BEFORE THE BRIDGE:
SIGHT AND SOUND AT THE GOLDEN GATE

SOUTH GALLERY

A free exhibition celebrating the 75th anniversary
of the completion of the Golden Gate Bridge

May 23 to November 18, 2012

Presidio Trust
103 Montgomery Street
Presidio of San Francisco
Golden Gate National Parks

INTRODUCTION

"Open Your Golden Gate!"

The entrance to San Francisco Bay is one of the most dramatic harbor entrances in the world. This exhibit of ***sight and sound*** celebrates the incomparable Golden Gate Strait. It has given its name to the iconic bridge whose 75th anniversary we mark this year. From a window in the North Gallery, you can glimpse the Gate and the bridge.

Others are telling the story of the bridge. This exhibit and its accompanying programs explore the waters and lands that frame it. It surveys the dramatic geology, unique fog patterns, eventful history, art and poetry of the Golden Gate Strait itself.

The Golden Gate is not only scenic; it is also hidden, dangerous, commercially important and strategic. Military installations long commanded, and preserved, the high grounds that flank it. When advances in military technology made static coastal defenses obsolete, Bay Area park activists and political leaders worked to transform these federal lands into the great national park we enjoy today -- the Golden Gate National Parks.

We hope you enjoy this Presidio Trust exhibit.

Randolph Delehanty, Ph.D.

Historian / Presidio Trust Public Programs
exhibition curator and handbook author

SOUTH GALLERY

Before The Gate

The Golden Gate 10,000 years ago
Robert Hynes, National Park Service

About 18,000 years ago, San Francisco Bay did not exist. Today's gulf of the Golden Gate Strait was a vast meadow with a river that emptied into the ocean. The coast lay 25 miles west of here, near the Farallon Islands. As the climate got warmer, water locked in glaciers in the Sierra Nevada was unleashed and the ancient river valley that is now San Francisco Bay slowly flooded. As global ice sheets melted, ocean levels gradually rose 300 feet over 4,000 years and the coastline receded to its current location. The Golden Gate Strait is an estuary – a drowned river mouth. Surf, wind and currents continue to sculpt this famous gateway to California.

California as an Island

For centuries, California was thought to be an island and that the Gulf of California to the south (off Baja California) joined with Puget Sound to the north. Not until 1747 did Ferdinand VII of Spain issue a royal decree stating that California was part of the North American mainland.

panel 1

Golden Gate Strait

Serene, indifferent of Fate,
Thou sittest at the Western Gate;
Upon thy heights so lately won
Still slant the banners of the sun;
Thou seest the white seas strike their tents,
O Warder of two Continents!
And scornful of the peace that flies
Thy angry winds and sullen skies,
Thou drawest all things, small or great,
To thee, beside the Western Gate.

Bret Harte, *San Francisco (From the Sea)*, 1902

Water and the Gate

The Golden Gate Strait is one of the most dramatic harbor entrances in the world. It is the only major gap in the 300-mile long Coast Range. Two and a half million gallons of water flow in and out of the Gate each day. The water level fluctuates from two to seven feet with the tides. At its deepest, the Gate is 300 feet deep forming a great underwater canyon. Before modern water diversions for the farms and cities of the Central Valley and southern California, plumes of fresh water flowed out the Gate. Today, more than half the fresh water that once flowed into the bay is diverted for agricultural, industrial and urban uses. Changes in the balance of fresh and salt water have reduced the number of striped bass, herring and shrimp in what was once a productive fishery. Today there are active proposals for a canal or tunnel/pipeline to divert more water from the Sacramento-San Joaquin Delta away from the bay and down the 444-mile long California Aqueduct to central and southern California.

panel 1

Golden Gate Strait

Contemporary Underwater Mapping / USGS Map 2917

This high-resolution, multibeam echosounder oblique view looks west to east through the Golden Gate towards central San Francisco Bay. The sea floor is color coded for depth with purple for the deepest areas and light blue-green for shallow areas. Vertical exaggeration is approximately 4 times for the sea floor and 2 times for the land. This new technology of sea-floor mapping emerged in the mid-1990s. Ships with hull-mounted transducers send a fan of sound energy toward the sea floor, then record the sound reflected from the sea floor through a set of receivers aimed at different angles. As the ship moves forward, it maps a swath of sea floor. Ships go back and forth "mowing the lawn." They produce sea floor maps of unprecedented accuracy and can detect features as small as one meter (3 feet) across. The system provides both bathymetric (depth) data and also records the amount of sound energy returned from the sea floor called "backscatter." Backscatter data help scientists identify the materials of the sea floor, such as rock, sand, or mud. Because multibeam data are digital, they can be manipulated in many ways. Shadows can be added to create relief maps that are easier to read and interpret. Moving images can be created as well as still pictures. In the Theater of this exhibit is an underwater tour of the Golden Gate and San Francisco Bay created with this new technology.

These new maps help answer important questions:

● What types of bay floor provide habitats for fish and shellfish?
● How do currents move sediment on the bay floor?
● How much rock must be trimmed from pinnacles on the bay floor to ensure that ships do not run aground on them and cause oil spills?
● Where can sediment dredged from harbors and shipping channels be most safely disposed of?

U.S. Geological Survey; National Oceanic and Atmosphere Administration; California State University, Monterey Bay; U.S. Army Corps of Engineers; the Center for Integrative Coastal Observation, Research and Education / 2006

panel 2

San Francisco Bay and Its Region

San Francisco Bay is fed by runoff from the Sierra Nevada that flows down sixteen rivers to the Sacramento-San Joaquin Delta. The bay drains approximately 50,000 square miles, or forty percent, of California. It is from 3 to 12 miles wide east-to-west and between 48 and 60 miles long north-to-south depending on whether San Pablo Bay to the north is included. The south arm of the bay toward San Jose can be as shallow as six feet. Sediment from inland creeks and rivers continually flows out the Gate to replenish coastal beaches. Dungeness crab, California halibut and Pacific salmon, among other species, rely on the bay as a nursery. The bay is on the Pacific Flyway and millions of waterfowl rest and feed here annually. Fishing, crabbing, sailing, wind surfing and kite surfing are popular recreations on the bay. Hardy swimmers, members of historic swim clubs, even brave its chilly waters.

The bay is an aesthetic as well as natural and economic resource. Its color changes from season to season, day to day and even hour by hour. It can be aquamarine, deep blue, slate gray, silver and many colors in between. It can be calm or agitated with whitecaps. At night it becomes a black mirror of the moon-lit sky. In fog or rain, it can disappear altogether in a gray mist.

San Francisco, Oakland, San Jose, and many smaller cities and suburbs in nine counties, with a population of approximately 7.15 million, make the Bay Area the West Coast's second-largest urban area. With a Gross Domestic Product of $535 billion in 2010, the Bay Area can be considered the 19th largest economy in the world. Productivity growth in the Bay Area is the highest in the country.

panel 2

San Francisco Bay and Its Region

Save the Bay

Between 1850 and 1960 an average of four square miles of the bay were filled for development each year. This reduced the size of the bay from 787 square miles in 1849 to 548 square miles today. When the City of Berkeley proposed to fill more of the bay, Kay Kerr, Sylvia McLaughlin and Esther Gulick created the first modern grassroots environmental movement in the Bay Area in 1961, now called Save The Bay. They mobilized thousands of Bay Area voters and local legislators and won a state moratorium against more fill in 1965. The Bay Conservation and Development Commission became a permanent State of California agency in 1969 with a mandate to protect the bay, regulate shoreline development, and increase public access to the water. BCDC was the first coastal zone management agency in the country and worked to prevent more bay fill, to stop raw sewage from flowing untreated into the bay, to encourage tidal marsh restoration and to expand the accessible shoreline from 4 miles in 1969 to over 200 miles today. The San Francisco Bay Trail is a pedestrian and bicycle trail that will eventually allow continuous travel around the bay. As of 2011, some 310 miles of the estimated future 500 miles linking the shoreline of nine counties have been completed.

panel 3

The Hidden Gate

This is the Golden Gate; the rock-bound way
Viscaino and Cabrillo failed to find,
The port Sir Francis on the "Golden Hind"
Sailed past to anchor in a rough, bleak bay;
And we are Argonauts (or so we say),
Shore-driven by fair Fortune's favoring wind,
We enter, lo, a splendid harbor lined
With ships that flags of all the world display!

