Chapter 1: The Physical Setting

Regions and Landforms:
Let's take a trip

The land surface of California covers almost 100 million acres. It's the third largest of the states; only Alaska and Texas are larger. Within this vast area are a greater range of landforms, a greater variety of habitats, and more species of plants and animals than in any area of comparable size in all of North America.

California Coast

The coastline of California stretches for 1,264 miles from the Oregon border in the north to Mexico in the south. Some of the most breathtaking scenery in all of California lies along the Pacific coast.

More than half of California's people reside in the coastal region. Most live in major cities that grew up around harbors at San Francisco Bay, San Diego Bay and the Los Angeles Basin.

San Francisco Bay

San Francisco Bay, one of the finest natural harbors in the world, covers some 450 square miles. It is two hundred feet deep at some points, but about two-thirds is less than twelve feet deep.

The bay region, the only real break in the coastal mountains, is the ancestral homeland of the Ohlone and Coast Miwok Indians. It became the gateway for newcomers heading to the state's interior in the nineteenth and twentieth centuries. Tourism today is San Francisco's leading industry.

San Diego Bay

A variety of Yuman-speaking people have lived for thousands of years around the shores of San Diego Bay. European settlement began in 1769 with the arrival of the first Spanish missionaries. The bay was seized by United States Marines during the Mexican-American War in 1846-1848.

Development of the area proceeded slowly throughout the later nineteenth century. The coming of the Santa Fe railroad in 1885 spurred population growth as did the establishment of major army and navy bases during World War I. San Diego today has the largest concentration of military personnel of any city in the nation.

Los Angeles Basin

The Los Angeles Basin is the largest lowland area in California that directly fronts the ocean. Long the home of the Tongva people, settlement of the basin grew rapidly in the late nineteenth century. During the boom of the 1880s, the population of Los Angeles swelled from 11,000 to 50,000.

Construction of a huge breakwater along the harbor at San Pedro began in 1899 and was later extended to protect the combined harbors of San Pedro and Long Beach. In 1994 this bustling port overtook New York as America's premier gateway for foreign trade.

Mountains of California

Mountains cover most of the surface of California. The various ranges tended to isolate the diverse Native American cultures that flourished within the present boundaries of the state. The mountains also were formidable barriers during the early decades of European American exploration and settlement.

Mount Whitney, the highest point in the United States outside Alaska, rises to a majestic 14,495 feet above sea level in Sequoia National Park, at the headwaters of the Kings and Kern rivers. In southeastern Siskiyou County is Mount Shasta, a solitary peak of volcanic origin whose summit is 14,162 feet. Just to the south stands Mount Lassen at 10,457 feet.

Mt. Lassen was an active volcano between 1914 and 1921.

The Sierra Nevada and the Coast Ranges are California's two major mountain ranges. The Klamath Mountains and the Cascades are located along the northern border of the state. The Transverse Ranges bisect southern California. The mountainous spine of the Baja California peninsula extends north into the Peninsular Ranges.

Coast Ranges

The Coast Ranges extend from Cape Mendocino in the north to Point Conception in the south. Consisting of uplifted sedimentary material, much of which has been metamorphosed, the Coast Ranges average less than 4,000 feet in height. On the seaward slopes of the northern ranges are forests of coast redwoods, greatly diminished by more than a century of commercial logging.

Mount Hamilton, a 4,261-foot peak located east of San Jose, is the site of the Lick Observatory, built in 1888. Mount Diablo, rising to 3,849 in eastern Contra Costa County, was the scene of coal-mining activity in the 1860s.

Sierra Nevada

The Sierra Nevada is the largest mountain range in California, occupying one-fifth of the total area of the state. It extends more than 400 miles along California's eastern border and contains many snow-capped peaks over 13,000 feet. Several modern highways through the range--including those that cross Tioga, Sonora, and Ebbetts passes--are routinely closed in the winter.

