: Chione, Pecten, Pismo Clam, and Abalone. These shellfish provided a staple food source, thereby supporting an apparently stable large population center. The inland foothills area provided an environment similar to today's. This, along with the foothill's source of oaks and pinyon pines, may have provided a stable food source for another large population center. It is possible that these two areas were exploited by the same people only on a seasonal basis. As yet, this pattern has not been firmly established.

Malcolm Rogers suggested that the La Jolla Complex can be broken down into two phases: the La Jolla I and the La Jolla II (Rogers 1945:167-198). These are based on differences in burial patterns and artifact assemblages. It has been later suggested that these are not really phases, but rather "seasonal, economic differences or differences in the artifact sample...." (Moriarty et al. 1959:24).

New changes in the environment caused silting in the coastal lagoons between 5,000 and 3,000 B.P. which forced the large population centers to break down into smaller groups and move inland (Warren et al. 1961:2-56; Wallace 1962:178-179; Rogers 1939:1-75). It is again found that there is a major economic shift; a shift from a heavy seasonal reliance
Figure 10. Shoshonean and Pre-Ceramic, Yuman linguistic intrusions ca. 3,000 B.P.-1,500 B.P.
on shellfish to one where the major emphasis is on milling and hunting.

Sites of the La Jolla Complex are usually found near the coast extending from the Mexican border to Los Angeles. Radiocarbon dates indicate a general land occupation of 7,500 B.P. to approximately 3,000 B.P., when the first intrusion of the Pre-Ceramic Colorado and Desert Yuman peoples began. Also, the first trade materials from the north and the Channel Islands appear in the middens at this time.

By 2,000 B.P. the amalgamation of the two cultures had produced a variation from the former cultural patterns resulting in a third culture; sufficiently different enough to be given a separate identification. The term Diegueño was given to this group and they became the Historic Indian of southern San Diego County. There is much known about these people as they were in San Diego County at the time of European contact. Ethnographically, they are most often called by the Spanish name of "Diegueño." More recently the term "Kumeyai" has been used.

Culture History

The earliest documented inhabitants of the Pacific littoral in San Diego County were Paleo-Indians of the San Dieguito Complex. The complex was first reported in archaeological literature by the late Malcolm J. Rogers, at which period of time he termed the complex as the Scraper Maker
Figure 11. Linguistic boundaries and tribal orientation ca. 1,500 B.P. to European contact in 400 B.P.
Culture (Rogers 1929:454-467). Since 1929, many archaeologists have authored papers concerning themselves with the problems of interpreting the prehistory of the San Dieguito culture. With the advent of radiocarbon dating and continued field research on the complex, the recent archaeological literature contains a concise and well-documented synthesis of the San Dieguito culture history.

Rogers perceived this culture as having a generalized hunting economy, camping along now extinct lake shores or playas and streams, subsisting on the flora and fauna associated with these environments. In its final definition, the San Dieguito Complex was classified according to four temporal phases and four spatial aspects, estimated to have existed from 10,000 B.P. until the advent of the Desert Culture or Early Milling Stone Horizon, circa 5,000 to 6,000 B.P. (Rogers et al. 1966:1-6). In San Diego County, the Harris Site, SDi 149, a coastal manifestation of the San Dieguito, La Jolla and Yuman cultures, Rogers identified the San Dieguito component to be Phase III. The Harris Site has since been utilized as the San Dieguito Type Site for continued research on this particular manifestation of the Paleo-Indian Complex (Warren 1966).

According to the hypothesis developed by Warren (Warren 1967:168-185), the San Dieguito Complex is distinct from the Desert Culture and represents a generalized hunting tradition which moved into the area along a north-south belt in the western Great Basin region. While some regional variation is
apparent, the San Dieguito Complex can be defined as comprising leaf-shaped knives of several varieties; small leaf-shaped points; stemmed and shouldered points generally termed "Lake Mojave" and "Silver Lake" points; ovoid, large domed, rectangular end, and side scrapers; engraving tools; and crescents.

The San Dieguito Complex in southern California has come to mean a flake industry characterized by well-made knives 3-5" long, leaf-shaped points, a great diversity and number of plano-convex scrapers, including scraper planes, and crescents (Moriarty 1969:2). Moriarty also interprets the San Dieguito Complex as Pre-Desert, with an initial date of 8,000 to 11,000 B.P., for little or no evidence of grinding technology has been found in association with the complex thus far. Throughout the Southwest and Pacific littoral areas of the North American Continent, there are numerous industries and complexes described in the archaeological literature which closely resemble the lithic assemblages of the San Dieguito Complex. According to Moriarty (Moriarty 1969:2), the local differences appear to be no greater than we would expect among closely related, but not identical cultures. The recurrence of general categories and frequencies in lithic typologies suggests a common ecology for these local manifestations. When the recurrence of specific and specialized tool types appear, this suggests prehistoric connections. This constitutes a complex (i.e., a series of locally varying cultures untied by a basic tradition
in material culture and by a common pattern of life). The San Dieguito Complex and other locally varying complexes are, thus, combined producing what Moriarty terms the Early Playa-Flake Complex, which is placed chronologically at the end of the Pleistocene Wisconsin glaciation around 10,000-11,000 B.P.

Simpson (Simpson 1958:4-10) states that accumulating evidence suggests that San Dieguito be applied solely to the Pacific Coast manifestation of a broader complex. According to Brott (Brott 1969:7), the San Dieguito component of the Harris Site should be classified as a pattern of the Paleo-Indian Stage. This Paleo-Indian Stage belongs to a wider tradition, the Paleo-Coastal Tradition of the Western Lithic Co-tradition. The Western Lithic Co-tradition, as described by Davis (Davis 1969:13), would encompass the Paleo-Indian industries identified by Campbell (Campbell et al. 1935:75), the Playa Industry (Rogers 1937), San Dieguito III (Rogers 1950), and various other associated industries.

In Meighan's recent summary of Pacific Coast archaeology (Meighan 1965:710) he concludes that there is no firm evidence for interglacial man on the Pacific Coast, despite claims for such discoveries (i.e., Carter 1957). But even the most conservative scholar believes that the Pacific Coast had been settled and inhabited by at least 8,000 to 10,000 years ago, and with scattered indications that the cultural record will be documented to at least 10,000 to 12,000 B.P. in the near future. Meighan feels the artifact assemblage of the San
Figure 12.
Dieguito Complex represents a culture dependent upon hunting for subsistence and is comparable in a general way to such North American finds as Folsom and Clovis (Llano).

The temporal and spacial relationships must be evaluated to achieve a proper perspective of the cultural history for the San Dieguito. The interpretation of these points will generally follow those of Rogers et al. (Rogers et al. 1966), Warren (Warren 1967), and Davis et al. (Davis et al. 1969), with various other authors' descriptions combined under the above.

In Rogers' (Rogers et al. 1966), final definition of the San Dieguito, the cultural unit was subdivided into four phases of development based upon geographic and typological differences which he observed in the entire complex's tool assemblage. Of these four chronological phases, San Dieguito I, II, and III were considered to be the major temporal culture phases, with the entire complex dated to have initially existed 10,000 B.P. No absolute dates are assigned to the various phases' changes, for they fluctuate spacially, as well as temporally, throughout the complex. The geographic boundaries of the San Dieguito Complex were divided into four aspects: the Central Aspect, the South-eastern Aspect, the Southwestern Aspect, and the Western Aspect. It is the Southwestern Aspect which concern us most here in this study, for it is here that we have a coastal manifestation of the San Dieguito Complex as ex-
emplified at the Harris Site, SDi 149.

Warren (Warren 1967), in dating the San Dieguito Complex at the Harris Site, utilizes a radiocarbon date from the La Jolla component, stating that this represents the termination of the San Dieguito Complex at this site. The initial date for the La Jolla Complex was set at 5,500 to 6,000 B.C., thus, the San Dieguito Complex must predate 8,000 B.P. Later C-14 samples assayed confirmed this temporal placement for the complex. Included under the San Dieguito Complex are manifestations described at various locales throughout the Southwest: the Playa Industry (Rogers 1939); the San Dieguito Complex (Rogers 1958:1-23); the Lake Mojave Culture (Campbell and others 1937:75-78); and the Lake Mojave Complex (Wallace 1962: 172-182). According to Warren, the San Dieguito Complex has a known distribution from the San Diego Coast north and east into the Mojave Desert and north into Death Valley, Panamint Basin and the Owens Valley as far as Owens Lake. Other isolated pockets indicate a probable distribution along portions of the Lower Colorado River and the Colorado Desert of California, and, perhaps, north into the region of Mono Lake (Davis 1963:202-212; 1964:291-392).

Davis et al. (Davis et al. 1969) interpret the San Dieguito Complex as a pattern, the San Dieguito Pattern, of the Western Lithic Co-tradition. According to Brott (Brott 1969:8), a pattern combines temporal, ecological, stylistic, social, and geographic information and is an organization
of the culture complexes and traits which appear to occur consistently together. Thus, the San Dieguito Pattern, as interpreted by Davis, would include the coastal manifestations such as at the Harris Site and the desert manifestations such as the Lake Mojave Complex. A date of $9080^{+350}$ B.P. at the Harris Site is the accepted temporal placement for this pattern. As mentioned before, the San Dieguito component at the Harris Site would be classified as the San Dieguito Plateau Variant of the San Dieguito Pattern of the Paleo-Indian Stage. The Paleo-Indian Stage is of the Paleo-Coastal Tradition of the Western Lithic Co-tradition. This may appear to be somewhat confusing taxonomy, but it has been found to be quite useful in the synthesis of general and specific prehistoric cultures.

In the following discussion, the terms San Dieguito Complex (Warren 1967), San Dieguito Pattern (Davis et al. 1969), Early Playa-Flake (Moriarty 1969), San Dieguito I, II, and III (Rogers 1966), Lake Mojave Complex (Wallace 1962), and Lake Mojave Culture (Campbell and others 1937) shall be considered synonymous.

Descriptions of the San Dieguito lithic technology vary from typology to typology, as proposed by their respective authors. For an artifact description of the Harris Site in accordance with the typology proposed by Warren and True (Warren and True 1961), it is best to read *The San Dieguito Type Site: M. J. Rogers' 1938 Excavation on the San Dieguito River* by Warren, 1966. This monograph contains
a modified version of Rogers' lithic typology for the San Dieguito Complex. Rogers perceived San Dieguito I and San Dieguito II phases as using the percussion technique and the third phase, San Dieguito III, as utilizing both percussion and pressure flaking techniques in the manufacture of their implements (Rogers 1939). Two percussion flaking techniques were observed in the first phase of the complex, the reverse flaking technique, a corrective process, and the intermittent retouch technique. A diagnostic feature of the second phase is the addition of the double-convex blade or knife which, because of the presence of a possible transitional form, the plano-convex blade, does not necessarily connote a cultural change or the coming of a new people into the prehistoric picture. Phase two types were not discontinued during the third phase, but were refined in form and function through the use of pressure flaking.

In both San Dieguito II and San Dieguito III, the assemblage is almost identical from area to area, except for the absence of the stemmed blade in the western region of the Pacific Coast. Another criterion used to distinguish San Dieguito III is pressure flaking of finer grained materials such as Chalcedony, Jasper, and Obsidian which are more amenable to fine flaking (Rogers 1939:27-28).

At the Harris Site, Warren and True (Warren and True 1961) summarized the artifact inventory as including a wide range of scraper types, leaf-shaped knives and dart points,
with an occasional stemmed or notched specimen, chipped stone crescents which are often eccentric, relatively few hammerstones, and crude chipped tools. For the most part, the artifacts are percussion flaked by a well-controlled technique and made of local felsitic materials. Some specimens are pressure flaked and other local, fine-grained volcanics and imported materials are utilized occasionally. Pottery, of course, is absent and grinding implements are found to be extremely rare. No cultural change was evident in the artifact assemblage at the Harris Site according to Warren and True, although it was noted that such a small sample of artifacts was recovered that it was impossible to evaluate Rogers' phases of the San Dieguito Complex. Moriarty's work at the Harris Site, 1962-1964, did reveal an artifact assemblage which supported Rogers' Phase II and III. Warren (Warren 1966) states that Rogers' original field notes on the Harris Site mentioned the possibility of San Dieguito I, II, and III represented at the site. But in Warren's report on the Harris Site (Warren 1966:17), he reiterates that no stratification of San Dieguito II and III is demonstrated at the site. Hayden stated that on the basis of Rogers' published reports and an analysis by Warren and True, plus his own field experience, the type site (the Harris Site) is properly assigned to Phase III (Hayden 1967). Moriarty's excavations, which were far more extensive than any previous efforts, provided a larger and more varied artifact assemblage than ever collected
before. As a result it must be recognized that Rogers' Phase II is also present.

In Davis' analysis of the lithic material of the San Dieguito Pattern, the assemblage of typical San Dieguito artifacts may be summarized as follows:

1. Heavy, "horse-hoof" planes
2. Rounded end-scrapers, retouched by light percussion and probably hafted
3. Side-and-end scrapers, probably hafted
4. Ovoid scrapers, probably hafted (Moriarty 1962:149-152)
5. Choppers, made of large and heavy primary flakes
6. San Dieguito Type 1 knife/points (Warren 1961) with one end pointed and the other round. Cross-section is lozenge-shaped. These tools are narrow and thick, rather than wide and thin.
7. San Dieguito Type 2 knife/points (Warren 1961). These are large, thinned bifaces;
8. Long-stemmed point/knives with weak shoulders
9. Crescents (rare)
10. Hammerstones
11. Macroflakes
12. Thick primary flakes
13. Thin trimming and finishing flakes (Davis 1969:75).

In the comparative studies of eight quarry workshops of the Western Lithic Co-tradition, Davis (Davis et al. 1969:
xi) mentions some other interesting interpretations of the lithic technology. First, the lithic materials are not merely "blanks and rejects," but have probably been shaped, used, or modified for special purposes. Second, the preponderance of choppers, chopping tools, notched scrapers and ovate bifaces raises the possibility that these sites may be for secondary manufacturing of implements of wood. Third, it is noted that the Paleo-Indian stone-knappers of western North America did not focus on blade production, and last that the Western Lithic Tradition included a variable complex of core-and-flake industries.

The analysis of paleo-environmental factors contributes important data to the interpretation of prehistoric cultures. Various authors in archaeological literature have contributed to this needed information for the San Dieguito Complex: Moriarty (1969), Warren and True (1961), Warren (1966, 1967), Davis (1974) and Donnan (1964). Moriarty suggests some environmental interpretation for the San Dieguito Complex involving paleo-climatic factors, stating that the latest phases of the Wisconsin glaciation appear to be contemporaneous with the Early Playa-Flake Complex. In considering the south-eastern manifestation of the San Dieguito Complex, Moriarty states:

The conclusion emerging from all this evidence is that in the late Pleistocene southeastern California was arid.... (Moriarty 1968: Part II, 9-23).
Transitional Phase

Chronologically succeeding the San Dieguito Complex on the Pacific Coast Littoral is a cultural complex based upon the gathering of shellfish and seeds for primary subsistence, the La Jolla Complex. While it had appeared that the La Jolla Complex was culturally and temporally distinct from the earlier San Dieguito Complex, there are several suggestions in the present archaeological literature which propose the possibility of a transitional phase linking these two complexes.

At Agua Hedionda Lagoon in San Diego County, a transitional pre-Desert phase has been described linking the San Dieguito and La Jolla Complexes, dated 7070 B.C. (Moriarty 1967:553-556). According to Moriarty, this lagoon site clearly demonstrates a continuous occupation from the San Dieguito coastal manifestation to the later La Jolla phases. The excavation of U.C.L.J.-M-15 at Agua Hedionda Lagoon determined that "no variation in the profile occurred and there appeared to be an unbroken continuity of occupation from the lowest level up through the overlying midden to the surface" (Moriarty 1967:555). Typological variance occurred at the 13-decimeter level when milling and grinding implements no longer appeared; while below this level, mineralogical content changed to the greenish flesitic materials which are generally associated with those of the San Dieguito Complex. The technique and pattern later proved to be that of the San
Dieguito by comparison with the assemblage found at the type site, yet within this level were intermingled artifacts of the La Jolla I Phase.

According to Moriarty's hypothesis, the San Dieguito, a Pre-Desert hunting culture, migrated to San Diego and Imperial Counties about 10,000 to 11,000 years ago, eventually settling near the coastal areas. Sometime before 9,000 B.P. and extending to around 7,500 B.P., this complex entered into a transitional phase characterized by a generalized hunting and milling stone culture.

Temporal and spacial variations in the transitional phase fluctuated somewhat based upon suggested environmental differences experienced by the Pre-Desert Culture. Moriarty suggests varying Desert influence in different ecozones:

Radiocarbon evidence from the Agua Hedionda site tends to indicate that the first occupants had already entered a transitional phase between a hunting and a milling culture. The necessity for the creation of large points (that is, the continuance of the hunter tradition) on the coast is abrogated to a large extent by the abundance of faunal material in the marine shoreline ecologies which produced more than sufficient protein. On the other hand, the more inland areas may well have retained a Pre-Desert Culture longer because the climatic and physiographic changes inland were slower and less dynamic than those on the coast. Environmental variation, therefore, may well have been the major factor which led to the transition of the hunting culture into the Milling Complex (Moriarty 1967: 555).

Closely related to this transitional phase described by Moriarty is a similar inland manifestation which has combined traits of the San Dieguito, La Jolla, and Pauma Complexes.
Originally True (True 1958:255-263) placed the Pauma occupation just prior to or during the initial stages of the Altithermal, about 8,000 B.P., within the temporal range described by Moriarty for the coastal transitional phase. This complex was characterized by flaked stone implements and grinding tools similar to those of the San Dieguito, Topanga, Oak Grove, and La Jolla Complexes. The diagnostic traits and material types of recovered projectile points suggested contact and influence between desert cultures and the Pauma Complex, yet points had a low frequency in the total lithic assemblage. A predominance of milling and grinding implements suggests a seed grinding economy much like that of other inland Desert complexes of the Milling Stone Horizon.

Although the Pauma Complex was later re-evaluated in its relationship to the La Jolla Complex (Warren, True, and Eudy 1961), original inferences suggested from the lack of shellfish remains and surface artifacts indicate the possibility that the Pauma Complex is represented by seasonal camp sites rather than permanent villages and settlements. Thus, the probable seasonal migrations to the coast brought the people of the Pauma Complex in contact with those of the San Dieguito. The milling technology and gathering economy also suggests relationships to the La Jolla, Topanga, and Oak Grove Cultures.

Other possible interpretations of transitional phenomena can be observed at the San Dieguito type site, the Harris Site.
According to Warren, the Locus II assemblage "represents the terminal phase of the San Dieguito, perhaps reflecting an early influence from the desert" (Warren 1966:18). While this locus had been radiocarbon dated to 2,770 B.C., Warren's contention is that if we accept this date, then we must assume that a culturally distinct group is represented at Locus II, which intruded upon the area already occupied by the La Jolla population.

Another interpretation of Locus II at the Harris Site is suggested by Brott while classifying the type site according to his revised taxonomy. He states the technological analysis of the lithic material by several experts revealed that the material is morphologically and chronologically different from that of the San Dieguito Pattern, and accepts the radiocarbon date of 2,770 B.C., which falls within the range for the La Jolla Pattern. "It is quite possible that we are uncovering the Hunting Mode or the Male-activity Mode of the La Jolla Pattern" (Brott 1969:9).

The La Jolla Complex

Malcolm Rogers first described the La Jolla Complex as preceding the San Dieguito Complex based upon the lithic technology, which he felt to be less advanced than that of the San Dieguito. Tentatively named the "Shell-Midden" people, this complex was later termed the La Jolla Culture by Rogers in 1945, at which point the complex was subdivided into two developmental phases, La Jolla I and La Jolla II.
There are several local expressions of this cultural tradition (i.e., La Jolla, Topanga, and Oak Grove).

According to Rogers:

Immediately after the disappearance of the San Dieguito people with their excellent stone-flaking technique, a new stock with a seafood-seed-gathering complex and no ability to work stone moved in, probably from the north at the beginning of the Christian era (Rogers 1945: 171).

A general overview of the complex and its culture was summarized in 1961 as follows:

A simple gathering people arrived on the littoral area of San Diego County sometime prior to 7,500 years ago. They apparently came from the interior desert and brought with them a way of life adapted to areas where large game was scarce and where a greater dependence was placed on gathering of vegetable foods and hunting and trapping of small game. Such an economy was not readily adaptable to the ocean resources; however, it appears to have been easily adapted to the lagoons which wrinkled the San Diego coast line and supported abundant supplies of easily gathered shellfish. The use of shellfish resulted in a food supply capable of supporting a relatively large population for a gathering economy. While the shellfish represented a large portion of the food supply, gathering of vegetable foods and to some extent hunting of small game still continued, possibly with some seasonal migrations to the foothills of the Peninsular Range (Warren et al. 1961:28).

It is generally accepted that the entire coastal Milling Stone Horizon is the second tradition to manifest itself on the southern California Coast. This tradition is represented by the combinations of the various local expressions of the coastal Milling Stone Horizon from Santa Barbara County to
San Diego County, and extending from the coast to the foothills of the Peninsular Range. The spatial limits of the La Jolla Complex are defined as extending from southern Orange County, through San Diego County, to below Black Warrior Lagoon in central Baja California. The marine phase of the Complex follows the coast and extends inland only a few miles.

The La Jolla Complex is geographically the southern-most expression of the entire tradition. Its spatial placement determines several crucial factors which interact with the cultural development of the complex, possibly the most important factor being that of environmental differences between the eastern and western local expressions of the tradition. The differences in spatial delineations closely correspond to temporal variation within the tradition.

According to Kowta (Kowta 1969:35-69), the Milling Stone Horizon in southern California first manifests itself as the non-coastally-oriented Topanga I Complex about 8,000 B.P. in the Los Angeles-Santa Monica Mountains area. Upon close examination of the Topanga I Complex lithic assemblage, it is found to be relatively similar in composition to the assemblage of the Pauma Complex in San Diego County. The 8,000 B.P. date postulated for the Topanga I Complex also appears to be consistent with that hypothesized by True for the Pauma Complex, and, also, for Moriarty's Transitional Pre-Desert Phase in coastal San Diego County. Thus, it may
be suggested that by 8,000 B.P., a non-coastally-oriented complex or series of geographical variants of the Milling Stone Horizon migrated to the southern California coastal strip, initiating the basal tradition for the later coastally-oriented Milling Stone Horizon complexes.

Adaptation to the coastal environment is assumed to have begun about 7,500 B.P. and is represented by several local variants of the Milling Stone Horizon; the La Jolla Complex in the coastal San Diego County area, and the Oak Grove Complex in the Santa Barbara area. According to Kowta:

The coincidence of these dates with the initial phase of the Altithermal has led some authors (e.g., Warren and Pavesic 1963:420-421) to suggest that the Milling Stone complexes represent a coastward movement of inland populations finding the interior increasingly unfavorable for human occupation. If, in fact, such a movement did take place, . . . it would be reasonable to assume that the 5,500 B.C. age for the dated Oak Grove and La Jolla components, which already show some adaptations to the coastal environment, represents not the initial arrival of those populations but a somewhat later period (Kowta 1969:36).

The Encinitas Tradition appears at about that same time in San Diego and Santa Barbara Counties (Warren 1968:2). Yet, as local expressions of the tradition, the La Jolla Complex persists until about 2,000 B.P. in San Diego County, while in the Santa Barbara area, the tradition terminates between 5,000 and 3,500 B.P., with the inception of the Campbell Tradition. Variation in spatial-temporal relations is important
when considering the possible cultural influences upon the marine oriented phase of the La Jolla Complex.

The La Jolla Complex is seen as a local expression of a tradition which has been variously termed the Encinitas Tradition (Warren 1968), the Milling Stone Horizon (Wallace 1955), the Milling Archaic (Davis 1968), and the Early Archaic (Moriarty 1975). Within the La Jolla Complex, several authors have suggested subdivision into several developmental phases based upon environmental and cultural changes. Rogers proposed a chronology for the La Jolla according to two developmental phases, La Jolla I and La Jolla II. The material pattern of the first phase may be summarized as consisting of: "a basined metate, un-shaped mano, a few primary flakes of stone, and an even lesser number of crude, beach-cobble choppers" (Rogers 1945:172). Other characteristics of this phase include the lack of evidence for the use of the bow and arrow, unsegregated interment of the dead without mortuary offerings, new tool types, improvement of flaking technique, and the increased use of the metate. Phase II is characterized by gradual technological and cultural enrichment, formation of true cemeteries through the segregation of burials, and trade contact with the Channel Islands.

In 1966, Moriarty proposed the use of stratigraphically controlled radiocarbon dating coordinated with typological change for the development of culture phase divisions (Moriarty 1966:21-23). According to his chronology, La
Jolla I would begin about 7,500 B.P. with the termination of the transitional phase, and persist until about 5,500 B.P., when the second phase begins. The second phase, La Jolla II, ranges from 5,500 B.P. to 4,000 B.P. and the third and last phase, La Jolla III, persists from 4,000 B.P. until 3,000 B.P., when a process of amalgamation between the La Jolla culture and the Yuman culture begins. Phase by phase characteristics are summarized below so that a general description of the La Jolla culture patterns and traits can be observed through time.

**La Jolla I: 7,500 to 5,500 B.P.**

1. Appearance of milling implements.
2. Mineralogical change in lithic assemblage from felsitic materials of the transitional phase, to local rhyodacites, meta-quartzites, and diabases for Phase I.
3. Crude percussion flaked lithic assemblage based upon a cobblestone, chopper, and scraper typology.
4. Increase in variety of tool types and flaking technology.
5. Burials are complete inhumations, flexed, unsegregated with no attempt at directional orientation, and occasional mortuary offerings such as shell beads.
6. Artifact assemblage indicates stable food gathering economy which is fairly sedentary.

**La Jolla II: 5,500 to 4,000 B.P.**

1. Additions to lithic assemblage.
2. Contacts with northern coastal and Channel Island cultures.
3. Drilled and polished stone artifacts, increased in bifacial artifact types.

4. Reappearance of projectile points, of which there are four specific types: (1) lanceolate, (2) small triangular points with concave base, (3) equilateral triangle with convex base, and (4) a large blade type.

5. Burial practices now include flexed burials with a generalized orientation, segregation into true cemeteries, and occurrence of mortuary offerings.

La Jolla III: 4,000 to 3,000 B.P.

