



PART I

Gateway to the West



The Bay and the Land

"... an immense arm of the sea, or an estuary, which penetrated into the land as far as the eye could reach . . ."

—PADRE JUAN CRESPI

WHEN the first settlers, led by Lieutenant Jose Joaquin Moraga, arrived June 27, 1776, on the site of San Francisco, the American people were yet to declare themselves a Nation—though within seven days they would do so, 3,000 miles away on the Atlantic seaboard. Seven decades would pass before the heirs of '76 would raise their flag on this site. Two years more, and the name of San Francisco would go round the world.

It "never was a village"—this had been its proud boast. Where barren sand dunes, marshes, and brackish lagoons had surrounded an abandoned mission and a decaying fort with rusty cannon, San Francisco sprang into life overnight—a lusty, brawling he-man town of tents and deserted ships. Business, mushroomlike, flourished in mud-deep streets. Almost before it had achieved a corporate identity, San Francisco was a metropolis—to be named in the same breath with Boston or Buenos Aires, Stockholm or Shanghai.

When the other cities of the Coast were still hamlets in forest clearings or desert cow-towns, San Francisco was "The City." It is "The City" still. Massed on the tip of its Peninsula, its skyscrapers tower skyward from the peaks of the highest hills: great shafts of concrete banked in swirling billows of white mist when the fogs move in from the sea—glittering with pinpoints of reflected light from their countless windows when the sun shines from a clear blue sky. Crowding on each other, the hills rear their endless terraces of buildings, descending to the water's edge like steps, cleft by streets that strike up the steepest slopes and plunge down the deepest valleys with reckless fidelity to their straight and narrow paths.

Around the curving Peninsula's tip jut widespread fingers that are piers harboring their great ships. Soaring to heights greater than the hilltop skyscrapers, the girders of the bridge towers lift their slim steel spans high above the smokestacks of passing ships. Over their suspended roadbeds traffic streams across the racing tides of the Golden Gate to the bluffs and thicket-choked gullies of the Marin shore and across the Bay's wide sweep of gray-green water to the mainland. There, on the

eastern shores of the Bay, rising like the tiers of a vast amphitheater to wooded crests, spread mile after mile of buildings—homes and schools, business blocks and factories. And on every side the age-old hills—vivid with the green of fresh-growing grass after winter rains, sere and brown in summer—encircle the blue water: wilderness neighbor to the city.

THE OPENING OF THE GATE

If some titanic convulsion of the earth were to drain San Francisco Bay of all its waters, it would look merely like one of those shallow, hill-rimmed valleys which stretch away from its upper and lower reaches. Through a gap in the chain of hills along its eastern edge, a great river would pour into its upper end and, winding southward, flood out to sea through a deep gorge hollowed in the coastal range. Within the recent geologic past the Bay was just such a valley, the Golden Gate such a river canyon. But as time went on, the valley sank until ocean waters came flooding through the Gate to submerge all but the peaks of its hills. Last of all in the long series of the earth's transformations from which emerged that part of the planet known as California was the Bay's creation. But the geologic upheavals destined to open the Golden Gate had begun long before.

West of today's Pacific shore, perhaps 500 million years ago, rose a land mass extending into what is now the Pacific Ocean. Where the Sierra Nevada now rises is thought to have been a low land mass, lapped on the Nevada side by an inland sea. As the eons passed, this great basin sea advanced westward into California, retreated and advanced again, until by 200 million years ago it may have reached as far as the site of Monterey—well over toward that westward-lying coast along the ocean.

Eventually the ocean itself found its way into the watery area that later was to become California. The western land mass probably was cut off from the mainland, forming an elongated island of which the present Farallon Islands were a part. Eastward lay a submerged trough, and into this trough sediment was continually draining from the island's slopes. To the incredible depth of over three miles the sediment was laid down in the water, slowly solidifying. From this trough was later elevated the San Francisco Peninsula, its foundations partly composed of the thick deposits which drained from the westward island.

And then began that long series of geologic events which finally resulted in the emergence of the coastline of California. Between 120 and 150 million years ago the ridges of both the Coast Range and the Sierra Nevada were pushed up. Unlike the Sierra Nevada, which was to maintain its general structure despite erosion, the Coast Range rose from the inland sea only to sink again. At least three times the ocean en-

gulfed the region between the Sierra Nevada and the westward island and advanced to the foothills of the Sierra Nevada.