Clarence Urmy, *San Francisco Bay*

Early explorers sailed right past the hidden Gate for over two centuries. Because of its high cliffs, offshore rocks, hidden sandbars and treacherous currents navigators sailed about 30 miles off the dangerous California coast. The narrow Golden Gate Strait disappears from that distance because the curvature of the Earth puts the Gate below the horizon. The high land of the Coast Range on either side of the Gate appears unbroken, especially with the East Bay hills creating a continuous backdrop. In addition, fog often shrouds the entrance to the bay. Spanish explorers finally discovered San Francisco Bay from the land in 1769.

San Francisco Fogs

Hiram D. Pierce, *Up from Panama*, 1849:

"Thursday, 26th, 1849 (78th day at sea) Morning thick & foggy. Not able to see a mile. At ½ past 12 raised Anchor & got underway for the harbor. Wind & tide in favour. The Senery was most wild & desolate. Large naked rocks some of them covered in guana projecting out & towering up, the entrance being about one mile wide & tide running through at 6 miles. A great abundance of fowls covered the water. … There is said to be 175 Sail in the Harbour. All is life & bustle.

panel 3

The Hidden Gate

Harold Gilliam, environmental writer:

"The advance of the summer fog over San Francisco Bay is surely one of the earth's most impressive natural phenomena. … To the observant it is more than a spectacle. It is an experience of the senses."

The Pacific Ocean is the great moderator of San Francisco's Mediterranean climate of mild rainy winters and long dry summers. The temperature of the ocean here varies only a few degrees from winter to summer. It is cooler than the land in summer and warmer than the land in winter.

In the summer, winds blow down the Californian coast carrying invisible moisture. When these winds pass over the cold upwelling of the California Current the vapor condenses into visible drops – fog. The resulting fog bank stands off the coast most of the summer. On summer afternoons, as hot air rises in the Central Valley of California, the fog is sucked in through the gap of the Golden Gate filling the air over San Francisco Bay. The morning sun warms the air and burns off the fog. In the winter, cold air settles in the Central Valley and fog forms not over the ocean but inland over the tule [bullrush] marshes of the Sacramento-San Joaquin Delta to the northeast. This "tule fog" drifts over the bay leaving the coast itself sunny and clear. August and September are the foggiest months at the Gate. The winter months are the foggiest inland. The least fog is in April, May and June.

As the oceans have warmed over the last 100 years, the temperature difference between the sea and the land has declined and the Bay Area is experiencing fewer foggy days. If this trend continues, it will affect coastal plants including the redwoods, *Sequoia sempervirens*, which depend on fog moisture to survive the dry summers.

more >

panel 3
The Hidden Gate

There was much confusion over the existence and location of San Francisco Bay. Among the first ships that passed by the Gate were Spanish galleons on the seven month Manila-to-Acapulco route following the California Current eastward across the Pacific and then down the rugged California coast to Acapulco. The Manila Galleons began their rich trans-Pacific trade in 1565 which continued until 1815. They exchanged Mexican silver for Chinese silks and porcelain. But these passers-by did not enter the bay. Juan Rodríguez Cabrillo's exploration of the California coast in 1542 missed the entrance to the bay. In 1579, English privateer Sir Francis Drake sailed down the Pacific Coast and landed east of Point Reyes. He probably careened [beached] his ship in Drakes Bay to make repairs. Drake, too, missed the Golden Gate. Exposed Drakes Bay off Point Reyes, which the Spanish and English *did* know about, was originally named *Bahia de San Francisco* by Sebastían Rodríguez Cermeño in 1595. Sebastían Vizcaíno discovered and named Monterey Bay in 1602 and named Point Reyes in 1603 in honor of the Feast of the Three Kings (Epiphany).

Searching for Monterey Bay, Spaniard Gaspar de Portolá marched his troops from San Diego up the California coast in 1769, accompanied by the Franciscan missionary Junipero Serra. Portolá failed to recognize the bay when he came to it and kept marching north. From the west slope of Montara Mountain in San Mateo County the group spied the Gulf of the Farallones outside the Golden Gate, but not the actual bay. Portolá sent Sergeant José Francisco de Ortega to scout ahead. Ortega reported on November 2, 1769 that a great estuary blocked his passage north. Today, the Portolá Discovery Site is on Sweeney Ridge east of Pacifica in the Golden Gate National Recreation Area. Portolá's soldiers spied "an immense arm of the sea." None of these explorers realized that they had discovered San Francisco Bay. They thought they were seeing what we now call Drakes Bay. Portolá returned south to San Diego, once again passing Monterey Bay and this time recognized it. In 1770, Portolá sent Pedro Fages to explore the great estuary. Fages marched along the East Bay hills and first saw the Golden Gate from across the bay. In 1775, Juan Manuel de Ayala led an exploratory mission on the *San Carlos* into the bay, and the ship's pilot, José de Cañizares, named it for St. Francis of Assisi.

The Canticle of the Creatures or The Song of Brother Sun
by St. Francis of Assisi
(born 1181 - died 1226)

Most High, all-powerful and good Lord
yours are the praises, glory, honor and every blessing
to you alone, Most High, they do belong
and no one is worthy to speak your name.
Praised be you, my Lord, with all your creatures
especially Sir Brother Sun
through whom you give us the day and light
he is beautiful, radiant with great splendor,
and of you, Most High, he is our symbol.
Praised be you, my Lord, for Sister Moon and the Stars
in heaven you created them clear and precious and beautiful.
Praised by you, my Lord, for Brother Wind,
and for the air, and for the clouds
for the calm blue skies and for every changing weather
through them, you sustain life in all your creatures.
Praised be you, my Lord, for Sister Water
who is very useful and humble
precious and chaste.
Praised be you, my Lord, for Brother Fire
through whom you light up the night,
he is beautiful and joyful,
wild and strong.
Praised be you, my Lord, for our Sister, Mother Earth
who bears and nourishes us
who produces the many different fruits
and the colorful flowers and herbs.
Praised be you, my Lord, for those
who grant forgiveness for the love of you,
who endure trials and illness,
Blessed are they who endure in peace
for by you, Most High, they will be crowned.
Praised be you, my Lord, for our Sister Bodily Death
from whom no one living can escape,
woe to those who die in mortal sin,
blessed are they she finds doing Your will
because the second death cannot harm them.
Praise and bless my Lord,
and give Him thanks and serve Him
with all humility.

panel 4

Charting the Gate and Early Contacts

The Spanish viceroy in Mexico City, Antonio Bucareli, sent Lieutenant Juan Manuel de Ayala aboard the *San Carlos* to see if the Golden Gate was navigable. On August 5, 1775, Ayala, having sent a launch ahead to find safe anchorage, entered the Golden Gate and anchored for the night inside the bay. On August 7, the *San Carlos* moved to the north side of Raccoon Strait between the Tiburon Peninsula and Angel Island. A week later, the *San Carlos* shifted to Angel Island's Ayala Cove. Ayala's pilot, José de Cañizares, and members of the crew spent 44 days making the first soundings of the spacious bay. Cañizares returned in 1776 as captain of the *San Carlos* and refined his chart. The following year, Spain established the capital of Alta California on Monterey Bay to the south.

Early Contacts, Dispossession and Near Extinction

Anthropologists think that the first people came to California more than 10,000 years ago. Human migrations crossed the Bering land bridge from Siberia to North America and then filtered down the coast, or perhaps inland, to California. These were the ancestors of the Ohlone who inhabited the San Francisco peninsula when the Spanish arrived from northern Mexico. At the time of first contact, there were from 10,000 to 20,000 native people in many small tribes and territories living in the Bay Area and some 300,000 aboriginal people in California as a whole. The Spanish sought to convert these people to Catholicism and settle them in 21 agricultural and pastoral villages. Mission *San Francisco de Asís* (Mission Dolores) was established in 1776 at the same time as the Presidio. The missionaries amalgamated separate tribes into "Mission Indians." But European-introduced diseases, including measles, small pox and tuberculosis, soon decimated the natives who had no immunity to them.

Scientific expeditions like that of the Russian Imperial Navy's Otto von Kotzebue around-the-world expedition of 1815-1818 were the first to depict the native peoples, flora and fauna of the Bay Area. Louis Choris, the official artist accompanying Kotzebue, made the first watercolors of the aboriginal peoples. On that expedition, naturalists Adelbert von Chamisso and Johann Friedrich

Eschscholtz also made the first studies of California flora and fauna including the first scientific description of the California poppy and the grizzly bear. The Russians collected native artifacts, including abalone jewelry and feather headdresses, which survive today in the Peter the Great Museum of Anthropology and Ethnography in St. Petersburg, Russia.