1. Geographic change in site locale to lower elevations, along edges of coastal lagoons, or possibly further inland.

2. The possibility that many of the sites representing this phase are now underwater off the Pacific Coast.

3. The beginning of the process of amalgamation, about 3,000 B.P., between the La Jolla and Yuman cultures which extended to about 2,000 B.P.

The early gathering complexes of western San Diego County have several interesting differences and similarities in the La Jolla lithic assemblage. These differences correspond to spatial variation within five geographically distinct zones, possibly representing environmental areas. Similarities between the sites consisted of several traits which all areas have in common. The extreme paucity of projectile points and of mortars and pestles is such a trait. Manos, metates, and large scraper planes, however, are found in abundance. The majority of sites surveyed were located on knolls overlooking present or extinct bodies
of water, and when there occurs a midden associated with the site, it contains shellfish remains of pecten and Chione.

The San Marcos-Escondido and Valley Center areas have exhibited tool types considered representative of the Pauma Complex. The assemblage of the Pauma Complex includes types which are rare or absent in the other three areas, such as numerous finely worked small plano-convex scrapers, shaped manos, knives and points, comales, perforated stones, and the wedge-shaped mano. Sites on Point Loma, at Batiquitos Lagoon and the Lower San Dieguito Valley are placed within the La Jolla Complex and exhibit traits common to other known La Jolla sites such as Scripps Estates Site I, U.C. Agricultural Station, the Del Mar Site, and the Sorrento Site.

Traits characteristic of the La Jolla Complex which appear to be absent or rare in the Pauma Complex area include cortex based scrapers, cobble choppers, and scraper plane types 2A and 2B. Coastal areas also appear to have relatively greater numbers of unshaped uniface manos than do the sites of the Pauma Complex (Warren, True, and Eudey 1961:23).

The Green Valley and Poway area sites were tentatively interpreted as representative of a marginal phase of the marine oriented La Jolla Complex, for the assemblage appears to be more similar to the coastal sites than to the Pauma Complex (Miller and Moriarty 1963:1-4). No greater frequency of unshaped manos and core hammers is found in association
with the Green Valley area sites as compared with La Jolla sites. These traits are not considered characteristic of either the coastal area or Pauma Complex sites.

The coastal manifestation of the Milling Stone Horizon in San Diego County has been shown to exhibit both temporal and spatial variation corresponding to developmental and environmental differences. At Batiquitos Lagoon, Crabtree, Warren, and True discuss the typological changes within a single site (Crabtree, Warren, and True 1963:341-343). It is concluded that:

While there are no apparent major changes or really significant trends in the artifact types through time at SDi-603, a series of shifts is encountered in the relative frequency of certain artifact categories in the three strata (Crabtree, Warren, and True 1963:342).

There appear to be four shifts in the relative frequency of artifact types--delineated according to three strata, of which Stratum 3 is the oldest and Stratum 1 the youngest. They may be summarized as follows: (1) small domed scrapers represent approximately 5 per cent of the lithic assemblage from Stratum 3, yet are nearly absent in Stratum 2, and completely absent in Stratum 1; (2) milling implements account for 37 per cent in Stratum 3, 52 per cent in Stratum 2, and 33 per cent in Stratum 1; (3) flake scrapers and scraper planes progressively increase in frequency during the occupancy at the site; and (4) cobble tools (uniface, etc.) decrease in relative frequency from 15 per cent in Stratum 3
to less than 2 per cent in Stratum 1.

In general, these shifts reflect a slight technological change away from the use of cobble and other types of core tools to the use of flake tools. This does not suggest any major shift of culture type or focus. The predominance of mano and milling stone in the middle stratum suggests that the subsistence pattern had shifted toward seed gathering, accompanied by a decline in the importance of shellfish gathering. This latter interpretation is supported by the analysis of column samples which indicate a sharp decline in the amount of shell remains noted from Stratum 2 (Crabtree et al. 1963:342).

Subsistence pattern changes compared to typological differences is but one approach to the study of prehistoric culture, the investigation of paleo-environmental conditions is yet another. The majority of archaeological research concerning paleo-environmental factors of the San Diego County manifestations of the Milling Stone Horizon have been centered around lagoon ecology.

Interpretation still varies slightly from author to author, but generally an attempt has been made to draw correlations between the various stages of lagoon ecology and the resulting fluctuations in population size, settlement patterns, and subsistence patterns. In their discussion on postglacial climatic change, Baumhoff and Heizer state that there is no consensus concerning the chronology for environmental change (Baumhoff and Heizer 1965:697-707). Assuming that 7,500 B.P. is the initial date for the arrival of the Milling Stone Horizon in southern California, it is found that this date generally corresponds to a period in
the climatic sequence termed the Altithermal. The 7,500 B.P. date is well within the range of all proposed climatic chronologies, and corresponds to a period of increasing warmth and dryness in the western desert area.

Shumway, Hubbs, and Moriarty were able to confirm this supposition by utilizing the shell assemblage from the midden of the Scripps Estate Site to infer climatic conditions. Both sea and air temperature were postulated as being warm, based upon mass spectrometric paleotemperature determinations and analysis of species absence or presence in the midden. "Notably absent (was) the giant chiton (*Cryptochiton stelleri*), which is an excellent indicator of the cold that extended from about 1,000 B.P. or earlier to about 600 years ago" (Shumway et al. 1961:109). The presence of the species *Tegula* is considered yet another indicator of warmer temperatures.

The rainfall of the Altithermal was probably greater than the present, yet it was still inadequate to create permanent bodies of water except in the larger canyons and valleys. With this greater rainfall, many areas may have contained enough water to produce small marshes in the depressions which lie adjacent to habitational sites. The coastal environment, also, appears to have been different in La Jolla times.

Many La Jolla middens contain quantities of California mussels, *Mytilus californianus*, the rock oysters, *Pseudochama exogyra*, which are molluscs adapted to rocky foreshore
environments. That these species were gathered for consumption suggests a different shore from that presently existing off the San Diego County coast today. Even greater quantities of bay molluscs, primarily pecten and Chione, are present in La Jolla middens, suggesting that estuarine conditions were also somewhat different from the present. The inferred physiographic conditions seem to indicate that:

... during the period from 7300 years ago or earlier until at least 3700 years ago, the shore north of La Jolla was considerably more rocky than at present with estuaries sufficiently deep and in sufficient contact with the sea to maintain, in baylike conditions, flourishing populations of pecten and Chione. These conditions would be met by a rapidly rising sea level, during which the accumulation of shore sand would be kept low (Shumway et al. 1961:113).

It is later proposed that the above conditions may well have existed on the southern California coast until possibly 1,000 B.P., yet by this date, many of the shellfish gathering peoples had abandoned the sites north of La Jolla and migrated further south in northern Baja California where bays and rocky shores remained.

Other anthropologists interpret the local environmental changes in a somewhat similar way, though there is disagreement concerning the exact sequence of events. At Batiquitos Lagoon, evidence suggests that by 6,300 years ago, increasing importance of pecten and Chione can be interpreted as indicative of the disappearance of the rocky foreshore environment on the San Diego coast. The silting in of Batiquitos Lagoon created a
habitat more ecologically fit for pecten and Chione than for Mytilus. This condition existed until about 4,000 years ago, at which point the lagoons were silted to the extent that they were no longer habitable by either pecten or Chione. From 4,000 to 1,200 years ago, these environments were no longer capable of supporting as large populations as the previous period.

The final hypothesis proposed by Warren and Pavesic combine the earlier conclusions with recent radiocarbon data.

It is maintained that there is little evidence for a heavy population on the San Diego Coast after 3000 years ago, except where permanent fresh water supplies and bays now exist, such as around Mission and San Diego Bays, the Santa Margarita River, and possibly the San Dieguito River. Even at these places, it may be that the populations were also declining by 3500 years ago (Warren and Pavesic 1963:418).

Thus, according to the sequence proposed by Warren and Pavesic (1963), around 6,300 B.P. the rocky foreshore on the San Diego coast was gradually being replaced by sandy beaches and mud flats. This condition resulted in the silting of numerous lagoons creating favorable habitats for large populations of pecten and Chione capable of supporting sizeable aboriginal populations. These environmental zones remained essentially unchanged until 3,000 to 3,500 B.P., at which point, the continued silting of the lagoons destroyed the mollusk populations. It is further suggested that the La Jolla Culture reached its population climax during the period between 7,000 and 4,000 years ago, and then, with the reduction of the food supply in the lagoons around 3,000 to 4,000 B.P., population
on the coast decreased and seed gathering and/or hunting took on more importance for the economy. The occupation of coastal La Jolla sites appears to be regular but seasonal during the initial period before 6,000 B.P., although later the occupation became increasingly intermittent and of a lower intensity, although the general activities remained the same. The seasonal occupation suggests that activities other than shellfish gathering were occurring during La Jolla times. It is suggested that the possible seasonal migrations of the La Jolla may be represented by the Pauma Complex further inland.

As the lagoons became unable to support the large La Jolla populations (around 1,100 B.P.), seed gathering and hunting may have assumed a greater importance in the subsistence pattern. The Pauma sites could have been the temporary seasonal campsites which supported small portions of the La Jolla peoples while hunting and gathering further inland due to the destruction of the coastal subsistence pattern. This settlement pattern may reflect the population shift of the La Jolla from the littoral zone to the western foothills, leaving a small population near the mouth of a lagoon where some fresh water and shellfish remained, while the majority of villages and camps existed further inland.

The Pauma Complex is, as yet, temporally undefined and its exact relationship to southern California prehistory is still unknown. Crabtree et al. state that:
The suggestion that the occupation (at SDi 603) has always been seasonal raises the very real possibility that the little known "Pauma Complex" (True 1958) might prove to be an inland variant of a later, more evolved La Jolla Complex (Crabtree et al. 1963:344).

Recently, Kowta has suggested ecological implications of the scraper planes found in the assemblages of the Milling Stone Horizon. Although the scraper plane may be considered a generalized tool of many functions, such as the sharpening of grinding implements as suggested by Treganza and Bierman (Treganza and Bierman 1958:73). Kowta hypothesized that it was utilized in the exploitation and preparation of agave and yucca for food and fiber. According to Kowta, the scraper planes might have been utilized in the manufacture of the "crucial chisel-ended digging stick" which is pounded into the agave plant to sever the crown from the root (Kowta 1969:52-69). A summary of other tools found at archaeological sites of the Milling Stone Horizon possibly utilized in the exploitation of agave for food and fiber includes hammerstones and manos involved in pounding the leaves for preparation; knives used to remove excess leaves; a metate upon which to scrape the fibers free of the pulp, to crush the leaves preparatory to drying them for later consumption, and probably to grind up the dried cakes in preparation for eating; and a scraper plane to remove the pulp in preparing fibers for cordage. The implications inferred from Kowta's analysis of scraper planes indicate not only the function of the tool, but, also, the possible
origin of the technology involving prehistoric migrations, contact and the related ecological factors.

... at the onset of the Altithermal, agave-adapted peoples of the interior either migrated to the southern California coastal areas bringing with them the technology of agave exploitation or transferred the technology to resident California groups, in either case initiating the Milling Stone Horizon. Archaeological implications of this are: (a) the Milling Stone Horizon dates to the onset of the Altithermal; (b) the Milling Stone Horizon assemblages contain items that are identifiable in the context of agave exploitation; (c) no pre-Altithermal coastal assemblages exhibit these items; (d) there were resident groups in California at the onset of the Altithermal in a position to adopt such items if the introduction of the traits did not take place through migration, and (e) there were pre-Altithermal populations in the interior already adapted to agave exploitation (Kowta 1969:55-56).

Migrations into southern California may be a result of the desiccation of the grasslands, and, finally, with further desiccation, the coast cultures must have been more strongly influenced by diffusion and migration of the peoples from the interior.

It is believed that the Encinitas Tradition persisted along the coast without major interruption for about 2,500 years after its initial arrival from the interior. There appears to be little evidence for cultural changes during this period and nothing to suggest major ecological shift to maritime hunting and fishing. The economic pattern appears to have been centered around collecting activities, which were apparently well adapted to the various plant communities and the littoral zone, with a rocky foreshore and long, narrow estuaries at the mouths of the streams.
About 5,000 B.P., this tradition with its ecological adaptation ended in the Santa Barbara area with the introduction of the Campbell Tradition, yet apparently persisted until 2,000 B.P. on the San Diego Coast.

The Campbell Tradition represents the introduction of a new technology for ecological exploitation centered around hunting, especially that of maritime resources, providing a wider range for environmental adaptation than that of the Encinitas Tradition. The influence of the Campbell Tradition was only minimally felt in the San Diego area around 4,800 B.P. The aboriginal shift in population and economic activities in the San Diego area probably account for the decrease in influence southward.

It appears that the aboriginal population on the San Diego coast north of Mission Bay decreased and it is suggested that the center of economic activities and consequently the population center shifted to: (1) inland areas where fresh water and the richer ecological zones of oak parkland, chaparral and pinon were more easily reached and (2) the area of Mission and San Diego Bays where the littoral resources still were plentiful. Furthermore it seems likely that the straight sandy beaches of the San Diego coast north of Mission Bay were not as heavily utilized as seal rookeries as the rocky points and islands in the Santa Barbara Channel. Given the limited resources of the littoral zone and the shift inland of population and center of economic activities, the development of a maritime culture was prohibited and nothing comparable to the maritime adaptation of the Campbell Tradition is found on the San Diego coast (Warren 1968:7).

Some influence from the Campbell Tradition was felt along the San Diego coast. Around 5,000 B.P. changes occur
in the artifact assemblages of the Milling Stone Horizon; most noticeably, projectile points occur more frequently, and mortars and pestles appear for the first time. Although this intrusive cultural influence is of considerably short duration, it appears that it was eventually assimilated into the Encinitas Tradition which remained relatively undisturbed on the San Diego coast. The Harris Site, Locus II, suggests the possible influence of the Campbell Tradition. Radiocarbon dated at 4,770 B.P., Locus II contains notched projectile points suggestive of a new economic pattern in the La Jolla culture, that of hunting. It is also possible that the technological influences of the Campbell Tradition, such as the mortar and pestle, enable the La Jolla to adapt better to the inland environment as the lagoons became unable to support large quantities of shellfish necessary to the coastal populations.

The coast Milling Stone Complexes had contact with interior groups between 5,000 to 3,500 B.P. also. Traits of the Pinto Basin Complex are represented in assemblages of the Milling Stone Horizon, but, also, borrowings typical of central California groups. An analysis of the physical characteristics of the La Jolla population supports this. According to S. L. Rogers, comparative analysis of specific physical characteristics of the La Jolla population "suggests affiliation with the stocks of the San Francisco Bay region, the Sacramento Valley and the Great Basin, rather than the Southwestern populations" (S. L. Rogers 1963:29).
Present evidence indicates that the La Jolla Complex is the San Diego coastal manifestation of the Milling Stone Horizon, resulting from either migration or technological diffusion from the interior Great Basin cultures. Adaptation to the immediate coastal environment of rocky foreshores and lagoons appears to have been an easy transition until 5,000 to 6,000 B.P., when the coastal area was no longer able to support the population. Influence from traditions to the north and east resulted in the diffusion of technological innovations enabling the La Jolla to adapt better to the new ecological conditions further inland around the foothills of the Peninsular Ranges. Cultural and ecological conditions, from 3,000 to 2,000 B.P., remained relatively stable with probable seasonal migrations between the coast and foothills. The La Jolla exploited a wide variety of marine and land resources. It has been suggested that with the arrival of the Yuman and Shoshonean cultures, elements of La Jolla people migrated further south into Baja California where the culture may have persisted until 800 B.P. The remaining group were assimilated into the later cultures.

Late Prehistoric Occupation Period; Yuman and Channel Island Influences

Evidence of the later phases of the La Jolla occupation at San Diego indicate a fairly stabilized cultural tradition. This condition resulted from a changed subsistence pattern
because of changes in ecological and environmental factors around 4,000 B.P. By 3,000 B.P., two separate patterns were recognized within the La Jolla Culture: (1) a land based gathering subsistence in place of the lagoon orientation shellfish based economy; and (2) a retention of the basic marine oriented subsistence pattern in certain locales with the subsequent development of a quasi-maritime based economy. Sometime following, or during, these later stages of adjustment strong influences from both the Colorado River and the Channel Islands were introduced. This coordinated, in the case of the Colorado River Yumans, with the actual migration of small groups of these people.

The introduction of the acorn-based subsistence economy was quickly adapted by the land based gatherers of the inland areas. This influence probably came from the Santa Barbara area where a similar economy can be hypothesized as existing by inference from the earlier cultural assemblages. The acorn-based subsistence economy is characterized by the utilization of the mano and metate seed grinding equipment as opposed to the mortar and pestle grinding implements of the Milling Stone Horizon.

The next influence to be introduced into the La Jolla Culture area was the concept of cremation. The beginning of cremation practices apparently corresponds with the actual migration of the Yuman people into the San Diego coastal area. At the Beach and Tennis Club Site, U.C.L.J.-M-6, Moriarty has found evidence which suggests that the process of amalga-
formation between the Yuman and La Jolla Cultures began about 3,000 B.P. and culminated around 2,000 B.P. (Moriarty 1966: 23). At this site, cremation replaces inhumation around 2,500 B.P. although by 3,000 B.P. enough Yuman additions were present in the artifact assemblage to infer the settling of the Yumans among the La Jolla peoples of the coast had taken place at that time.

Sometime following the mixing of the Yuman and La Jolla Cultures, a new group of Shoshonean speakers penetrated into the area between southern Los Angeles County and northern San Diego County. According to True, the combined results of this so-called Shoshonean intrusion and the Yuman-La Jolla amalgamation can be seen in the development of two separate cultural traditions in San Diego County. The first development terminated in the Kumeyaay (Diegueno) occupation of southern San Diego County, with

. . . the continuation of the basic milling stone base, modified by the introduction of an acorn economy, modified by the introduction of cremation disposal of the dead and by a continuous series of influences from the desert areas to the southeast (True 1966:29).

The second development resulted in the Luiseno occupation of northern San Diego County, where

. . . the basic milling stone pattern was terminated and replaced by the mortar and the pestle. Here the change was more marked than in the previously described Diegueño area, and milling stone elements were greatly reduced in importance. The same appears to have been the case with scrapers and hammerstones (True 1966:292-293).
A more detailed analysis of these two cultural developments is necessary in order that a more complete archaeological perspective of the differences and similarities noted in the ethnographic record can be understood. As stated before, the differences correspond to the developmental changes brought about by the arrival of two distinct culture groups in the San Diego area.

The Yuman Horizon appears to have started with an uninterrupted transition from the Amargosa phase into what Rogers called the non-ceramic Yuman Horizon (Donnan 1964: 11; Rogers 1945:173-174). By 4,000 B.P. a group of tribes occupying the junction of the Gila and Colorado Rivers and extending southward to Yuma, shared linguistic and cultural elements which defined the Yuman culture area (Moriarty 1968:2). A slow migration and/or expansion into new environmental zones resulted in the contact between the westernly-moving Yuman people and the coastal La Jolla about 3,000 B.P. as evidenced at U.C.L.J.-M-6. Whether this contact was the result of simple expansion of the Yumans into new areas or the result of a possible forced migration is unknown. In the Mojave Desert area, Donnan states the possibility that increased aridity and the expansion of the Shoshonean people into this area resulted in the retreat of the Yuman groups (Donnan 1964:13). It is very possible that this added stimulus may have initiated the Yuman migrations into the previously thinly inhabited area to the west, resulting in contact with the La Jolla Culture.
Whatever the case, by 2,000 B.P., a non-ceramic Yuman Horizon on the Pacific Coast appeared in certain La Jolla sites. Stratigraphic evidence suggests a cultural continuum between the La Jolla and Yuman traditions. According to Moriarty, the process of amalgamation between these two cultures appears to have begun as early as 3,000 B.P. and lasted until 2,000 B.P. (Moriarty 1966). The amalgamation resulted in an increased diversity of pressure flaked artifacts, importation of desert lithic materials, the appearance of the practice of cremation, and the knowledge and utilization of the bow and arrow technology.

The Yumans of the pre-ceramic horizon appear to have adapted to two different ecological zones in San Diego County which closely correspond to the two separate patterns recognized within the La Jolla Culture. The Yuman adaptation to the coastal environmental pattern can be seen in the amalgamation between the La Jolla and Yuman peoples at U.C. L.J.-M-6. At this site, there appears to be a cultural continuum from the La Jolla tradition through both the pre-ceramic and ceramic Yuman horizon. Inland, the Cuyamaca complex or phase represents the Yuman adaptation to the varied ecological zones of the peninsular Range (Warren 1968: 9-10). The close relationship between the La Jolla and Yuman cultural traditions is exemplified by Warren, who states:
The Yuman Tradition appears to have adapted to the same range of ecological zones as the earlier Encinitas Tradition. However, the methods and techniques of food production were somewhat different. The presence of the bow and arrow and the knowledge of how to process acorns, for example, apparently allowed for more extensive exploitation within this range of ecological zones. This increase in food production made possible and perhaps stimulated a cultural fluorescence that was not found in the earlier Encinitas Tradition (Warren 1968:10).

Although no pre-ceramic horizon is associated with the inland Cuyamaca Complex (thus, denoting it as the Cuyamaca Phase), Moriarty presents evidence of a pre-ceramic Yuman horizon on the coast. This horizon is radiocarbon dated to 2,300±150 years B.P., while the earliest known occurrence of ceramics is on the Spindrift Site and dates to 1,270±250 B.P. (Moriarty 1966:27).

The exact chronological sequence for the Shoshonean intrusion into southern California is, as yet, unknown. Kroeber has suggested that the Shoshoneans of California do not represent a single migration or drift, but rather a succession of local waves (Donnan 1964:13; Kroeber 1925:578-580). Kowta hypothesizes a date of around 3,000 B.P. for the first appearance of Shoshonean speakers in the Los Angeles Basin (Kowta 1969:50), although 2,000 B.P. is generally accepted as the date for the complete and finalized intrusion which resulted in the division of the Chumash and Kumeyaay, both Hokan speakers.

According to Warren (Warren 1968), there is linguistic
evidence of this late Shoshonean intrusion from the interior of California to Los Angeles, Orange, and northern San Diego Counties. To the north, the Shoshonean speakers appear to have borrowed heavily from the Chumash, and adopted a maritime economy on the coast; however, the inland sites of Los Angeles County appear to have affiliations with the desert. In northern San Diego County, the Shoshoneans seem to have adjusted easily to the ecological zones of the Peninsular Range, borrowing from the Kumeyaay to the south. These southern groups are represented by the San Luis Rey phases as described by Meighan (Meighan 1954), and illustrate the Shoshonean adaptation to the inland areas as opposed to the northern groups which are in contrast with them in their maritime adaptation (Warren 1968:9). The differences between the two phases are defined as follows:

San Luis Rey I is defined by the occurrence of small triangular projectile points, mortar and pestle, mano and milling stone, and simple flake scrapers. San Luis Rey II exhibits all of these plus pottery, cremation and pictographs (Warren 1968:5).

Although, as mentioned, no inland pre-ceramic Yuman phase has been identified with which to compare the San Luis Rey I phase, the Cuyamaca phase is considered similar to the San Luis Rey II phase in many respects. Yet True has noted several differences between these two phases upon which he hypothesizes the existence of two separate cultural traditions related to the cultural developments of these linguistically distinct groups (True 1966, 1970).
The following traits or elements are suggested as typical for the Cuyamaca complex are (sic) those elements that set the Cuyamaca complex apart from the San Luis Rey complexes in spite of a number of shared traits:

1. Defined cemetery areas apart from living areas.
2. Use of grave markers.
3. Cremations placed in urns.
4. Use of specially made mortuary offerings such as miniature vessels, miniature shaft straighteners, elaborate projectile points, etc.
5. Cultural preference for side-notched projectile points.
6. Substantial numbers of scrapers, scraper planes, etc., in inventory in contrast to smaller numbers in San Luis Rey area on this time plane.
7. Emphasis and stress placed on use of ceramics. Wide range of forms and several specialized ceramic items such as rattles, bow pipes, effigy forms, etc.
8. Steatite industry.
9. Substantially higher frequency of milling stone elements when compared to San Luis Rey.

The linguistic and cultural differences of these two distinct complexes culminated in the known historic occupation of the Yuman speaking Kumeyaay of the southern portion of San Diego County and the Shoshonean speaking Luiseño of the northern section of the county.
The prehistory of San Diego County is intricately associated with the migrations of populations from the interior valleys and basins of the west.

The Proto-Historic Cultural Setting

At the time of historic contact, the western Great Basin and southern California regions were occupied by several aboriginal groups belonging to two distinct linguistic stocks: Yuman speaking peoples of the Hokan stock and several groups speaking Shoshonean variations.

The boundaries for the various ethnic groups present at the time of contact were defined almost entirely from linguistic studies and from informant data describing the territories of each extant group as they were remembered.

In several decades that followed, this basic knowledge was expanded and refined in works by Kroeber, Dixon and others. It was obvious at an early date that the defined linguistic provinces were distinct entities with no transition dialects separating the various areas. Thus, the linguistic boundaries reported in early works were usually clear-cut and were for the most part accurate representations of the ethnic distributions as they existed in early historic times.

By 1904, for example, Kroeber was able to lump the linguistic groups of California into three large categories. They were correlated with the three main cultural provinces of the state. Because of these studies it was possible to show that the Shoshonean occupation of California and portions
Figure 13. The linguistic boundaries for Southcentral and Southern California (after Kroeber, 1925).
Figure 14.

a. Yuman summer house.

b. Yuman house - early type.
of the western Great Basin was comparatively recent intrusion into an area perviously held by Hokan speaking peoples. Further, the data available at the time suggested that, although the so-called Shoshonean intrusion was relatively recent, it was of sufficient age to permit the development of several southern California groups "in place," and Kroeber was able to suggest a considerable time span separating the division of these groups from the parent stock (Kroeber 1907:164).

The general conclusions reached by Kroeber and his co-workers in this regard were confirmed by the statistical evaluation of the same data. The examination of the University of California, Berkeley, culture element lists resulted in the blocking out of a number of what Klimek called "cultural strata," and it was possible, using this method, to see the relationships between the various component elements in such strata expressed in terms of a "coefficient of similarity" (Klimek 1935:1-70). From these results he was able to conclude that there was a significant correlation between the various linguistic groups and certain cultural patterns. These correlations, however, although clear-cut and definite for some portions of the cultural pattern, did not fit across the board and were, in many instances, a number of traits which crossed over the ethnic-linguistic boundaries in several kinds of overlapping relationships. Because of this, he could not seem to separate the infra-southern California subprovinces in any clear-cut manner.
Thus, in spite of the fact that the two basic southern California linguistic provinces had been obviously modified by two different and separable spheres of influence, there were enough elements held in common so that it was impossible to see these two areas as culturally distinct.