At a point about 36 million years ago, the picture of California begins to emerge in clearer detail. On the eastern border is the wall of the Sierra, following about the same direction as in the twentieth century, but lower, less rugged, its slopes covered with luxuriant vegetation. Still under water, the center of the State is a great inland sound, extending far enough westward to submerge the site of San Francisco. A long island stretches northwest from the present vicinity of Salinas. Islands are scattered in the sound.

For many million years the geography of this California changed little; but great activity was brewing in the earth. Far offshore the bottom of the sea was sinking. As it sank, the land along the coast was thrust upwards, buckling under the pressure. All of California was rising, but the extra thrust upon its western edge caused a slip along which occurred a sidewise movement of at least 700 feet and possibly as much as 20 miles. Along this same fault, extending from Point Arena south to the Mojave Desert, there was to be a shift of about eight feet in the year A.D. 1906, which would cause a great disturbance in the city of San Francisco. (Because the rock mass is broken along the fault, any abnormal strain within the earth is apt to be taken up there; such movements occur frequently, but rarely displace the surface more than two-tenths of an inch.) The same thrusts that were to cause the San Francisco Peninsula's earthquake fault also helped to lift it above the sea. There was pronounced folding of the Coast Range at this time, not only on the Peninsula, but along the line of the Berkeley Hills.

About one million years ago the Great Valley was becoming filled with sediment. Brackish water still covered part of the valley; it drained, not through the Golden Gate, which did not yet exist, but through various other outlets; one at the Russian River and another at Monterey Bay. The San Francisco-Marin area probably was separated from the mainland by marshes, so shallow that they could be crossed by the primitive elephant (whose fossils have been found near Menlo Park). The last great uplift raised the Sierra Nevada Range to a height of 4,000 feet above its present elevation; the Coast Range shared in this uplift.

Most recent of California's important geological events have been those which formed San Francisco Bay and the Golden Gate. As the marshes along the coast and farther inland dried, continued folding in the Coast Range blocked off the drainage of the Great Valley through the Russian River and Monterey Bay, forcing the rivers to find another outlet. They converged in a new course through a canyon north of the Berkeley Hills at what is now Carquinez Strait, thence down through a

valley, and finally through the mountains that extended up the San Francisco Peninsula and northward into Marin County.

However solid the earth may have seemed beneath the feet of the first human inhabitants when they came (probably between 30 and 40 centuries ago) to hunt game and pick wild fruit in the coastal valley behind the river's mouth, it was sinking imperceptibly. The sea cliffs to the west were tilting upward on their outer side; but every year the floor of the coastal valley was a little lower. As fast as the sea cliffs rose, the river scoured deeper its channel through them, thus gradually carving down the sides of the Golden Gate. Then finally came a time when the floor of the coastal valley sank beneath sea level. The ocean flooded through the mouth of the river over 400 square miles of the Indians' hunting ground. The land would go on sinking until the very shell mounds which the first settlers left behind them on dry land were lapped by the tides; and yet as it sank, the rivers would lay down their rich silt, torn from mountain sides and lowlands of the Central Valley basin, over the bottom of the Bay. So was made, for how long no one can tell, the harbor known today as San Francisco Bay.

EARTH AND WATER

Midway in the great chain of mountain ridges that stretches along the continent's edge down the southeast-tending California coast is a narrow gap. Between its steep headlands the long Pacific rollers, breaking in spray against the cliffs to north and south, pour in swift tides. As the headlands recede on either side, an expanse of water opens out, stretching eastward to low, gently sloping hills. To the north, wooded peaks rise steeply above bluffs close at hand; to the northeast, barren capes guard a distant strait. Southward a sheet of water extends farther than a man can see, between marsh-edged flat lands. Here, where ocean tides roll in over a valley long sunk below sea level, salt water mingles with fresh, is muddied with the yellow silt of rivers, pouring into the Bay's upper reaches. At either end, sloping valleys walled like the Bay between ranges of hills that parallel each other, east and west, spill their creeks into it. Among the encircling hills, sloughs and canyons twist to the water's edge.

So well hidden from the sea beyond its narrow gateway by mountainous coastal walls that exploring navigators passed it by for more than two centuries, San Francisco Bay is one of the world's largest landlocked harbors. Measured along a straight line from the mouth of Sonoma Creek in the north to the mouth of Coyote Creek in the south, it is approximately 60 miles long and measures 14 miles at its greatest width. Its outlet to the sea, the Golden Gate, is three miles long and, at its widest point, a mile wide. In all, the Bay covers an area of a

little more than 400 square miles. Although more than 70 per cent of its area is less than 18 feet deep, it reaches a depth of from 100 to 140 feet in its central part and of 357 feet in the main channel of the Golden Gate. North of its narrowest point, the strait between Points San Pedro and San Pablo—where it is known as San Pablo Bay—the water is shallower.