The people from the United States who began migrating to California in great numbers in the late 1840s did not attempt to "civilize" the native peoples as the Spanish had. They drove them off their lands and starved or killed them. Many Indian women and children were made indentured servants, virtual slaves. In 1851, California Governor Peter H. Burnett promised that "a war of extermination will continue to be waged between the races until the Indian race becomes extinct." Briefly, the State of California even paid a bounty for every dead Indian. Federal agents promised reservations in the 1850s in the Central Valley, but they were never established by Congress. By 1870, there were only about 58,000 natives remaining in the state. The low point was reached in 1900 when the Indian population in California plummeted to fewer than 16,000.

Native American Recovery

Native populations across the country began to recover in the twentieth century. The 2010 census counted 723,225 Native Americas in California, including those who selected only Native American and those who selected more than one race. California's Native American population is growing. Many are migrants from other states. The occupation of abandoned Alcatraz in 1969 by young Native American activists from many tribes was a psychological turning point in contemporary Indian cultural assertion. Though eight Ohlone/Costanoan groups have initiated the process for federal recognition, the Ohlone are not a federally-recognized tribe. Today there is a movement to revive the Ohlone/Chochenyo language.

panel 5

Naming the Gate

Second Lieutenant John Charles Frémont, U.S.A. in 1846:

"To this Gate I give the name *Chrysopylae*, or Golden Gate; for the same reasons that the harbor of Byzantium [Constantinople] was called *Chrysoceras*, or Golden Horn."

Juan Manuel de Ayala did not give a name to the entrance to the bay. It was John Charles Frémont of the U.S. Army Topographical Corps who christened the Golden Gate in 1846 and who published the name in his *Geographical Memoir of California* in the spring of 1848. These memoirs appeared *before* the discovery of gold at Sutter's mill that same year. The Yankee Forty-niners liked the name, but translated it from Greek into English. Nonetheless, most presume that the Gate was named for the gold that passed through the portal and out to the world.

The Bear Flag Republic and the Golden Gate

Second Lieutenant John Charles Frémont, U.S.A. made a second exploration of Mexican California coming down from Oregon. Perhaps encouraged by his expansionist father-in-law, Senator Benton of Missouri, Frémont went to Sutter's Fort in today's Sacramento and urged the American settlers to break away from Mexico and to establish a Republic of California. The insurgents created their own flag, the Bear Flag, which they flew over the Mexican Sonoma Barracks on June 14, 1846. On July 1, Frémont and his men, including Kit Carson and twenty Delaware Indians, rowed from Sausalito to the abandoned *Castillo de San Joaquin,* the Mexican fort on a bluff overlooking the Golden Gate. They spiked the bronze cannons and returned to Sutter's Fort. On July 9, upon learning that the U.S. and Mexico were at war and that Commodore John D. Sloat, U.S.N. had occupied the Mexican provincial capital at Monterey, Frémont enlisted under Sloat's command and the Republic of California ceased to exist. The Mexican Pueblo of Yerba Buena (where San Francisco's Chinatown is today) was seized by Captain John B. Montgomery, U.S.N. in command of the *U.S.S. Portsmouth* on July 9, 1846 without firing a shot. In 1847, the Americans renamed Yerba Buena after better known San Francisco Bay.

panel 6

The Commercial Gate

At the end of our streets is sunrise;
At the end of our streets are spars;
At the end of our streets is sunset;
At the end of our streets – the stars

George Sterling, *The City by the Sea – San Francisco*, 1922

Following mercantilist economic principles, Spain closed the harbor to all but her own ships in 1776, though smuggling was rampant. When Mexico broke away from Spain in 1821, the new nation liberalized trade and opened the port to all ships. English and Yankee traders soon dominated the trade that developed at Yerba Buena Cove (today San Francisco's Financial District) exchanging manufactured goods for the cattle hides and tallow (animal fat) produced by Mexican ranchers. In 1835, the Mexican governor in Monterey authorized the founding of the Pueblo of Yerba Buena on the cove of the same name where the wild mint *Satureja douglasii* grew. Today it is San Francisco's Chinatown. The pueblo's plaza is now Portsmouth Square and Garage at Kearny Street between Clay and Washington streets. When the U.S. seized California in 1846, Yerba Buena became the most important port in California.

The Golden Gate Entrance to the Bay of San Francisco: Sunrise
Thomas A. Ayres, 1855
Bancroft Library, University of California, Berkeley

This early lithograph shows the Marin Headlands with the Point Bonita Lighthouse to the far left and Point Lobos with its telegraph station in San Francisco to the far right. Red brick Fort Point at the Presidio is near the center of the image. The celebrated clipper ship *Flying Cloud* arriving from New York is to the left of the pilot schooner. To the right is the Pacific Mail steamer *John L. Stephens* arriving from Panama. In reality, the two ships never arrived in San Francisco on the same day but the artist wished to depict the shift from sail to steam. The shattered mast floating in the foreground hints at the dangers of navigating the Gate.

panel 6

The Commercial Gate

Bostonian Richard Henry Dana on the ship *Alert* engaged in the cattle hide trade in *Two Years Before the Mast*, 1835:

"We sailed down this magnificent bay with a light wind, the tide, which was running out, carrying us at the rate of four or five knots [4.6 to 5.7 miles per hour]. It was a fine day; the first of entire sunshine we had for more than a month. We passed directly under the high cliff on which the presidio [*Castillo San Joaquin*] is built, and stood into the middle of the bay, from whence we could see small bays making up into the interior, large and beautifully wooded islands, and the mouths of several small rivers. If California ever becomes a prosperous country, this bay will be the center of its prosperity."

Richard Henry Dana returned to San Francisco twenty-four years later in 1859:

"We entered the Golden Gate, passed the lighthouses and forts, and clipper ships at anchor, and came back to our dock, with this great city, on its high hills and rising surfaces, brilliant before us and full of eager life."

The commercial importance of the Golden Gate increased as California boomed and ships from around the world entered the harbor. The earliest docks were in San Francisco's Yerba Buena Cove where the Financial District's skyscrapers stand today. Soon the State of California built a seawall and developed the finger piers along the Embarcadero. The completion of the first transcontinental railroad in 1869 with its terminus in Oakland made the bay the key link in trans-Pacific trade. As the state developed with wheat farming in the Central Valley in the 1870s, Port Costa exported that bulk commodity to Europe. Other specialized ports ring the bay including sugar at Crockett and petroleum at Point Richmond. The high point for ship traffic was the late nineteenth and the beginning of the twentieth century when passenger liners, freighters, coastal and river ships, fishing boats, ferries and pleasure craft crisscrossed the busy harbor. A few ferries still dock at San Francisco along with occasional cruise ships, but with containerization almost all cargo has shifted across the bay to the modernized Port of Oakland where there is more space to park containers.

panel 7

The Dangerous Gate

Farallon Islands: “The Devil’s Teeth”

San Francisco Chronicle, March 7, 1937:

"Death looked into the eyes of five sailors off the Farallones last Friday when a school of killer whales, mad with the blood lust as they slaughtered more than 100 seals, turned to attack the small boat of the lighthouse tender *Sequoia*. The killers appeared off the rocky island as a surfboat from the tender was put off with the regular weekly supplies. … Flashing through the scarlet water the whales slashed and ripped as the frightened seals fought toward the shore. Suddenly one of the killers sighted the churning oars of the small boat and streaked toward it. As the black fin cut the water, [second mate Charles B.] Medd ordered the oars pulled into the boat. The whale cut on through the water, its 25-foot bulk certain to overturn the boat. At the last moment, it dived. Satisfied that the object without movement was not alive, the killer returned to the pack for another attack on the seals."

Los farallones is a Spanish mariner’s term for small, pointed islands. The Farallon Islands rise like seven granite icebergs in a seven-mile-long line 27 miles west of the Golden Gate. Sir Francis Drake landed there in 1579 to harvest seals and eggs. About 1810, the Russian-American Company brought Aleut crews down from Alaska to hunt seals and sea lions.