**Background Origins of the San Diego Area Indians; The Yuman**

The Yuman people of California are linguistically and racially members of the same stock. The basic origin of the group remains a mystery as it extends back into antiquity far beyond the possibility of human interpretation. It can be said with some security, however, that the tribes which occupied the junction of the Gila and Colorado in Arizona, as well as those that extended southward to Yuma, shared the same language and culture elements (which define the Yuman) by 2,000 B.C. Migration from this center westward brought the first elements of the Yuman culture into contact with the Pacific Coast about 1,000 B.C. where they later appeared to have merged with the coastal La Jolla culture. By the time of the Spanish contact the Yuman linguistic stock had divided itself into a number of basic tribal units. The California tribes centering on the lower Colorado River were the Mojave, the Halchidhoma, and the Yuma. The westward desert was the territory of the Kamia. The mountainous areas of San Diego County belonged to the southern or southeastern Diegueño. The coast and the foothills were occupied primarily by the northern or northwestern Diegueño as seen in Figure 15.
Figure 15. Kroober's boundaries for the Indian tribes of Southcentral and Southern California.
The generalized northern boundary of the Yuman is outlined in Figure 13. The area has been compressed by incursions of Shoshonean peoples from the north.

The incipient Maritime Stage of the San Diego and Mission Bays, and the Land Resource Collecting Stage north of San Diego, apparently persisted until influences from the east were felt on the coast. These influences signaled the end of the La Jolla Complex around 3,000 B.P. The subsequent cultural manifestations has been termed the Yuman and the Shoshonean cultures. These manifestations are characterized primarily by the addition of pottery and a series of small triangular projectile points.

On the basis of the available data taken from the Spindrift Site in La Jolla the arrival of pottery is tentatively placed at A.D. 800 or 12,000 years ago on the San Diego coast. There can be little doubt that the cultures represented at the Spindrift Sites are remains, both culturally and historically, closely related to the present Luiseno and Diegueno groups. Unfortunately, the coastal population was dispersed at a very early date (i.e., between 1769 and 1830). being among the first to feel the effects of contact with European culture. Consequently, there is little in the way of ethnographic data available for the historic aboriginal population of the coast. The lack of data has created somewhat of a problem, since a number of attempts have been made at cultural reconstruction for the San Diego Coast (Ascher 1959:168-178).
Figure 16. Principal trade routes through southern California.
The size and proximity of villages reported both by explorers and by modern archaeologists make it clear that this was the zone of densest settlement. Almost every permanent water source close to the beach has a large campsite nearby; some have several, though probably not all were occupied concurrently. They represent large and apparently permanent settlements, and many, such as Point Sal, Malaga Cove, and the La Jolla Beach and Tennis Club show substantial stratigraphic depth.

The coastal and island peoples fished, collected shellfish, and hunted sea mammals with technologically more refined equipment ... All of the coastal peoples also hunted and gathered and prepared plant foods, but the marine resources provided additional food security and permitted far greater population concentrations (Aschmann 1959: 48-51).

The extension of Santa Barbara Channel ecology and inland San Diego County cultural traits to the San Diego Coastal Province has resulted in an erroneous cultural reconstruction for the coastal region.

The most abundant trade item that moved from the San Diego County coastal region to the southwest was marine shell. This was an extensive and long enduring trade material. At least seventeen species of marine shell, occurring only in Pacific coastal waters, have been recovered from sites in and around San Diego Bay. The number of species would be greater excepting that in many cases there is a possible origin from the Gulf of California and, therefore, the list given in the Table relates only to those that can be derived from the Pacific Coast waters (Gladwin et al. 1937:141; Aschmann 1959).

Although the Hohokam region seems to have been supplied
from the Gulf of California, some of the material, such as the Haliotis pendants which occur at Snaketown, resemble those manufactured in California. Also, Ventana Cave, which appears to show a major reliance on material from the Pacific Coast (See Figure 17).

At the time of contact the Diegueno of San Diego were still a hunting gathering people with a strong inclination toward seed and food plant subsistence. Plant foods were collected from named locations belonging to the villages as a whole, and from more specific locations belonging to lesser social units. Smaller plots, individual trees, rock outcrops, eagle's nests and berry patches belonged to specific family units and in some instances to individuals. Nearly all resources of the environment were exploited in the highly developed seasonal round which extended from valley floor to the mountain tops. Village communities were scattered at nearly regular intervals along the flanks and at the base of the mountains. Generally, they were located along perennial streams or near reliable springs. All communities contained several resident houses, sweat house structures and special ceremonial enclosurers. The village complex operated as a separate, autonomous, social and economic group within a well defined territory, which was defended against trespass (Kroeber 1920:151-169; Bagby 1953:535-554; 1963).

Population Stance

In spite of all of the opportunities that existed for a
TRADE RELATIONS BETWEEN GROUPS IN SOUTHERN CALIFORNIA

Figure 17. Location of the principal trade routes through California. Circled numbers represent routes documented in the literature (see text).
sharp reduction of population, the southern California area eventually became the most populous of all of California (Almstedt 1968:9-15).

The southern coastal aboriginal groups filled their ecological niche with a very large population. Most probably the remoteness of the inland regions and the coastal foothills reduced the frequency of their exposure to disease (after the contact period) and it was in these regions that the villages remained longest undisturbed. Village endogamy among the Diegueño also tended to reduce the frequency of exposure. In addition, there were other important factors that contributed to the size of the population. The San Luis Rey Mission, for example, was not founded until 1798 and its assistencia at San Antonio de Pala was not founded until 1816. This was only five years prior to the beginning of that long twilight of disorder preceding the final secularization of the missions in 1834 (Bancroft 1883-1886:649, 663-665).

Since the bulk of social institutions existing in any culture is to some degree related to population density, and since the Diegueño bands had more elaborate social patterns than early ethnologists believed, it is concluded that the village community populations were not restricted in size except for the amount of food resources available. The demography supports this contention and this, in turn, is supported by a survey of the ecology and various features of terrain and climate. Ecological balance, all other things being equal, will insure that high population density along
with natural food resources, including an adequate water supply, will occur together (Balls 1972).

The Diegueño, previous to the arrival of the Europeans, had community pattern of two types. The first was the restricted wandering pattern. In this type the communities wandered within a territory that they defined as theirs and defended against trespass, or they maintained exclusive rights to food resources of certain kinds. Movement within the area may have been erratic or may have followed a seasonal round, depending on the kind of food resources utilized. The second type was the centrally based wandering type (Beardsley et al. 1955:136). In this pattern a community spent part of each year wandering and the rest of the year at a semi-permanent settlement or central base to which it may or may not return in subsequent years (Beardsley et al. 1956:305).

Famine in San Diego County, which might have resulted from the failure of a single staple crop, did not occur. This was due primarily to the fact that the groups in their home territories learned to exploit all their ecologic zones, not hesitating to utilize all of the possible sea, as well as land resources. Large populations could be sustained in this well-exploited area and the population of villages ranged from 150 to 400 people (Bean and Saubel 1961:233-236; 1972).

The establishment of a chain of Spanish missions hinged, in part, upon economic and military considerations, one of which was a suitable population reserve. Since the mission
chain in Alta California was, in fact, established and did, indeed, serve as a series of military magazines, then the conclusion that appropriate ecologic conditions existed is difficult to avoid, even though there is little in the landscape today to encourage such a view. Agriculture, forest fires, desiccation and other fruits of Spanish and Anglo-American occupation have radically altered the conditions which made for a rich hunting-gathering territory in aboriginal times.

The Diegueño hunting-gathering economy was totally at the mercy of the environment. Although there was a sufficient food supply, cyclic periods of drought and infestations of the oak trees occasionally caused great difficulty. At such times they turned to more intensive hunting and trapping to fill the food loss. It was the marine environments of the lagoons and nearshore, however, that provided the bulk of supplementary food at these crucial periods. In these environments a reasonably dependable supply of shell food was always available as selective gathering of only the largest specimens was done during normal periods. Because of this selective gathering of lagoonal and nearshore shell species the reproductive balance was not destroyed. The rare occasions when necessity caused the Diegueño to over exploit this food source were insufficient to cause serious or lasting effect (Braidwood and Reed 1957:19-32).

Since techniques for providing food in San Diego County hunter and gatherer groups were highly efficient, it is
reasonable to expect that their population size would reflect this attribute. In general, this appears to have been true. Additionally, the specializing of diet requires a larger territory to support groups of hunters and gatherers than is necessary for non-specialized groups. A non-specialized diet allows the group to exploit all of the food resources in an area. If this is done effectively only a small area may be needed (Cook and Treganza 1950:223-226).

Improved technology makes it possible to utilize and prepare more food at higher quality level, but specialization of the diet often leads to less food abundance than would be available to a group with a simpler technology. Thus, the absolute food supply did not determine the size of the population in Diegueño hunter and gatherer groups. Population size was controlled, in part, by cultural preference for only part of the food resources (Watson 1969:86).

In the final analysis, perhaps the most critical factor in San Diego Indian population size was the remarkable peacefulness of the peoples compared to such groups in the rest of the United States. Lacking many of the techniques of organized warfare, population size was relatively free from the attrition resulting from major hostilities. This resulted in far greater stability in their communities (Caldwell 1958; Carter 1954:165; 1959:8-30; Clark 1969; Caughey 1952; Cook and Heizer 1965:1-39).
Coastal gathering, fishing, some hunting (mostly small game)

Mountain gathering, hunting

Desert gathering, hunting

River valley: flood irrigation agriculture, some gathering & hunting

Figure 18. Area patterns defining food gathering practices within the four Ecological Systems in Southern California and Baja California. (Borland, 1964:2-29).
Place Names in the Diegueño Area

Our present knowledge of Indian place names taken from the literature contains more errors than truth. There is a distinct advantage in knowing the locations and the names of former Indian villages, but though the names often have survived in the literature the locations are just as often lost. Figure 19 presents a reasonably accurate place name location for sites throughout San Diego and Imperial Counties. The circled numerals are the recent place names for sites where the original Indian name is no longer available. Often the investigator will be given a specific name (i.e., presumably of Indian origin) for the place. More often than not, careful investigation proves these informations to be in error or a product of misunderstanding. An additional problem is the inability of early ethnographers to agree on the phonetic spelling of many of these names. We have, therefore, a variety of names which cannot be situated geographically, as they are often applied to one place (Kroeber 1916:31-69). Henshaw clarified, fortunately, many of the locations of the Diegueño by listing, by name, the former rancherias that the Diegueño occupied.

Diegueño is a collective name, probably in part synonymous with Comeya, applied by the Spaniards to Indians of the Yuman stock who formerly lived in and around San Diego, California, whence the term; it included representatives of many tribes and has no proper ethnic significance; nevertheless,
Figure 19. Pre-Spanish village locations in the Yuman territory in Southern California. Circled numbers represent the European names for sites where the Indian name is lost or in doubt.
it is a firmly established name and is here accepted to include the tribes formerly living about San Diego and extending south to about latitude 31° 30'. A few Diegueños still live in the neighborhood of San Diego. There were about 400 Indians included under this name as attached to the Mission agency of California, but they are now officially recognized as part of the "Mission Indians." The rancherias formerly occupied by the Diegueños, so far as known, are: Abascal, Awhut, Cajon, Camajal, Campo, Capitan Grande, Cenyowpreskel (?), Cojuat, Coquilt, Corral, Cosoy, Cuyamaca, Ekquall, Focoma, Gueymura, Hasoomale, Hassasei, Hattaam, Haqai, Honwee Vallecito, Icayme, Inomassi, Inyaha, Kwalwhut, Luguna, La Punta, Lorenzo, Mactati, Maramoydos, Mataguay, Matame, Matironn, Mattawottis, Melejo, Mesa Chiquits, Mesa Grande, Meti, Nellmole, Nipaguay, Otai, Otat, Pocol, Prick-away, San Dieguito, San Felipe, San Jose, San Luis, San Pascual, Santa Isabel, Sequan, Suahpi, Tacahlay, Tahwie, Tapanque, Yacum, the Conejos and the Coyotes are mentioned as former bands of Diegueños (Hodge 1910:390).
Summary

The reason for placing a detailed description of the variety of cultures which have existed in San Diego County since prehistoric times was done in order that park staff and other interested personnel could have a detailed understanding of the culture sequences discovered within the Cabrillo National Monument.

At least three of the cultures, the San Dieguito, the La Jolla, and the proto-historic Diegueno, have been discovered within the park boundaries. In order to facilitate a greater understanding of these cultural sequences and their various inter-relationships, it was felt that the construction of a complete synthesis including the best available information relating to these occupations be developed. Special attention by the writer to the archaeological potential of the park is discussed in the later portion of the report.

The recent archaeological survey produced new evidence of La Jolla, as well as Diegueno, occupation. Additionally, evidence for earlier cultures, such as the San Dieguito, were also discovered in the past. The details regarding these discoveries, plus the cultural overview, it is hoped, will provide assistance in the training of park staff in understanding this important aspect of the interpretative history of the park.
The sea expeditions to the California Coast in the early Spanish Discovery Period are usually very similar. The operations of marine navigations on the coast would have quite naturally duplicated, in general, the conditions from one expedition to another. The prevailing northwest winds of the California coast made such expeditions dangerous and difficult. Close navigation of the coast, when attempting to sail in a northwesterly direction, was nearly impossible at certain times of the year (Moriarty 1969:61-67).

The advancement of naval architecture during this period had been extremely slow and as mariners are constantly risking their lives on the vessels which they direct or operate they are by nature relatively conservative. This is particularly true in the sense of naval architecture and innovations or advancements. Progress has been extremely slow in the evolution and development of sailing vessels (Chapman 1921; 1939).

Sailors find old ways have worked the safest and most understandable. Therefore, any specialized advancement or development, in the sense of new architectural invention, has always been looked upon as dangerous. Such advancements only become acceptable after a long period of experiment (Coues 1900).

Interest in the Pacific coast waned thereafter and for more than forty years nothing was done to further knowledge
nearly two hundred years thereafter was depicted as an island (Beechey 1831).

At the head of the Gulf Ulloa came about and sailed southward. He rounded the tip of Baja California and journeyed northward along the west coast to a point a little above the Cedros Islands. The extent of Ulloa's discoveries along the Pacific shore cannot be established conclusively, although it is known that he reached Cape Engano. Ulloa returned to Mexico and shortly afterwards followed Cortes on his last trip to Spain (Moriarty 1965: 1-17; Beilharz 1971:41-43).

An expedition a year later under Francisco Bollanos, ordered out by Cortes' principal rival, Viceroy Antonio de Mendoza, and outfitted and dispatched by Cabrillo, evidently had added nothing to the discoveries of Ulloa (Pourade 1960).

The following year, 1542, Mendoza sent Cabrillo northward. This expedition reached the vicinity of southern Oregon, having discovered and explored more than 1000 miles of coast line. Actually, Cabrillo extended the discoveries of Ulloa. He obviously knew the limits of Ulloa's explorations for he did not go through the ritual of claiming land for Spain until he reached what is now the Bay of San Quentin, about 170 miles south of San Diego, even though he had stopped often and had explored thoroughly the ports and bays south of there.
CHAPTER III

HISTORIC CULTURE SETTING

Spanish-Mexican Period

Explorations (Cabrillo-Vancouver)

When the long train of events which finally resulted in the settlement of Alta California are viewed as a whole, Juan Rodriguez Cabrillo's contribution falls into perspective and, as a result, stands out, perhaps, as the single most important element. Expeditions sent out by Hernando Cortes, the conqueror of Mexico, discovered the tip of Baja California in the early 1530's. Subsequent voyages at his direction gradually defined the Gulf of California, both the shores of Baja California and the Mexican mainland. Cortes's final effort came in 1539 when he sent out Francisco de Ulloa. Ulloa sailed to the head of the Gulf of California, thus establishing the existence of the peninsula shape characteristic of Baja California. A voyage a year later by a rival confirmed Ulloa's discovery and penetrated the land by way of the Colorado River to about the present site of Yuma. But neither report had permanent affect upon cartographers since California for
of those shores. Along with the dangerous and stormy voyage across the Pacific by the Manila galleon came a quickening of interest in Alta California. A port was needed where repairs to the galleon could be made and the scurvy-ridden sick treated. As a result, an expedition was dispatched in 1585 under Pedro de Unamuno and another one in 1595 commanded by Sebastian Cermeno. Both expeditions added important details to the knowledge of the coast the Cabrillo expedition had discovered and explored.

Seven years after Cermeno and sixty years after Cabrillo an expedition under Sebastian Viscaino made an extensive and thorough exploration of the Pacific Coast. Although the voyage did not extend beyond the northern limits of the Cabrillo tract, Viscaino has had the most lasting effect upon the nomenclature of the coast. Many of the names he gave to places have survived, whereas practically everyone of Cabrillo's has faded away. Cabrillo named the port which was his first stop in what is now the United States, San Miguel; sixty years later Viscaino changed the name to San Diego, the name which has survived (Davidson 1886; 1955:46).

For the next one hundred and fifty years random reports from captains of Manila galleons undoubtedly added a detail here or there to the knowledge of the west coast, but between the voyage of Viscaino and the settlement of Alta California, in 1769, there are no known Spanish voyages of
exploration along the Pacific coast (Davis 1953).

Cabrillo's voyage gave cartographers information they needed to define, for the first time, the western shores of the unknown land to the north of Mexico. Subsequent voyages added details to Cabrillo's information which, in time, permitted the mapmakers to depict accurately the west coast. But as these reports came in and were examined and utilized, the names Cabrillo gave to various places were gradually supplanted. Viscaino's report delivered the final blow to Cabrillo's place names. Since his voyage was the last one, Viscaino's names became fixed in the mapmakers' minds and, thus, survived (Duflot de Mofras 1937).

The Cabrillo expedition sailed in two ships, neither of which, perhaps, was more than one hundred feet long. Cabrillo and his men travelled along the coast during the season of the year when storms are most prevalent. The navigational instruments they had were so primitive the voyagers were consistently off one to two degrees in latitude, thus, contributing materially to the difficulty historians have in correlating places mentioned with present day sites (Elliot 1883).
Figure 20. General physiography of Point Loma and surrounding area
The following Tuesday and Wednesday they sailed along the coast about eight leagues, passing some three uninhabited islands to the landward. One of the islands is larger than the others. It is two leagues in length, and makes a shelter from the westerlies. The islands lie at 34°, and are three leagues from the mainland. This day they saw on land great smokes; it appears to be a good land, with great valleys, and inland there are high mountains. They called the island 'Islas Desiertas.'

On Thursday they went about six leagues north-northwest along the coast and found a very good enclosed port, to which they gave the name of San Miguel. It lies at 34° 20', after anchoring they went ashore, where there were people. Of these, three waited, and all the others ran away. To these three they gave some gifts, and the Indians told them by signs that people like the Spaniards had passed inland; they showed much fear. At night the Spaniards left the ships in a small boat to land and to fish. There happened to be Indians there, and they began to shoot with their arrows, and they wounded three men.

The next day, in the morning they went with the boat further into the port, which was large, and caught two boys who understood nothing, not even signs, and they gave them shirts and soon sent them away.

The day after that, in the morning three large Indians came to the ships, and by signs told how inland there walked men like the Spaniards, bearded and dressed and armed like the ones on the ships, and they showed that they had ballistas (i.e., crossbows), and made gestures with their right arm as if they were spearing. They went running as if they were on a horse, and showed that they killed many of the Indian natives, and for that reason they were afraid. These people were well proportioned and large. They went around covered with the furs of animals. While in port, a very large storm passed, but because the port was so good they felt nothing. The weather came from the west-southwest, and south-southwest and it was rainy. This was the first real storm they had undergone, and they stayed in the
Puerto de San Diego situado a 32 grados 32 minutos de latitud septentrional.
A... La isla que cu. bre Pucano.
B... Lengua de Arenas.

Nota. Los números del Sondado denotan 0 x x x.

Figure 21. Early Spanish chart of Point Loma and San Diego.
plot until the following Tuesday. There the natives called the Christians 'Guacamal.'

On Tuesday, the 3rd of October, they left the port of San Miguel (Moriarty and Kiestman, 1962:2-4).

In the years that followed, the Spanish crown sought to develop a safe route across the Pacific over which it could exchange the treasures of Asia for the precious metals taken from the peoples of Meso-America and Mexico (Engelhardt 1912; 1920).

They did not solve the problem of the west to east route until 1565. Father Urdaneta, in the ship SAN PEDRO, discovered the secret of the return route from the Philippines and marked the way for the great China ships that were to operate under the guidance of the Spanish authorities for many years (Fages 1937).

This discovery, once again, directed attention to the coast of Alta California. Authorities hoped to discover bays with safe watering and revictualing areas suitable for refurbishing the galleons, thereby easing the trials of the terrible journey across the Pacific. They desired construction of military forts to support these establishments and to stave off, as long as possible, the advances of other European countries into the Pacific coastal regions. Plans to occupy ports and construct presidios to protect them were not carried out because Spanish authorities decided that it was of greater advantage to seek out the "Islands of Gold and Silver" (Moriarty and
There were various reports circulating about the Pacific at the time giving differing locations for these fabulous islands. The fact is that they never existed, at least in the form the legends described. The expeditions sent in search of them were wasted. Meanwhile, the coast of Alta California went unexplored. After the discovery of the famous Black Stream (i.e., the Kuroshio Current that runs north of Japan and eastward across the Pacific toward the northwest coast of the United States), the route of the Manila galleon moved farther north. This took place in 1584, and there were a number of voyages in and around that period. The galleons proceeded across the Pacific by making an easting slightly north of Japan, near 40° north latitude, and arrived somewhere from that point, until they passed the tip of Baja California, where they turned in at such ports as Acapulco and Manzanillo.

They made no attempt to use any port on the Pacific coast for some years (Forbes 1937).

It is recorded that only two galleons landed investigators on the California coast in the period between Father Urdaneta's voyage in 1565 and the expedition of Sebastian Viscaino in 1602. The first was Pedro de Unamuno, who, in 1587, sighted two small islands along the California coast and what appeared to be a great bay. He anchored his galleon and landed on the beach that had a lagoon behind a
sandbar. He had the wooded hills that ring the bay explored. The area was probably Morro Bay or very near that vicinity (Sanchez 1929).

Although there was increasing need for safe harborages for the Manila galleons, the Spanish ignored the requirement until the depredations of Drake and other privateers brought to the Crown's attention the earlier plans for occupying safe harbors on the California coast. As a consequence, Sebastian Rodriguez Cermeno, in command of the galleon SAN AUGUSTEN, received instructions to make a careful survey of the coast from the Cape Mendocino area south to the tip of Baja California on his return from Manila in the latter part of 1595. Unfortunately, while he anchored in what is now called Drake's Bay, a bad storm caught and wrecked his vessel. He was forced southward in his longboat and was unable to attempt any detailed exploration of the coast. On the fifteenth of December in 1595, the survivors must have passed Point Loma and the entrance to San Diego Bay. There is no reference to this in his log. Although he undoubtedly knew the bay existed, under the conditions of his overcrowded longboat and the great anxiety of the survivors to reach home, he neglected to investigate the harbor at San Diego.

It was not until the earliest days of the 1600's that the Basque merchant Sebastian Viscaino managed to obtain authority to explore the northwest coast.

A year or so earlier he had received permission to
attempt a settlement in Baja California. This failed, and upon his return he immediately volunteered to lead another expedition to the outer coast.

The following is an element from the Log of Viscaíno, translated by Dr. Bolton:

The next day, Sunday, the 10th of the month (December 1602) we arrived at a port, which must be the best to be found in all the South Sea, for, besides being protected on all sides and giving good anchorage, it is in latitude 33 1/4°. It has very good wood and water, many fish of all kinds, many of which we caught with seine and hooks. On land there is much game, such as rabbits, hares, deer, very large quail, royal ducks, thrushes, and many other birds.

On the 12th of the said month, which was the day of the glorious Don Diego, the general, admiral, religious, captain, ensigns, and almost all of the men went on shore. A hut was built and mass was said in celebration of the feast of Senor Don Diego. When it was over the general called a council to consider what was to be done in this port, in order to get through quickly. It was decided that the admiral, with the chief pilot, the pilots, the masters, calkers, and seamen should scour the ships, giving them a good cleaning, which they greatly needed, and that Captain Peguero, Ensign Alarcon, and Ensign Martin de Aguilar should each attend to getting water for his ship, while Ensign Juan Francisco, and Sergeant Miguel de Lagar, with the carpenters, should provide wood.

When this had all been agreed upon, a hundred Indians appeared on a hill with bows and arrows and with many feathers on their heads, yelling noisily at us. The general ordered Ensign Juan Francisco to go to them with four arquebusiers, Father Fray Antonio following him in order to win their friendship. The ensign was instructed that if the Indians fled he should let them go, but that if they waited he should regale them. The Indians
waited, albeit with some fear. The ensign and soldiers returned, and the general, his son, and the admiral went toward the Indians. The Indians seeing this, two men and two women came down from a hill. They having reached the general, and the Indian women weeping, he cajoled and embraced them, giving them some things. Reassuring the others by signs, they descended peacefully, whereupon they were given presents. The net was cast and fish were given them. Whereupon the Indians became more confident and went to their rancherias and we to our ships to attend to our affairs.

Friday, the 15th of the month, the general went aboard the frigate, taking with him his son, Father Fray Antonio, the chief pilot, and fifteen arquebusiers, to go and take the soundings of a large bay which entered the land. He did not take the cosmographer with him, as he was ill and occupied with the papers of the voyage. That night, rowing with the flood tide, he got under way and at dawn he was six leagues within the bay, which he found to be the best, large enough for all kinds of vessels, more secure than at the anchorage, and better for careening the ships, for they should be placed high and dry during the flood tide and taken down at ebb tide, even if they were of a thousand tons.

I do not place in this report the sailing directions, descriptions of the land, or soundings, because the cosmographer and pilots are keeping an itinerary in conformity with the art of navigation.

