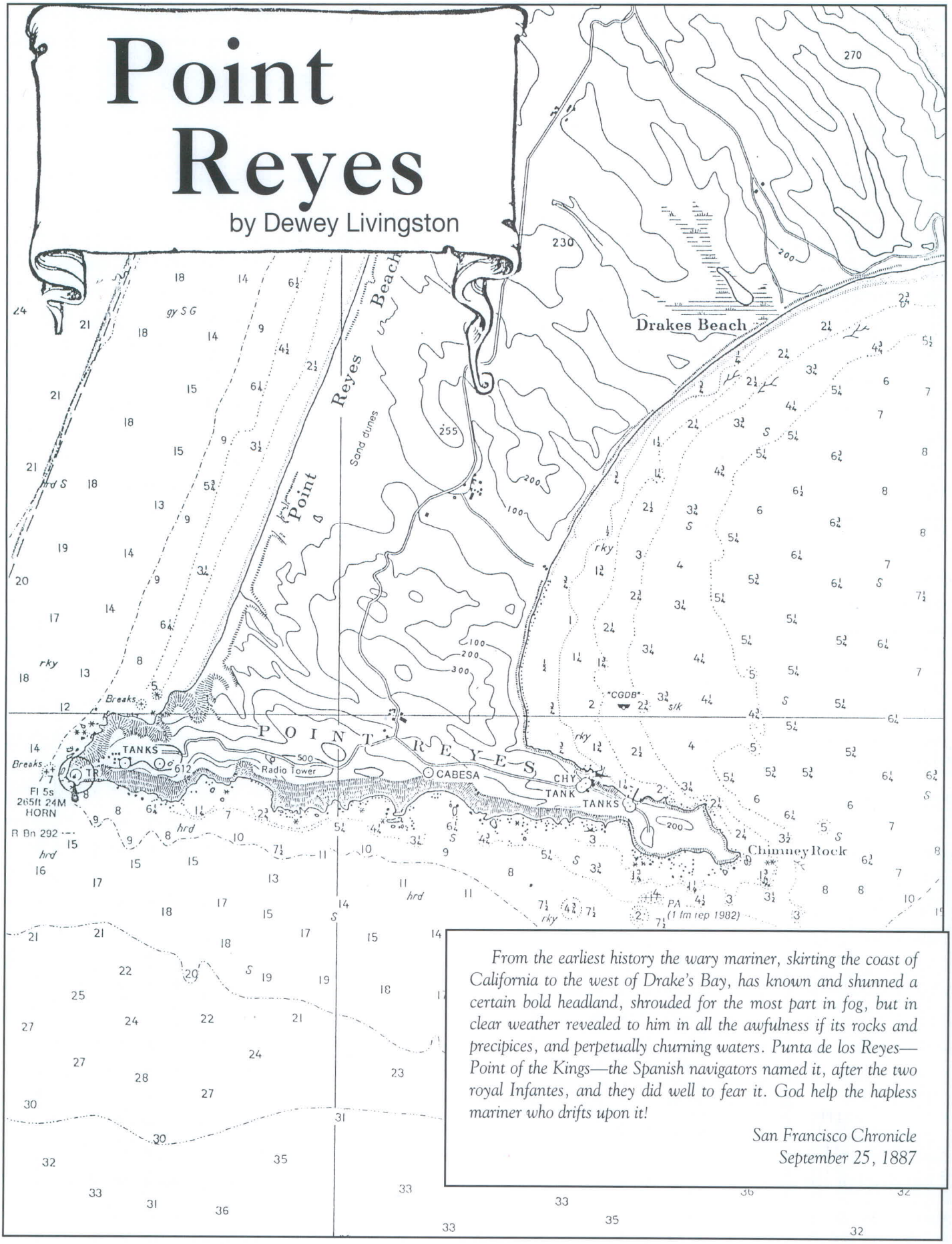
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Point Reyes

by Dewey Livingston



From the earliest history the wary mariner, skirting the coast of California to the west of Drake's Bay, has known and shunned a certain bold headland, shrouded for the most part in fog, but in clear weather revealed to him in all the awfulness if its rocks and precipices, and perpetually churning waters. Punta de los Reyes—Point of the Kings—the Spanish navigators named it, after the two royal Infantes, and they did well to fear it. God help the hapless mariner who drifts upon it!