The eastern side of the Sierra Nevada rises steeply, whereas the western side has a more gentle slope. Forests of pine, fir, and cedar cover the lower elevations. Rushing mountain rivers have cut dozens of deep canyons in the western Sierra. Glaciers sculpted the sheer granite cliffs of the spectacular Yosemite Valley.

The placer gold discovered in California in 1848 was eroded from rock outcroppings in the high Sierra and deposited in stream banks and ancient riverbeds of the western foothills.

Central Valley

The Central Valley lies between the Coast Ranges and the Sierra Nevada. More than four hundred miles long and about fifty miles wide, the Central Valley is the most productive agricultural area in California.

Oak woodlands and bunchgrass prairies once covered the valley floor and great tule marshes extended over the flood plain. Beavers in the inland streams first lured European Americans across the continent to California in the 1820s. Overhead is the Pacific flyway, a heavily traveled route for migrating birds. Beneath the surface of the valley lie rich deposits of oil and natural gas, created millions of years ago from the remains of marine plants and animals. Irrigated cropland today covers most of the valley and produces more agricultural products than any comparable region in the world.

The Central Valley is really two valleys in one. In the south is the San Joaquin Valley , drained by the northward flowing San Joaquin River; the Sacramento Valley lies to the north and is drained by the southward flowing Sacramento River.

San Joaquin Valley

Ancestral home of the Yokuts and Miwok Indians, the San Joaquin Valley extends southward from the Sacramento River to the Tehachapi Mountains. European Americans first entered the valley in the 1770s, pursuing deserters from the coastal missions. When Jedediah Smith and other trappers came to the valley in the 1820s they reported that "Beaver were abundant in all the Creeks & Rivers."

After the gold rush European settlers established vast wheat farms on the valley's fertile soils The coming of the Southern Pacific Railroad triggered further agricultural development but also led to disputes over land ownership between the farmers and the railroad.

The great Central Valley Project, constructed in the mid-twentieth century, guaranteed sufficient water for the diversification of crops. Today the valley produces tomatoes, potatoes, alfalfa, sugar beets, cotton, olives, almonds, peaches, and dozens of other fruits

and vegetables. The valley's largest cites are Stockton, Fresno, and Bakersfield.

Sacramento Valley

Flowing through the heart of the valley is the four hundred-mile long Sacramento River. The Sacramento River carries one-third of the annual runoff of all California streams, the largest flow of any river in the state.

Many Native American cultures flourished in the Sacramento Valley prior to European exploration in the late eighteenth century. The valley bears the Spanish name for the "Holy Sacrament," a name first applied to the Feather River by Gabriel Moraga in 1808.

Johann Sutter, a German-speaking Swiss immigrant, established the first European settlement in the valley on a Mexican land grant at the confluence of the Sacramento and American rivers. During the gold rush hordes of people heading for the mines in the foothills of the Sierra Nevada crossed the valley. Sacramento, Marysville, Yuba City, and other towns flourished as supply centers for the miners.

Wheat farming dominated the valley economy in the 1870s and '80s. Improvements in irrigation and transportation led to diversification of crops, including the raising of apples, apricots, pears, walnuts, rice, barley, alfalfa, safflower, and sorghum. The largest city in the valley is Sacramento, the state capital.

California Deserts

Much of the eastern half of southern California is a large desert triangle--a vast expanse of sandy valleys, dried lake beds, and short ranges of rugged mountains. These southern deserts were as much a barrier to overland migration to California in the eighteenth century as the steep eastern face of the Sierra Nevada was in the nineteenth.

Mojave Desert

The Mojave is the largest desert in California, covering some 25,000 square miles. Much of the surface consists of immense stretches of sandy soil. Active volcanoes erupted long ago, depositing layers of lava, mud, and ash onto the desert floor. Today the region is dotted with extinct volcanic cones and small isolated mountain ranges.

Several Native cultures, including the Quechan (Yuma) and Mojave, flourished along the Colorado River. Others, such as the Cahuilla and Serrano, lived farther west. The Old Spanish Trail crossed the region in the late eighteenth century, as did the Santa Fe railroad in the nineteenth. Today the region supports several resort centers and successful farming communities in the western Antelope Valley. Dry lake beds contain rich deposits of boron, a valuable mineral used for jet-engine and rocket fuels.