In this bay the general, with his men, went ashore. After they had gone more than three leagues along it a number of Indians appeared with their bows and arrows, and although signs of peace were made to them they did not dare to approach, excepting a very old Indian woman who appeared to be more than one hundred and fifty years old and who approached weeping. The general cajoled her and gave her some bread and something to eat. This Indian woman, from extreme age, had wrinkles on her belly which looked like a blacksmith's bellows, and the naval protruded bigger than a gourd. Seeing this kind treatment the Indians came peaceable
and took us to their rancherias, where they were gathering their crops and where they had made their paresos of seeds like flax. They had pots in which they cooked their food, and the women were dressed in skins of animals. The general would not allow any soldier to enter their rancherias, and, it being already late, he returned to the frigate, many Indians accompanying him to the beach. Saturday night he reached the captain's ship, which was ready; wood, water, the fish were brought on board, and on Wednesday, the 20th of the said month, we set sail. I do not state, least I should be tiresome, how many times the Indians came to our camps with skins of martens and other things. Until the next day, when we set sail, they remained on the beach shouting. This port was given the name of San Diego (Bolton 1959).

Father Antonio de la Ascension accompanied Viscaíno and the following is from an account he wrote in 1620:

Finally, after much labor we reached the port of San Diego, which is very good and capacious and offers many very good advantages for Spanish settlement. Here the ships were cleaned and oiled again, the place being quiet, and there being many friendly and affable Indians there. They use bows and arrows and appear warlike and valiant, since, notwithstanding, they came to see us every day, they always treated us with so great a distrust that they never had complete confidence in us. They pronounced us very well in our language what they heard us speak that anyone hearing them and not seeing them would say they were Spaniards. Every day they would come in order that we might give them some of the fish we caught in the net, and they would go away quietly after they had helped to haul it in.

The harbor is large and secure, and has a large beach within, like an island of sand, which the sea covers at high tide. In the sand on this beach there is a great quantity of yellow pyrites, all full of holes, a sure sign that in the neighboring mountains and adjacent to this port there is gold mines; for the water, when it rains, brings it from the mountains, and the whole watershed converges here. On the sandy beach which I said was in this harbor we found some large pieces, like adobe, brown or dark red in color, and very light in weight, like dried
cowdung. They had neither a good nor a bad odor, and they are said to be amber. If this is so, there are great riches and an abundance of amber here.

There are many different kinds of fish, of very good taste and flavor, such as ray, sea-horse, lobster, crab, guitarras, sardine, turtle, and many other kinds. There is much wild game and hunting and fowling; and there are many large, grassy pastures. The Indians paint themselves white, and black, and dark London blue. This color comes from certain very heavy blue stones, which they grind very fine, and dissolving the power in water, make a stain, with which they daub the face and make on it lines which glisten like silver ribbons. These stones seem to be of rich silver ore, and the Indians told us by signs that from similar stones a people living inland, of form and figure like our Spaniards, bearded, and wearing collars and breeches, and other fine garments like ours, secured silver in abundance, and that they had a name for it in their own language. To ascertain whether these Indians knew silver, the general showed them some silver bowls and a plate. They took it in their hands and spun it around, and, pleased by the sound, said it was good, and was the same as that possessed and valued highly by the people of whom they had told us. Then he put in their hands a pewter bowl, but when they struck it the sound did not please them and, spitting, they wanted to throw it into the sea.

The people of whom the Indians told us might have been foreigners, Hollanders or English, who had made their voyage by the Strait of Anian and might be settled on the other coast of this land, facing the Mediterranean Sea of California. Since the realm of narrow, as has been said, it may be that the other sea is near that place; for the Indians offered to guide and take us to the place where they say the people are settled. If this is so, it is probable they have large interests and profits there, since their voyage is so long and difficult. Still, it is true that by passing through the Strait of Anian and reaching their land by that latitude, their voyage is only half as long as that from the port of San Juan de Ulua to Spain. This will be clearly seen from evidence furnished by the globe. In this case, it will be to his Majesty's interest to endeavor to assure himself of the fact: first, in order to know the route, and
secondly, in order to expel from there such dangerous enemies, lest they contaminate the Indians with their sects and liberty of conscience, by which great harm to their souls will follow, whereby instructing them and leading them in the paths of the true law of God will be made very difficult. Besides this, his Majesty will be able to secure many other advantages, as I shall show later.

After we left the Port of San Diego we discovered many islands placed in a line, one behind another.

The next sighting of Point Loma is reported by Captain Vicente Vila of the San Carlos in 1769:

At nine o'clock, as the sea-breeze had shifted to the NW and the fog had lifted somewhat, the islets or rocks, which General Viscaíno called Los Coronados, and the pilot Cabrera Bueno, islands of San Martin, were sighted. They are the best and surest marks for making the port of San Diego which is situated about five and half or six leagues due north of these islands. At this hour they bore SSE, at a distance of eight (leagues).

At noon, I noted the island of San Clemente bearing west, and the island of Santa Catalina bearing WNW. The headland at the entrance to the port of San Diego is the southern extremity of the hill which covers and protects this port to the SE, (and lies) at a distance of from three to four leagues. The rocks or small islands of Los Coronados bore ESE, at a distance of nine leagues

Latitude by observation . . . 32° 50' north
Direct Course . . . . 43°00', 2nd quadrant
Distance made good . . . . . . . . . . 51 knots
Longitude reached . . . . . . . . . 257° 53'
From Saturday, 29, to Sunday, April 30.--On the lookout for the port under all sail, heading to the eastward; wind fresh from NNW, sea smooth. (April 30, 1769).

At four o'clock in the afternoon (April 30, 1769) I clewed up and furled the courses and top-gallant sails, at a league is distance from the point which I named Vallado, as the outline of the hill (protecting) the port suggested a stockade (Point Loma). At this place we began to enter a kelp-field with thick patches of seaweed. When the packet had been under way for more than two knots, she stopped almost still and did not answer the helm. I sounded until we had passed it completely, hauling very close to the point in fourteen and fifteen fathoms. Black sand and, in places, gravel.

From this point seaward, to the SSE, there runs out a ledge or rocks. The sea breaks over half of the ledge but not over the rest, as it runs out into deeper water so that, at a little more than two cables-length from the extremity of the headland, there are two fathoms and a half; stony bottom at three cable's-lengths, three fathoms; also stony at four cable's-lengths, four fathoms, the same. It was five o'clock in the afternoon when I passed through, hauling the wind, which changed to the merest puff from the northward, with flaws. At this hour I discovered the packet San Antonio anchored at Point Guijarros, and we broke out our colors. She broke out hers and fired one gun to call in her launch which was ashore. I continued to tack; and, as the wind had fallen almost calm, I lowered the topsails and anchored in six fathoms of water, loose black sand. At this hour the tide was already running out.

At eight o'clock at night, the launch of the San Antonio came with her second in command and pilot, Don Miguel del Pino, who gave us an account of her voyage.

Don Miguel Constanso sailed with Captain Vial in 1769. He was a cartographer and he left a narrative of the expedition. The following is from the translation by Dr.
Ray Brandes of the University of San Diego:

... on April 29, entered the port of San Diego, one hundred and ten days out of La Paz. But its crew, and the troops it transported—which hardships could not fail to be excessive in so long and painful a voyage, and in the rawest of the winter, arrived in a deplorable state.

... Following the west shore of the Port, they discovered a short distance away a group of Indians armed with bows and arrows, to whom they made signs with white cloths calling them to a parley. But, keeping at a distance, moving away as our men moved toward them, prevented a meeting. Nor was it possible, either, for our men to make greater speed, for they were weak, and after such a long voyage had, as it were, lost the use of their legs. These Indians stopped every little while upon some height, watching our men, and showing the fear which the strangers caused them by the very thing they did to hide it. They thrust one point of their bows down in the soil, and grasping it by the other end they danced and whirled about with indescribable velocity. But, as soon as they saw our men draw near, they again withdrew themselves with the same swiftness. At last it was contrived to attract them by sending toward them one soldier, who, depositing his arms on the earth, and using gestures and signs of peace, they consented to let him near. He distributed some gifts to them while the others were coming up who finished assuring these Gentiles with some more considerable presents of ribbons, glass, beads and baubles. They asked them by signs where the watering-place was, and the natives, pointing toward a grove which was made out in the distance to the northeast, gave to understand that within it ran some river or arroyo, and to follow, that they would take them to it.

They walked some three leagues, until they arrived on the banks of a river hemmed in on either bank by a low ridge of very leafy willows and cottonwoods. Its channel must have been twenty varas wide, and it discharges into an estuary which at high tide could admit the launch, and make it convenient for accomplishing the taking on of water.
PLANO del Puerto DE S. DIEGO

Nota.
1. El dibujo representa el lugar marca por el 2º Piloto de la Armada de Juan Pantoja
   del Puerto de San Diego.

2. Las numeraciones de latitud en ángulos de la Armada de Juan Pantoja.

Figure 23. The Juan Pantoja map of San Diego Bay.
Within the grove was a variety of shrubs and odoriferous plants, as the Rosemary, the Sage, Roses of Castile, and above all a quantity of wild grapevines, which at the time were in blossom. The country was of joyous appearance, and the lands contiguous to the river appeared of excellent friableness, and capable of producing every species of fruits.

... There are in the land, deer, antelope, many hares, rabbits, squirrels, wild cats, and rats. The ring-necked turtle-doves abound, and so do the quail, calendar-lark, mockingbird, thrush, cardinal, and hummingbird, jackdaw, crow and hawk, pelican, gull, divers and other maritime birds of prey. There is no lack of ducks nor of geese, of different shapes and sizes. There is a variety of fish. The best are the flounder and the sole which besides being of delicate taste, are of extraordinary size and weight from fifteen to twenty pounds. In the months of July and August one can catch as much bonito as one wishes. During all the year there are halibut, burgaos, horse-mackerel, dogfish, rays, mussels and cockles of all species. In the winter months the sardine runs in as great abundance as on the coasts of Galicia and Ayamonte. The principal sustenance of the Indians that inhabit the shore of this port is fish. They eat much cockles, for the greater facility they have in catching them. They use balsas (rafts) of rushes, which they manage dexterously with a paddle or oar of two blades. Their harpoons are of some varas in length. The point is of bone, very much sharpened, inserted in the shaft of wood. They are so dexterous in hurling this that rarely do they miss their target.

Captain George Vancouver was a former companion in exploration of Captain Cook. In 1791 he was sent by the British government into the North Pacific, primarily to receive the transfer of territory agreed upon by England and Spain at the close of their long dispute. According to Vancouver's log he reached San Diego in the Discovery November 27, 1793.
The land wind blew a moderate breeze on the morning of Wednesday the 27th, with which we stood to the southward along shore; but the weather was so excessively hazy as to prevent our seeing about us until after eight o'clock, when we discovered ourselves to be near the south-west point of entrance into port San Diego, called by the Spaniards Punta de la Loma, bearing by compass S. 57 E. distant three or four miles; the northernmost of some small islands, named by the Spaniards the Coronados, S. 15 E. and the Lagoon, that is to say, Puerto Falso, N.N.E. four miles distant. Point Loma is the southern extremity of a remarkable range of elevated land, that commences from the south side of Puerto Falso, and at a distance has the appearance of being insular, which effect is produced by the low country that connects it with the other mountains. The top of this tract of land seems to terminate in a ridge, so perfect and uniformly sharp, as apparently to render walking very inconvenient. The fact, however, is not so; but when viewed from sea, it has that singular appearance. It descends in very steep rocky cliffs to the water side, from whence a bed of growing weeds extends into the ocean, half a league, or two miles.

The land wind died away as noon approached, and was succeeded by a gentle breeze from the N.W. with which we steered towards Point Loma, through a continuation of the bed of weeds, extending in a south-westerly direction from that point, whence lie some breakers at the distance of a mile. Our soundings on first entering the weeds were 20 fathoms; this depth gradually, though not very regularly, decreased to six fathoms as we passed within about a mile of the southern part of the breakers; then deepened again to nine fathoms, and so continued until we entered the channel leading into port San Diego, across which is a bar. This we passed in three fathoms and a half water, and favored with the assistance of the flood tide, we turned into the port; where, about two in the afternoon, we anchored in ten fathoms water, fine sandy bottom, at the usual place of anchorage in the harbour. Point de la Loma, in a line with the south-eastermost of the Coronados, bore by compass S. 8 E.; Punta de Guijarros, a low spit
of land, projecting from the high steep cliffs within the former, and which, properly speaking; constitutes the west point of entrance into the port, S. 18 E.; and east point of entrance, which is also very low, but not a spit of land, bore S. 36 E.; the former distant about a mile, the latter about three fourths of that distance. The Presidio of San Diego bore N. 21 E. distant three miles and a half, and the nearest shore north west, within a quarter of a mile of our anchorage.

... Although we did not make any survey of the port of San Diego, it may not be improper to state a few particulars relative to it, that came under our observation during the time we were there stationary. The mission of San Diego is not within sight of the sea, nor of the port; it is situated in a valley within the view of, and about two miles distant from, the Presidio to the north-east; which was the only building seen from our anchorage.

The sharp ridge of land (Point Loma), mentioned on the 27th of the preceding month, is connected with the other mountains by an isthmus, or tract of very low land, which in the rainy season is flooded, and at high spring tides makes the sharp land, forming the west and north-west side of the port, an island. The Presidio is on the continental side of this low sandy isthmus. The peninsula bears a very different appearance when seen from the port, from that before described as observed from the ocean. It descends with an uneven surface, and some bushes grow on it, but no trees of a large size (Wilbur 1953; Eastwood 1924: 265-340).

In 1792 the explorer and scientist Jose Longinos Martinez wrote:

New California is situated between Latitude 34 and Latitude 39. It is a narrow strip of land which, from the presidio of San Diego to that of San Francisco, is some 300 leagues in length. At its widest point it is sixteen to twenty leagues in breadth, and three or four at its narrowest.

In the country surrounding San Diego there
is an abundance of the black mica which is used in Germany for the making of crucibles. The summit of the little mountain (Point Loma) on the point of the port of San Diego is strewn with opaque garnets.

On the whole coast of New California no other port is known but that of San Diego, which is one of the best ports discovered. There is another close by, called False Port which if it had a good entrance would be better. There are several on the coast of Old California which may be useful some day, but that coast has not been explored from the sea, and still less by land, because of the lack of water, and hence it is not known (Martinez 1961).

In the year 1827 the Frenchman, Duhaut-Cilly entered the harbor past Point Loma. He left us the following description:

The 17th, we left the bay at San Pedro to go to San Diego. The distance between these two points is some twenty-eight leagues, and the direction, southeast $90^\circ$ south, corrected.

The next morning, at three, we were in sight of a land which, from its small expanse and its form we took at once to be the Coronados, a group of small islands, lying five leagues south-southwest from the entrance to San Diego. But we wished to make sure that it was not an island Vancouver places seven leagues west-northwest from the same entrance; and having obtained $32^\circ 34'$ north latitude from the meridian altitude of the moon, we were confirmed in our first opinion; thus we were in the best position to enter the harbor at daybreak.

I had procured such good information concerning this place, that we experienced no trouble in entering without the assistance of a pilot.

San Diego Bay is certainly the finest in all California, and much preferable, for the safety of vessels, to the immense harbor at San Francisco, whose great extent leaves it too much exposed to winds and waves. This one at San Diego has not
this drawback; it is a passage, from one to two miles wide, running at first in a north-northeast direction, then turning toward the east and southeast, forming an arc five leagues in length. It is sheltered, to the west, by a long, narrow and steep hill, extending from the south-southwest, under the name of Point Lorna. Two miles within from this point, juts out, perpendicularly to it, a tongue of sand and pebbles like an artificial mole, ending in a perfectly rounded bank. A deep passage, about two hundred fathoms wide, divides this natural causeway from a sandy peninsula which, following the curve of the channel protects it on the side toward the sea for its entire length.

The depth is not everywhere the same; and as one advances farther within, the channel in the middle of the bay is narrowed by the shallows from both banks. The most comfortable anchorage is a mile within the passage, opposite a nice beach of yellow sand; the anchor falls in twelve fathoms, within hailing distance from the western shore.

From the extreme end of Loma begins a long sheet of seaweed, stretching for more than a league to the south-southwest; it is so thick on the surface of the water that, if one undertook to pass it with a light breeze, he might find himself stopped by this obstacle which, however, offers no other danger, for there is everywhere a depth of fifteen to twenty fathoms; they are long cords of the species of fucus which grow from the bottom to spread their broad, brown leaves upon the water. Some of these slender stems bear spheres of the shape and size of a ball of twenty-four, hollowed like a grenade, or rather like a bomb; and undoubtedly intended by nature to support, on the surface, the branches of algae when they become too heavy.

To avoid passing through this floating field, we brought to the north-northeast of Point Lorna, then, steering for this point of the compass, with a good wind from the west-northwest, we entered quickly, skirting, a half-mile away, first the seaweed, then the point itself. Following this direction, one avoids a bank, on which are only a few feet of water, ety where the waves do not always break. This shoal begins at the sandy point forming the right side of the entrance to the bay, and stretches for about one and a half miles toward the south.
The sounding, which had gradually lessened, gave no more than three fathoms on arriving athwart the end of Loma; but on coming a half-point to starboard, they gave five fathoms. Arrived opposite the shoal I have just spoken of, and which was then breaking at several points, we steered toward the end of the mole, which we went around, at a distance of two ship's lengths, in a depth of ten fathoms.

A rasant fort of twelve guns is build upon the point where this tongue of land joins Loma. On our approach, the Mexican flag was raised and enforces by a shot: at once we hoisted our own, paying it the same respect. Every time we saw displayed the Mexican colors, they produced upon us a feeling of joy, and for a moment made our hearts beat. Some of us who had served under the empire took them always, at first glance, for those which had guided our steps to victory: the Mexican flag differs from the tricolor only in the part which is green instead of blue; the other parts are the same and similarly arranged.

From the point of the fort there is nothing more to do than to steer for the sandy beach appearing toward the north, and to anchor opposite, in eleven to twelve fathoms (Duhaut 1929:214-250).

One of the treasures of the Henry E. Huntington Library and Art Gallery is an eight page pamphlet by Father Jose Maria Guzman describing the Territory of Alta California in 1828. Its importance lies in its character as an official report on the Mission district at the time of secularization. Guzman was the Guardian of the Apostolic College of San Fernando, in Mexico. Father Guzman wrote:

Lastly, the port of San Diego is unsurpassable on account of its safety, and once communication is established with the interior a most alluring plan for speculation will present itself, particularly in the line of sardines, cod-fish and otter, which abound on these coasts but from the catching of which at the present time only foreigners who seek this enterprise derive a benefit (Guzman 1828).
On December 12, 1847 Brevet Major W. H. Emory reached San Diego with General Kearney's soldiers. In his "Notes of a Military Reconnaissance from Fort Leavenworth in Missouri to San Diego, in California," he wrote the following:

On the hill, before reaching the rancheria, the Pacific opened for the first time to our view, the sight producing strange but agreeable emotions. One of the mountain men who had never seen the ocean before, opened his arms and exclaimed: 'Lord, there is a great prairie without a tree.'

December 12. We followed the Solidad through a deep fertile valley in the shape of a cross. Here we ascended to the left a steep hill to the table lands, which, keeping for a few miles, we descended into a waterless valley, leading into False Bay at a point distant two or three miles from San Diego. At this place we were in view of the fort overlooking the town of San Diego and the barren waste which surrounds it.

The town consists of a few adobe houses, two or three of which only have plank floors. It is situated at the foot of a high hill on a sand flat, two miles wide, reaching from the head of San Diego Bay to False Bay. A high promontory of nearly the same width, runs into the sea four or five miles and is connected by the flat with the main land. The road to the hide houses leads eastward to this promontory, and abreast of them the frigate Congress and the sloop Portsmouth are at anchor. The hide houses are a collection of store houses where the hides of cattle are packed before being shipped; this article forming the only trade of the little town.

The rain fell in torrents as we entered the town, and it was my singular fate here, as in Sante Fe, to be quartered in the calaboose, a miserable hut, of one room, some 40 x 30 feet square. A hugh old gun was mounted in this hovel, looking through an embrasure to the westward. In this building I was told that I
Figure 24.

a. Early photograph (late 1800's) showing sailing vessel leaving San Diego Harbor.

b. Early sketch of San Diego Bay late 1900's.

c. 1900's photograph showing details of La Playa.
could stow my party and my instruments safely.

We preferred the open air and the muddy plaza, saturated with all sorts of filth, to this wretched hole; but having no alternative, our chronometers and instruments were stowed in it and guarded by the indefatigable Mr. Bestor. I went off to accept from the hospitality of a friend the first bed I had seen in many months. About midnight there was one of those false alarms which ever and anon disturbed this goodly town. Four burley fellows rushed to man this gun, but they found themselves unexpectedly opposed by Mr. Bestor and two or three of my party. But for this timely resistance, my whole little stock of chronometers, barometer, &c., would have been totally destroyed. In the morning, through the kind exertions of my friend, Captain Gillespi, I was enabled to get a house with two rooms, the only unoccupied quarters in the town.

Vessels may ride at anchor in the harbor, perfectly land-locked, but in very heavy southerly gales some inconvenience may be felt by those not provided with good ground tackle, from the immense volumes of kelp driven into the harbor.

The kelp (fucus gigantens) occupies a space in front of the harbor some miles in length and half a mile wide. At a distance, I took the kelp for a low island, but was informed of my error by Captain Schenck, who told me vessels were forced through it in a stiff breeze (Emory 1947).

The Pacific Coast Pilot

During the years 1854-1858, the United States Coast Survey Brig the R. H. Fauntleroy performed the first survey of the Pacific Coast of the United States. The Commander was George Davidson. The result of the survey was the first edition of the Directory of the Pacific Coast of the United States. A second edition was published in 1862 and
a third edition in 1869. In 1880, Davidson was asked to do a fourth edition. He produced what is now considered the classic edition of the Pacific Coast Pilot. The following descriptions were taken from the fourth edition dated 1889:

San Diego Bay

Point Loma

Whether approaching it from the southward or westward, Point Loma is first raised as a flat-topped island, and even when well up with it this isolated headland stands out sharply defined, because the country behind it is comparatively low. It is the southern part of the western boundary of San Diego Bay and the termination of a remarkable narrow spur of coarse, crumbling sandstone, which rises south of Puerto Falso, or False Bay, and west of the Bay of San Diego, to the height of three hundred feet; after stretching south for about five and a half miles, gradually increasing in height to four hundred and fifty-seven feet, it terminates abruptly on its sea face abreast the bar at the entrance to the bay. It is covered with coarse grass, cacti, wild sage, and low bushes.

The Bay of San Diego lies to the eastward of the ridge of Point Loma, with the entrance indistinguishable until close up with it.

Next to San Francisco, no harbor on the Pacific Coast of the United States approaches in excellence that of San Diego. The marks for distinguishing it are quite notable; there are no outlying dangers; the entrance is easily approached; heavy southeast storms are unusual; and twenty feet of water can be carried over the bar, the channel across which is well buoyed. There is less rain, fog, thick haze, and more clear weather in this section of the coast than at all points to the northward, and the approaches are more readily distinguished on that account (Davidson 1955:46).

Ballast Point
On the eastern side of Point Loma ridge, at one and one-quarter miles from the southern extremity, there is a low, narrow, boulder point, stretching one-third of a mile to the north-northeastward, and forming a natural breakwater for the protection of the bay. This is ballast Point, forming the west side of the entrance to the bay. In December, 1885, there were two large white one story houses at the outer end of the point at twenty or thirty feet above the level of the bay. It is proposed to place a light-house on this point.

Point Loma Light-House

This primary sea-coast light is less than half a mile from the southern end of the point and situated upon its highest part, four hundred and twenty-four feet above the sea. The building consists of a stone dwelling of one and a half stories, with a low round tower of plastered brick, rising six feet above the roof to the base of the lantern. The focal plane of the light is four hundred and sixty-two feet above the sea. The light is of the third order of Fresnel, flashing red and white, alternately, at intervals of 1 minute, exhibited (since November 15, 1855) from sunset to sunrise, and illuminates the entire horizon. When a vessel is in the channel outside of Ballast Point she does not see the full brightness of the light on account of its height and nearness. In clear weather it should be visible from a height of--

10 feet above the sea, at a distance of 28.3 miles
20 feet above the sea, at a distance of 29.8 miles
30 feet above the sea, at a distance of 30.9 miles
60 feet above the sea, at a distance of 33.5 miles

The geographical position of the light-house, as determined by the U.S. Coast and Geodetic Survey, is:

<table>
<thead>
<tr>
<th>Latitude</th>
<th>32° 40' 13&quot;.55 north</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longitude</td>
<td>117° 14' 37&quot;.84 west</td>
</tr>
<tr>
<td>Or, in time</td>
<td>7h 48m 58s.5</td>
</tr>
</tbody>
</table>
The magnetic variation was $13^\circ 36'$ east in 1885, with a yearly increase of 1'.5. The variation of the compass will reach its easterly maximum about 1895.

From the light we have the following bearings and distances to prominent objects:

Los Coronados, Southern Islet S. $13^\circ$ E. Distance, 15 miles
Point La Suen N.$46\frac{1}{2}^\circ$ W. Distance, 17 miles
Point Fermin Light-house N. $54^\circ$ W. Distance, 81 miles

From the light-house the islands of Santa Catalina, seventy miles distant, and San Clemente, fifty-eight miles distant, are distinctly visible in clear weather.

The English Admiralty Chart No. 2461, with corrections to March, 1865, has the Point Loma Light erroneously located on False Point, about seven miles northward to its true position. In the "Light-Houses of the World," by Findlay, 1868, it is placed 'near Point Loma,' etc.

The light-house on the highest part of the Loma is frequently hidden by the high fogs when the lower parts are visible; therefore, to increase the usefulness of the light it has been determined by the Government to place it on the southern extremity of the point, of which due notice will be issued.

We have seen the light when the vessel was four miles south of Los Coronados.

The Pueblo Lands of San Diego

The Mission of San Diego was established May 14, 1769, under authority of the Church. By the Mexican law of 1833, it reverted from the Church to the National Government. The Pueblo of San Diego was organized in 1835 under the Mexican law of 1791, which entitled all Pueblos to "four common leagues of land, measured from the centre of the
Presidio square, namely; two leagues in every direction."

In 1845, a survey and map of the Pueblo lands were made by Henry D. Fitch, which were regularly approved by Governor Pio Pico, and the lands assigned to the Pueblo. California was acquired by the United States in 1846, and the Pueblo was protected under the new government by the treaty of Guadalupe Hidalgo, which provided the "Mexicans now established in territories previously belonging to Mexico and which remain for the future within the limits of the United States, shall retain the property which they possess." In 1851, a Commission, appointed to settle land title in California, adjudged in the case of the claim of the City of San Diego to the Pueblo lands, "that the claim of said petitioners is valid; and it is therefore decreed that the same be confirmed." In 1871, the Commissioner of the General Land Office defined the boundaries of the dry lands of the Pueblo according to the Fitch map made in 1845, and his opinion in the matter was subsequently confirmed by the Secretary of the Interior (Banfini 1856; Black 1913; Bryant 1848; Heilbron 1936).