The summit of 317-foot-high Southeast Farallon Island was selected for a lighthouse in 1856. After 1871, the light was accompanied by foghorns. Egg pickers frequented the rookeries collecting thousands of murre and gull eggs. In 1909, the islands were declared a federal bird sanctuary, the Farallon National Wildlife Refuge, which they continue to be today. From 1946 to 1970, steel drums containing nuclear waste were dumped offshore in the Farallon Island Nuclear Waste Dump. Today the islands are managed by the U.S. Fish and Wildlife Service and Marin-based PRBO Conservation Science.

panel 7

The Dangerous Gate

The Bar and Bar Pilots

British Captain Frederick William Beechey, *A Luxuriant Country*, 1826:

"Off the harbor of San Francisco there is a [sand] bar which extends from the northern shore, gradually deepening its water until it approaches the peninsula [of San Francisco] on the opposite side…. Of this bar, however, we were ignorant, and naturally steered directly for the harbor, in doing which the depth of water gradually diminished to five fathoms [30 feet]. This would have been of no consequence had it not been for a swell which rolled heavily over the bank [so] that it continually broke; and though our depth of water was never less that 4 ½ fathoms [27 feet], the ship on two or three occasions disturbed the sand with her keel. The tide was unfortunately against us, and the swell propelled the ship just sufficiently fast for her to steer without gaining any ground, so we remained in this situation several hours. … As we passed the entrance, a heavy sea rolling violently upon a reef of rocks on our left bespoke the danger of approaching that side too close in light or baffling winds; while some scattered rocks with deep water round them skirting the shore on our right, marked that side also as dangerous; so that the entrance may be justly considered difficult. … The port of San Francisco does not show itself to advantage until after the fort is passed, when it breaks upon the view, and forcibly impresses the spectator with the magnificence of the harbor. He then beholds a broad sheet of water, sufficiently extensive to contain all the British navy…."

The San Francisco bar forms a great semicircle of underwater sand that stretches from Point Bonita on the north to mid Ocean Beach in San Francisco. During heavy seas it becomes a mass of dangerous breakers. It is bisected by the main ship channel which is 2,000 feet wide and 50 feet deep and requires continual dredging. The San Francisco Bar Pilots Association was established in 1849 to guide ships over the bar and into the harbor. Pilots continue to guide ever-larger container ships into San Francisco Bay today. There are 57 licensed bar pilots who each earn about $450,000 a year. Ships pay an average of $12,000 per round trip.

more >

panel 7

The Dangerous Gate

Shipwrecks

"The cries and groans of the sufferers were most piteous."

The Daily Evening Bulletin, 11-12 November, 1858 reporting on the shipwrecked passengers aboard the square-rigged ship *Lucas* that hit the Farallon Islands

There are about 360 shipwrecks in the region. The oldest is the *San Agustin*, a Spanish Manila galleon dragged ashore at Drakes Bay during a gale in 1595. Among the most famous later wrecks was the *S.S. Tennessee*, a wooden side-wheel steamship that linked Panama with San Francisco, lost in 1853 north of Point Bonita. Her name is remembered at Tennessee Cove in the Marin Headlands. The three-masted clipper ship *King Phillip* launched in Maine in 1856 ran aground at Ocean Beach at the foot of Ortega Street in 1878 while being towed through the Golden Gate during high tide. Now and then El Niño storms scour away the sand to reveal the water-logged bones of the old ship. Then the sands cover her over again. She is considered the most intact wooden shipwreck on the West Coast. The greatest loss of life occurred in 1901 when 128 people perished aboard the trans-Pacific steamship *City of Rio de Janeiro* which was swept off her course by a strong ebbing tide and struck the rocks at the Golden Gate. Most of these shipwrecks are eligible for inclusion on the National Register of Historic Places. Threats to these submerged cultural resources include beachcombing, sport-diver collecting, professional salvage, and treasure-hunting.

Suicides

There is another way that the Golden Gate is lethal: It has a fatal attraction for suicides. In the nineteenth century, Golden Gate Park was the place where some San Franciscans chose to end their lives with cyanide. Today, it is a leap from the bridge (which a few actually survive). In Eastern cosmologies the Western Gate, where the sun sets, is the Gate of Death. Both the Miwok and Ohlone peoples believed the Pacific Ocean was where the dead went when they died.

panel 8

Lighthouses and Lightships

Oh, what is the bane of a light-keeper's life?
That causes him worry, struggles, and strife,
That makes him use cuss words and beat up his wife,
It's Brass work.
…
I dug, scrub and polish, and work with a might,
And just when I get it all shiny and bright,
In comes the fog like a thief in the night,
Goodbye Brass work.

Fred Morong, Light-keeper of the Point Reyes Light Station, 1930s

United States Lighthouse Service

The first Congress established the Lighthouse Service in 1789. The first lighthouses on the West Coast were at Alcatraz (1854), Point Bonita and Fort Point (1855) and Southeast Farallon Island (1856). Lighthouses often had distinctive shapes or painted patterns so that mariners could differentiate them. Distinct flashing patterns also distinguished individual lighthouses so that mariners would know which light they were seeing. Fresnel Lights can be seen for 20 miles out at sea. Lighthouses had from one to five attendants called keepers. They were nicknamed "wickies" because one of their duties was to trim the wicks of the early oil lamps. Some keepers were married and had their families with them. On the Gate there were lighthouses and fog signals at Mile Rocks, Fort Point, Point Bonita and Lime Point. Inside the bay there were three lighthouses on Angel Island, one on Alcatraz, one on Yerba Buena Island, one at Oakland Harbor, one at Southhampton Shoal and one on East Brother Island. Outside the Delta there were lighthouses at Mare Island, Carquinez Strait and Roe Island. The Lighthouse Service was absorbed into the U. S. Coast Guard in 1939. Most lighthouses were automated in the 1980s.

panel 8

Lighthouses and Lightships

Point Bonita Lighthouse

Point Bonita Lighthouse, originally set on a 306-foot high cliff on the north side of the Golden Gate, began operations in 1855. Its Fresnel lens was made in Paris and shipped around Cape Horn. But its light was often obscured by dense high fog. A new lighthouse was built at the tip of Point Bonita lower down, where there is less fog. It began operations in 1877 using the same lens from the 1850s that had guided the clipper ships. The light can be seen 18 nautical miles out to sea. A building housing a fog signal was built next to it and replaced by the current building in 1900. When the trail leading to the lighthouse fell into the sea, a suspension bridge was built to give access the lighthouse. That bridge was recently replaced by a new span. In 1898, the Point Bonita Life-Saving Station was established and operated until the 1940s. In 1981, the U.S. Coast Guard automated the light and the lighthouse was transferred to the National Park Service. **Point Bonita Lighthouse** is still active and can be visited Saturday, Sunday and Monday.

The Farallon Island Lighthouse's Fresnel lens is at the San Francisco Maritime National Historical Park Visitor Center at Jefferson and Hyde streets along with a new exhibit on **The Waterfront**. Open daily.

Lightships

The U.S. Lighthouse Service also operated floating lighthouses called lightships. They were painted red with the name of their station in giant white letters on both sides of the hull and moored at sea for months at a time. Many of them had both lights and fog horns. The San Francisco lightship was replaced by a large, automated navigational buoy in 1971.

Today, Lightship ***Relief WLV 605*** is moored at Oakland's Jack London Square and operated by the United States Lighthouse Society. It once relieved lightships when they were periodically dry docked for maintenance. Open Saturday and Sunday.

panel 9

Cannons, Bells, Whistles, Trumpets, Sirens and Foghorns

Sounds, as well as lights, are also employed to warn mariners of dangerous waters. Over time these have included cannons, bells, whistles, trumpets, sirens and foghorns.

Ferdinand Lee Clarke, Fog and Fog Signals on the Pacific Coast, *Overland Monthly*, vol. XII, No. 70, October 1888, page 355:

"While rays of light can pass through strata of unequally heated air, fog and mist, or snow, sound waves are bent up or down or to either side, even sometimes totally extinguished, by these same conditions. It is sometimes impossible to hear sound signals, or their tones, or the direction from which they come. General Duane reported to the Lighthouse Board in 1874 that, 'the signal is often heard at a great distance in one direction, while in another it will be scarcely audible at the distance of a mile. This is not the effect of wind, as the signal is frequently heard much farther against the wind that with it. … .The signal often appears to be surrounded by a belt, varying in radius from one to one a half miles, from which the sound appears to be entirely absent. …[T]he sound is audible for the distance of a mile, is then lost for about the same distance, after which it is again distinctly heard for a long time.'"

The peculiar conformation of the land on both sides of the Golden Gate as two large arcs confused the notes of the sound signals and at some points rendered them inaudible. It was a common experience of navigators entering the harbor and keeping along the Marin shore to lose the sound of the whistle on Lime Point when they were nearing Point Diablo, though after they passed Point Bonita it was generally heard distinctly up to Lime Point.

In 1857, a cannon from Benicia Arsenal was placed on Point Bonita and fired every 30 minutes during fog. But the gun consumed a prodigious amount of powder and was expensive to operate. It was replaced the following year by a fog bell. The cannon is now at Coast Guard Island in the Oakland Estuary.

panel 9

Cannons, Bells, Whistles, Trumpets, Sirens and Foghorns

Bells were another early device used to warn mariners. A 4,000-pound bell at the Point Knox Fog Signal on Angel Island was struck by a hammer activated by huge weights that dropped like those in a tall-case clock. When the mechanism failed on July 2, 1906, Keeper Juliet Nichols struck the bell by hand for 20 hours.