San Francisco Chronicle
September 25, 1887

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Point Reyes, historically named Punta de los Reyes, is an odd-shaped peninsula that protrudes into the Pacific Ocean about 35 miles northwest of San Francisco. The peninsula forms a triangle with Tomales Point on the north, Bolinas Point on the south, and the most prominent, Point Reyes, on the west. The peninsula is characterized by rolling hills covered by grass, brush or forest and surrounded by beaches. Point Reyes itself, however, consists of an abrupt headland forming the shape of an inverted "T." It is upon the westernmost tip of this headland that the Point Reyes Light Station has stood for 120 years.

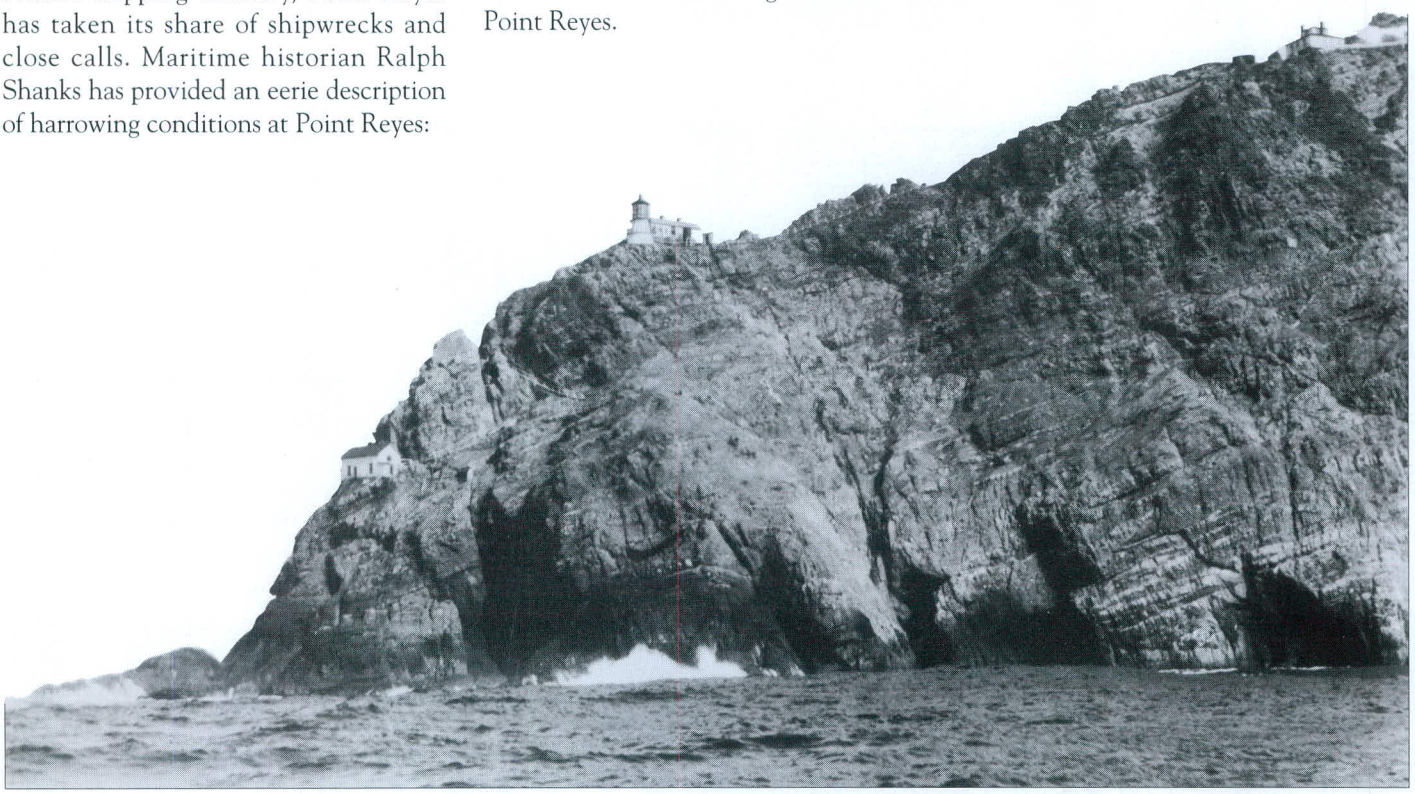
Since the earliest days of marine commerce Point Reyes has been both a significant landmark and a hazard to mariners. Despite its geographic prominence, Point Reyes is often shrouded in dense fog and is considered to be the windiest place on the West Coast and one of the foggiest places in the United States, second to areas on the East Coast. A wickedly heavy surf pounds Point Reyes Beach, directly north of the headland. From the beginning of the Pacific shipping industry, Point Reyes has taken its share of shipwrecks and close calls. Maritime historian Ralph Shanks has provided an eerie description of harrowing conditions at Point Reyes:

Offshore, the ocean currents become confusing, moving in opposite directions. The sea is deep, too, so that the early-day mariner could not use a lead line to determine his depth or position. A breaking beach and rocks often loom without warning. Worse, configurations in the headlands and other causes make it difficult to hear the warning blast of a fog horn when vessels approach from the north. Stranding was a terrible prospect, for Point Reyes Beach may well have the heaviest surf in California. Here, then, is a fitting graveyard for ships.