The Alcaldes and Ayuntamientos had authority under Spanish and Mexican laws to grant lands and, subsequent to the change of flags, the control of the disposal of these lands vested in the Legislature of the State. By acts of the Legislature (1850 and 1852) power was given the municipal authorities of the City to dispose of the Pueblo lands;
and the Legislature, by acts of 1870 and 1872, confirmed all deeds of conveyance made in good faith on behalf of the City for a valuable consideration.

In April, 1874, the Patent of the United States for the lands was issued to the City Trustees (Hopkins 1929; California Archives 1832).

The U. S. Army on Point Loma

As early as 1792, the Spanish authorities were aware of the defenseless condition of their California ports and orders were issued to local commanders that every precaution be exercised to prevent foreigners becoming cognizant of the fact. The matter was brought home forcibly by Captain George Vancouver of the British Navy, who, while on his voyages of discovery in the Pacific Ocean, visited San Diego in 1793. He reported,

The Presidio of San Diego seemed to be the least of the Spanish establishments. It is irregularly built, on very uneven ground, which makes it liable to some inconveniences, without the obvious appearance of any object for selecting such a spot. With little difficulty it might be rendered a place of considerable strength, by establishing a small force at the entrance of the port; where at this time there are neither works, guns, houses or other habitations nearer than the Presidio, five miles from the port and where they have only three small pieces of brass cannon (Bancroft 1886:649).

Thus, aroused by the Britisher, and somewhat perturbed
by the encroachments of the Russians from the north, San Diego Spaniards projected a fort at Punta de los Guijarros (Point of the Cobblestones). Workmen and materials were sent from Monterey and Santa Barbara while brick and tile were hauled from the Presidio to the beach and taken across to the point in a flat boat. In 1797, acting upon the advice of the engineer, Captain Alberto de Cordoba, the first proposition of a circular fort on the end of the point was changed to his plan for an adobe fort with two fings mounting ten guns, sited near the shore end of the peninsula was adopted. This fort was located on the ground once occupied by one of the batteries of Fort Rosecrans-Battery Fetterman, two 3-inch seacoast guns. This battery has been razed and a storehouse erected on the site (Files, Fort Rosecrans).

Fort Guijarros' baptism of fire occurred March 22, 1803, when it engaged in battle with the Yankee brig *Lelia Byrd*, which vessel, being suspected of contraband dealings in furs with the inhabitants of San Diego, was seized by the port authorities and put under armed guard. Overpowering the guard the vessel's crew raised anchor and stood out to sea, carrying the guard aboard with her. The fort opened fire, scoring several hits. The wind being light, it was considerable time before the brig reached the channel. As it passed Ballast Point the Americans fired a broadside from their six 3-pounder guns, driving the defenders from their batteries, while the vessel slipped out to sea after
putting ashore the terror-stricken guards who had been forced to line the rail during the engagement (Cleveland 1929:194-199).

As time passed the fort fell into disuse and disrepair. By 1839, but two serviceable cannon were left. In January, 1840 the remnants of the fort and casamata were sold to Juan Machado for forty dollars. One of the guns is now mounted on a pedestal in Old Town Plaza; another is at the site of Fort Stockton, on Presidio Hill; the rest have disappeared. One rumor is that they were spiked by an American sea captain in 1842 and thrown into the Bay; another that they were moved to Los Angeles or Santa Barbara. Later many of the tiles from the old fort were used in 1854 in constructing the Old Point Loma Light-house (MacMullen 1939:10-11).

The best and most concise history of the early U.S. Army occupation of Point Loma was compiled by Colonel George Ruhlen, U.S.A. (ret.). Colonel Ruhlen wrote that the southern portion of Point Loma peninsula was set aside as a reservation for military purposes by Executive Order of the President of the United States, February 26, 1852. The northern boundary was established by drawing a line across the peninsula from the harbor to the ocean, a distance of one and one-half miles above La Punta de los Guijarros, or Ballast Point as we now call it. Actual title to the land, the Army has contended, passed to the United States from
Mexico under the Treaty of Guadalupe Hidalgo, executed February 2, 1848, which concluded the war with Mexico and brought California under the American flag (Dana 1964).

Two small tracts were later set aside for lighthouse purposes: one at Ballast Point and the other at the south end of the reservation; a third tract was reserved for the quarantine station near La Playa. On September 24, 1901, the northern portion of the reservation was transferred to the Navy Department for a coaling station.

The reservation was first occupied for military purposes by the United States February 28, 1870, it having previously been used for that purpose by both the Spaniards and Mexicans (Hayes 1929; McGraw 1922).

By general acts of the California legislature, March 2 and 9, 1897, the state of California ceded to the United States exclusive jurisdiction over all lands within the state held, occupied, or reserved by the Government of the United States for military purposes or defense. Including the right and title of the state in and to the parcels of land extending from high-water mark out 300 yards beyond low-water mark, lying adjacent and contiguous to such lands of the United States as lie upon tidal waters and are held, occupied, or reserved for military purposes or defense. The state reserved the right to serve and execute on such reservations all civil process, not incompatible with this
Figure 25.


b. Troops of 19th Coast Artillery ready for inspection 1908.
cessation, and such criminal process as may lawfully issue against persons charged with crimes committed without said lands (Paraphrased: Dr. John Winter, Professor of Law, USD, 1976).

For many years the entrance to San Diego Bay was unprotected. In 1872, a project was undertaken for the construction at the hilt of Ballast Point of earthen seacoast batteries for fifteen guns of the largest caliber to protect the important harbor of San Diego. Construction commenced in May 1873, and continued through the following year. Considerable progress had been made when work was stopped, funds having been exhausted. The embankment of the faces of the batteries was raised to the level of the parade and one magazine was partially built. For twenty years no additional work was done and the batteries were left in this unfinished state, in an utterly worthless condition as no appropriations for seacoast defense were made by Congress for over fifteen years from 1875 to 1890 (Annual Reports, 1872-1888).

In 1885, President Cleveland by direction of an act of Congress appointed a board of distinguished army and navy officers and civilians who were to "examine and report at what ports fortifications or other defenses are most urgently required." San Diego was one of the ports listed (Annual Reports, 1896:19-20).

Construction of the emplacements for two 10-inch
Figure 26.

a. Detailed view of 12 inch mortar at Whistler Battery.

b. Detail of 16 inch guns at Battery Ashburn.
seacoast guns on disappearing carriages was commenced at Ballast Point in January 1897, and continued for several years. A third emplacement was completed February 7, 1898; the guns were mounted by artillery troops of the garrison between April 9 and May 21, the same year (Annual Reports, 1897:7-8, 20, 774-778).

A submarine mining casemate also was completed about this time. The Engineer Corps of the Army, at that time, was charged with the operation of submarine mines. The engineer officer in charge of construction work organized a volunteer company of citizens of San Diego to plant and operate the mine field. This organization, numbering about eighty men, included carpenters, electricians, civil engineers, surveyors, telegraphers, boiler makers, steam engineers, boatmen, mechanics, and four or five soldiers from the Engineer Battalion of the Army. On May 23 and 24 they planted fifteen electrically controlled submarine mines in the channel, an open passage marked by bouys being left. The mine field was protected by two smooth bore muzzle loading guns of Civil War vintage and patrolled by the Revenue Cutter Corwin. The guns used for many years to ornament the headquarters building entrance at the fort were later placed in storage on the base. The mines remained down until September 1898, when they were raised, cleaned, and stored (Annual Reports, 1898:30, 775-778).

On February 2, 1898, a detachment of twenty soldiers
from Battery D, 3d Artillery, under command of 2d Lt. George T. Patterson, from San Diego Barracks, occupied the new post. Captain Charles Humphreys with the rest of the battery arrived February 15 to complete the garrison. In July, 1900, Battery D was sent to China where it participated in the Boxer uprising, thence to the Philippine Islands, and after having served in France during World War I retuned to Fort Rosecrans on July 1, 1924. In 1858, Battery D was stationed at San Diego Mission, then a military post, from which place it was sent to fight Indians in Washington Territory. It was the last military unit to occupy the old mission (Nelson 1956; Pourade 1964:155-166).

In accordance with General Order No. 134, AGO, War Department, 1899, the fort was named for General William S. Rosecrans, who, a few months before, had died in Los Angeles. An 1842 graduate of the United States Military Academy, Rosecrans resigned from the service in 1854 and was operating one of the first oil refineries in the world in Cincinnati when the Civil War broke out. As McClellan’s field commander in West Virginia, he shattered Confederate forces in that state and handed Robert E. Lee his first defeat. Later transferred to the West, he smashed the Rebels in two furious battles, Iuka and Corinth, in less than thirty days. Given command of the Army of the Cumberland, he fought Braxton Bragg at Murfreesboro, Tennessee,
Figure 27.

a. Firing 10 inch mortar.

b. Loading preparation for 16 inch gun.
in a classic of maneuver, but was beaten by the Confederates following the bloody Battle of Chickamauga.

Exiled to Missouri, he was responsible for the repulse of Sterling Price's invasion of that state in 1864. Following the war, he was appointed Minister to Mexico. He later moved to Redondo, near Los Angeles, and engaged in real estate and mining speculations. He served two terms in Congress and later served as Register of the Treasury. He died March 11, 1898. He visited San Diego in 1871 in the interests of the Texas and Pacific Railroad and is purported to have offered Alonzo Horton $250,000 for New San Diego (Heitman 1903:846; Smythe 1907:337).

In 1901, the 115th Company of Coast Artillery was organized at San Diego Barracks and then transferred to Fort Rosecrans where it continued to serve until July 1, 1924, when transferred to Puget Sound, Washington.

On July 25, 1905, the 28th Company of Coast Artillery (formerly Battery E, 3d Artillery) arrived at the post where it remained until transferred on July 1, 1924, to the Columbia River, Oregon.

Service at Fort Rosecrans was considered highly desirable and applications for transfer or reenlistment of discharged soldiers into companies stationed there were being constantly received. As a result the garrison was maintained at full strength with capable and experienced
Figure 28.

a. 10 inch gun firing from open position on southwest side of Point Loma.

b. 10 inch gun on disappearing carriage at Battery Wilkeson.
soldiers. It was known as an "old soldiers' home," as many of those who served there, when discharged or retired from the service, became substantial citizens of San Diego and the surrounding community (Rolle 1969: 205-245).

Work on the fortifications continued in 1899 with the construction of the fourth emplacement of the 10-inch gun battery. Originally designated Battery Wilkinson, it was subsequently divided into two batteries of two guns each, the left pair being named Wilkinson and the right pair Calef. Battery Fetterman (two 3-inch guns) and Battery McGrath (two 5-inch guns) were built at the same time.

The buildings and other installations were erected from 1901 to 1904, all of frame construction except the post exchange, which was built of brick (Quartermaster General, 1905:423).

From 1911 until the outbreak of World War I the garrison of the post was active in patrolling the Mexican border, housing and guarding interned military prisoners captured at the border while fleeing from Mexico, and assisting in the training of the California National Guard.

Two 12-inch mortar batteries (Whistler and White) were constructed in 1915 and 1961; one in a ravine just west of the post and the other in a ravine on the bay side of the peninsula ridge a short distance south of the gate
on the upper road.

During World War I, besides maintaining a complete garrison for the defenses, several units were organized, trained and dispatched overseas; namely: 1st Battalion of the 65th Coast Artillery, 54th Ammunition Train, 1st and 2d Anti-aircraft Batteries. Cantonment buildings were erected to house the additional troops. After the end of the war, in 1922, it was determined that the Coast Artillery did not have sufficient men to fully garrison all of its stations in the United States and at the same time maintain the overseas garrisons at adequate strength. The latter task required nearly one-half of the manpower of that arm. Consequently, some of the home forts were reduced to a caretaker status, among which was Fort Rosecrans.

Fort Pio Pico, a sub-post of Fort Rosecrans, located on North Island opposite Ballast Point, built in 1906 was abandoned in 1919 and the armament there--two 3-inch guns--was installed at Battery McGrath, Fort Rosecrans, whose 5-inch guns had been sent to an overseas outpost.

By 1941, however, war clouds threatened and immediate steps were taken to augment the defenses of San Diego. The cantonment buildings erected in 1917 had been torn down. New structures replaced them, some near the post and others on the upper part of the reservation. The latter have since been turned over to the Navy for use
with its electronic laboratory.

Battery Strong (two 8-inch guns on barbette carriages) was sited on a knoll on the ocean side of Point Loma about three quarters of a mile south of the upper gate. The emplacements were constructed in 1937 and the guns mounted in April 1941.

Battery Humphries, 6-inch gun, was situated on the bay side of the point near the southern tip.

Battery Ashburn (two 16-inch guns in casemates) was erected on the seaward side of the peninsula north of the old lighthouse and was completed August 26, 1943.

Anti-aircraft batteries, searchlights and fire control installations were placed along the coast line from La Jolla to the Mexican border. In 1942 the 262d and 283d Coast Artillery Battalions were organized and trained at the post before departure overseas. Other units also used the facilities of the fort for special training.

World War II saw the passing of the battleship and the end of its counterpart, seacoast artillery. The airplanes' bombs and rockets, and the guided missiles have replaced the heavy and large caliber shore guns. Fort Rosecrans again has been placed on a caretaker status and its armament scrapped. Its activity continues, however, as headquarters for Army Reserve components in the region of San Diego.
There are a number of California historic landmarks within the bounds of the reservation, some accessible to the public, others are on restricted parts of the reservation, and a few have been obliterated. During 1910 a road surfaced with disintegrated granite was constructed along the crest of the peninsula from the reservation line to the old lighthouse. This road was sprinkled with salt water which tended to keep the surface in good condition for the largely horse-drawn traffic of those days—automobiles were few. Seawater obtained from the bay was raised by a pump set up near the bay shore of the reservation to a tank on top of the ridge and there distributed to water carts.

**Fort Rosecrans National Cemetery**

Fort Rosecrans National Cemetery is one of three national cemeteries located in California, the other two being the San Francisco National Cemetery and Golden Gate National Cemetery, both in the San Francisco area.

The cemetery grounds are part of a larger area set aside for military purposes by Executive Order dated 26 February 1852, shortly after the admission of California as a state of the United States. The military reservation was named Fort Rosecrans Military Reservation in 1899 honoring the Civil War leader, Major General William S. Rosecrans, United States Volunteers. Following the Civil War, General Rosecrans served as United States Minister to Mexico (1868-1889) with subsequent service as a United
States Congressman from California. He died on 1 March 1898. General Rosecrans' remains are interred in Arlington National Cemetery.

Fort Rosecrans National Cemetery, the second cemetery area in California to achieve national cemetery status, was so designated by War Department General Orders No. 7, 5 October 1934. The initial area of the cemetery comprised approximately eight acres, and included the long established post cemetery of the military reservation. Subsequent accretions of land from within the area of the military reservation have extended the boundaries of the cemetery to 71.34 acres.

Many of the interments made in the post cemetery of the military reservation date back to the early years of the territory of California. A noteworthy monument in this area of the Fort Rosecrans National Cemetery commemorates the lives and services of men of the United States Army who participated in one phase of the Mexican War (1846-1848), which had special significance in California history. This monument, a large granite boulder brought from the battlefield of San Pasqual, marks the final resting place of the remains of eighteen individuals who were members of Brigadier General Stephen Watts Kearny's expedition to California, and who died at the battle of San Pasqual, 6-10, December 1846, against Mexican forces.

The remains of these casualties of the battle of San
Pasqual were initially interred on the battlefield. In 1874, they were removed to the San Diego military reservation, and finally reinterred in the post cemetery of the reservation when it was established in 1882. The remains could not be individually identified, and the gravesite was marked only as the burial place of eighteen unknowns. In 1922, the San Diego Parlors of Native Sons and Daughters of the Golden West had a large boulder from the San Pasqual battlefield brought to the cemetery and placed at the gravesite. A bronze plaque listing the names of seventeen soldiers and one civilian was affixed to the boulder. In 1949, a new plate bearing the names of the decedents was placed over the original name plate which had become worn through exposure to the elements.

Another outstanding monument in the Fort Rosecrans National Cemetery is the stone obelisk to the memory of the deceased of the U.S. Bennington, which suffered a boiler explosion in San Diego harbor on 21 July 1905. The Bennington was at anchor in the harbor preparing for departure to search for the USS Wyoming, which was reported broken down at sea. About 10:30 a.m. on 21 July an explosion in the ship's boiler killed one officer and sixty-five crew members, with severe injuries to many others of the ship's complement.

Many of the dead were brought to the then post cemetery at the Fort Rosecrans Military Reservation and
interred in an area which has come to be known as the Bennington plot. Each of the thirty-six graves in this area is marked by a government headstone. The Bennington Monument is erected within this area. It is a granite obelisk seventy-five feet high. The front face bears the inscription, "To the Bennington's Dead, July 21, 1905." An inscription on the rear of the monument indicates that it was "Erected by the Officers and Men of the Pacific Squadron to the Memory of Those Who Lost Their Lives in the Performance of Duty."

La Playa As A Fishing Village

The main street had (in 1906) some three houses along its length, but the roadway was grown with grass and weeds, betokening the lack of traffic which was once anticipated by the founders of the town. The inhabitants were mainly fishermen, Portuguese leading in nationality. Along the beach could be seen the drying racks upon which the albacore and barracuda, after being dressed and salted, were dried in the sun, preparatory to shipment to market. It was very similar to the fishing settlements along the New Foundland and Nova Scotia coasts, where can be seen to this day, the fishing boats and other equipment the fishermen have in order to carry on their occupation. The people at La Playa were described as:

... a kindly lot, but not over versed in the
affairs of the day. Their work may be small, but they do not manifest any great dissatisfaction with life. Even the children, though deprived of many of the things which their fellows of the city may enjoy, seem to find much to amuse them. They certainly must learn the methods of preparing fish, for they will be found in close proximity to the brine casks as their elders put the fish through the salting process.

That the artist will yet come to La Playa and there find a field for work with his brush is a prophecy which cannot be so very far fetched, for the place certainly affords subjects worthy of consideration. To visit the place is also restful for the man who may be tired with the duties of office, for he will be interested in the comparatively primitive life which is yet to be found there. The day is coming, however, and is not so very far distant, when La Playa and all its surroundings will be occupied by homes of business and professional men from the city, for it has a beautiful outlook upon the bay, across which is seen San Diego, with its protecting mountains in the background (San Diego Union 1906:8).

The Cultural and Physical Influence of the Theosophical Community

The life of Madam Katherine Tingley and the Point Loma Theosophical Community has been dealt with extensively and writers have explored its numerous cultural influences. The physical impact on Point Loma is largely ignored. The latter is, however, an important part of the legacy of the society left to San Diego.

Her financial backers referred to Point Loma as "this God-forsaken place" (Greenwalt 1955:34). Magically she transformed it into a botanical showcase. Even though but a fraction of the gardens remain, they still are enormously
The Theosophical Society was founded in 1875 by Helena Petrona Blavatsky, a scholarly Russian mystic, and Henry Steel Olcott, an American attorney and author. Its primary objective was to study the wisdom of the ages in order to find and use certain eternal truths (Harris 1974:2).

In 1891, Mme. Blavatsky died and a struggle for the leadership split the society. As a result of this schism, William Quan Judge became president of the Theosophical Society in America while Henry Olcott and Annie Besant directed the other division.

Judge died in April of 1895, and it was revealed by his close friends that he had chosen Mme. Tingley as the new "Outer Head" (Anon. 1951:264-289).

Katherine Augusta Tingley was born in 1874 in Newbury, Massachusetts. Her early life included two unsuccessful marriages and a marked interest in philanthropy and spiritualism. After becoming leader, she went on a world-wide theosophical "crusade," which was backed by her supporters (Harris 1974:3).

In 1896, Madam Tingley announced her intention to carry out, in the near future, her childhood aspiration to found a city in the west where the higher life should be lived, where small children should be taught and could begin to start the seeds for the upbuilding in the west,
but she herself had never been west. The place of consummation had been identified by General Fremont. She had met the aging General in New York City a few weeks before his death. In her own words:

I told him this story, this fairy story; that in the golden land, far away, the blue Pacific, I thought as a child that I could fashion a city and bring the people of all countries together and have the youth taught how to live, and how to become true and strong and noble, and forceful royal warriors for humanity. 'But,' I said, 'all that was passed; it is a closed book, and I question if it will ever be realized.'

He said, 'There are some parts of your story that attract me very much. It is your description of this place where you are going to build your city. Have you ever been in California?'

'No,' I answered.

'Well,' he said, 'The city you have described is a place that I know exists.' And he then told of Point Loma. He was the first to name the place to me (Anon. 1914:426-427).

She interpreted Theosophy in a practical way. She wrote, "Think of Theosophy not so much as a body of philosophic or other teachings, but as the highest law of conduct which is the enacted expression of divine love or compassion." (Tingley 1922:3).

In 1897, she arrived at Point Loma to open a "School for the Revival of the Lost Mysteries of Antiquity." A Raja Yoga School was established so that young children could not only be given a quality education, but, also, be
guided into the theosophical way of life. California educators were quite impressed by the students' accomplishments (Greenwalt 1955:99-126). The community expanded to include living quarters for nearly five hundred residents, a refectory, bakery, stables, carpenter ship, smithy, machine ship, and even a publishing house and a Greek Theater overlooking the Pacific.

Lomaland, as the residents referred to it, became renowned throughout southern California for its superb dramatic and orchestral presentations. The Isis League of Music and Drama performed mostly Greek and Shakespearean plays because Mme. Tingley felt that the high ideals of these plays would stimulate the higher natures of the viewers. The community numbered in poets such as the mystic Welshman, Kenneth Morris, and scholarly writers Talbot Mundy, Henry T. Edge, and Charles J. Rayan. In the art field it included such luminaries as the English artist and designer, Reginald W. Machell; Edity White, who became renowned for her rose paintings, and the most famous -- Maurice Braun.

The Point Loma community, therefore, was founded upon the idea that in such a place men and women could more easily work out these high ideals, and for the training of children to the life as Theosophists believed it should be lived.

In 1900, Point Loma began to show the influence of
Katherine Tingley. She designed all the buildings herself and there was no other architecture like it in the United States. Tingley took over the hotel-sanitarium and topped its inner patio with a huge dome of aquamarine glass, which now enclosed a rotund three hundred feet in circumference and eighty-five feet in height. Three lesser, other-colored, domes rose from the towered corners of the building. The wooden exterior of the structure was stuccoed in such a way as to resemble stone facing. Madame Tingley hoped that one day the stucco could be replaced with stone so as to represent strength and permanence. However, this was never achieved due to lack of funds. This building was known as the Homestead.

Just west of the Homestead was built the most beautiful structure on the Point - the Temple. Built perfectly round, "it rose on two successive tiers or arches of gleaming, white, imitation stone, to be strikingly crowned by a spacious dome of amethyst-colored glass" (Greenwalt 1955:28). At night the domes were illuminated and they were visible for miles at sea.

Approximately a hundred yards south of the Homestead was a white, two-story building which provided offices for the Brotherhood headquarters. This building eventually became the home for Katherine Tingley. Nearby were many small cottages that housed members and children of the Society. After a few years of maturing, the grounds at Point Loma
were lush green with many trees and bushes that were always manicured beautifully.

In retrospect, Mme. Tingley commented:

Point Loma, fourteen years ago, was a wilderness of sagebrush and cactus where rattlesnakes and wild rabbits had their haunts . . . . It was eight miles from the town of San Diego, hardly accessible by road and only to be reached with difficulty by water. In point of scenery, location, and climate, it was the ideal spot of the world, and most admirably adapted for the educacional institution for which it was purchased.

In an interview with the San Diego Union, she compared Point Loma to some of the most beautiful parts of Italy and France and reported that she would immediately improve the grounds.

The water system out to the point, in those days, consisted of wooden pipes which were constantly splitting. Because of this, a well was drilled and a windmill was used to pump the water until the plumbing improved. A layer of topsoil there is from 1 1/2 to 3 feet thick, the rainfall averages ten inches annually, and when the first members of the community arrived it was a desolate place.

In 1899, Mme. Tingley needed trees for the setting of the "Eumenides," and she had eucalyptus trees brought in and propped up. According to tradition, she thrust a branch of eucalyptus into the ground and it took root and grew. The story may be fanciful, but, nonetheless, serious plantings got underway.
Soon the avenue from the Homestead to the Greek Theater was lined with pepper trees, eucalyptus groves were cultivated around the grounds, while palms, acacias, torrey and star pines abounded in the Central Grounds. The walks were bordered with pink ice-plant, and blossoming vines enveloped the cottages. The temple was almost totally covered with Boston Ivy, which grew from a cutting from Mme. Blavatsky's old English headquarters in London.

The ideal of the Point Loma students was to awaken to the individual responsibility of man to man. The meaning of "education" had a much wider significance than is normally given to the term; the basis of the education was the assumption that all men are divine. According to Theosophists, true education is the power to live in harmony with the environment in which they live and the power to draw out from the recesses of nature all the potentialities of character. The education at Point Loma was not confined to the learning of information of certain stated times of the day. Instead, the education consisted of a complete, all-life involvement of learning.

When Katherine Tingley bought the land at Point Loma she had envisioned lush trees and plants. She thought there should be gardens that would fill the Point Loma tables with freshly picked fruits and vegetables everyday. There were some physical problems with this. She drilled for a water supply and brought in all the fruit trees she could find.
Vegetable gardens flourished.

In 1905, M. G. Gowsell and Fred G. Plummer, both former members of the United States Geological Survey, moved to Point Loma. Plummer was subsequently appointed Chief Geographer in the United States Forestry Service and because of his official responsibilities he could only reside part-time at Lomaland. His family, however, had a permanent residence there.

Under the direction of these experts, a lath-house was constructed in which thousands of pine tree seedlings were cultivated and later planted by boys in the Raja Yoga School. By 1910, some twenty-two thousand trees were thriving in an unbroken forest of forty acres, and in the 1930's the number rose to a prodigious fifty thousand.

Madame Tingley often declared that a single Point Loma industry was never her primary aim; nor did she want to make the Hill completely self-sufficient. Contrary to her statement, however, Point Loma was a community, a settlement and, even in the early years, a colony.

The students raised exquisite chrysanthemums, asters, marguerites, narcissus, and pansies. This floral bounty was used to decorate Katherine Tingley's official residence, and enliven the stage of the Isis Theater at the regular Sunday evening meetings. Mme. Tingley reportedly said that she wanted the children to grow up naturally -- like the flowers they cultivated.
About the time of the San Diego-Panama California Exposition in 1915, the International Garden, composed of plants grown from seeds donated by global members, was shaping up along the palm-lined drive leading up from the Roman Gate, and by the 1920's the varieties exceeded a thousand.