Compressed air powered sirens appeared as early as 1903, but they were not popular with people on shore because of their unpleasant, piercing sound.

Foghorns often had distinctive sounds. The number, duration or frequency of blasts emitted identified individual foghorns. Foghorns were first powered by coal-fired steam engines which were later replaced by diesel engines and air compressors. Diaphone horns produce a soothing, double-tone **BEE-ohh** sound. Two-tone foghorns began operating about World War I. They are audible 5 miles out to sea. By 1936, there were 51 foghorns encircling the bay broadcasting their melancholy symphony in the fog. In 1954, William S. Hart wrote *The Song of the Foghorns* in three parts for piano and horn.

The Coast Guard removed the last federally-maintained foghorns in November 1992. They were replaced with devices that emit a high-pitched electronic beep. That sound, too, is disappearing from the bay as global positioning satellites and other aids to navigation replace them. Many San Franciscans lament the passing of the foghorns. It was a memorable experience to stand on the edge of the fog-shrouded bay at night listening to the different horns coming from different directions seeming to answer one another.

The champion surviving foghorns are the five at the Golden Gate Bridge. Three foghorns are mounted mid-span under the roadbed. One faces east and two face west. They have a two-toned sound. Two foghorns are mounted at the base of the south (San Francisco) tower. One faces east and the other west. They have one tone and a lower sound than the mid-span horns. Ships heading into the bay steer left of the south tower foghorns and right of the mid-span horns. Outbound vessels stay to the right of the mid-span horns. Some Presidio residents hear these consoling foghorns in their sleep.

10

Mile Rocks Lighthouse Foghorn
San Francisco Maritime National Historical Park

The two sea-swept Mile Rocks jut from the sea floor on south side of the Golden Gate Strait off Point Lobos. Swells from 15 to 25 feet high sweep over the dangerous rocks. After the wreck of the liner *Rio de Janeiro* in 1901 on the Fort Point Ledge with the loss of over 100 lives, Congress appropriated funds for the erection of a lighthouse on the notorious rocks. In 1904, intrepid sailors began construction on one isolated rock 40 feet by 30 feet surrounded by exceptionally strong currents. First, the tip of the rock was blasted off and leveled. Next, thick steel plates were secured in rings and concrete was poured behind them. Layers of steel plates rose to form a cylinder 40 feet high with walls four feet thick. The concrete caisson contains a staircase, a water cistern, and fuel tanks. A steel tower with four tiers was built atop the cylinder. The first level of the tower housed an air compressor for the fog whistle. The second tier had two levels with an office, a kitchen and day room below and two bedrooms and a bathroom above for the four-man crew. Over that was a circular storage room. And at the top was the lantern room with the light. Booms with Jacob's ladders extended from two sides of the structure for landing men and supplies. The total height of the Mile Rocks Lighthouse was 85 feet, almost as tall as a nine story building.

In 1965-66, the Coast Guard dismantled the tower and built a helicopter landing pad atop the caisson. An underwater cable from the Point Bonita Lighthouse on the opposite side of the Gate operates the Mile Rocks light. Today, only the base of the once-elegant lighthouse remains clinging to the wave-swept rock. The foghorns were donated to the San Francisco Maritime National Historical Park.

panel 11

Rescue at the Gate

"You have to go out –
but you don't have to come in."

The unofficial motto of the U.S. Life-Saving Service's surfmen

United States Life-Saving Service

Just as we have ambulances to serve the victims of traffic accidents, so in the nineteenth century the U.S. Life-Saving Service rescued people from shipwrecks in the busy, dangerous Gate. Eventually there were life-saving stations at Point Reyes, Bolinas Bay, Point Bonita, Fort Point near Crissy Field, Golden Gate Park at Ocean Beach and the Southside station south of what is now the San Francisco Zoo. Like lighthouses, the Life-Saving Service was under the U.S. Treasury Department. It began on the East Coast in 1871 and expanded to California in 1878. The Golden Gate Park Life-Saving Station at Ocean Beach was the first in the West. Most stations had six to eight surfmen under the supervision of a Keeper, the officer-in-charge. Surfmen were hardy, dedicated and brave. They worked six day weeks with low pay and no provisions for disability or retirement. Life-Saving Stations were equipped with a lifeboat, a surfboat and a life car. Life cars were enclosed metal-sheeted boats like pods drawn between ships and shore on a cable. Hand-pulled beach carts carried equipment including a Lyle gun to throw lines to ships, a breeches buoy, life preservers, flares, axes, shovels and lanterns. Rescue boats were propelled by oars. Gasoline-powered lifeboats appeared in 1907. The self-righting and self-bailing 36-foot wooden motor lifeboat soon succeeded it. Powerful tugboats summoned from the harbor often assisted rescues in rough waters. In 1915, the Life-Saving Service was combined with the Revenue Cutter Service to create the modern U.S. Coast Guard. The U.S. Lighthouse Service merged with the Coast Guard in 1939.

panel 11

Rescue at the Gate

The former **Fort Point Coast Guard Station** at Crissy Field in the Presidio is the only place on the West Coast where both a complete U.S. Life-Saving Service Station with a station and a boathouse, and a Coast Guard Lifeboat Station may be seen together. Today they serve as the Gulf of the Farallones National Marine Sanctuary Visitor Center.

The Point Reyes Lifeboat Station on Drake's Bay in the Point Reyes National Seashore is home to the 36-foot wooden **Lifeboat Number 36542**, the last old time motor lifeboat on the Pacific Coast. Open weekends during whale watching season, late December to April.

panel 12

“Open Your Golden Gate!”

Alta California, August 16, 1885:

“The situation of the Presidio is extremely picturesque. … [L]ying chiefly on high rolling ground, almost every turn in the roads and paths by which it is intersected discloses some new and superb view. The brow of the hills at the extreme western limit commands the finest prospect of any point on the peninsula. … Looking from a lofty eminence, through the broad gateway, with its lofty sentinels of rock guarding the approach on either hand, one comes to realize for the first time the dignity and vastness of the Pacific.”

Facing west, from California’s shores,
Inquiring, tireless, seeking what is yet unfound,
I, a child, very old, over waves, towards the house of maternity, the land of migrations, look afar,
Look off the shores of my Western Sea – the circle almost circled;
For, starting westward from Hindustan, from the vales of Kashmere,
From Asia – from the north – from the God, the sage, and the hero,
From the south – from the flowery peninsulas, and the spice islands;
Long having wander’d since – round the earth having wander’d,
Now I face home again – very pleas’d and joyous;
(But where is what I started for, so long ago?
And why is it yet unfound?)

Walt Whitman, *Facing West from California’s Shores*, 1900

panel 12

“Open Your Golden Gate!”

Enjoying the Golden Gate

The dramatic Golden Gate is one of the great sights in California and both San Franciscans and visitors have long enjoyed looking at it and just being near it. The earliest San Francisco day-trip attractions were seeing the Pacific Ocean and the seals on Seal Rock from the Cliff House. At first, horses and carriages transported people over the western sand dunes and out to the Cliff House, but soon streetcars improved and democratized access. Sutro Baths, and later Playland-at-the-Beach, became popular resorts. Walt Whitman came out to Ocean Beach to see the Pacific. The scenic Ferries and Cliff House Railroad, and later pleasure drives for automobiles, were built along the edge of the Gate to afford views of it. Today El Camino Del Mar in Lincoln Park and Lincoln Boulevard in the western Presidio (which was an open post from the 1870s on) are favorite scenic drives on the south side of the Gate. Cliff-hugging Conzelman Road in the Marin Headlands offers spectacular views of the Gate, the bridge and gleaming San Francisco from a high vantage point on the north side of the Gate. The Golden Gate has come to symbolize freedom and opportunity, essential San Francisco values.

panel 13

Before the Bridges . . . and Since

Robert Louis Stevenson, *Arriving in San Francisco*, 1879:

"The day was breaking as we crossed the ferry [from Oakland to San Francisco]; the fog was rising over the citied hills of San Francisco; the bay was perfect – not a ripple, scarce a stain, upon its blue expanse; everything was waiting, breathless, for the sun. A spot of cloudy gold lit first upon the head of Tamalpais, and then widened downward on its shapely shoulder; the air seemed to awaken, and began to sparkle; and suddenly "The tall hills Titan discovered," and the city of San Francisco, and the bay of gold and corn were lit from end to end with summer daylight."