Into San Pablo Bay empties the drainage of the valleys to the north and the hinterland to the east. Petaluma, Sonoma, and Napa Creeks pour in from the north. Through narrow Carquinez Strait, six miles long, joining San Pablo Bay with shallow Suisun Bay to the east, pour the combined waters of California's two great rivers, the Sacramento and the San Joaquin, which drain the Central Valley and the Sierra Nevada's western slopes. The gorge cut by the silt-laden river waters, winding out to sea through the succession of bays and straits, can be traced by the yellow stream that crosses the Bay's blue ripples. The river's ancient delta, built up through the ages before the ocean broke through the Golden Gate, has been traced as far out to sea as the Farallon Islands, 23 miles off Point Bonita.

The peaks of low hills once rising from the drowned valley's floor are islands now. Opposite the Golden Gate, rocky Alcatraz (130 alt.) rises abruptly from the swift tides. Northward, divided by narrow straits from the coves and inlets of the Marin shore, rise green-clad Angel (782 alt.) and Belvedere (350 alt.). A little to the southeast the rugged hump of Yerba Buena (343 alt.) appears almost midway across the Bay.

From opposite sides of the Golden Gate the sheer bluffs at land's end of the San Francisco and Marin Peninsulas face each other. The narrow hilly strip of the San Francisco Peninsula stretches 30 miles southward from the Golden Gate between Bay and ocean, tapering in width from 7 miles at its tip to approximately 21 where it merges with the mainland. On the Bay side it is bordered with mud flats and salt marshes; on the ocean, with rugged cliffs and sandy beaches. The tip of the Peninsula, walled off from the south by the steep narrow ridge of San Bruno Mountain (1,315 alt.), is a rough square with jagged outlines, scored haphazardly by rocky hills and winding valleys, once a rolling waste of sand dunes and marsh-girt lagoons. In the center of this area rises a dominant crescent-shaped range, culminating in Twin Peaks (904 alt.), Mount Davidson (916 alt.), and Mount Sutro (909 alt.). Southward spreads a zone of billowing hills, merging into San Bruno Mountain. Beyond troughlike Merced Valley, cutting from Bay to ocean parallel with San Bruno Mountain, the Peninsula is scored with parallel ridges running north and south—among them, Buriburi Ridge (700 alt.), the Sawyer Ridge (about 1,200 alt.), and Montara Mountain (1,952 alt.). Between the Buriburi and Sawyer

Ridges lies a 15-mile-long segment of the San Andreas Rift Valley, following the course of the San Andreas earthquake fault. Farther south the Santa Cruz Mountains, of which these Peninsula ridges are the northern offshoots, lift their wooded slopes to greater heights. Some 80 miles from the tip of the San Francisco Peninsula they taper off into low hills where Monterey Bay cuts its crescent line into the coast.

The Golden Gate is but a narrow break in the great mountain chain of the Coast Range, which continues northwest up the Marin Peninsula under the name of the Bolinas Ridge. An irregularly shaped, deeply and intricately dissected mountain mass, the Marin Peninsula is crisscrossed by ridges radiating from its highest point, at the southern end of the Bolinas Ridge—Mount Tamalpais (2,604 alt.). The deep canyons that scar the flanks of the ridges widen into gently sloping valleys merging with salt marshes on the Bay side; on the ocean side they twist tortuously to the sea, where the hillsides end abruptly in sheer cliffs. Paralleling the Bolinas Ridge on the west is the long narrow valley which follows the course of the San Andreas fault. Its northern reaches are filled with the waters of marsh-bordered Tomales Bay, extending southeastward like a thin finger, laid along a line as straight as if it had been sheared off with a knife. To the west, hilly, triangular Point Reyes Peninsula juts into the ocean like a plowshare, sheltering behind its long promontory curving Drake's Bay with its white-faced cliffs like the chalk cliffs at Dover. East of the Marin Peninsula's hilly mass the flat reaches of Sonoma and Napa Valleys merge into tule marshes at the Bay's edge, divided from each other by the gentle slopes of the mountains.