Vegetable gardening had a slow start because of quail, rabbits and gophers, but once the plants took root the problems ceased-- in fact, the birds now controlled the insects. The director of kitchen gardens, M. G. Gowsell, reported in 1923 that the vegetable crop amounted to nearly sixty-two tons.

In the spring of 1901, citrus, olive, and guava trees were planted inside the fence paralleling Catalina Avenue, and some apple, peach, pear, and plum trees were set out to please the former East Coast denizens of the community; a large tract of mulberry trees was added to support a short-lived silkworm industry. John Walker, a New York farmer, was appointed to tend them but, despite his efforts, in ten years half the trees were dead or useless. This, of course, did not daunt optimistic Katherine Tingley who turned over the project to Orange I. Clark, a California horticulturist who brought hearty citrus stock from his groves in Orange County. He attempted creating an orchard on the Pacific side of the slope, but the constant breeze proved too strong to accommodate heavy bearing. In 1915,
he chose a more sheltered area and his grove flourished.

Experiments were conducted on avocado pollination and, in 1923, the results were recorded in the California Avocado Association Annual Reports and other similar publications. Irrigation, fertilizers, and the introduction of new varieties of avocados were the subjects of other experiments.

The Point Loma Community was actually one of the pioneers of avocado growing in California, and Lomaland's experiments with new varieties were of great significance. From the period of 1915 to 1925, the number of trees increased from four to two hundred and fifty. Thirty varieties were represented.

Clark and his half-brother, Willard Smith, made a valuable contribution to the state citrus industry. Through their efforts, it was discovered that Santa Ana conditions caused dehydration in plants (it was formerly supposed that it was an electric "windburn"), and that proper irrigation and well-developed root systems could prevent damage to a grove.

Deciduous fruits were formerly considered to be impossible to grow because of the lack of the necessary extremes in climate, but Clark overcame this. He searched for deciduous trees that had first been grown in southern China, and Japanese plumbs. They did so well that work continued with lesser known species, such as the Fuyu
persimmon and the feijoa, which possesses a pineapple-like flavor. In the late 20's, a farm authority said of Point Loma, "In no other place in California have closer records been kept of production and behavior of many leading varieties."

By 1922, the tables had fresh fruit every day, and by 1927, the staggering total of 123,158 lbs. of fruit was reached, and the California Cultivator, "the leading farm weekly of the Pacific Coast" featured the Theosophical Community orchards in several articles.

What was Katherine Tingley's feeling about the horticultural activities? "When the human touch is given there is a response;" she wrote, "The flower that is nurtured by man's hand becomes a more beautiful flower, because there is a spiritual unity in the efforts of man and nature working together."

On May 31, 1929, Katherine Tingley was in an automobile accident which resulted in a double fracture of her right leg. The injury was not of itself a serious threat to life, but the theosophical leader had been in ill-health for some years. Additionally, she was eighty-one years old and had an advanced case of hardening of the arteries. The combination of physical ills proved too much and Katherine Tingley died on July 11, 1929. She did not appoint a successor and, consequently, after much deliberation Gottforied von Purucker was appointed the new leader of the Society.
Three months after the death of Mme. Tingley, in 1929, the Stock Market crashed. Because of the debt of the community approached $1,000,000 it was necessary to slash the annual funds for water from $5,100 to $960. Because the value of the water exceeded that of the fruit produced, the fabulous gardens and orchards were allowed to wither. In 1941, only about one hundred and thirty people remained, and the gardens were only a shadow of what they had once been. Finally, in 1942 Purucker sold the land and moved to Covina. Thus, after forty-five years, the theosophical experiment at Point Loma came to an end.
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The Cave on Point Loma

We also examined the other great curiosity of the Playa, a natural one - being a cleft in the adjacent hills some hundred feet in depth, with a smooth, hard floor of white sand and its walls of indurated clay, perforated with cavities wherein dwell countless numbers of great, white owls . . . Through this cleft we marched into the bowels of the land without impediment for nearly half a mile.

Thus wrote Captain George H. Derby, U.S.A., far better known by his nom de plume, "John Phoenix, Gentleman." He was writing about a "cave" he had explored on Point Loma near La Playa.

At the turn of the century an attempt to find the cave was made by a young man from San Diego. The following is his description of the adventure:

This cave used to be occupied by a hermit, but when the soldiers were located at Fort Rosecrans they drove the old man away, as the cave was on the government reservation. It is quite a way up a canyon, but can be seen from the road leading to the fort.

The hermit seldom left the shelter of his earth-bound home. Sometimes he would come down the canyon and go out with the fishermen, and in this way would secure fish and other supplies which he would take back to his canyon retreat, and then he would not be seen again for a week or two.

Near the cave was a good spring, and there was always enough small underbrush for his needs in cooking. On several occasions the boys of the neighborhood raided his cave during his absence, and did not find things on his return in just the shape he left them when he went away.
As the launch drew up to the pier at Quarantine Station I prepared to step from the "hurricane deck" to the wharf steps, and my captain gave me a parting direction to the effect that the canyon which I should seek was just beyond the little house which could be seen on the slope of the hillside.

At the time La Playa was first laid out nearly one-half of the town site lay within what is now government property.

Passing from the pier and along the fence of the Quarantine Station I took my way southward, past the new coaling station wharf, and so on toward the canyon 'beyond the little house.' With the hope that I might learn something more of the cave, I stopped at the house designated and asked the woman if she knew anything about a cave in the neighborhood. Her answer was in the negative, although she had been living there for some time. Having done nothing more than to lose a few minutes of my time, I regained the highway and soon came to the mouth of the canyon. Looking up its winding course, I saw a great, dark hold in the hillside and I knew that I was at least approaching the hermit's cave, even though I might not find the yawning cavern described by Derby.

Descending from the roadway, by a circuitous path, I reached the sandy bottom of a dry water course and proceeded to wend my way along its tortuous path. Webs of great spiders had been spun across the creek bed, and I found it expedient to use a stick to knock them out of the way. At times there would come a rattle from the underbrush growing on either side, which sounded unpleasantly like that of a snake, but I soon saw that my alarm was simply caused by some dry seed pods shaken by the breeze. Now and then the bed of the stream was blocked by great rocks, and I imagined that there must be some very pretty little waterfalls during the winter rains. Still climbing upward, I finally came to the mouth of the cave, and after reconnoitering to see if any bob-cats or other animals were within, I ducked by head and entered.

The cavern mouth is about three feet high and some five or six feet across, but immediately back of the entrance the chamber widens out and the roof
arches so that a man of five and a half feet can comfortably stand with his hat off. The cavern is some fifteen feet in its longest dimension and about ten feet from front to back. Sitting inside, one can look out through the entrance and get a beautiful vista of the bay, with the highway crossing the line of vision. The sandy bottom is dry, and there is a gently sloping rock floor in one portion of the cave which might well have been adapted to use as a foundation for a bed. The roof of the cave is coated with a layer of hardened soot, which must have accumulated during the years of occupancy by the hermit and his possible predecessors. It would not have taken much effort to close the mouth of the cave in some way to protect the lone occupant during the nights from the approach of any wild animals.

Today the cave is occasionally visited by soldiers from the fort and by poaching hunters, as is manifest from the cartridge shells which can be found in the vicinity. That the hunter comes under the domination of poacher is evident when one reads the signs which Uncle Sam has had posted, warning all passersby that no shooting is allowed on the government reservation. Now and then a soldier will be seen patrolling the hillsides and canyons in search of a hunter, the report of whose firearm has been heard.

The solitude that surrounds the cave prompts the lone visitor to sit for a time within its protecting walls and let the world pass on in its endless journey, but the descending sun also gives a hint that the return shall be made to the pier in order to catch the city-bound launch.

From the former San Diego City Clerk, Mr. A. Wright, we have the following description of Point Loma as it was in 1909:

... and soon we were ascending the slopes of Point Loma, our route taking us up a canyon road, at whose every turn we were afforded a new panorama of the bay below and the city beyond it, climbing the hills to University and Florence Heights and Golden Hill. The ground squirrels
and roadrunners watched us inquisitively as we passed along, but scampered to a place of safety if we stopped to see them more closely. 'Twas evident that they believed in the old adage that familiarity breeds contempt. On either side of the roadway were wide stretches of wild flowers, in the midst of which the meadow larks sang and the butterflies and bees disported.

Finally we gained the summit of the point, and passed the tent village which is maintained by the Theosophists during the summer season. They have hundreds of acres inclosed by fences, and everywhere can be seen signs which threaten prosecution of those who trespass upon their domains.

The residence of former Secretary of the Treasury Lyman J. Gage and the United States wireless station, where records of receiving have been made that have startled the electrical world, are seen as the drive is continued. Next comes the national cemetery on the brow of the peninsula, wherein are resting the victims of the Bennington disaster, which occurred in San Diego Harbor in 1905, when over three score of the complement of the gunboat lost their lives as the result of a boiler explosion.

Not far beyond loomed up a whitewashed stone structure, the object of our trip, and soon we reached it and began its exploration. Access was easily gained through an old door which long since lost its licks, and, after first descending several steps to a fort of basement, we began the ascent of the old staircase to the main floor, where were the living-rooms of the former occupants. Big fireplaces were prominent features, showing that the need of adequate heating apparatus was necessary to overcome the bleak winds which struck the lighthouse in its exposed position. The walls of the building seemed a foot or two in thickness, and the windows were narrow and few in number. A winding stairway led to the second floor, where were located the sleepingrooms, while more turns in the stairway lands one in the tower, with its metal railing and framework of the long-disused dome. On every available spot of the white walls have been inscribed the initials or full names of visitors to the old structure, and some of these autographs date
back a dozen years or more.

Occasionally the old lighthouse has been used as a rendezvous of venturesome young people on Halloween, and it would be hard to imagine a more appropriate place in which to tell ghost stories by the fitful light of a fire in one of the old fireplaces, which the night wind whistled through the broken panes and the ironwork above. A person might easily bring himself to expect to see the ghost of his forebears in such a place under such conditions.

With all its appearance of age, the structure was erected only back as far as 1855, and it served to guide the mariner until 1891. It is said that it was superceded by another light because, at its height of nearly 500 feet above the water and the whiteness of its light, it was often mistaken for a star. Another reason for its abandonment as commerce at the port of San Diego increases is said to have been that on occasions its light was obscured by the high fogs which would sweep over the point.

From the old to the new lighthouse the frive has much of interest, and as the course is taken down the winding road on the western slope of the peninsula, the vista is delightful. We were fanned by the breezes from the ocean, and the sagebrush and wild flowers made the air most pleasant to breathe. Quail darted from the shelter of the clumps of brush and looked saucily at us, as much as to say: 'You can't shoot us, for we know you left your guns at home, and you are on the United States reservation, anyway.'

Cottontail and jack rabbits were equally provoking, and taunted us for our inability to do them harm. Above us circled the turkey buzzards, and off over the water gracefully floated in air the homely pelicans and the gainly seagulls. There was a haze hanging over the sea to the west and over the mountains to the east, but it was just enough to make the day delightful.

At the new lighthouse there is quite a settlement, including houses for the light-keeper and for other employees. It is on the extreme point of the peninsula, where it juts out to sea, and the revolving light, showing red and white
alternately, has saved many a craft from striking the rocky nose of Point Loma and has directed it to the channel of safety. The lens of the lighthouse was manufactured in Paris in 1887, and is composed of twelve panels of catadioptric prisms and twelve bullseyes. It is considered one of the best in the world for its size, and is valued at $10,000. In power it is classed as 100,000 candle power. Until the abandonment of the old lighthouse, San Diego had the second oldest in the State, that on Alcatraz Island, in San Francisco Bay, having been established in 1854, one year before that on Point Loma.

Statistics are generally dry, so we left the lighthouse and started to retrace our way to the summit of the peninsula, and when the ridge had been reached we started down the other side, passing through Fort Rosecrans, with its coast-defense guns of big caliber and its squads of soldiers, many of whom were lounging on the porches of the barracks, chatting and smoking. A short way beyond the fort is the new coaling station wharf and the quarantine station, and thence the road leads through La Playa, a hamlet which is now mainly the home of Portuguese fishermen, and so on around the bay and back to San Diego, which is reached as the sun is setting, silhouetting the old stone lighthouse as it had done oft before.

Time and its adjunct distance were different things in Point Loma's early days than they are today. In the year 1889, the fride from New Town to Pacific Beach was a trip that took three hours through the sand. People would make this trip on Sundays, usually, in order that they might swim on the open beaches where the community of Ocean Beach now exists.

Old San Diego residents remember two promotional schemes around 1890. One was the attempt to start a nail factory at Roseville and the other a watch factory at Otay.
Trips to La Jolla on Sundays took over three hours also, but you could swim and have luncheon there and be home by six o'clock. It took also about the same amount of time to go to the end of Point Loma.
CHAPTER IV

THE CABRILLO NATIONAL MONUMENT

Architectural Features Within the Park Boundaries

Old Point Loma Lighthouse

A survey of San Diego harbor was made by the Coast Survey in 1850 preparatory to the selection of the site for a future lighthouse. The site finally decided upon was located on the summit of Point Loma near the end, some ten miles from Old Town. No construction took place at the site until April, 1854, three years after the survey which determined the location. The location of the Point Loma lighthouse was a matter of dispute from shortly before the arrival of the construction crew on the west coast in January 1853 until the end of the year (Holland 1968:5-45).

Although the Coast Survey party had concluded that the logical place was near the end of Point Loma, the contract with Gibbons and Kelly merely said San Diego. The contractors objected to the Point Loma location because of the cost of building a road and bridges to haul materials to the site. After considerable disputing with
the Lighthouse Board, and rejecting an option to drop their contract, Gibbons and Kelly finally went ahead with construction in April 1854. The contractors for construction of the light were Messrs. Gibbon and Kelly of Washington, D.C., represented on the west coast by William J. Timanus, who supervised the construction. Before November of the same year, Timanus had completed his phase of the construction. But the full job was still not completed.

The following appeared in the San Diego Herald:

We shall endeavor, during the ensuing winter, to make the first named of our delegation, informed of the fact that we have no mail communication whatsoever with any place; that mail steamers pass every week almost within site of our wharves, carrying mail to Oregon and less important places to the north of us; that we are in want of a port of entry ... and among many other wants, a lantern, oil and keeper for our light house.

The editor replied:

We in San Diego may also ask for a "Lantern, oil and keeper" for the little stack of bricks erected on the top of Point Loma (San Diego Herald, November 25, 1854).

Nothing more was done until the arrival of the lantern, lens and other equipment on August 10, 1855. Before construction could be resumed, extensive repairs were needed - the result of the contractor's having used inferior materials. After many delays, light number 355, of the Twelfth
United States Lighthouse District, better known as the old Point Loma light, was lighted at sunset, November 15, 1855. All of the early California lighthouses were similar, if not identical, in architecture. The description... "a one-and-a-half story building with a low tower rising from its center..." often appeared in the early sailing directions for the Pacific Coast.

During the construction a reporter for the San Diego Herald visited the site and talked to Timanus, who gave him a description of the structure contemplated:

The walls will be twenty feet high from the foundation, and the entire building twenty feet wide by thirty feet long. There will be a cellar of six feet in the clear, the main building will be nine feet, two inches in the clear, and the attic three and one half feet. The 'tower' will be situated directly in the middle of the building and will be ten feet in diameter, thus leaving on each side rooms of fourteen to twenty feet. A spiral staircase will lead through the tower to its height, which is to be thirty-three feet from its base, thus there will be an elevation of four hundred and thirty-three feet from the level of the sea. A kitchen and other out offices are also to be erected of wood in the rear, and when completed will form a useful ornament (Holland 1968:10).

The general internal structure of the old Point Loma lighthouse is small in size. The two rooms in the basement were probably general storerooms. The south room on the first floor was the parlor, while the north room served as both a kitchen and dining room. This later room
VICINITY MAP
opens out onto an extra room or addition built on the back of the house. The rear (wooden) addition served as a larder and service room for the kitchen. The small room on the second floor was originally used as a bunk-room for the keepers during their duty hours, while the two larger rooms served as bedrooms for their families. The light gallery in the tower is reached by a spiral staircase and ladder. In 1882, the light was listed officially as being four hundred and sixty-two feet above sea level. Such an elevation was to have its advantages and disadvantages. The lofty position of the old Point Loma light was a disadvantage as an aid to navigation. It was found that high fogs often obscured the light while the coast line just below was clearly visible. By 1881, a new site had been picked, but at the time no funds were available to relocate the light. In 1889, Congress appropriated $30,000 for reestablishment of the Point Loma light on the lower site, where the light is still operating. The old illumination apparatus was dismantled and shipped to New York. The lighthouse was boarded up. The lighthouse survived partly due to the sturdy construction of the building. By 1913, it was in a dilapidated condition, and the commanding officer at Fort Rosecrans recommended that it be torn down. The old building had become a favorite tourist spot because of the magnificent view from the old tower. By this time the old ruins had acquired the cognomen
"Old Spanish Lighthouse." How and why this inaccurate name became attached to the building is not known for sure. About the same time other wheels were turning, and a movement was underway to erect a memorial to Juan Rodriguez Cabrillo, the discoverer and explorer of the west coast of the present United States. As a result of this activity a Presidential Proclamation dated October 10, 1913, was signed setting aside one-half acre of ground surrounding the Old Point Loma Lighthouse as Cabrillo National Monument.

In the fall of 1916 the Army noted that the old building was of "considerable historical interest." Since there were no restroom facilities and the visitors used "the basement and some of the rooms rendering the building unsanitary," the Army recommended constructing a concrete comfort station. But nothing came of that proposal. The Army encouraged soldiers and their families to live in it. Undoubtedly this move at least had the effect of halting temporarily the decline of the old structure. The Army also used the building as a radio station around the mid-twenties. In 1931, the Ninth Army Corps found funds to renovate the old lighthouse. Holes in the roof were patched, windows were replaced and iron bars put over them, and the building was repainted inside and out. These repairs were enough to stabilize the lighthouse until 1933 when Cabrillo National Monument was turned over to the National Park
Figure 29.

a. Aerial photograph taken in 1945 of the tip of Point Loma showing Lighthouse and Ballast Point. Note: submarine net in center top of picture.

b. Early photograph of 10 inch gun battery above Fort Rosecrans.
Service. The Presidential Reorganization Act of 1933 took most of the national military parks, national battlefields sites, and national monuments from the jurisdiction of other agencies, such as the War Department, and placed them under control of the National Park Service. The restoration work was completed in 1935 and the concessioner, who was also custodian of the Monument, set up his operation in the lower south room. Later he operated a tea room in the lower north room. The concessioner also lived in the building. In 1941, visits to the Monument were abruptly shut off because the military felt the purposes of wartime security precluded non-military activity on Point Loma. During World War II the lighthouse was used by the armed forces. At first the Navy used it as a signal tower.

This signal station lasted for about a year until another tower was built just south of the lighthouse. Thereafter the old building was used primarily for storage purposes. Finally, in 1946, the Army decided to return the Monument ot the National Park Service, and on November 11, 1946 the public was again welcomed. Since that time the feature has been a focal point for historical interpretation. The age of the building and the large visitation has forced the closing of the light tower; but the other parts of the building are maintained and are visited by thousands of visitors each year.
Figure 30.

a. Early picture of Point Loma Lighthouse 1902.

b. Plan drawing of Lighthouse and secondary building.

Note: The reorganized authority on the Point Loma Lighthouse is F. Ross Holland, Jr. of the Division of History, of the National Park Service. Mr. Holland's work *American Lighthouses* is a principle research source. His short monograph, *The Old Point Loma Lighthouse*, and various personal communications to the author form the basis for the following data.
Other Recent Features

The Statue of Juan Rodriguez Cabrillo

The Cabrillo Statue, made possible by the famous artist, Alavaro de Bree, of Portugal, now rests in the Cabrillo National Monument of Point Loma. The height of the statue is fourteen feet, it weighs fourteen thousand pounds, and rests on a six and one half ton granite foundation. The foundation is crowned by a shield bearing the Portuguese arms and, above, a Christian cross. The consul-General of Portugal in San Francisco, Dr. E. G. da Costa, described the statue as a "simple, expressive monument to Cabrillo as the real discoverer of this El Dorado of the Pacific" (Fletcher 1920).

Reginald Roland, former Director of the Fine Arts Gallery of San Diego, said:

It suggests the will and forcefulness of its subject. It is well and beautifully carved by its artist. It is a fine work of art; in its sense of plastic forms and values, in its texture appropriate to the medium, and in its architectural feeling for structure. Quite apparent is that fortunate balance of the natural and the abstract.

Its sculpturer, Alavaro de Bree, was only thirty-four years old when he completed the figure. A resident of Barcarena, Portugal, he had studied under master sculptors in France, Italy and Portugal, his native land. He ex-
executed several national monuments as commissions for his government.

Governor Olson of California publicly accused Colonel Ed Fletcher of illegally taking the statue to San Diego after he (without legal authority) had given the statue to the City of Oakland. The history of this controversial subject, as told by Colonel Fletcher, is as follows: "Our splendid citizen and businessman, Joe E. Dryer, President of the Heaven on Earth Club, states as follows:"

When I was at the New York World's Fair last June, Admiral Standley took me to the Portuguese Building, where we had a most pleasant visit with the Portuguese Commissioner. At that time, the Admiral had already severed his connection with the New York Fair and was acting solely as a private citizen of San Diego, where Admiral Standley makes his home. A second reason for his interest lay in his friendship for Admiral Thomas J. Senn of Coronado, who is Chairman of San Diego's 1942 Cabrillo Celebration, which will mark the 400th Anniversary of the discovery of California at San Diego.

The Portuguese Commissioner, Mr. Antonio Ferro, showed us a replica of the Cabrillo statue and added that the original had been sent to the Golden Gate Fair for exhibition there, whereupon it was to be presented to the people of California as a permanent tribute to the memory of Cabrillo; and, moreover, that the statue's appropriate place, inasmuch as Cabrillo first landed on California soil at Point Loma, in what is now the City of San Diego.

These good citizens, on their return asked me (i.e., Colonel Fletcher) to make every effort after the Panama-Pacific Exposition
was over to have the statue brought to San Diego, I promised to do my best.

An item in a San Francisco newspaper caught my eye. It stated that a $3,800 import customs duty on the statue was demanded by the Federal Government and could only be waived by the then Governor of California, Culbert Olson, officially accepting the gift in the name of the state. Its late arrival and a large expenditure of money in its erection was the reason the statue was not erected in the exposition grounds. With the formal acceptance of the gift by Governor Olson, it was released from Federal Customs and was stored in the private garage of a former Portuguese National in San Francisco.

The newspaper article also mentioned that, with the approval of the Vice Counsil of Portugal in San Francisco, this statue of Cabrillo would be located in the City Park of Oakland, as a gift from Governor Olson. As there were sixty or seventy thousand Portuguese citizens in and about Oakland, it looked to me like the Governor was playing politics and that it should by all means, be located in San Diego where Cabrillo first landed; either there or in Sacramento, our State Capitol, or Golden Gate Park. This beautiful statue, valued at $50,000 was a prize worth fighting for.

Having been a State Senator for four years with Governor Olson, I had a thorough disgust for many things he stood for. I resented the fact that the statue did not go to San Diego where I thought it belonged.

First, I quietly secured a legal opinion from our Legislative Council which stated that Governor Olson had the right to accept the statue in the name of the State of California, but the Legislature of California, only had the authority to dispose of the statue as the Legislature saw fit.

Through a friend, I located the address and, one Sunday, State Senator and Mrs. George Biggar, your mother, and I visited the home where the statue was still stored in the garage. It was so heavy it had broken the concrete in the garage floor. We discussed the matter with the lady, found she was sympathetic, and convinced her the statue should go to San Diego. Her husband having died recently, she wanted it out of the garage, but
insisted upon having some authority from the state before having it moved to San Diego permanently. I had shown her the legal opinion of our Legislative Council that only the Legislature had the authority to act. She wanted additional authority, which I promised to get. I immediately introduced a bill in the Senate whereby if passed the statue of Cabrillo would go to San Diego.

Before attempting to pass the bill, I won the support of Senator Arthur Breed of Oakland, Senator Roy Mielson of Sacramento, and Senator Jack Shelley of San Francisco, now Congressman Shelley. When this legislation was read by the Secretary of the Senate, I asked for immediate consideration of my bill without reference to committee. It took unanimous consent, and, there being no opposition, it passed the Senate, which I took as a very splendid compliment. When it reached the assembly, it was referred to committee and the bill killed, owing to the opposition of the assemblyman from Oakland. I was in this position: the State Senate was unanimously and officially behind me, but with the California Assembly opposed, my only thought was to get possession, as that is nine points of the law, so lawyers say. I had our good citizen, Mather Gleason, of San Diego, then President of the State Park Commission, write a letter asking the good lady to deliver the statue to me. Frank Jordan, Secretary of State, put on the golden seal of the State of California. On a Saturday morning, with that in my possession, together with a copy of the State Journal showing unanimous approval of the Senate, I submitted this documentary proof. She gave her consent for the statue's removal.

I had, earlier in the day, arranged for the drayman to be ready on a moment's notice to move the statue. When she gave her consent, I telephoned the drayman and a crew of four arrived with a tremendous truck. We had the statue on rollers out on the sidewalk when she called me into the house and asked me to talk over the phone to the Vice-Consul of Portugal who protested its removal and threatened court proceedings. I also got another telephone call from an attorney in Oakland who threatened an injunction. The lady was in tears, but it was too late. I promised her she would never regret it and left with the statue. By telephoning, I kept the Santa Fe Railroad
Depot open Saturday evening and they accepted the statue for shipment from me to the City of San Diego. My good friend, E. J. Engle, then President of the Santa Fe Railroad, hauled the statue to San Diego free of charge and the statue was locked up in the warehouse of the City of San Diego for safe keeping.

There was an immediate uproar, Governor Olson accusing me in the press of stealing the statue and I have two letters demanding the return of same to Oakland where he had promised it would go. I sent him a copy of the legal opinion of the Legislative Council and told him "nothing doing." Oakland made a demand through its assemblyman which, if passed by the Legislature and signed by the Governor, would have taken the statue away from us, but both times we were able to defeat these bills in committee, thanks to my pal Assemblyman Charlie Stream and Mrs. Jeanette Daley. Four out of five members of the State Park Commission of California by resolution voted for passage.