Colorado Desert

The Colorado Desert stretches over 4,000 square miles in southeastern California. Part of a great depression that extends southward to the Gulf of California, the desert lies 245 feet below sea level at some points.

The Colorado Desert includes the Coachella and Imperial valleys with the Salton Sea between. The Salton Sea was formed in 1905-1907 when waters from the Colorado River overflowed an irrigation system. Irrigation today supports a thriving agricultural economy in both the Coachella and Imperial valleys. Leading crops include lettuce, alfalfa, cotton, and sugar beets. Palm Springs is an elegant resort community, famous for its warm winter sunshine and star-studded population.

Death Valley

The most notorious of the California deserts is Death Valley, a deep trough about 130 miles long and six to fourteen miles wide. In the center of the valley is Badwater, the lowest point in the Western Hemisphere at 282 feet below sea level.

Death Valley was named by a group of gold-seekers who struggled through the region in 1849. Following the discovery of rich deposits of borax in 1873, the valley became famous for its twenty-mule teams hauling out wagon-loads of this valuable mineral. Because of its scenic, scientific, and historical interest, the region was included within the Death Valley National Monument in 1933.

The Climates of California:
Is "Sunny California" always sunny?

As early as 1840, author Richard Henry Dana flatly asserted that "California is blessed with a climate of which there can be no better in the world."

The image of the state as a land of perpetual sunshine--"It Never Rains in Southern California," as the song goes--has an obvious appeal. But California's climates are far more complex than the popular image suggests. Indeed, the climates of California are as diverse as those of southern Ireland and the northern Sahara. California has four of the five major climate zones found around the world (only the hot and rainy tropical climate is not represented). Included are the Mediterranean, semi-arid or steppe, desert, and microthermal or Alpine climates.

And no, "Sunny California" is not always sunny! Average yearly precipitation is about 24 inches, with rainfall ordinarily occurring between late October and early May. The heaviest precipitation falls along the northwest coast where annual rainfall ranges up to 110 inches.

Mediterranean Climate

Historian Kevin Starr, in his Americans and the California Dream (1973), called the state "an American Mediterranean." The description is apt for much of coastal California and parts of the interior valleys that enjoy a Mediterranean climate with relatively warm, dry summers and mild winters.

Even within this zone, however, are important regional variations. Along the coast, marine air and fog keep temperatures more moderate than in the Central Valley where summers are generally hot and cloudless. An intermediate version of the Mediterranean climate is found in the Coast Ranges and the foothills of the Sierra Nevada.

Semi-arid or Steppe Climate

The semi-arid or steppe climate zone encompasses much of the San Joaquin Valley and the fringes of the Mojave Desert. Rainfall here is less and temperatures are generally warmer than in the Mediterranean zone. A cooler version occurs in a narrow coastal strip from Los Angeles to San Diego.

Notable for its sunny summers, pleasant winters, and little rain, this and the Mediterranean climate zone are what best qualify California for inclusion in the nation's booming "Sunbelt." The air pollution that has plagued the region in the twentieth century--casting a noxious pall over sunny California--is the result of a sunlight-activated chemical reaction among pollutants trapped by a combination of onshore winds, interior mountains, and temperature inversions (in which cooler marine air is trapped beneath warmer air above.)

Desert Climate

A desert climate exists in the southeastern third of the state, east of the Sierra Nevada and Peninsular ranges and in the southwestern part of the San Joaquin Valley. Cut off by mountains from moisture-laden Pacific storms, this region receives very little precipitation. Here lies Owens Valley, celebrated by author Mary Austin as "the land of little rain" and scene of one of the most bitter water disputes in California history.

Summer temperatures in this region are the highest in the state, averaging over 100 degrees Fahrenheit in July in Death Valley. The highest temperature ever recorded in the United States, 134 degrees, was recorded in Death Valley on July 10, 1913.