The long list of Point Reyes shipwrecks begins with perhaps the most famous that of the Manila galleon *San Agustin* in 1595, considered to be the first recorded shipwreck on the California coast. Some of those that followed were the *Oxford* (1855), *Oregon* (1860), *Sea Nymph* (1861), *Monterey* (1862), *Bengal* (1863), *Norvick* (1863), *Labouchere* (1866), and *S.F. Blunt* (1868), to name a few. As commerce increased along the California Coast, the need for aids to navigation also increased. In response, the United States government overcame numerous obstacles and established a light station at Point Reyes.

The first plans for California lighthouses were drawn in 1849 when President Zachary Taylor authorized the U.S. Coast Survey to recommend lighthouse sites along the coast of the new territory. Of sixteen sites the Survey recommended—with Point Reyes ranked second—the government contracted for construction of only eight, and did not include Point Reyes. In 1852 Congress transferred administration of the country's lighthouses from the Treasury Department to the Lighthouse Board opening the way to provide much-needed improvements towards the safety of the country's burgeoning maritime industry. Point Reyes was in the West Coast area designated as the Twelfth District.

After construction had begun or been completed on the eight other California sites. Congress appropriated $25,000 on August 3, 1854 for a light station at Point Reyes. Of the appropriation, $10,000 was for illuminating apparatus and $15,000 for construction. The next month Point Reyes appeared on a map



Point Reyes from the sea looking north, February 1929. The fog signal building at left (original site) was razed when a replacement building was constructed next to the tower. The keeper's house can be seen at far right. Photo courtesy of the National Park Service.

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of the coast near San Francisco Bay, where the government reserved the tract of land "for Light House purposes." Inspector of the Twelfth District, Captain Campbell Graham, was informed in the following February that a lighthouse at Point Reyes was to receive priority for construction and that he should proceed with plans to erect the station as soon as possible. A letter from the Lighthouse Board explains where some of the pressure was coming from:

This light is asked for by the navigating interests, & it has been represented to be of great importance—which is not so readily understood when it is remembered that the point is so very near the Farallones, 1st order—Point Bonita 2nd order and the Point Lobos, which will be 2nd or 3rd order apparatus. The site has been selected—land reserved and the Inspector instructed to use all diligence in arranging for the commencement of the work.

By June of 1855 Captain Graham had arranged a contract for the construction under the supervision of Major Hartman Bache of the Corps of Topographical Engineers. The contractor, William Nagle, was to build a second order flashing signal in a tower like that at the Farallones and a keeper's dwelling similar to one at Point Bonita for the sum of $10,500.

One detail remained unresolved: the United States did not have title to the land. This detail turned into a major obstacle that resulted in a fifteen-year delay in construction of the lighthouse, at the probable expense of almost a million dollars in maritime losses at Point Reyes.

Most of the Point Reyes peninsula was unclaimed in 1840 when Antonio Osio applied to the Mexican governor for the 48,000-acre "Rancho Punta de los Reyes, Sobrante." The land had been under the distant stewardship of the Mission San Rafael from the time of its establishment in 1817 to 1834, when Mexican authorities disbanded the mission. The governor approved Osio's grant on November 20, 1843. Nine years later Osio sold the ranch to Andrew Randall, a prominent San Francisco doctor, politician and investor, for $25,000. Randall occupied the land with his family for a short time but often left it in the hands of a superintendent named Josiah Swain. Although the United States Land Commission confirmed Randall's title to the land in 1855, his reckless and investments around the state aroused trouble with creditors, many of whom had moved to foreclose on the property.

One creditor took the extreme step: July 23, 1856, in a rage over a debt, Joseph Hetherington approached Randall in a San Francisco hotel and killed him with a revolver. Vigilantes subsequently hanged Hetherington in front of a huge crowd. Randall's widow was left with a $237,000 debt and land that was "hopelessly mired in litigation."