Later, I went to Washington, met the Portuguese Minister Joao De Bianchi, a might fine chap, entertained him and his good wife, explained everything to them, sent her orange blossoms by plane, and, eventually, with the consent of the President of Portugal, we secured the support of the Portuguese Minister who told the Vice-Consul in San Francisco where to head in.

Smooth sailing again, but for safe keeping, we erected the statue on the United States Naval Training Station confines and dedicated it there. The statue was, for some time, under guard day and night by the United States Navy.

We had one dedication of the Cabrillo statue on December 19, 1940. We were honored with the presence of Dr. E. G. DeCosta, Counsil-General of Portugal in San Francisco, a new consul. Mayor Benbouth, Fred Rhodes, City Manager, Joe Dryer and the City Council all heartily cooperated, as well as Lawrence Oliver, Manual Medina, Joe Medina, and other prominent citizens of San Diego of Portuguese descent. There was a wonderful outpouring of all citizens in San Diego and, particularly, the Portuguese element. Our good friends, Bishop Charles F. Buddy, our beloved John Davidson, curator at the museum and historian, and his good
wife, took a lively interest and part in the ceremonies.

There was always danger of the Legislature reversing itself and taking official action removing the statue to Oakland. For several years, a bitter fight continued. I had first appealed to the Cabrillo Civic Clubs in California, both by letter and in person. I was ably assisted by Mr. Joseph Mento of Sacramento, President of the Cabrillo Civic Clubs of California. We secured, for San Diego, the endorsement of forty-five clubs all over the state. I received letters from several thousand school children, as well, from Sacramento and elsewhere endorsing San Diego as the location for the statue. Oakland citizens, working with Governor Olson, used every effort to get legislation passed to take it from us, but without avail.

After the statue had been officially dedicated in December, 1940, within the confines of the U. S. Naval Training Station, with the enlargement of the Cabrillo Park on Point Loma, it was agreed, with San Diego's consent, to move the monument to Cabrillo Park, mainly through the activities of Mrs. Wm. Paxton Cary, John Davidson, and others. I approved its change in location to the spot where Charles D. Warner, famous traveler and writer, wrote about Point Loma, in 1890:

The site commands one of the most remarkable views in the accessible civilized world, one of three or four really great prospects which the traveller can recall, astonishing in its immensity, interesting in its peculiar details, the wide curving coast line rising into mesas, the faintly seen snowpeaks of San Bernardino and San Jacinto to the Cuyamaca and the flat top of Table Mountain in Mexico. The near hills about this harbor are varied in form, poetic in color, one of them conical, San Miguel, constantly recalling Vesuvius, but the Naples view is limited, while this stretches away to
the great mountains that overlook the Colorado Desert. It is certainly one of the loveliest prospects in the world and worth long travel to see.

So, again, we had another dedication. Admiral R. S. Holmes rededicated the Cabrillo statue. We also had the blessing of Portugal, as evidenced by the following telegram of September 15, 1942:

Honorable Mayor P. J. Benbough
City of San Diego, California

Ever since my first visit to California, I have been looking forward to 1942 as the year in which I have hoped to again enjoy the beautiful Pacific Coast. Unfortunately, conditions do not allow me to leave Washington at the present moment and I am reluctantly compelled to decline your most kind and tempting invitation. It was, indeed, a pleasure to hear that, in spite of all that is happening, the 400th anniversary of the discovery of California by the Portuguese Navigator, Joao Rodriguez Cabrillo, will not pass unnoticed and I associate myself heartily with the celebrations which I have no doubt will touch the hearts of Portuguese extraction who have chosen the beautiful state of California for their home and who, I am proud to think, are loyally answering the call of this nation in these momentous days. Please accept and convey to Senator Fletcher and Lawrence Oliver by best and most cordial salutations.

JOAO DE BIANCHI
MINISTER OF PORTUGAL

All is well that ends well, and the Cabrillo statue is now in the hands of the United States Government for keeps.
Thus ended the travels and trivals of the Cabrillo statue. The feature has, in recent years, been moved twice since it originally came to the Park. It is now in an honored place on a point overlooking the Bay of San Diego.

Abandoned Military Structures

On Sunday, March 21, 1976, the survey of the primarily military structures at Cabrillo National Monument began at nine o'clock in the morning with the opening of the park area. Members of the survey team were Dr. James R. Moriarty, University of San Diego, Norma Catherine Moriarty, University of San Diego, Captain Wayman Bishop, University of San Diego and the United States Marine Corps, Brian Welker, University of San Diego, Park Technician Brett Jones, of the National Park Service and Park Volunteer Adena Boxer.

The principal purpose of the survey was to conduct a detailed examination of the location, size, and use of abandoned military structures within the park boundaries of the Cabrillo National Monument.

The first of these specialized installations were constructed beginning just before the 1900's and some were utilized, in part, until the end of the Second World War. They are now all abandoned. It is specially noted that no patent marks denoting date were seen in some of the structures although a careful search was made for such useful dating.
Figure 31. Location of abandoned military structures.
elements.

The structures fall into three general categories:

(1) Observation, sighting, range plotting bunkers.
(2) Disappearing searchlight bunkers.
(3) Power supply installations.

General Description Feature #1

Concrete container, curvilinear top setting on a rectangular concrete base. Iron door, hinged, long strap purpose: Junction Box for electrical mobile searchlight unit and auxiliary attachment. Internal, circular, cast aluminum box has inscription - 1909 Engineers Department U.S. Army, Colin Electric Company, New York. The exterior of the concrete box contains the following inscription - 1941, U.S.A. this inscription is located in the southwest corner of the box. Unit appears to have been reconstructed. It was installed earlier and was in use during the 1920's. The external reinforced steel concrete box was a recent addition at the beginning of the Second World War. An additional date does appear on one of the electrical elements within the metal features within the box. Patent date is 1904.

Feature #1 Measurements

Width . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 2'4"
Length . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 3'2½"
Height from concrete base ............ 3'7½"
Length of base ................. 3'10"
Width of base .............. 3'1½"
Height of base ................. 5½"
(small dimension ........... 3'3½")

General Description Feature #2

Large rectangular bunker, very high, (16' base to roof) concrete, reinforced, large wooden doors, metal coated probably light gauge tin, iron strapped for additional support. Probable use was for mobile in and out or disappearing large searchlight battery. General position would allow it to light any movement out to Zuninga Point covering directly the mouth or entrance to the harbor. Remnants of steel wrapped armoured cable still in attachment on wall and ceiling, 9 to 10 inch vent in roof for ventilation.

Standard U.S. Army, narrow gauge steel rails for trolleying searchlight forward through open doors to lighting position.

The thick concrete floor of the bunker contains two rectangular openings - one at the entrance which was probably used when working on the under carriage of the searchlight. The other seems to be an electrical union box which contains some cable and cable attachments. The feature is in excellent condition, walls and floor being substantially as when the feature was constructed.
The door features are particularly interesting as they open on the face of the bunker which view the aforementioned entrance of the harbor. The doors are about three inches taller than the ceiling and fit outside, but within the shelter of the roof extension. There is a large steel rod which secures the bunker door by hand pressure when inserted into the ceiling. The trollying rails extend beyond the door for approximately five feet and within the floor of the bunker approximately nine feet.

Feature #2 Measurements

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<tr>
<td>Width</td>
<td>12'</td>
</tr>
<tr>
<td>Height</td>
<td>13'</td>
</tr>
<tr>
<td>(one exterior air outlet)</td>
<td></td>
</tr>
<tr>
<td>Thickness</td>
<td>3&quot;</td>
</tr>
<tr>
<td>Gauge of rails</td>
<td>4' 1 7/8&quot;</td>
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significant measurements - smaller than usual.

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</tr>
<tr>
<td>Width of door opening</td>
<td>8'6&quot;</td>
</tr>
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Doors 4" higher than ceiling.
Figure 32.

a. Area of Features #8 and #9.

b. Feature #3 - Generator Installation

c. Feature #1 - Electrical Transmission Box.

d. Feature #2 - Searchlight Bunker.
General Description Feature #3

The Generator Plant. At the time of survey it was too tightly locked to make internal measurements. External measurements, therefore, are the only measurements to be given of this concrete structure.

Manufactured precisely the way Feature #2 was constructed. It is of concrete with reinforcing steel. It has three windows, each barred with 3/4 inch iron bars. Wire screening is positioned behind two of the smaller windows. There is a large door on the left hand side, and is sealed shut with nails. It also has two iron doors with heavy metal hinged straps. These are also sealed and they are directly beneath the two smaller windows on the right hand side of the structure.

The structure is rectangular. There is a three inch diameter pipe extending from the front through one of the two holes which appear on both sides of the large window.

The rooms of the building, as observed from one of the open windows, appear to be two in number. Each room being approximately the same size. The floor of the structure is heavy and massive concrete with rectangular holes in the floor. One is u-shaped and the other rectangular. Electrical features are still to be noted in the small rectangular hole in the floor which is located on the south side of the south room. Both structures were built just shortly before or during the First World War, thus, placing them within
the period of 1917 to 1920.

Further examination disclosed three air vent features and two concrete piles (truncated, pyramidal blocks) on the north side of the building. They were the base for a wooden platform supporting a container for some liquid. The lines for power and water were carried up the slope, directly to the north, and were hidden in groves cut in the sandstone.

In the front of the building is a low, flat, rectangular platform. Two pipes, three inches in diameter, extend from it vertically and appear to be filling pipes for fuel tanks which must lie below the surface.

North of Feature #3 there is a considerable amount of cultural material which is presently masked by the brush. Careful examination of the area is indicated. It was also noted in this area that there was some concrete structure debris and there is World War II telephone cable under the brush cover. East of Feature #3, about one hundred and fifty yards down, there is a series of structures still remaining. There is some indication of steps or a stairway which led to the bottom of the canyon. From the bottom, a path leads directly down the canyon to a sentry or lookout station which must have been located there for the purpose of protecting the approach to the power unit.

Feature #3 External Measurements
A totally masked position buried and overlooking Zuninga Point directly to the south. Large sliding hatch cover, tin and wood, on rollers and no longer functional. Placed on a concrete slab, horizontal to the ground, very low. One concrete post to the rear which contained armoured cable, a fragment of which still extrudes from the ground. This is a reinforced post of concrete and steel bar. A one quarter by two inch flat, rectangular bar about ten inches long is embedded at a right angle near the top of the post. It was used as a support for an electrical junction box.

In the southwest corner of the concrete slab is a flat, iron-strapped, metallic hatch cover which raises up and covers the entrance to the complex. Internally the main structure is a rising platform that can be lifted either manually or by electrically generated power. It is still operable manually. The floor of the platform rises up to the level of the ceiling. Once the hatch is removed on rollers, the searchlight could be exposed, used and quickly returned to its protective cover. Electrical attachments are still attached within the structure. It is the writer'
opinion that the structure was built during the First World War, as the same building techniques were used on the previously mentioned features. The feature was used throughout the Second World War and then abandoned. This is indicated by the internal improvement observed within the structure.

Additional note on Feature #4: very narrow gauge, 1\textfrac{1}{4}'' tracks carry off the roof of the feature to the northeast. Directly beyond this feature was a small wooden fence which led to what appeared to be the remains of the latrine.

Feature #4 Measurements

Outside Measurements:

<table>
<thead>
<tr>
<th>Description</th>
<th>Height</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latch</td>
<td>14'</td>
<td>13\textfrac{3}{4}''</td>
</tr>
<tr>
<td>Entrance</td>
<td>3'3\textfrac{1}{2}''</td>
<td>N-S 3'6\textfrac{1}{2}''</td>
</tr>
<tr>
<td>Width of Rail</td>
<td>11'4 3/4''</td>
<td></td>
</tr>
<tr>
<td>Hole in Platform</td>
<td>3'4''</td>
<td>3'6''</td>
</tr>
<tr>
<td>Platform</td>
<td>10'9''</td>
<td>9'6''</td>
</tr>
<tr>
<td>Under Platform (wall)</td>
<td>11'9''</td>
<td>13''</td>
</tr>
</tbody>
</table>

Interior Floor
Depth of Pit 4'10"
Width 6'3"
Length 13'
Interior Elevation (Floor to Ceiling) 9'5½"
Thickness of Roof 1'3"

General Description Feature #5

Square bunker with a cemented cobblestone roof, approximately 18" thick, four metal shutters which can be lifted for observing. The entire structure is of steel reinforced concrete, Second World War origin. Internal Structure: Circular mount for benched range recording and plotting device, writing on the wall indicates the coordinate data and ranges to the Hotel Del Coronado and other marked points and ranges. Dirt fill over the cobblestone and concrete roof. The feature is roughly square with an irregular roof. The feature has a concrete formed entrance through the roof with the usual steel rung ladder embedded in the concrete wall.

Feature #5 Measurements:

Outside Measurements:
Base Width 7'10"
Wall Thickness 8½"
8' x 8' Structure
Opening

Width
Length
4" Border
Aperture Opening
Outside Measurements:
Width (E-W)
Length (N-S)
Azimuth to Del Coronado
Range
Azimuth to Station Above
Range

General Description Feature #6

Feature #6 is precisely the same measurements and exactly the same appearance as Feature #5. It is, however, considerably higher on the slope above and to the south of Feature #5. It still contains the half table on the round circular hoop for sighting and the platforming of instruments for ranging. The roof of these structures is not just cobblestone and concrete, it has embedded in it square twist iron bar stock, approximately half inch in measurement, giving it an extremely strong surface.

Additional note on Feature #6: It should be noted that it has a smaller field of vision, having apertures only to the front and to the south side; whereas Feature #5 has vision to the north also.
Feature #6 Measurements

The same as those of Feature #5 with noted exceptions.

General Description Feature #7

Feature #7 is a concrete sighting bunker with apertures to the front and south only. Facing south and east it has a large square metal hatch cover and is constructed of concrete and steel reinforcing rod. It is similar in construction to the last two bunkers. Depth from top of entrance aperture to bottom is 1204". Internal measurements are 96" x 96". Note: At the back of Feature #7, is an additional feature, a 40" x 47" box which at one time had a metal, heavy hinge, strapped door. Use unknown. Height of bunker at aperture view 76". Back roof of bunker - 103" - ceiling to floor. Special note on Feature #7: It is not the usual type of bunker. The small space at the back is probably an ammunition container.

The sighting apertures are open to the southeast on a line with the Hotel Del Coronado. There are partial views to the direct south and north so that Ballast Point, as well as the mouth of the harbor entrance at Zuninga Shoals, can be observed.

Internally, there is a small circulate platform which was used as a mount for sighting and range devices. Nothing of the instrumentation remains or of the extensive electrical conduit work, which is still represented in the form of a
junction box on the wall. Massive armour cable leads down from it to the other bunkers.

General Description Features #8 and #9

Semi-circular concrete base on the east side of the tip of Point Loma overlooking Zuminga Point and the harbor entrance. Swivel mount base for stationery battery probably 37mm or 55 caliber anit-aircraft gun. A wooden shade structure was constructed behind the gun mount. Metallic fixtures for a central single swivel base and arcing fix assembly is on the sides and still in place. The structure was made of poured concrete, probably made in a wooden and metal mould, there does not seem to be any reinforcing. The concrete is of considerably different content than on previous features. Apparently made rather hastily, some smoothing of interior wall was done in a low semi-circle. The wall is about two feet high at its greatest elevation.

Remnants of the wooden structure are still to be seen on the back wall of the position. No other outstanding characteristics noted excepting for some writing which appeared to be inscribed with a sharp instrument at the time of formation of the pouring of the concrete, this appears on the inside of the wall. The inscription reads US 6-17-42. The date supports the original contention that the feature is World War II in origin. Adjacent to Features
#8 and #9 were wooden structures located between some eucalyptus trees to the west up-slope. This area, at one time, housed the above ground buildings for the military unit that ran the gun batteries at Features #8 and #9. Near it and toward Feature #9 was another wooden structure that was an underground bunker probably with a sod roof and wooden walls which would have acted as a bomb shelter or protective cover in case the unit was taken under fire.

To the south between Features #8 and #9 was protective covering of one gun probably as 37mm or 55mm, the type of Swedish design which was mounted on a single cylindrical base and had a universal elevation and maximum traverse capability. Throughout the entire arc of a circle these weapons, undoubtedly, were used to offer covering fire for the big gun crews under conditions of bombing and strafing. The only noted writing on Feature #9 were the initials RES.

Another feature in the area is a four inch concrete post embedded in a pipe with a large bronze screwhead centered in the top. It was the mount for range sighting binoculars of the style used aboard ship for range finding during the Second World War.

North and east of the range sighting mount about forty feet is a USGS marker dated 1933 #1. Within a few feet of the survey marker, toward the cliff edge, is another feature which was obviously a small gun pit. Elements of a wooden
door probably in the roof and tar paper indicated it could have been a two man post, probably also a guard post. North of both complexes a urinal pipe and the remains of a shading and cover for a latrine were found.

Special end note for second canyon. Two metal pipes were observed coming down from the slope at the junction of the canyon. This is where the road makes the u turn over the canyon axis. There is a heavy masking of foliage here and the pipes must lead to some feature, or be part of some feature that cannot be seen. It is suggested that the area in the second canyon be investigated carefully before any earth moving is done in the canyon bottom.

Features #8 and #9 Measurements

(Outside edge to center of swivel mounts)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outside radius</td>
<td>10'1&quot;</td>
</tr>
<tr>
<td>Height of wall exterior</td>
<td>2'0&quot;</td>
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<tr>
<td>Height of wall interior</td>
<td>1'1&quot;</td>
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<td>Swivel mount measurements</td>
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<tr>
<td>Inside radius</td>
<td>5½&quot;</td>
</tr>
<tr>
<td>Outside radius</td>
<td>1'6&quot;</td>
</tr>
</tbody>
</table>

General Description Feature #10a

This feature is located just below the Whale Watch and approximately twenty-five feet above Feature #10b. It
Feature 33.

a. Early 1899 photograph of military installation at La Playa.

b. 1899 photograph of concrete meteorological bunker above military installation.
A Tents of the 30th at Pt. Loma.

B
is constructed of concrete and cobblestone reinforced with steel. The structure is almost exactly the same in size and shape as Feature #10b, excepting for about four feet additional elevation.

The feature is entered from a steel trap door in the roof. There are three rooms with facilities for water and electricity. Some parts of these installations still remain in the unit. A survey mark in the form of a small copper nail is located directly in the center of the roof of upper part of the bunker. The internal structure of Feature #10a is exactly the same as the internal structure of Feature #10b. There are some minor furnishings; a bench and a small table in the upper room. One item of note is that the upper room in Feature #10a has a concreted post in the direct center of the room in front of the main hatch openings which must have had an instrument mounted on it. This is an iron pipe filled with concrete and bolted down with stud bolts, 8 in number. It has since been removed and is now down in the lower room beneath room one.

Additional note on Feature #10a - There has apparently been some recent use of Feature #10a. There is no particular clue as to what this use was, however, there are electrical fixtures which anti-date the Second World War in the installation.

Feature #10a Measurements
24'9" Front Top
1'11" Aperture
25' Front Bottom
1'1" Aperture

Width 8'6"
Length 14'
Height 6'6"

**General Description Feature #10b**

Is a two story complex in the face of the cliffs looking generally west just below Feature #10a, which itself is just below the Whale Watch. It consists of one room at the upper level which still has the bench on rollers with the circular iron ring embedded in an octagon-shaped, but extremely low concrete base. The base is, in turn, attached to the floor. This mount was used for a range sighting, angle and azimuth measuring instrument.

The lower complex consists of two rooms. One room being irregularly shaped and placed directly under the floor of the upper room and, in general outlines, has exactly the interior dimensions of the upper room. It is a five-walled room with a doorway in the west corner which leads to the sighting bunker. Certain elements of equipment still exist in the lower bunker; parts of the wooden bench attached by rollers to the circular steel ring embedded in the concrete frame for the sighting device. In
addition, there is an 8" steel post embedded in the concrete floor filled with concrete, smoothed off perfectly level on top, with an interior metal detachment protruding from the top approximately one and a half to two inches upon which could be mounted a sighting device. Such an instrument would have functioned with extreme accuracy due to the particular leveling and preparation of the mounting base. The post is bolted to the floor with eight one-quarter inch bolts. Some of the mechanical installations, particularly those elements which are used in sighting and range finding along with attachments which are obviously operated by electricity, are still in place. Some graffiti written apparently in pencil on the walls from the time of the Second World War still exist and ranges are given off the south Point Loma Light, the headland, and north Point Loma. Some other writing exists which cannot be read.

Installation #10b has a large Yale lock closed off on one of the iron ladder rings. We will try and have it removed so that I can check it for age with the Yale Company.

Feature #10b Measurements

Interior Measurements

<table>
<thead>
<tr>
<th>Width</th>
<th>8'6&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>14'</td>
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</table>
Height 6'6"
Widest Pt. 5'9"

Outside Measurements
1'2" High aperture
24' Front - 180°
25'3" - 180° Front aperture
1'1" High

General Description Feature #11

Second World War concrete installation, two story high, dug in on the cliff face just below the light—the Old Point Loma Light. The lower section is a secondary sighting position which would cover the operations in case the top bunker was taken out of action. The secondary bunker is of reinforced concrete steel support throughout, very efficient, and highly modern manufacture. The installation has been used recently by the Monument personnel as a darkroom it is still wired and power is still being generated to it. The installation, in a remarkably good state of preservation, can be utilized by the Park for a variety of uses. The installation consists principally of two rooms. The upper room has rectangular sighting ports covered by sheet steel. It is a fairly large room. The lower room, which lies directly below it, is about half the size of the room above. This in turn leads to a third room which is approached through a doorway to the west, and rises
up concrete steps to a secondary sighting platform.
This room is exactly the same as has been reported be-
fore. The ports are all sealed and it has been used as
a darkroom recently.

Some furnishings still remain in the structure,
simple woodworking in the darkroom, trays and running
water with a series of troughs and benches, a cabinet,
and two tables. In the lower room there is a large work-
shop table with metal legs and a wooden bookcase. The
ports look out to the west side of Point Lorna where the
Naval Underwater Center is located. The surface of the
roofs is cobblestone and concrete, reinforced with steel
bar. They are a minimum of two and one half feet thick.

On the surface of the uppermost bunker is a round
plate with large bolts embedded. This is apparently the
site of a very recent installation. No sign of erosion
has taken place on the surface or around the bolt heads.
There are a series of u-shaped reinforcing bars forming
a u-shaped appendage which are arranged along the peripheral
edges of the bunkers above the sighting ports. These were
used for the attachment of camouflage nets in order to pre-
sent an irregular surface that was not visible from the air
or sea. There is a heavy duty cable extending from a por-
tion of the upper bunker down the slope a distance of twenty
or thirty feet where it apparently ends in a break. It
appears to be an old power cable.
Feature #11 Measurements

Darkroom

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<tr>
<th>Measurement</th>
<th>Value</th>
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<td>Width</td>
<td>14'</td>
</tr>
<tr>
<td>Length</td>
<td>9'8&quot;</td>
</tr>
<tr>
<td>Height</td>
<td>6'9&quot;</td>
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</table>

Room Adjacent to Darkroom

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<tr>
<th>Measurement</th>
<th>Value</th>
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<tbody>
<tr>
<td>Width</td>
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<tr>
<td>Length</td>
<td>9'10&quot;</td>
</tr>
<tr>
<td>Height</td>
<td>7'</td>
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</tbody>
</table>

Upper Room

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>14'</td>
</tr>
<tr>
<td>Length</td>
<td>10'2&quot;</td>
</tr>
<tr>
<td>Height</td>
<td>6'9&quot;</td>
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</table>

General Description Feature #12

Feature #12 is a large complex of old gun mounts and ammunition bunkers above the Naval Underwater Center in a direct position just a little above the site of the parking facility when looking west. Feature #12 is a complex of features constructed in large part from corrugated 20 gauge galvanized steel curved plates covered by about one foot of concrete. A series of inter-connecting zig-zag trenches extend from one bunker to another. After an examination of the features within the site it was determined that they are of two types. A short one at the end of the zig-zag trenches, which have small rooms that were probably
permanent guard posts, were manned on a twenty-four hour a day schedule. The zig-zag trenches from the guard posts lead through trenches twenty or thirty feet long cut to six feet below the surface. Each trench ends at a large galvanized steel bunker which has about a foot to a foot and a half of concrete placed over the top of them.

At one time the structure had well constructed, two inch thick, wooden doors at both ends. The bunkers are filled now, mostly with debris, but there is sufficient material left to indicate that they were well-floored on two inch by nine inch beams covered by half inch flooring. Along the walls on both sides extended double rows of chicken wire racks on "two by four" frames and were bagged powder racks. The bunkers were probably ammunition bunkers and they undoubtedly stored ammunition for the large caliber long guns that were part of the coast field artillery establishment on Point Loma. The galvanized steel is in extremely good condition and there is no doubt that at least one of them could be put back into very good order. They probably will make extremely good storage units if a little restoration work were applied.

Dr. Roger Kelly of the National Park Service has suggested that the chicken wire frame works might have been bunks for the men of the detachments manning the battery. There is a similarity to quonset buildings such as used
during the Second World War as barracks. The size of
the interior wooden structures in this case, however,
meets the specifications for ammunition storage rather
than human occupation. What has been describes as guard
bunkers (which are in association with the larger bunkers)
do meet the specifications for human occupation and may
very well have served as quarters for the men on duty at
the battery position.

The survey uncovered approximately four of the large
bunkers and, therefore, it can be assumed that there are
eight of the smaller bunkers at the ends of the zig-zag
corridors which led to the major part of the complex. At
present two are so well masked by earth, probably fill
from the road, that they must be excavated before they
can be properly examined. More will undoubtedly be dis­
covered in the area, if some excavation or reforming of
the topography is performed.

Ammo Bunker Measurements

<table>
<thead>
<tr>
<th>Length</th>
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<tbody>
<tr>
<td>Width</td>
<td>10'</td>
</tr>
<tr>
<td>Height</td>
<td>8'</td>
</tr>
<tr>
<td>Concrete</td>
<td>1' Thick</td>
</tr>
</tbody>
</table>

Guard Bunker

<table>
<thead>
<tr>
<th>Length</th>
<th>9'10&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>7'10&quot;</td>
</tr>
</tbody>
</table>
During the survey of Feature #12, the investigator's attention was drawn to four concrete platforms noted on the January 1960 Master Shore Station Development Plan, Topographic map of Area 5. These circular concrete platforms were marked on the map as being positioned in a north-south line, parallel to and between Gatchell and Cabrillo Roads. Investigation by ground traverse located one of the features. It was almost totally covered by ground and vegetation. The feature discovered was the southernmost of the four. The other three are totally covered, but post-hole testing indicated they are still in position. It was noted that a circular iron rail, two inches wide passed around the circumference of the feature. The diameter was estimated to be approximately twenty feet. Only an excavation, however, will provide the accurate figure.