You who come after
you of the swift moving age of speedboat and airplane
may feel scornful of a generation of slow-moving ferryboats.
Do not be, I pray.
…
We revel in our bracing walks around her decks
and the visits she allows us with our friends.
She gives us the opportunity to ruminate,
to think calmly, to listen to the Great Voice,
to decide what we are to do when she shall land
us at the foot of Market Street.

When the world has lost its bearings,
she gives us time to take a new departure.
She has shown us sunsets we can never forget,
the canvas of a working city spread before us
on the lovely hill-sides in the morning light.

Ferryboat captain John Leale, *Recollections of a Tule Sailor*, 1939

panel 13

Before the Bridges . . . and Since

Ferries on the Bay

Before the opening of the San Francisco-Oakland Bay Bridge in 1936 and the Golden Gate Bridge in 1937, San Francisco and the Bay Area was stitched together by a web of ferry lines. There were nineteen major routes, most operated by railroad companies. Some ferries carried as many as 2,500 passengers. The first ferry designed for automobiles was the *Melrose* launched in 1908. As the city and the region expanded, and as automobile and truck traffic grew in volume, the ferries became choke points in the regional circulation of commuters and goods. The great bridges were the answer along with the highways and freeways that later linked them together and now ring the bay. The double-deck Bay Bridge originally had an electric rail line on its lower deck, the Key Route. It improved commuter transit in the Easy Bay and forged a link with downtown San Francisco. The Golden Gate Bridge did not include mass transit at first; it only served automobiles and trucks. This meant that Marin County attracted only those who could afford a car. Marin became a middle- and upper-class preserve. In 1970, when the bridge was close to reaching is rush-hour capacity, the renamed Golden Gate Bridge, Highway and Transportation District added ferries and buses that are partially subsidized by bridge tolls.

Regional growth and the shift from public to private transportation doomed the ferries. Something wonderful was lost in their passing. Riding the ferries was a pleasant interlude at the beginning and end of the working day. Being out on the water was relaxing and kept commuters in touch with the qualities of each day. People socialized on the ferries and chatted with friends or played cards or read the paper. Sometimes they fell in love. Arriving in San Francisco from the water made the city seem a special destination, its own island in a way. You can still capture something of this feeling when riding the Golden Gate Ferry to and from Sausalito or Larkspur. The ferries help you appreciate the natural qualities of this most fortunate part of the Earth, of how beautiful it is, and how central the bay is to the identity of the Bay Area.

more >

panel 13

Before the Bridges . . . and Since

The Alaska Packer Association's *Star Of Shetland* on Its Last Voyage Passing the Northern Tower of the Golden Gate Bridge and the Lime Point Lighthouse
unknown photographer, 1936
Texas Tech University, courtesy of the Collection of Donald H. Dyal

The past and the future were captured in this photograph taken on September 19, 1936 as the *Star of Shetland* was towed through the Golden Gate on her way to the ship breakers at Osaka, Japan. Launched in 1899 in Bath, Maine the steel-hulled, four-masted bark ended her career as one of the large fleet of the Alaska Packers Association with its home port at Oakland. Her sister ship, *Star of Alaska*, resumed her original name *Balclutha*, and can be visited at the Hyde Street Pier at the San Francisco Maritime National Historical Park.

BEFORE THE BRIDGE:
SIGHT AND SOUND AT THE GOLDEN GATE

NORTH GALLERY

A free exhibition celebrating the 75th anniversary
of the completion of the Golden Gate Bridge

May 23 to November 18, 2012

Presidio Trust
103 Montgomery Street
Presidio of San Francisco
Golden Gate National Parks

NORTH GALLERY

Two Centuries of Harbor Defense

War is a great spur to technological advance. An accelerating arms race continually makes costly weapon systems obsolete. Given the delays in Congressional appropriations and the long lead time in constructing and arming batteries, defensive systems at the Gate were often obsolete upon completion. The remnants of coastal defenses now within the Golden Gate National Recreation Area constitute one of the best and most extensive outdoor museums of military engineering and architecture in North America. They illustrate the evolution of coastal defense including "Third System" Fort Point; post-Civil War earthworks; the era of rifled, breech-loading guns and concrete batteries (1890-1905); World War I; the 1930s with its 16-inch naval guns; World War II with its minefields, anti-aircraft guns and anti-submarine net; and the Nike missile era that ended in 1974 when the last armaments were removed from the Bay Area. (Guns are described by the diameter of the projectile they fire, thus a 16-inch-gun fires projectiles 16 inches across from a barrel of the same dimension.)

A 6-inch "disappearing gun" has been reinstalled by the National Park Service for historic demonstrations at **Battery Chamberlain** at Baker Beach in the Presidio.

UNESCO Golden Gate Biosphere Reserve

In 1972, the strategic lands reserved for harbor defense on both sides of the Gate, together with Alcatraz and Angel islands, became the heart of the Golden Gate National Recreation Area. These lands are rich in archeological sites, military history, habitat for many rare and endangered plants and animals, and recreational and educational opportunities. Today the GGNRA is part of the 2-million-acre Golden Gate Biosphere Reserve established by UNESCO in 1988. The Reserve is a partnership of 11 federal, state, local government, university, and non-profit organizations and includes 13 protected areas from Sonoma to San Mateo counties and out to the continental shelf. The Biosphere Reserve Association has suspended operations because of lack of funding.

panel 14

Entrance to San Francisco Bay

The winds of the Future wait
At the iron walls of her Gate,
And the western ocean breaks in thunder,
And the western stars go slowly under,
And her gaze is ever West
In the dream of her young unrest.
Her sea is a voice that calls,
And her star a voice above,
And her wind a voice on her walls –
My cool, grey city of love.

George Sterling, *The Cool, Grey City of Love*, 1920

panel 15

Sand Waves at the Mouth of San Francisco Bay / USGS Map 2944

This high-resolution, multibeam echosounder oblique view looks west to east towards the Golden Gate and San Francisco Bay. The sea floor is color coded for depth with purple for the deepest areas and orange and light blue-green for shallow areas. Vertical exaggeration is approximately 4 times for the sea floor and 2 times for the land. The Presidio bluffs where the batteries were built appear to the upper right. This new technology of sea-floor mapping emerged in the mid-1990s. Ships with a hull-mounted transducer send a fan of sound energy toward the sea floor then record the sound reflected from the sea floor through a set of receivers aimed at different angles. As the ship moves forward, it maps a swath of sea floor. This technology produces sea floor maps of unprecedented accuracy and can detect features as small as one meter (3 feet) across. The system provides both bathymetric (depth) data and also records the amount of sound energy returned from the sea floor called "backscatter." Backscatter data help scientists identify the materials of the sea floor, such as rock, sand, or mud. Because multibeam data are digital, they can be manipulated in many ways. Shadows can be added to create relief maps that are easier to read and interpret. Moving images can be created as well as still pictures. In the Theater of this exhibit is an underwater tour of San Francisco Bay created with this technology.

U.S. Geological Survey; National Oceanic and Atmosphere Administration; California State University, Monterey Bay; U.S. Army Corps of Engineers; the Center for Integrative Coastal Observation, Research and Education / 2006
http://pubs.usgs.gov/sim/2006/2944/

Entrance to San Francisco Bay / Chart 18649
National Oceanic and Atmospheric Administration

Adjoining Point Reyes National Seashore and the Golden Gate National Parks are three National Marine Sanctuaries: Gulf of the Farallones National Marine Sanctuary (1981), Cordel Bank National Marine Sanctuary (1989), and Monterey Bay National Marine Sanctuary (1992). These sanctuaries promote the comprehensive management of their significant ecological, historical, recreational and esthetic underwater resources.

panel 16 [map on platform]

Harbor Defenses of San Francisco during World War II

Will Elder, National Park Service

mine field and submarine net configuration from an illustration by Brian Chin

As battleships became more powerful and naval guns could reach greater distances, harbor defenses struggled to keep up. Coastal defense shifted from within the Gate (Fort Point, Fort Mason, Alcatraz and Angel Island) to outside the Gate (Presidio coastal bluffs, Marin Headlands, Fort Miley and Fort Funston). The Army expanded its land holdings to accommodate longer-range guns and aerial and logistical support (Hamilton Army Airfield, Oakland Port of Embarkation). The Navy also expanded from Mare Island Naval Shipyard to Hunters Point Naval Shipyard, Oakland Naval Supply Depot, Alameda Naval Air Station and Moffet Field Naval Air Station. Harbor defenses reached their maximum extent during the war with Imperial Japan.