At the height of the battle over Point Reyes during 1856 and 1857, at least three different parties claimed to own the property due to the fraudulent settlement of liens against the property. One, Dr. Robert McMillan, had the financial resources to hire one of the premier law firms in San Francisco, Shafter, Shafter, Park and Heydenfeldt, and to pay off the liens on the land. McMillan won the property title in court in 1858 and the Shafter law firm took over the ranch after paying McMillan $70,000 and Randall's widow $14,700.

Brothers Oscar and James Shafter, natives of Vermont, bought out their partners Park and Heydenfeldt in 1858 and undertook to establish a series of dairy ranches at Point Reyes. The Shafter brothers were instrumental in the long delay in getting the lighthouse built at Point Reyes.

While the land title was in dispute, the Lighthouse Board could only sit and wait. Design work had commenced but on



Aerial view of Point Reyes looking southeast, lighthouse at extreme right. Drakes Bay, where the construction material was off-loaded, can be seen at top left. Photo courtesy of the National Park Service (c. 1959)

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October 24, 1855, the Board ordered all work suspended until the U.S. government officially acquired the land. Bache tried to clear up the disputes and secure title during the winter of 1855-56. On March 18, 1856 a deed was drawn up for an 83-acre parcel for sale to the government by Thomas G. Richards of San Francisco, one of the claimants who at that time had appeared to have gained legal title. Then, according to historian Anna Coxe Toogood:

On March 19 Bache wrote to (Lighthouse Board) Secretary Jenkins to explain that Richards had first offered to sell for $2000. Considering $1500 an ample price for the land and a right of way from Drakes Bay, Bache had counter-offered $1000, which Richards had declined to accept. The two parties reached an agreement the next month, however, and on May 2 Bache forwarded the deed to the United States Attorney General for approval.

Unfortunately, the transaction did not work out. While the District Attorney for Northern California and the U.S. Attorney General worked out details, the land changed hands again, ending up with the Shafters.

Meanwhile, Bache pressed ahead on design and construction details. In September 1855 the Lighthouse Board shipped twenty-nine cases of second-order illuminating apparatus from the East Coast, which arrived on the West Coast the following spring. The lighthouse lantern was to be completed by Hayward, Bartell and Company of Baltimore, Maryland, but Nagle's construction bid for the house and tower had to be put on hold pending confirmation of title. In late 1859 the Lighthouse Board's engineer submitted plans for a California Cottage-type house with the tower enclosed on the west side, facing the ocean. These plans were eventually abandoned as years passed with no title being transferred to the United States.

Oscar and James Shafter were both knowledgeable and crafty in their land dealings. After they gained title in 1858 they asked what the Lighthouse Board considered an exorbitant amount of money for the land and right-of-way for the lighthouse. Although the California legislature passed an act in 1859 providing "for the relinquishment to the United States, in certain cases, to title in lands, for sites of lighthouses and for other purposes," the government took no action against the Shafters for a decade, perhaps due to their stature in state politics: besides being powerful lawyers, Oscar held a seat on the state supreme court and James had been elected a state senator. The Shafters' stubbornness enraged California Senator William Gwin, who spoke before the U.S. Senate on April 19, 1860 to plead the Point Reyes case:

There is a lighthouse that ought to have been built at Point Reyes years ago. We had an appropriation of $25,000. The parties owning the ground, knowing the necessity of having a lighthouse there, asked $25,000 for three and two-thirds acres, the amount of the entire appropriation, when it was not, in fact, worth twenty-five cents an acre. The Lighthouse Board would not give it; and the appropriation lapsed back into the Treasury. The commerce between California and Oregon is suffering constantly for want of that lighthouse.

As if heeding Gwin's advice, Congress appropriated an additional $40,000 for the lighthouse and $2,500 for a fog signal in 1860, and another $15,000 in 1867. Lt. Col. R.S. Williamson, the Twelfth District engineer, dealt with the Shafters and their new partner, Charles Webb Howard, over a price for the land. The Lighthouse Board authorized Williamson, who felt that the land was "intrinsically worthless" except as a lighthouse site, to make an offer of $5,000. Historian Toogood noted:

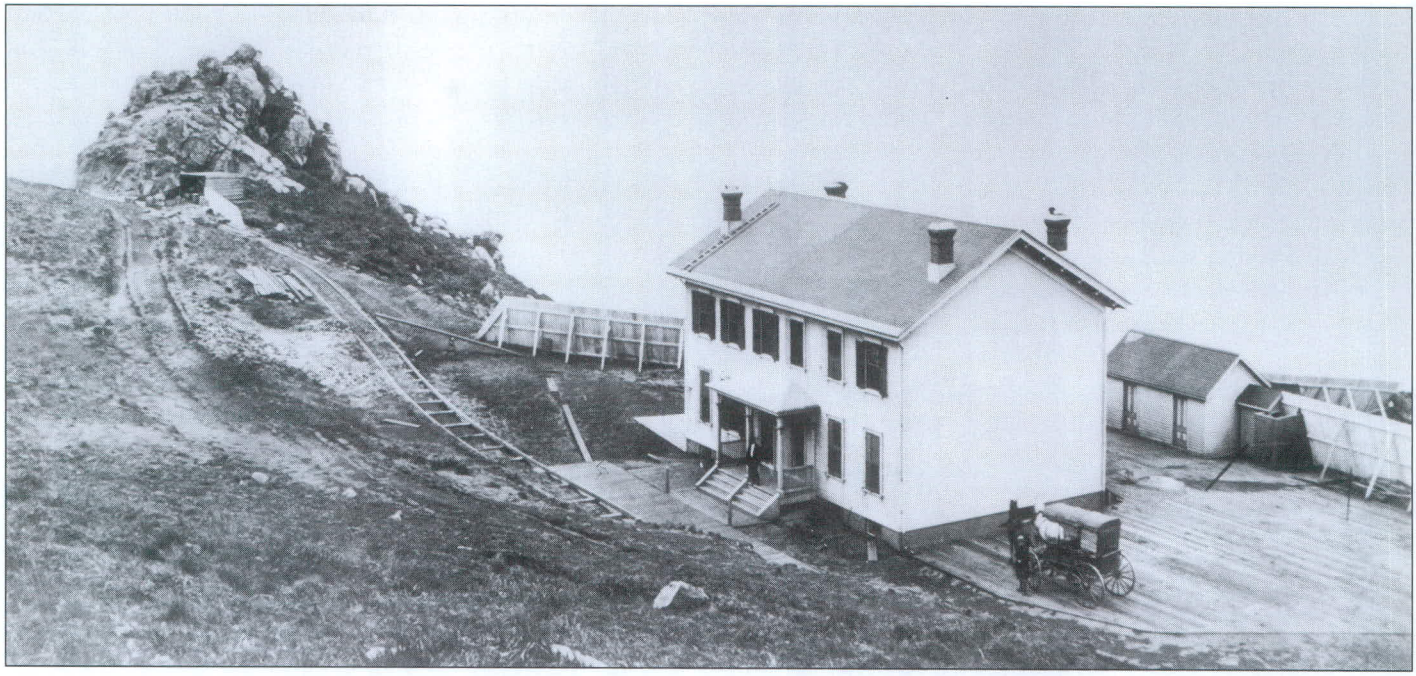
The negotiations were complicated by the fact that the District Attorney, Delos Lake, advised Williamson that the new proposal from the Shafters and Howard to sell the twenty-three acres at issue for $10,000 was not far from what a jury would appraise the land. Furthermore, the owners, in their letter of July 8 (1868), warned that they were on the verge of disposing of their lands; if they did so without making a deed for the lighthouse, negotiations would then have to be continued with the new owners, causing yet further delays.

In November 1868 Williamson received clearance from the Lighthouse Board to instigate condemnation proceedings against the Shafters and Howard. An advertisement stating such was run in the Marin County newspapers for four months as required. Meanwhile the Shafters made a counter-offer of $6,000, a sum supported by the Board of Marine Underwriters in San Francisco. No doubt in an attempt to move the project along, the underwriters had formed a committee to investigate the dangerous delays in getting the lighthouse built. They provided to the Lighthouse Board a list of shipwrecks at Point Reyes since 1860, which had resulted in over three-quarters of a million dollars in losses.

The Lighthouse Board authorized Williamson to accept the Shafters' price in January of 1869 and a deed was signed on July 28 of that year. The sale gave the U.S. government 83 acres for the lighthouse reservation, "together with a convenient embarcadero on Drakes Bay and the right to land at any point between Drakes Bay and the tract herein conveyed, and a convenient right of way between the two; a perpetual right of access across to the beach on the north side of the point for firewood, and the perpetual right to take the same for the use of the Light House Keepers for fuel; a perpetual right to take water from the spring most convenient to said Light House site, and the right to take materials from the Granite quarry on the Bay aforesaid to be used in the erection of such portions of the Light House and other buildings connected therewith as it may become desirable to build of stone." After fifteen years of frustration, the construction could now begin.