Along the Bay's eastern shore, beyond the narrow coastal plain, stretches the serrated skyline of the Berkeley Hills, culminating in Bald Peak (1,930 alt.); and behind, across a line of narrow, shallow valleys, rise the rugged crests of a parallel ridge culminating in Rocky Ridge (2,000 alt.). To the east, broad flat Ygnacio Valley extends north to the shores of Suisun Bay and south into the narrow, level San Ramon Valley. From the valley's edge steep slopes rise in long sweeping lines to the summit of Mount Diablo (3,849 alt.). To the south, San Ramon Valley meets narrow, 40-mile-long Livermore Valley. Beyond, the ridges of the Mount Diablo Range extend to meet the Mount Hamilton Range, paralleling the Peninsula ridges and the Santa Cruz Mountains across the Bay.

South of the Bay's southern tip, the fertile plains of the Santa Clara Valley extend for 70 miles between the walls of the Mount Hamilton (4,029 alt.) Range and the Santa Cruz Mountains, 15 miles apart—a long, narrow extension of that same valley whose upper reaches, now submerged, are the Bay itself. From the marshes of the Bay's southern

end, the valley floor slopes upward gradually toward the south, where offshoots of the two mountain ranges curve inward and enclose it.

THE CLIMATE

The Bay of San Francisco and its shores share with the rest of the Coast the moderate climate which it owes chiefly to the prevailing winds off the Pacific. Because of the break in the coast line the region has a climate even milder than enjoyed elsewhere along the Coast, because it receives more than its share of ocean-cooled air currents, sucked in by forced draft through the Golden Gate. Their deflection in various directions by the hills gives contingent sections widely differing weather.

At the tip of the San Francisco Peninsula, the mean annual temperature is 56.4° F.; the mean temperature of the coldest month, January, is 50° F. and of the warmest month, September, 61.5° F. But just northward across the Gate, mean temperatures are approximately five degrees lower in winter and five degrees higher in summer. Cold months are likewise colder and warm ones warmer on the eastern side of the Bay and down the Peninsula. The average annual rainfall at Kentfield in Marin County, less than 15 miles north of the Gate, is more than twice that of San Francisco—45.33 inches as against 21.85 inches. South of the city, rainfall decreases progressively, reaching an average of 15 inches at San Jose.

Although the tip of the San Francisco Peninsula enjoys sunshine for an average of 66 per cent of all the daylight hours in the year, it has acquired a more celebrated reputation for its fogs. They are of two principal varieties. Tule fog, a winter phenomenon, consists of low-hanging clouds of condensed vapor which drift about the Bay in serpentine fashion, sometimes blanketing completely one section of city or Bay while another is bright with sunlight. Most prevalent is the white fog which forms off the headlands on either side of the Golden Gate and drifts inland as the temperature rises inland in the warm valley section of the State. This fog forms in huge blankets, averaging about 1,700 feet thick, sometimes shrouding the entire tip of the Peninsula and spreading across the Bay to its eastern shore.

The Bay region, like most of the California coast, knows two seasons—the wet and the dry—and throughout much of the area the difference in average temperatures between them is seldom more than ten degrees. Even this slight difference is usually nullified by cooling breezes off the ocean which take the sting out of summer heat. At the tip of the San Francisco Peninsula early autumn is actually warmer than summer—for summer is the season of fogs. Only the rains, which come between October and May, call more than momentary attention to the change in seasons.

The temperature, rainfall, and even the winds follow predictable cycles, permitting residents to fall into a pattern of adaptations, less pronounced than those required by four seasons, but quite as regular. The weather's summer schedule is particularly dependable. A San Franciscan knows, almost to a certainty, that he will waken on a July morning in a world of light, bright fog and little wind. By noon the sun will be shining, and still will shine at midafternoon, though presently it will be hidden by the billows of white vapor that tumble over the hills and through the Gate. Within an hour a stiff salt breeze will be driving this fog, like a band of frantic wraiths, through hills and valleys; but the wind will be dying and the fog dispersing by half past seven. With the lengthening of night will come a softness, lightness, and clarity in the air which makes sleep seem a dullard's habit.

WILD LIFE

Simple and clear was the pattern of vegetation around San Francisco Bay before the coming of the white man. Along the coast, in the region of greatest winter rain and heaviest summer fog, were the redwood forests, extending almost without interruption from southern Oregon to San Francisco Bay and continuing south in canyons and other fog traps to the coast below Carmel. The grass and oak savannah extended eastward to the Sacramento Valley and along the floors of the principal inter-mountain valleys of the Coast Range. A thicket of low-growing chaparral clothed the interior ranges and the dry southern slopes. Fringing the Bay were marshes choked with tule rushes.

Conspicuous changes have taken place in the outlines of the three major types of vegetation. Much of the forest has been replaced by grass, brush, or crops; the early grassland area is occupied by cultivated land. However, the region is fortunate to possess many game preserves, water districts, and other sections where natural conditions still prevail and many more that are being restored. The residents are making a start toward restriction of destructive lumbering, bad range management, poor fire control, and unregulated killing of game and fish.