During World War II, seventeen batteries with about 125 soldiers each manned the harbor defenses of San Francisco. In 1942, when the threat from Japanese attacks was most acutely felt, the artillerymen lived at the gun batteries and remote observation posts for weeks at a time. Three minefields with 600 mines were placed outside the Gate. Anti-aircraft guns were installed at various points and an anti-submarine net was stretched inside the Gate. The Harbor Defense Command Post was at Fort Winfield Scott in the western Presidio.

Modern long-range aerial bombardment perfected during World War II made coastal batteries obsolete and the Coast Artillery Corps was disbanded in 1950. After a brief period of Nike missile defense from 1954 to 1974, Army and Navy lands became excess to military needs. In 1972, Bay Area Army reservations were transferred to the National Park Service to create the Golden Gate National Recreation Area. The U.S. Army left the Presidio of San Francisco in 1994 after 147 years of guarding the Gate.

panel 17

Spanish Imperial and Mexican Frontier Outpost

In 1792, British naval captain George Vancouver described the Presidio:

"We soon arrived at the Presidio…. The only object of human industry which presented itself, was a square area, whose sides were about two hundred yards in length, enclosed by a mud wall, and resembling a pound for cattle. Above this wall, the thatched roofs of their low small houses, just made their appearance. On entering the Presidio we found one of its sides still unenclosed by the wall…. The only entrance into [the compound], is by a large gateway; facing which, and against the centre of the opposite wall or side, is the church; which, though small, was neat in comparison to the rest of the buildings. … On the left of the church is the commandant's house, consisting, I believe, of two rooms…. The rest of the houses, though smaller, were fashioned exactly after the same manner; and in the winter, or rainy seasons, must be at the best very uncomfortable dwellings."

Hernán Cortéz conquered Mexico in 1519. New Spain, with its capital in Mexico City, became the source of fabulous wealth from its silver mines. Spain used this bonanza to wage costly wars in the Netherlands. When Russian and English ships penetrated the North Pacific, the Viceroy in Mexico ordered the establishment of presidios at San Diego, Santa Barbara, Monterey and San Francisco. The presidios were political, military and administrative centers. The Presidio of San Francisco became the northernmost outpost of the far-flung Spanish Empire and was established in 1776 at the same time as Franciscan Mission Dolores. *El Castillo de San Joaquin* was built on a bluff overlooking the Golden Gate in 1794. The guns placed there were from 100 to 160 years old. In 1797, a second battery was built at *Punta de San José*, today's Fort Mason. The garrison raised crops and cattle. Soldiers went without pay for very long periods. Between 1815 and 1820, the Presidio reached its zenith with 373 soldiers and their families.

When Mexico achieved its independence in 1821, it took a year for the news to reach the Presidio. In 1835, General Vallejo redeployed Mexican troops north to Sonoma Barracks and a caretaker was put in charge of the Presidio. This was the situation when Lieutenant John Charles Frémont, U.S.A. spiked the guns at *El Castillo de San Joaquin* on July 1, 1846.

panel 18

Arming the American Gibraltar

New York Tribune writer Bayard Taylor, *A Reporter's Story*, 1849:

"As the view opens through the splendid strait, three or four miles in width, the island rock of Alcatraz appears, gleaming white [with guano] in the distance. An inward-bound ship follows close on our wake, urged on by wind and tide. There is a small fort perched among the trees on our right, where the strait is narrowest, and a glance at the formation of the hills shows that this pass might be made impregnable as Gibraltar."

Brevet Major William Austine, Fort Point's commander, in 1861:

"During the summer months the post is enveloped in fogs, and dampness and high winds constantly prevail, and consequently rheumatism and severe colds are very common."

Red brick Fort Point was built by U.S. Army Corps of Engineers between 1853 and 1861. It is a "Third System" fort like those that protected East Coast and Gulf Coast ports. Workers blasted the 90-foot cliff on which the Spanish had built *El Castillo de San Joaquin* down to 15 feet above sea level. A crew of 200 men built its seven-to-twelve-foot-thick walls and its three tiers of casements (vaulted rooms) to house cannon. A barbette tier on the roof had additional guns and a sod roof to absorb hostile fire. The lighthouse atop the fort was built in 1864. At its greatest strength, Fort Point mounted 102 cannon including powerful 10-inch Rodman guns that could fire solid shot over two miles. Along with heavily armed Alcatraz Island and a never-built fort on Lime Point on the Marin side, it was part of a planned triangular system of defense built to guard the entrance to the most important harbor on the West Coast. Batteries were built on Angel Island in 1863 and at Fort Mason in 1864. During the Civil War (1861-65), as many as 500 men were garrisoned at Fort Point. Men slept two to a bunk, head-to-foot, for warmth in the cold fortress. Just as the fort was being armed, advances in rifled artillery that could pierce brick walls made Fort Point obsolete. (Rifling refers to spiral grooves cut into the interior of a gun barrel that cause the projectile to spin. Rifled guns are more accurate than older, smooth-bore weapons.)

panel 19

From Earthworks to Concrete Batteries

San Francisco Call, June 2, 1893:

"All day yesterday the reverberations of heavy explosions were heard throughout the city [during the annual artillery practice at the Presidio and Alcatraz]. … The bay contains so many craft of all sorts that it would be too dangerous to have the shells explode. When the targets are outside the heads [the Golden Gate], the explosive shells are used. … The shell first struck the water eighty yards short [of the target] and it then ricocheted across the bay. Each time it struck a mass of spray arose. Before it sank the projectile had traveled several miles."

The bombardments during the Civil War demonstrated the fragility of brick forts. Modern guns reduced them to piles of rubble. On the other hand, the quickly thrown up earthwork batteries of timber and earth absorbed incoming projectiles rather than crumbling. In the 1870s, Army Engineers built low-profile earthwork batteries on the hills above Fort Point. Though they were inexpensive, Congress stopped making appropriations for new earthwork batteries from 1876 to 1890.

In 1885, Congress directed President Grover Cleveland to appoint a board chaired by Secretary of War William C. Endicott to recommend new harbor defenses. The Endicott Era batteries incorporated the new technology of breach-loading, rifled steel artillery with highly efficient pointed projectiles (instead of cannon balls) and higher-powered propellants. These guns had far greater accuracy and range. Projectiles weighing up to half a ton could reach more than eight miles out to sea. The new batteries were built of concrete and surrounded with earth and sand. Earthworks might extend more than a hundred feet out from gun emplacements. These two-story batteries had guns on their upper levels and ammunition magazines below ground. In 1905, President Theodore Roosevelt appointed Secretary of War William H. Taft to head another board that recommended electrically-powered ammunition hoists, telephones, searchlights and modern fire control systems. The noise and concussion of the guns was tremendous and deafness was an occupational hazard in the Coast Artillery Corps. Gun crews worked as synchronized teams reloading the guns without verbal commands. The guns at the Presidio never fired a shot in anger.

panel 20

The Curtain Rises on a Global Power

San Francisco Chronicle, May 7, 1908:

"Imagine out near the Farallones a great archipelago of two dozen islands, each an active volcano, staining the sky with smoke belched from their craters. Imagine that chain of islands shifting into a file on the horizon, pointed like an arrow at the center of the Golden Gate. Then imagine those islands growing out of the gray perspective until they are transformed into formidable factories, immense buff chimneys towering from turrets, piled high on a slivery foundation. Imagine those factories, the most magnificent fighting machines that man has been able to devise, edging toward you with hardly a ripple, slipping through the gray-green sea as easily as pleasure boats in a pond. That was San Francisco's first vision of the Atlantic fleet on May 6, the start of a spectacle that will never be forgotten in this city as long as one stone stands on another."

While coastal defense was an important part of the Army's role in the late nineteenth and early twentieth centuries, the nation's first line of defense was the U.S. Navy. California herself had been conquered by the U.S. Pacific Squadron in 1846 before the Army could reach the West Coast by marching from Fort Leavenworth, Kansas. By 1902, the U.S. Navy ranked third in the world in battle line strength. Eleven new battleships were built between 1904 and 1907 under President Theodore Roosevelt. TR sent the fleet around the world, a first for a major navy. With the exception of a few admirals, no one knew of Roosevelt's plans, including Congress. He announced only that the fleet would steam from Hampton Roads, Virginia, around Cape Horn, to the West Coast on a training exercise. On December 16, 1907, sixteen white-painted battleships with 14,000 sailors began a fourteen-month long, 43,000-mile cruise that made twenty ports of call on six continents. The grand parade of ships entered the Golden Gate on May 6, 1908 with cheering San Franciscans crowding the shoreline and the hilltops. The Great White Fleet arrived home at Hampton Roads in triumph on February 22, 1909. President Roosevelt closed his expansionist presidency with this first global assertion of American military power.

panel 21

Gateway to Empire

Secretary of War Redfield Proctor, 1891:

"The troops should be assembled by regiments, or at least battalions, in well-built posts at strategic and convenient points as rapidly as it can be done consistent with adequate protection against possible Indian depredations. Even for this purpose it has been found by experience that troops stationed at convenient railroad centers are more available then those at posts nearer the scene of trouble but not on the railway. Besides economy of transportation, supplies, etc., a much greater percentage of men is available for service from a large post than a small one . . . and the discipline and drill of the command is improved."