At the close of fiscal year 1869 the Lighthouse Board had $49,288.12 set aside for construction and had asked Congress for an additional appropriation of $45,000, which was granted on July 15 of the next year. Phineas T. Marston, a carpenter from Maine who had specialized in church building and had been recently appointed Superintendent of Lighthouse Construction on the West Coast, received the contract for site preparation and construction of the keepers dwelling.

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The newly constructed keeper's duplex, circa 1870. Path, and stairway to tower at left. Note horse and carriage at right. Eadweard Muybridge photograph, National Archives, courtesy NPS.

The contractor's first task, begun in the latter part of January 1870, was to build a road from the designated landing at Drakes Bay (at today's fish docks) to the lighthouse site, a distance of about three miles. Starting at a sheltered cove behind the east headland of Point Reyes, the road wound up a steep hillside and through a part of the pasture land of one of Charles Webb Howard's dairies, designated "A Ranch." Passing near the dairy complex, where the road to Olema (about 20 miles distant) and San Rafael headed north, the lighthouse road then went up a steep hill to the sandy top of the west headland, where it traversed areas alternately composed of sand and rock. The road terminated at the site of the keeper's dwelling, the first building to be constructed.

Originally, the area at the top of the bluff near the dwelling site had been earmarked as the site of the lighthouse, with the dwelling incorporated in the structure in a style typical of the East Coast light stations. This location, however, had a serious flaw: there was no visibility in the typical heavy fogs. At the request of the Lighthouse Board, the United States Coast Survey sent its talented surveyor, George Davidson, to Point Reyes in June 1869, to look at the situation. Davidson, well acquainted with the California coast after almost twenty years in charge of the Pacific Coast survey, traveled to Point Reyes via ferry from San Francisco to San Quentin and stagecoach to Olema. The next day Davidson and fellow surveyors Edward C. Cordell and Augustus F. Rodgers hired a wagon and proceeded to the foggy Point Reyes headlands.

Davidson had been convinced as early as 1853 that Point Reyes needed a light at a location low on the cliffside, due to the heavy fogs there that "lift" just enough for a lighthouse at a certain elevation to be seen by a ship. So, departing from the proposed lighthouse site down the steep reidge to the west, the party "followed the sharp, jagged ridge of the head below the old location to a shelving, projecting point about 275 feet beneath it." There they found a suitable location where "with very little labor in taking away the sloping and higher part (27 feet) of the point to the north eastward, sufficient space can be had for a lighthouse of the size of that at Mendocino."

Using a hand level and compass, Davidson figured that the new location was 225 feet above sea level and offered a superior arc of visibility. In his official letter to his superior, Superintendent Benjamin Peirce of the U.S. Coast Survey, Davidson stated: "This location commends itself so soon as seen, and we recommend that it be adopted as the site for the proposed light . . . the rock is solid, and when the spur is levelled off there appears no reason to doubt its adaptability as a safe and sure foundation." He added, "We especially and earnestly recommend that a powerful fog trumpet or steam whistle be placed on the ledge below any selected location. In very thick weather it will be of greater use than the light itself." To confirm these recommendations, Davidson had recently distributed circulars to mariners asking for comments about peculiarities of the location and experiences in navigating the Point Reyes area.

Davidson also recommended that the light be a facsimile of the recently completed light at Cape Mendocino in Humboldt County to the north. He also commented on the state of the road from the proposed landing ("The road . . . is practicable with little grading") and the lack of a dwelling site within view of the proposed light tower ("But sufficient space immediately adjacent to the tower may be made for a small house for watching, working and sleeping quarters"). Davidson, Cordell and Rodgers

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left a mound of stones at their chosen site and returned to San Francisco.

Inspector of Hydrography Carlisle Patterson disputed Davidson's recommendations, and the Army Corps of Engineers concurred. Patterson felt that the tower should be placed even further down the cliff at a possibly higher cost. "A cheap lighthouse," he argued, "in a comparatively useless place, is a wasteful expenditure." The Lighthouse Board accepted Davidson's recommendation, however, and ordered construction to begin.

Preparation of the lighthouse site, on the rocky cliff to the west of the dwelling site, proved to be a laborious and dangerous, and hence, and expensive task. Near the end of January, crews blasted and graded a route down the cliff, then leveled a section of the cliff to accommodate erection of the tower. A tramway was built to carry tools and materials down the cliff to the lighthouse site. This tramway, consisting of a ramp skirting the north side of the wooden stairway upon which a cable-controlled cart operated, continued in practical use after construction was completed. Historic photographs have pictured a railway system at the top of the stairs, which could have been an original portion of the tramway system. Presumably handcarts traversed the area between the keepers dwelling and the top of the stairs on these rails; the rails appear in photographs into the 1920s.