Microthermal or Alpine Climate

The microthermal climate of California is much like that found in the Alps where summers are short and cool and winters are vigorous. Average temperatures in the coldest month are below freezing at the higher elevations of the Sierra Nevada, the Modoc Plateau, and the Klamath Mountains.

Most of California's water supply originates in these higher elevations as winter

snowpack and spring runoff. About three fourths of the annual precipitation occurs in the mountainous northern third of the state, whereas about 80 percent of the water demand (mostly for agriculture) occurs in the southern two-thirds. Moving water from where it naturally occurs to where demand has been created has been one of the greatest challenges in the history of California.

The California State Flower

The official California State Flower is the Golden Poppy. Easily distinguished by its four brilliant orange, satiny petals and finely divided, gray-green leaves . It can be found blooming from March through May on hillsides and valleys across California.

The Golden Poppy's scientific name, Escholtzia californica, comes from an Estonian physician, Johann Friedrich Gustav von Escholtz, who visited San Francisco Bay aboard the Russian ship Rurik in 1816. Also aboard the Rurik was the self-taught botanist Adelbert von Chamisso who named the flower in honor of his friend and traveling companion.

In 1913 the legislature adopted the Golden Poppy as the California State Flower: "Its satiny petals, bright with the gleam of our gold mines, rich with the sheen of our fruits, and warm with the radiance of our sunshine, typify the ideal of California as no other flower could."

The California State Bird

The California quail (Callipepla californica) was named the official California State Bird in 1931. [Alternative name: California Valley Quail (Laphotyx californica). A plump bird, the California quail is easily recognized by its prominent forward-curving, teardrop-shaped plume. The adult male has a bluish-gray chest with white bands below its chin and over its eyes.

The California Quail is found in mixed woodlands, brushy foothills, and in suburban parks, usually near permanent sources of water. Highly gregarious, coveys of up to two hundred individuals may assemble in the fall and winter to descend on city parks and gardens to feed on seeds and invertebrates.

The California State Tree

In 1953 the magnificent California coast redwood (Sequoia sempervirens) became the official California State Tree. Among the coast redwoods are the world's tallest trees, some having reached a height of more than 360 feet. Their massive trunks are usually 10-15 feet in diameter, but their tiny cones are only about one inch long. The fibrous bark is reddish brown; the crown is open and irregular.

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Once widespread on the seaward slopes of the northern Coast Ranges, the redwoods have been greatly diminished by more than a century of commercial logging. Conservation efforts date back to the mid-nineteenth century. The Save-the-Redwoods League, founded in 1918, was among the many groups instrumental in funding and creating preserves of old-growth trees. Activists in the early 1990s renewed the campaign to block the cutting of the remaining 5 percent of virgin redwood forests.

The California State Animal

The official California State Animal is the grizzly bear (Ursus horribilis californicus), so designated by the state legislature in 1953. Once common in California, the grizzly bear was exterminated in the state because of its reported ferocity. The last reported California grizzly was killed in 1922.

Among the largest bears in the world, grizzlies grow up to eight feet long and weigh more than eight hundred pounds. Their name comes from the white-tipped fur that gives them a grizzled or gray-streaked appearance. Their overall color varies from creamy-brown to almost black

The grizzly bear was feared and honored in many Native American cultures. During the Spanish and Mexican periods, grizzlies were hunted for meat and captured for sport.

Vaqueros would capture a grizzly, transport it to a bull ring, and tie its hindleg to the foreleg of an enormous, long-horned California bull. Spectators then placed their bets on whichever animal they believed would survive the fight.

A favorite symbol for California, the grizzly bear appears on the state seal and flag.

The California State Mineral

Not surprisingly, gold is the official mineral of the Golden State. Treasured because of its scarcity, beauty, softness, and malleability, gold has been valued throughout the ages.