After the Army subdued the western tribes and forced them onto reservations, small posts all over the West were closed and larger posts were developed at key rail centers. The Army's domestic role shifted to suppressing strikes on the railroads, factories and mines of the industrializing West. The Presidio of San Francisco expanded greatly in the mid-1890s, including building the brick barracks along Montgomery Street you are in now. With the war against Spain in 1898, and the subsequent war to suppress the independence movement in the Philippines, the Presidio became the key post for U.S. expansion across the Pacific. Troops mustered and trained here for the long war in the Philippines that lasted until 1915.

The United States Army Transport *Sheridan* is seen against the Marin Headlands on its way to Manila in 1916. During World War II, troopships sailed through the Golden Gate on their way to and from the vast Pacific Theater. More recently, aircraft carriers home-ported at Alameda sailed out the Gate.

panel 22

Fort Winfield Scott

San Francisco Call, April 2, 1911:

[The adoption of the] "old mission style" [at Fort Winfield Scott was] "in accordance with the wishes of the merchants' association. . . . After much consideration, the plans drawn up by General [Arthur] Murray, Colonel [John A.] Lundeen, former commander of the post, Colonel Biddle and Major Williamson were adopted and approved."

About 1900, the Army divided the Presidio reservation into an Infantry post to the east, the historic Main Post, and a new Coast Artillery post to the west. Fort Winfield Scott was completed in 1912 on a plateau on the ocean side of the Presidio for the headquarters of the U.S. Army Coast Artillery Corps, Artillery District of San Francisco. It manned the coastal batteries across Lincoln Boulevard begun in the 1890s that lined the bluffs of the Presidio as well as the Marin Headland forts, Angel Island, Fort Miley, and Fort Funston. Fort Winfield Scott had its own commander, 30 officers and 950 enlisted men.

Fort Scott's horseshoe-shaped parade ground was a new departure in post design. Around this north-facing open space are barracks and administrative buildings built of reinforced concrete. There are buildings of various kinds at Fort Scott including a commandant's quarters, officers' quarters, barracks with classrooms, a guardhouse, a chapel and officers' club. Fort Scott introduced Mission style architecture to the Presidio with white stucco-covered walls, curvilinear gables, and red tile roofs. The Mission style spread across the Presidio in the twentieth century creating a "Californian" image for the post.

The Coast Artillery officers' row along serpentine Kobbe Avenue is one of the great residential streets in San Francisco. Most are either in the Mediterranean style with white stucco walls and red tile roofs, or in the Georgian Revival style with red brick exteriors and tile roofs.

The Presidio Trust is working to repurpose Fort Winfield Scott as a national center for service and innovative leadership.

panel 23

The Last Big Guns

Thomas Pandolf, 9th and 244th Coast Artillery Corps, 1929:

"When your 16-inch guns used to fire off . . . I have seen fellas bleeding in the mouth, nose, ears. The [standard operating procedure] in those days when you fired was: open your mouth, and stand on your toes for the shock. You would be surprised [by] the concussion. If you were standing anywhere near the mouth of that 16-inch you would drop dead and nobody would know what hit you. The concussion would kill you."

World War I (1914-18) saw the introduction of aircraft and aerial bombing in warfare. Obsolete guns were removed from batteries at Fort Winfield Scott in 1918. In the 1920s, battleship guns became more powerful. The last generation of new seacoast guns was completed in 1940 and protected by thick, overhead concrete shields. They were modified 16-inch naval guns designed for battleships emplaced on land and could fire a one-ton projectile up to 25 miles out to sea. Coastal defenses were augmented with observation aircraft from Crissy Army Airfield of 1921 and Hamilton Army Airfield in Marin County built in 1932. The four biggest guns were installed at Batteries Davis and Townsley on the high ground of Forts Funston and Cronkhite, covering the south and north approaches to the Golden Gate. After the U.S. Navy won the Battle of Midway in June, 1942 sinking four Japanese aircraft carriers while losing one American carrier, the threat of a Japanese attack on California diminished and the U.S. Navy seized the offensive in the Pacific. No more big guns were installed at San Francisco. When the war was over, all the guns were all scrapped. Not one was kept as a war relic.

During the Cold War (1954-1974), Nike-Ajax and Nike-Hercules missiles, guided by radar and computers, were installed at twelve sites in the Bay Area including one site in the Presidio to shoot down long-range bombers. All were removed by 1974 when inter-continental ballistic missiles (ICBMs) replaced bombers. ICBM silos were built deep in the interior in places like the Dakotas.

Today, **SF-88L launch site** at Fort Barry in the Marin Headlands is the most completely restored (unarmed) Nike launch site in the country.

panel 24

The Open Post / The Open Gate

John S. Hittell, *A Guide Book to San Francisco*, 1888:

"General [Irvin] McDowell, late commanding the Pacific military division of the national army, made fine roads through the Presidio reservation, planted trees, and commenced other improvements, so as to convert it into a public park, which, in time, may rival the Golden Gate Park in its attractions."

Ansel Adams on his famous photograph of the Golden Gate of 1932:

"One beautiful storm-clearing morning, I looked out the window of our San Francisco home and saw magnificent clouds rolling from the north over the Golden Gate. I grabbed the 8 x 10 equipment and drove to the end of 32nd Avenue at the edge of Seacliff. I dashed along the old Cliff House railroad bed for a short distance, then down the crest of the promontory. From there a grand view of the Golden Gate commanded me to set up the heavy tripod, attach the camera and lens, and focus on the wonderful evolving landscape of clouds. …. I have been after that for ten years, and at last got a really satisfactory plate."

Ansel Adams to Wallace Stegner, president of the Sierra Club, on the Golden Gate lands in 1961:

"I would like to see a man in charge of the [National] Parks who would have the imagination to see the enormous importance of making the Golden Gate environment a National Monument. …I am personally going to fight for this thing as I don't think the Park Service people will have the taste or imagination to realize fully what a wonderful thing this project could be…. with all U.S. Government land, the costs of establishing such a Monument would be practically nothing…. I am concerned about this because I know from many rumors and many direct statements of various people, that real estate development of the Presidio and a large part of the Marin County area is very much in the works…."

panel 25

The Bridge and the Presidio

This shall remain: the ragged headlands flung
Far out against the sunset-crimsoned sea;
Dim spits and isles; and one star-lantern hung
Over the wrinkled, lone immensity;
These clouds that flare from ruby-red to gray;
Those peaks that stab the violet dusk; and white
Of breakers curving in wide lips of spray
Under the bald and seagull-peopled height.

Stanton A. Coblentz, *From the Golden Gate Bridge*, 1945

The Department of War was involved in the creation of the Golden Gate Bridge in many ways. First was the matter of determining the clearance under the bridge for battleships. Second was the granting of rights-of-way for highways 101 and 1 that give access to the bridge. Doyle Drive (Highway 101) was elevated to permit ground access to Crissy Army Airfield. Highway 1 passes through a tunnel in the middle of the Presidio. Land was also taken for the Toll Plaza and bridge headquarters. Historic Fort Point was preserved by building a great steel arch over it. The fort was used as a field office by the bridge's engineers during construction. The ground-breaking ceremony for the bridge was held on Crissy Army Airfield. Some military structures including disarmed batteries and roads on both side of the Gate were demolished and then replaced as Works Progress Administration (WPA) projects. As compensation for lands taken, the Bridge District paid for building a new Central Reserve Magazine (large red circle) and two Monterey style officer's quarters on the post, Quarters 1 for the Commandant and Building 1332 on Wright Loop at Fort Winfield Scott (two smaller red circles). The military was granted free access to the bridge to reach the Marin forts. Seismically substandard Doyle Drive is being replaced with the Presidio Parkway, a $1.1 billion public-private project that will cover over part of the highway to link the Main Post with Crissy Field. The Parkway is making right-of-way payments of $38.5 million that the Presidio Trust is using to rehabilitate historic buildings and landscapes in the Main Post.

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