Marston hired a second group of laborers in April 1870 to build the keepers dwelling on a site about 450 feet east of the top of the tramway. A 217-foot-long retaining wall had to be built to provide a level space for the yard and garden for the keeper; the stone for this wall was probably taken from the Drakes Bay granite quarry mentioned in the 1869 deed. Workers then backfilled the wall, forming a large level yard. A wind fence erected on the top of the wall extended around the north and west sides of the house. Extensive grading to the south of the house produced a wide passageway needed to reach the lighthouse steps.

Carpenters built a two-story frame house, according to an official description at the time, "in the most thorough and substantial manner, (and) the materials of which it is built are of the best quality." The house featured a brick cellar and "was well-painted, inside and outside, with three coats of paint." Fences and outbuildings were whitewashed, no doubt giving the keepers complex a new and tidy appearance. A four-foot high fence, 1300 feet long and also whitewashed, was built some distance to the east of the dwelling to mark the boundary of the lighthouse reservation. While the dwelling occupied a somewhat protected spot on the headland, winds wreaked havoc during and after the construction, as reported later in a newspaper:

Time and again, it is said, the workmen engaged in the construction of the buildings had their tools blown away, and once the breeze lifted bodily a carpenter's kit and hurled it over the cliff. A stiffish gale unroofed the keeper's house soon after its completion.

In August, Marston completed the dwelling contract and the first keeper, John C. Bull, and his wife, Melissa, moved into the house.

Joseph Bien, a San Francisco machinist who had recently completed the lighthouse at Cape Mendocino (Point Reyes' only "sister" lighthouse, being practically identical), received a contract to construct the tower and install the lighting apparatus in April 1870. As the only man qualified in the state to build a lighthouse to government specifications, Bien was well paid at his own request, a fact that irked engineer Williamson. To be paid according to the weight of the iron tower, at eighteen cents per pound, Bien set to work fabricating the heavy sections of tower wall while waiting for the French-made lens apparatus to arrive via steamer from the East. The shipment eventually arrived but with a case of prisms missing, causing a frantic search during July and August by the engineer and the shipper, the Pacific Steamship Company. Someone found the missing case in time so as to not delay the assembly of the lantern.



View down the stairs under construction, probably late 1870. Note that the site of the future equipment building (right of tower) has been graded. Eadweard Muybridge photo, USLHS.

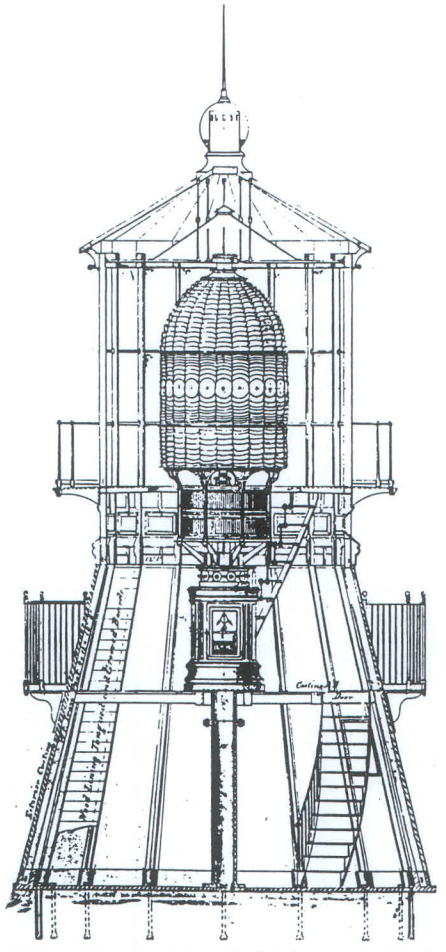
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After making three specified alterations on the tower and repairing damage to the lens apparatus suffered during shipment, Bien was ready to ship the parts to Point Reyes by September 15, 1870. The boxed parts arrived by steamer at the Drakes Bay landing; crews hauled them up the road to the bluff above the lighthouse site on October 9. A crew of seven men hired for the occasion then lowered the tower parts and apparatus down the tramway to the construction site. The tower's bed plates were attached to bolts embedded in the rock-and-concrete foundation that had been laid on the site.