A search of the Fort Rosecrans record book indicates that there were two batteries of four 155mm guns located on
fixed mounts in this area between the First World War and the Second World War. As is the case with the masked bunkers, it is recommended that at least one of these positions be excavated for the purpose of determining more adequately its measurements.

General Description Feature #13

Feature #13 is a complex of underground bunkers, three in number, which are located on the western side of the park property off Gatchell Road directly below the Lighthouse. All three bunkers are of reinforced concrete. The largest feature is a disappearing searchlight bunker with a sliding roof cover which is exactly the same in construction, age, and measurement as Feature #4. The entrance way is buried and it was not possible to enter without some excavation. The exterior of the feature is well-defined and equal in condition to that of Feature #4 and it was assumed that, like #4, it was build sometime just before or during the First World War. The condition of exposed attachments would indicate a restoration of the feature during the Second World War and its subsequent use.

The other two bunkers are both buried and partially destroyed. They appear to have been abandoned sometime after the First World War. Earth masks both to such a degree that no measurements are possible without consider-
able excavation work. It is recommended that this be accomplished and that the final report contain a description of what is discovered.

Feature #13 Measurements - Bunker #1

Same as measurements for Feature #4.

Archaeological Survey of Cabrillo National Monument

Four hundred years ago the first Spanish explorers anchored their vessels behind Ballast Point and began the first investigation of the eastern shoreline of Point Loma. Among the first items reported in the logs of these ships was a description of the Indians occupying the peninsula. These people were the Yuman speaking Diegueno, the Historic Indian of San Diego. Their culture, however, extends back at least two thousand years into antiquity.

Very early in the occupation of the San Diego region the mission fathers recorded the names of two of these villages. They were located in the area of La Playa and on the elevation above the Roseville settlement. At La Playa the village was called Totakamiam, the village above Roseville was named Pauipa.

A prehistoric trail passed through both of these villages and extended to the south along the terrace of the eastern slope of Point Loma, ending at the tide pool area
near the present Naval Underwater Center. Numerous shorter trails passed up the western sloping canyons south of the Point Loma Sewage Treatment Facility. These other trails joined the main trail on the eastern slope. This main trail passed through the entire length of Point Loma, ending at the Indian village of Cosoy on the other side of the San Diego River.

The best descriptions of the prehistoric Indians were given by the mission fathers. This part of the culture history is covered specifically in Chapter II of this report. It should be noted that the preceding culture, the La Jolla Complex, also occupied various areas on Point Loma in town ranging from approximately 8,000 B.P. up to the time of their amalgamation with the Yuman culture intrusion into the San Diego region. It is also to be expected that the earlier San Dieguito culture, which has been given the time span of roughly 11,000 to 8,000, also occupied hunting and gathering sites on the Point Loma peninsula.

A few discoveries of archaeological material related to the San Dieguito Phase II and Phase III have been reported from Point Loma, principally by Dr. George Carter and the author. These, however, have been incidental or rare finds and no San Dieguito sites have yet been reported from the peninsula area.

The effect of European culture on that of the local
Indians brought about the same difficulties in San Diego as has been noted in other areas of California where European cultural accretion replaced, to a large extent, that of the indigenous culture. The Indians, during the period of early American and late Mexican occupation, found a small number of work tasks available to them. These were principally various types of ranch work, and the whaling activities which centered about the whaling station on Point Loma. Here, also, cattle hides were prepared and stored. The best descriptions for these activities are found in Dana and Scammon.

The first serious scientific attempt to develop an ethnology of the Indians of San Diego and the first archaeological investigations that were conducted on Point Loma took place from 1902 to 1920. This early period brought the University of California archaeologists, N. C. Nelson and H. O. Welty, on the scene and they provided the first archaeological descriptions on Point Loma.

None of these sites were located within the present boundaries of the Cabrillo National Monument. However, this series of sites provided the first basic published information on Point Loma archaeology. The material was published in Alfred L. Kroeber's *Handbook of the California Indians* in 1925 and provided Dr. Kroeber with cultural information which he quoted after analysis in his description.
of the Diegueno Indian.

The sites were recorded by the University of California Archaeological Survey and they are to be found in the University of California Archaeological Survey, Site Survey Records under numbers SDi-44 through SDi-49. The largest number (five in all) of these sites was located along the present course of the San Diego River where it empties into Mission Bay.

Most of these sites were destroyed during the necessary excavations for the Mission Bay development project. Three of the sites are located on the east side of the Point Loma peninsula. One is located south of La Playa and the other two approximately a mile north, all of these were situated on the prehistoric beach trail which was noted before. In the 1930's and again in the 1950's, Dr. George Carter, Distinguished Professor of Geography, presently at Texas A & M University, conducted a series of surveys in San Diego County and included Point Loma in his study. He noted a number of hearth sites (i.e., food preparation sites) the references for this report are found in Dr. Carter's book, *Pleistocene Man in San Diego*, published in 1957. The pertinent data is to be found on pages 272-277.

Additionally, a report is also included in the L. G. Hertlein and U. S. Grant, IV publication, *The Geology and Paleontology of Marine Pliocene of San Diego, California*. 
As was noted earlier in the section on geology, the Hertlein-Grant publication of 1944, page 40, describes the discovery of a fragment of a camelopus jaw from the vicinity of Fort Rosecrans. There is no indication that this paleontological find is related to, or was related to, any given cultural material, but it is being noted here as an item which should be researched in greater depth at the earliest opportunity.

One of the most sought after associations in early man archaeology in California is the hope of discovery of cultural material with the remains of extinct Pleistocene animals. Such a discovery, obviously, would provide hard scientific evidence for a long period of occupation by man in the western hemisphere.

During the 1950's, the author had an opportunity to examine some of the areas on Point Loma which were then coming under fairly intensive development. The results of these investigations supported the discoveries of Dr. Carter. There was also an opportunity, at that time, to examine the two sites north of La Playa which were originally discovered by Nelson and Welty. At this time, Dr. Joan Jensen of California Western University was conducting a program in Prehistoric Sites Archaeology. Her students were excavating the northernmost of the three Nelson-Welty sites on Point Loma. The author examined the excavations at the request of the instructor. After study-
ing the recovered cultural material and the stratigraph he defined the site as Diegueno to a depth of about eighteen inches and La Jolla from eighteen inches to maximum depth in the midden, which was approximately thirty-six inches. This was the normal stratigraphic sequence for the two cultures. A report was written by the students and a copy of the manuscript is in the author's file.

The next archaeological activity took place out in the Point Loma area when a one-day survey by Dr. Claude Warren was made at the request of the Cabrillo Monument historian, Mr. Ross Holland. The results of that survey are as follows:

On the basis of this survey it appears that no archaeological remains are present within the boundaries of Cabrillo National Monument. However, reports of sites elsewhere on the Point, as well as the presence of the camelopus find, indicate that Point Loma may contain rich archaeological sites, as well as the remains of Pleistocene fauna.

... It should be noted that construction on the present property will possible reveal buried sites or remains of Pleistocene fauna. These possibilities should be taken into consideration during such construction.

Warren's survey was undertaken on December 26, 1969. From the time of the Warren survey until the present no other archaeological surveys have been conducted within the Monument boundaries. The continuing practice of the
author to investigate any reports of cultural material discovered in and around the park area being the only exception.

On a number of occasions in the past sixteen years approximately twenty reports have been investigated. One was the discovery of a human remain within the Fort Rosecrans boundaries in 1962.

Excavations for road preparation (resurfacing) encountered a flexed burial with orientation of the body through its long axis north and south, lying on its left side facing east. Some food shell material, a mano, and fragments of a large irregular slab rock metate were discovered in direct association with the burial. The author, at the request of the F.B.I., identified it as a La Jolla burial of the late phase placing a date of approximately 5,000 to 6,000 years before the present. The remains were then covered and left in place where, presumably, they are to this day.

No permission was granted for further investigation of the area although it must be concluded that there is a large La Jolla site in the near vicinity of the road, south of the interior gate to Fort Rosecrans. From time to time, various finds of projectile points and other more easily recognized artifact material have been brought to the author's attention. The principal amount of this material falls within the cultural tool assemblage of the
Diegueno. A few San Dieguito or La Jolla artifacts make up the rest. All of these were from areas generally on the east side of the peninsula and represent erratic finds rather than indicating the location of archaeological sites.

Area I

Area I is the principal and central locus of buildings, roads, parking lots, lighthouse, garage, and the Whale Watch of the Cabrillo National Monument. These areas have all been graded or filled to varying elevations or depths in order to level the crestline or top of the central southern area of the Park. The paths and roadways are all covered with asphalt and a detailed investigation produced no evidence of archaeological remains within this area.

Any site which had been present would have undoubtedly been destroyed or seriously damaged by the intensity of the development. There are, however, some peripheral areas which are presently covered by plantings of small decorative brush and trees with a thick covering of succulents which make it impossible to examine the surface without their removal. It is in these areas that sites, if they exist, have been masked by fill and by the intense amount of foliage.

No sites of archaeological significance were discovered within Area I.
Area II

Area II extends from the northernmost boundary of the Park where the maintenance buildings are located, and extends directly south from them to the boundary at the foot of the intersection of Gatchell and Cabrillo Roads.

The topography in the area is extremely steep and falls away to the west from an elevation of nearly four hundred feet to the terraces of one hundred and twenty-five to one hundred feet which parallel the western side of Point Loma. The area is not conducive to human occupation, as it is much too steep and is completely exposed to the prevailing northwest winds throughout its length.

Area II, however, is cut by a number of small drainage cut canyons that begin near the crest and drop steeply to the west where they empty into the sea. The outer reaches of all of these topographic features, within the Park boundary, fall in Area II. Investigation of these canyons produced no evidence of cultural material other than that of recent origin (i.e., beer and soft drink bottles).

During the survey, attention was drawn to the intense amount of cover, mostly scrub chaparral. The slopes and most of the level ground was masked by vegetation and could not be observed. Great difficulty was encountered
in running foot traverses through the area. However, five traverses parallel to the long axis of Area II and twelve at right angles were made over a period of two days. The results were negative.

No sites of archaeological significance were discovered in Area II.

Area III

Area III is bounded by the shore to the east and the crestline of Point Loma to the west. The north and south boundaries are precisely those boundaries of the Cabrillo National Monument before the latest inclusion of new Park property. This is the area of the Visitor's Center and the overlook where the statue of Juan Rodriguez Cabrillo is in place. It is also the area of the main parking lot and, as a consequence, all of the surface of the area has been graded and to a large extent covered by asphalt.

Investigation of the periphery of these areas produced no evidence of archaeological material. But, again it must be noted, as in Area I, that there is the possibility that archaeological sites were masked by earth when the leveling process was done. Additionally, the fact that succulents, decorative shrubs, and other flora have been planted in those areas where soil is still exposed. The vegetation masks these surfaces to such a degree that it
is impossible to determine whether sites exist beneath
the cover.

The principal undeveloped region of Area III is a
series of terraces where there is a gentle ingradient.
The west area slopes rather steeply from the crest of
the ridge to the east where a large one hundred and twenty-
five foot terrace with a series of smaller terraces have
provided excellent sites for U. S. military activities in
the past. Twenty ground traverses, utilizing four people
at a time, were conducted over a period of three days and
failed to discover any archaeological sites.

The natural cover is more intense on this side of
Point Loma than on the western slope and it is better
developed in size. The canyons are very steep and the
surface quite irregular. It is unlikely that the sites
would be located in this area because of its distance from
and difficulty of access to the beach. The few beaches
that do exist on this side are small and subject to tidal
coverage. It would be unlikely that they were used for
anything except the most limited kind of gathering.

No sites of archaeological significance were dis-
covered in Area III.

Area IV

Area IV is bordered on the north by the original
southern boundary of the Park and is triangular in shape.
The portion represents the newest edition to the Park. It is small in area and is similar in topography and vegetative cover to that of Area III. Ground traverses through the bushes of this area, where it could be accomplished, disclosed no evidence of archaeological material. The caveat for masked sites holds true for Area IV.

No sites of archaeological significance were discovered in Area IV.

Area V

Area V extends from the Water Filtration Plant's southern boundary to the Naval Underwater Center at the southwestern end of Point Loma. The boundaries east and west are the ocean on the west side and the ridge line of Point Loma's crest on the east.

The area, excepting for the roads and three parking spaces on the coastal terrace, is covered with a dense growth of scrub and chaparral. The surface of the ground is masked by heavy undergrowth to such a degree that cutting passage through would create paths and cause serious damage to the natural cover. Thus, it was necessary to conduct part of the archaeological survey on an intuitive reconnaissance plan. This means that those locations within Area V which were, in the opinion of the survey director, most likely to contain sites were investigated on foot.
Area V is sectioned by two roads which run roughly north and south. The first road parallels the shore and extends from the Naval Underwater Center to the Water Filtration Plant boundaries. It is at an elevation of approximately one hundred feet above sea level. The second road is the access road to the lower portion and it extends from the top of the ridge crest of Point Loma in the north (at the entrance to the National Monument) and comes down in a generally southwesterly direction where it meets the lower road at the Naval Underwater Center. The areas between the roads, as before described, are heavily masked with vegetation. The area is cut by a number of fairly shallow canyons which widen into sharp walled arroyos or gullies as they near the lower road.

Just opposite the northernmost parking lot, in Area V, there is a deep-cut canyon which falls from the upper elevation by the road and ends at the lower road at a concrete revetment now in much disrepair. Originally it must have channeled the seasonal flow of water under the road in order to keep it safe from erosion. Special Note: One small Torrey Pine tree stands halfway up the slope at the approximate mid-point position in Area V. The small tree stands between the two roads on a fairly gentle slope just below a two inch water line. There is also a faucet attachment and a basin at this point. The tree is remarkable in that it stands alone and is the only one of its
species in the area. The tree at this stage of its growth is approximately eighty to eighty and a half feet high, it is wind warped, but is in healthy condition. Estimated age is approximately ten years.

Archaeological Sites Discovered in Area V

Site CNM-M-#1

This is a partially buried La Jolla culture site. The site is identified principally because of the occurrence of food shell material discovered eroding out of the face of a small road cut. The depth is approximately three feet below present surface. The site is located about twenty yards along the lower road south of the upper parking lot (lot #3) at a halfway point between the two military stations at the extreme ends of Area V.

The area exposed shows the California mollusk in greatest abundance along with some chione. No artifacts were discovered on the immediate surface. The lateral dimensions of the site indicate it to be very small.

It is the opinion of the author that the site was a small food preparation area and is not significant. As only a small portion is exposed, however, caution must be taken in the event of any development in the area of the site.

Site CNM-M-#2
This site, located along the lower road about one hundred yards south of #1, appears to have been a small gathering site that was badly disturbed when underground signal cables were placed through it by the Naval Electronics Laboratory. The cables were in a trench that had been excavated to a depth of four feet. Investigation of the cut showed that the midden was masked by slope drift of the trench excavation, cultural debris from the site was again food shell in the form of turban shell, chione, California mollusk. Some fragments of thick Pismo clam valves were also discovered. A number of fractured rocks appear as anomalies mixed with the usually rounded conglomerate of the area. The lack of pottery evidence and other criteria marking Diegueno artifact assemblages indicate that it is a La Jolla site. The size of the site and the small amount of food shell material would indicate that it was a collection and food preparation site. The site is not significant archaeologically.

Site CNM-M-#3

This site is located directly off of the lower road in front of a green metal post about seventy-five yards south of #2. The post marks some kind of junction for electrical equipment and has a yellow danger tag on it. The site appears to be about twenty feet by twenty
feet. It is a remnant that has been cut by the road. Surface examination discovered only shell and some broken rock. It appears that the site has been cleaned of surface artifacts at some time in the past. Reconnaissance indicated none on the surface of the near area. The site is another food gathering and preparation area located back from the shore. It is La Jolla in origin. The site is not significant archaeologically.

Recommendation

It may be argued that no cultural remains are insignificant in an archaeological context and there is some justification for this position. Nevertheless, there is no logical rationale for the permanent preservation of every grinding slick and temporary food preparation site in the area. The guiding principal should always be can any increase in our knowledge or public benefit be gained in preserving a site?

In light of the foregoing, therefore, it is the opinion of the author that no sites of archaeological significance were discovered in the survey. In case of development in or on the areas of the reported sites, a qualified archaeologist (i.e., a scholar with a terminal degree) be present during excavation. In addition, is should be part of any development plan that an archaeologist be present during any earth moving.
CHAPTER V

RECOMMENDATION RELATING TO THE RESOURCE POTENTIAL IN THE CABRILLO NATIONAL MONUMENT

Physical Environment

Whenever possible, every effort should be made to record and preserve unique geologic features, this particularly in the case of paleontological material. It is recognized that saving all unique geologic features is impossible, because they are often small, widely scattered, and of low or indeterminate value. However, recommendations for the preservation of specific sites must be predicated on the compilation of a more comprehensive inventory. When the inventory of unique geological features is more complete it should be distributed to local geologists, paleontologists and naturalists so that they can suggest priorities for preservation.

Perhaps a good first step would be to make a compilation of the field trip routes and stops used by interpretative personnel. The features already mapped might be combined with field trip stops and other specific features such as the historic sites and the more interesting mineral deposits. Such a compilation would give an indication of
the distribution and concentrations of points of interest.

After additional cataloging has been completed, a process should be established not simply to protect and preserve sites, but also, to investigate and utilize them. Areas should be established then as education and research preserves.

An informed education program to help field personnel recognize potential fossil sites should be considered. In addition, established procedures for communicating paleontological discoveries to interested scientists should be of real value.

Geologic and soil investigations of proposed development sites, to determine the presence of potentially unstable conditions, should be conducted.

Grading, earth moving, and landscaping operations within the coastal management zone should provide for a naturalistic form of soil and wide use of native vegetation.

**Landslide Dangers**

In most of the rock types that are present in the coastal region, landslides occur. The Cabrillo formation of Point Loma has failed in a number of locations at various times in the past. Slides occur where the rock is weakened by a combination of fault or fracture planes and steep slopes. Failure may be caused by excavating, undercutting of hillsides, stream erosion, or, more commonly, by wave erosion.
Wave erosion of the sea cliffs or bluffs maintains a steep slope along most of the peninsula. Where slide susceptible portions of geological formations and/or faults are present, landslides are a definite possibility.

It is necessary that continuing attention to this possibility of landslides be directed to area where the development of structures, trails, or observation areas are proposed or already in existence.

When developing certain areas within the park, special attention should be directed toward the possibility of potential earthquakes, seismic sea waves, flooding, or unstable soil. Development should be carefully regulated, retained as open space, or assigned to other appropriate use that will not create demands for major alterations to the natural environment for protection against such hazards.

The Pacific Ocean creates a stable environment over the water surface and gives rise to the wind patterns resulting from pressure difference in the air mass. Because pressure differences exist and air mass movement is generally from west to east, moist air tends to move in over the Cabrillo Monument from the ocean. Water temperatures and ocean currents are closely related to air temperature and air movements.

In 1972, scientists of Scripps Institution of Oceanography wrote that the recent weakening of the cold California Current has and will allow tropical storms to reach farther
north. Meteorologists agree that storms need warm water for their existence and as long as San Diego coastal waters remain warmer, the County will experience increasing thunder storms and severe weather. As a consequence, tanker traffic along the coast and within the ports should be routed to minimize the possibility of oil spills. Ballast disposal should be regulated to prevent contamination of local waters. State and Federal regulations governing discharge of vessel wastes into State waters should be reviewed, updated and enforced.

The shoreline should be developed in a way that provides for recreational purposes while preserving, as much as possible, the natural environment of the coastal management zone. It is suggested that objections and standards related to the ocean coastline need to be defined and identified. Consideration should be directed to the preservation or enhancement of natural and cultural characteristics. Also, the kinds, locations and character of human activities and development that are compatible in the beach areas. A more comprehensive inventory, analysis, and evaluation of ecosystem resources and processes within the beach zone, including the consequence of shoreline alterations, must be constructed.

Instructional or educational reserves should be established to allow for field trips, field projects, and the regulated collection of materials for laboratory work.
Adequate sites should be set aside for mariculture research and practice which will benefit both higher education and the economy of the State.

**High Quality Vegetative Areas**

Parts of the lands of the Cabrillo National Monument must be preserved because they are in a "high quality" natural state (i.e., where plants and wildlife exist unchanged by man in an ecological balance).

When a natural resource is examined for future planning purposes, its significance is determined in "significant" vegetative cover areas or wildlife are of particular significance because of their sensitive ecological nature, and their value as educational or scientific areas and open spaces.

High quality areas are defined by three criteria.

**Endemic species:** Areas which contain plants of extremely limited distribution, generally found only in specific locations. This includes plants which are found only in San Diego County and those which are rare in San Diego County, but also found elsewhere.

**Research:** Areas of past or current research of native vegetation and its relation within the ecosystem of man, plants and wildlife.

**Undisturbed:** Areas which man has disturbed minimally. This includes areas in which the vegetation may have been
disrupted, but has naturally regenerated to late stages of development.

In addition, it should be noted that the weather, topography, and vast expanses of heavy plant growth make the Cabrillo National Monument a prime target for wildfires.

The Cabrillo National Monument is vulnerable to wildfires for several reasons: Point Loma's Mediterranean-type climate produces a cool, moist growing season followed by long, hot summers when vegetation dries out. The usual moist sea breezes are replaced periodically by dry winds from the north or east. In the southern part of the state, these "Santa Anas" can blow as hard as one hundred miles per hour. In parts of the Cabrillo Monument the topography is steep, rugged, and sometimes impassible.

All of these conditions increase the chances of brush-land wildfires and add to the problems of fire suppression. Firefighters generally agree that the front of a large fire pushed by strong winds through heavy, unbroken fuel cannot be stopped, even with masses of men and equipment. Firefighters can only get out of the way and hope for a break in the weather, the topography, or the supply of fuel.

Conventional firebreaks or fuelbreaks may help, but they cannot always stop the advancing front of such a blaze. The disastrous southern California wildfires of 1970 jumped eight-lane freeways. As a consequence, all safety
measures should be taken during the dry periods.

Examination and Excavation of Cistern

This feature constitutes a future action for productive research. The feature is located adjacent to the restored old lighthouse and was used as a water catchment for the provision of lighthouse personnel.

After a long period of disuse, it has become filled with material washed and thrown in so that the floor is now covered with a deposit of soil and artifact material. Tentative investigation, in 1975, revealed a quantity of objects dating from before the 1900's.

It is recommended that the cistern be excavated after application of safety controls and that the artifact material be cleaned, preserved, and, if in sufficient quantity and quality, be displayed as part of the historical, interpretative program.

Conclusion

It is concluded that this study has demonstrated the desirability and need for a specific historical study utilizing the National Archives and the various military arms of service for the purpose of determining adequately the history and development of the existing military structures within the Monument. Questions that should be answered are directed toward the uniqueness of the military
use of the area and their significance as examples of land use.
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Essay on the Sources

Much of the primary source material used in this paper was made available by the courtesy of the Reverend Maynard J. Geiger, O.F.M., Ph.D., archivist and historian for the Franciscan Fathers at Santa Barbara Mission. The archives of that mission contain thousands of documents (including originals, photostats, and transcripts) pertinent to Spanish-American and California history, as well as a representative library in the field.

It will be noticed that the list contains a number of informes. A word on these is in order. These were reports which the superior at a mission was required to make, ordinarily at the end of each year. They were divided into sections, each referring to a particular sphere of mission work -- "Baptisms," "Marriages," "Granary," "Sowings and Harvests," "Livestock" and similar entries. They contain an invaluable amount of information about the routine, the problems, and the activities of each mission and give an insight into the character of the missionaries. In a study of the California missions they are indispensable. The length of the informe varies from two or three to as many as eight or ten pages, depending on the events in the year covered. Occasionally an extraordinary report was
drawn up to relate or discuss a special question, such as Lasuen's resume of San Diego's history, May 10, 1783.

Among the published primary sources, the translations of the late Herbert E. Bolton were used extensively. The diaries and other writings of Fray Juan Crespi, Fray Pedro Font, and Fray Francisco Palou can be found with good annotation in Dr. Bolton's editions.

The translation of the extant writings of Fray Junipero Serra has been completed by the Reverend Antonine Tibesar, O.F.M. Three volumes are now available and the fourth will be published shortly. The translation includes the Spanish text of each letter, as well as liberal annotation. As Father Serra was the founder of San Diego and the presidente of the California mission system during the years covered in this paper, Father Tibesar's work was indispensable.

The biography of Serra by the man who knew him best—Fray Francisco Palou—is a sine qua non in any study of the first years of California. Father Geiger, a student of California history and of Serra for over twenty years, has recently published his excellent translation of Palou's Vida. This also was frequently used in the preparation of this paper.

In the secondary source material of this study, there are several classics. A special mention must be made of the works of the late Father Zephyrin Engelhardt, O.F.M.
Father Engelhardt was a real pioneer in California mission history, dedicating over thirty years of his long life to the production of his monumental works. These include a four volume general history of the missionization of Lower and Upper California, of which volume two contained the pertinent material for this study. Father Engelhardt also published individual histories of the Upper California missions, including, of course, San Diego. This afforded much valuable information for the paper.

One of the giants of southwestern history was the late Hubert Howe Bancroft. He and his collaborators produced what is perhaps the most complete work in this field.

The translations, relating to early voyages of exploration, are in all cases the best and most scholarly available. Unfortunately, most of the accounts of these voyages are still buried in the archival collections in Mexico City, Seville, or Madrid. All expeditions by sea sent their logs and diaries of the Chaplins to the Vice-roy of Mexico. These, in turn, were copied and distributed to various archives in Spain. Therefore, we should have more or less available most of these primary documents. Unfortunately, research scholars have been unable to find the largest portion of them. Another problem is that because of the various political changes which have taken
place in Spain since, large numbers of these manuscripts have found their way into collections of private individuals. Where possible, personal interviews were conducted with individuals who had knowledge not available in the literature.

As complete a survey as possible of the ethnological and archaeological literature pertaining to the San Diego area was made. Also, the literature relating to the physical environment, where it applies to the topics, is included.

When specific reference to a work was made it is noted in the text; all others included in the bibliography are less directly applicable. They are listed in order that part staff and others will have the greatest possible selection of works available to their further studies.
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