Typical virgin areas of forest are preserved in Muir Woods National Monument and Santa Cruz Redwood Park. Here are trees, many from 1,000 to 2,000 years old, rising 300 feet or more with diameters of 12 to 16 feet. Their clean, gently tapering shafts, clothed with thick, purplish, massively fluted bark, rise uninterrupted by branches for approximately a third of their height. The foliage is delicate and feathery, but dense enough to keep perpetual twilight on the forest floor. Scattered among the great columns are smaller trees: broad-leaf maple, madrone, golden chinquapin, and California laurel. In separate stands, usually along the ridges at the inner margin of the

fog belt, is found the somber, massive Douglas fir. Forming close thickets are huckleberries, azaleas, rhododendrons, California buckthorn (the dried bark of which is medicinal cascara sagrada), salal, wild currants and gooseberries, salmon- and thimble-berries, and elder. And in the damper shade, watered by the fog which the trees precipitate, Woodwardia and sword ferns give cover to mosses, dogtooth violets, true violets, wild ginger, redwood sorrel, trillium, fritillaria, clintonia, and the pungent yerba buena which gave San Francisco its first Spanish name.

The redwood forest and its associated meadows and streams are particularly rich in animal life; raccoons, skunks, wild cats, woodrats, and weasels are fairly common. As is natural in so deep a forest, birds are not conspicuous. Those most often seen are the varied and hermit thrushes, quail, flycatchers, California tanagers, robins, various sparrows and warblers.

The chaparral formation in California is remarkable, both for its high degree of development and for its numerous methods of adjustment to the long dry summers, wet winters, periodic fires, and intense sunshine. Its root systems are often extensive; its leaves protect themselves from excessive evaporation by turning their broad surfaces away from the sun, by growing in small, needle-like shapes, and by resorting to other devices such as thick skins, coatings of fuzz, exudations of resin, and restriction in the number of "pores." Many typical shrubs have the ability to sprout after fires from the root's crown. Others seed profusely and grow vigorously in burnt-over soil. The most widespread members of the chaparral are the various species of ceanothus, used by the Indians for soap; manzanita, with white bell-like blossoms, red or chocolate bark, neat oval leaves; California buckeye, which blooms in heavy clusters and bears fig-shaped fruits; chamise (*adenostoma*); chaparral pea; many dwarf oaks; and yerba santa, with pale lavender flowers and leaves spotted with resin.

The chaparral was the home of the extinct California grizzly and the now rarely seen California condor. Typical of both chaparral and grasslands are the brush rabbit, coyote, gray fox, various rats and mice, pocket gophers, and moles. Some of the more distinctive birds are the California jay, stellar jay, California thrasher, Anna hummingbird, house finch, mourning dove, and valley quail. Hawks, owls, and buzzards are very common.

Formerly the savannah was covered with a thick sod of perennial grasses; today it is dominated by the aggressive annual wild oat, a Spanish importation. However, the spring still brings a flourishing abundance of California poppies, lupines, nemophilas, cream cups, brodiaea, owl's clover, Indian paintbrushes, irises, shooting stars, and many composites.

One of the region's most interesting natural environments is the marshy border of the sloughs and estuaries where willows and cottonwoods grow. Wading birds are numerous; also the great blue heron, night heron, bittern, egret, and snowy egret. The estuaries, filled with tule rushes, are favorite nesting places for pelicans, coots and ducks, wrens, red-winged blackbirds, and many warblers.

Along the seacoast too, there is a distinct community of wild life. Gulls, terns, cormorants, and brown and white pelicans congregate in numbers. Hair seals and sea lions are still abundant, though the fur seal has disappeared.

Offshore, all along the Pacific Coast of North America, grow great beds of brown kelp, plants which in some cases are as large as redwood trees. This dense marine thicket provides shelter for a host of small fish, many of them valuable for food. Perch and rock and tom cod are typical species. Other ocean fishes found fresh in San Francisco markets are sea bass, various flatfish, halibut, and salmon. Crab, abalone, clams, shrimp, and oysters (both native and planted) are the principal shellfish. Bay and river fishes include shad, steelhead, striped bass, and several species of native and imported trout.

In 1940 the San Francisco Bay communities are as close as any urban area in the United States to primitive landscapes. At distances but little farther than city limits are forests, thickets of chaparral, and tule marshes, so wild that any explorer but the more experienced woodsman might easily imagine himself the region's first inhabitant.