The origins of California gold stretch back through the mists of geologic time to the very creation of California. According to the theory of plate tectonics, the subduction of the Pacific Plate beneath the western edge of the North American Plate generated enormous heat. Within this molten crucible, metal-rich compounds dissolved into solutions that were injected into fissures of rocks being formed above. Thousands of veins of gold thus were created in the granite core of California's primordial mountains. Over eons of time, erosion tore lose tiny particles of gold and washed them into rivers and streams, where they lodged on sandbars or behind stones. There most of the particles lay undisturbed until their widely publicized discovery on January 24, 1848.

As news of the gold discovery spread, newcomers came to California from across the country and around the world. Between 1848 and 1854, the peak year of production, miners harvested nearly $350 million in gold. The gold rush was the foundation for the economic history of California, and for much of its social, cultural, and political history as well.

The California State Rock

The official California State Rock is serpentine. It serves as a host rock for such valuable minerals as asbestos, chromite, magnesite, and cinnabar.

Often mottled in various shades of green, serpentine can be polished to a marblelike sheen. It is often used as an ornamental stone, known as verd antique or serpentine marble. Buildings throughout California have decorative elements fashioned from this

beautiful native rock.

The California State Reptile

The state legislature designated the desert tortoise (Gopherus agassizi) as the official California State Reptile in 1973. The desert tortoise grows to ten to fourteen inches long and can be found in dry, sandy areas throughout southeastern California. Like its distant relative, the giant tortoise of the Galapagos Islands, the desert tortoise has a brown, dome-shaped shell and thick, stumpy legs.

A protected species, the desert tortoise is remarkably long lived if not removed from its native habitat. It typically feeds at dawn and dusk and lies in a shallow burrow throughout the day, sometimes sharing its underground home with the occasional rattlesnake or owl.

The California State Fish

In 1947 the state legislature selected the golden trout (*Salmo aguabonita*) as the official California State Fish. (*Alternative name: Oncorhynchus aguabonita.*)

A brilliantly colored fish, the golden trout has bright red markings on its sides, underbelly, and cheeks. Along its spine, dorsal and caudal fins, are large, black spots. It grows to 28 inches in length.

The golden trout was originally found only in the waters of the Kern River in the southern San Joaquin Valley. Later it was introduced to mountain streams throughout the higher elevations of the Sierra Nevada.

The California State Insect

In 1973 the state legislature selected the dog face butterfly (*Zerene eurydice*) as the

official California State Insect. *[Alternative name: Colias eurydice.*] The dog face butterfly is brilliantly colored and has a wingspan of less than two inches. The male's fore wing is purplish to pinkish orange with dark purplish brown along the front and outer edges. The pattern of the orange area resembles a dog's face in profile. The female's fore wing is entirely yellow except for a conspicuous black dot. The hind wings of both sexes are a brilliant yellow.

The dog face butterfly is found in open woodlands along coastal California south to the Baja California peninsula.

The California State Marine Mammal

In 1976 the state legislature named the gray whale (Eschrichtius robustus) as the official California State Marine Mammal.

Gray whales were hunted almost to extinction in the nineteenth century. Whalers from the United States and England frequented California ports during the Spanish and Mexican periods. Stations for offshore hunting were established during the early American period from Crescent City in the north to Point Loma on San Diego Bay in the south.

The gray whale averages about 36 feet in length and can be spotted from the California coast during their migration. The gray whales summer in the Bering sea or other northern waters and spend the winter in favored breeding areas in coastal Baja California. In most years, the first southern-migrating individuals pass along the California coast in December with peak numbers passing by in early January. Northward movement may begin as early as February. Mother-calf pairs often travel at a leisurely speed and very close to the shoreline from April to June. Their migration is the farthest of any mammal.

The California State Fossil

The saber-toothed cat (Smilodon californicus) was named the official California State Fossil in 1968. Common in California 40 million years ago, the saber-toothed cat was a powerful, tiger-sized carnivore with eight-inch fangs. It hunted thick-skinned animals such as mastodons and woolly mammoths.

The saber-toothed cat became extinct about 12,000 years ago, but many bones have been excavated from the La Brea tar pits in Los Angeles. The saber-toothed cat and other prehistoric mammal bones from the tar pits are displayed at the George C. Page Museum on Wilshire Boulevard.