In little over a month and a half the lighthouse reached completion; a notice to mariners dated November 1870 announced that the light would begin operation on December 1, 1870, with characteristics being a white light flashing every five seconds from a white tower located 273 feet above mean sea level, visible from a distance of twenty-three and a half miles at sea when looking from a ship's deck fifteen feet above the water. According to the notice, bearings could be fixed with the lighthouses at Point Bonita, twenty-seven and a half miles southeast, at South Farallon Island, seventeen and three-quarters nautical miles south and east, and at Point Arena, sixty-seven miles northwest.

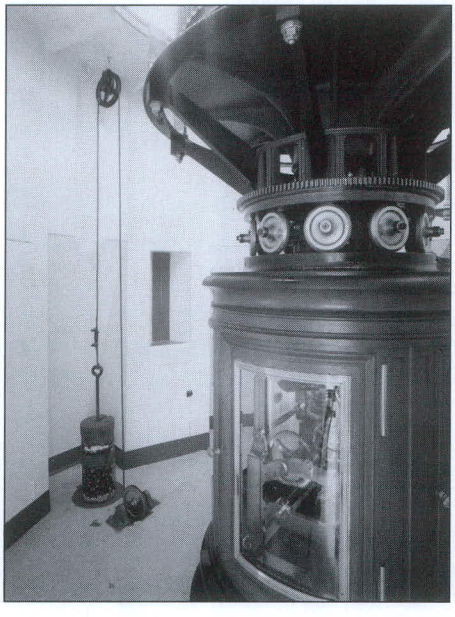
An excellent description of the lighthouse appeared ten years after its construction in a detailed history of Marin County published in 1880:

The station is Number 495, and the light is a first order Funk's [sic: correct spelling is Funck's*] Hydraulic Float. There are four circular wicks in the lamp, whose diameters are as follows: Three and one-half inches, two and one-half inches, one and three-fourths of an inch, and seven-eighths of an inch. The lamp consists of two chambers for oil, one above the light and one below. The oil is pumped from the lower into the upper, whence it passes through a chamber in which there is a regulating float, which governs the flow of oil to the lamp. The flow of oil is in excess of the amount consumed to the extent of one hundred and twenty drops each minute. The object of this is to prevent the charring of the wick. This overflow is conducted to the lower chamber, and pumped again into the upper. In this way there is no wastage. The upper chamber is pumped full of oil every two hours. This is what is known as a "flash[ing] light," i.e., the lenses revolve around the light in such a manner that the focus of each lens appears as a flash. There are twenty-four of these focal lenses, and the entire revolution is made in two minutes, thus causing the flashes to appear every five seconds. A very complete reflecting arrangement is constructed about the light, so that every ray is brought to the focal plane, and passes thence across the surging billows to warn the mariner of dangers, and to guide him safely into the quiet harbor. These reflectors consist of a series of large glass prisms, divided into segments, varying in length as they approach the apex of the cone. Of these prisms there are eight horizontal series above the lenses, and the same number below them. Then there are eighteen series on the concave surface above the light, and eight series on the concave surface below, making a total of forty-two series of reflecting prisms, and the height of the reflecting apparatus, including the lenses, is eight feet and ten inches, and it is five feet and six inches is diameter. Viewed from the outside, the outlines are very similar to a mammoth pineapple. The reflector is revolved by a clock-work arrangement, and requires weight of one hundred and seventy-five pounds to drive the machinery. There is a governor attached to the gearing for the purpose of regulating the motion and speed of the revolving reflector. This weight requires to be wound up every two hours and twenty minutes. The lenses are of the La Pute patent, and the gearing was made by Barbiere & Fenestre, in Paris, in 1867. This light is on a sixteen-sided iron tower, and it is twenty-three feet from the base of the tower to the focal plane. It is two hundred and ninety-six feet above the sea level, and can be seen at sea a distance of twenty-four nautical miles. It illuminates an arc of two hundred and eighty-five degrees. The oil used is refined lard oil, and the yearly supply at this station is seven hundred and sixty gallons. The lamp will consume seventeen pints of oil, on an average, every ten hours.*



Above – The cast iron Point Reyes tower is identical to the Cape Mendocino, CA tower which was completed in 1869.

Below – The clockworks to rotate the lens is contained in a compartment under the lens. The weight that powers it can be seen at left. Note the chariot wheels upon which the lens rotated (center). Dewey Livingston photo courtesy of the National Park Service.



The Lighthouse went into operation as scheduled on December 1, 1870.

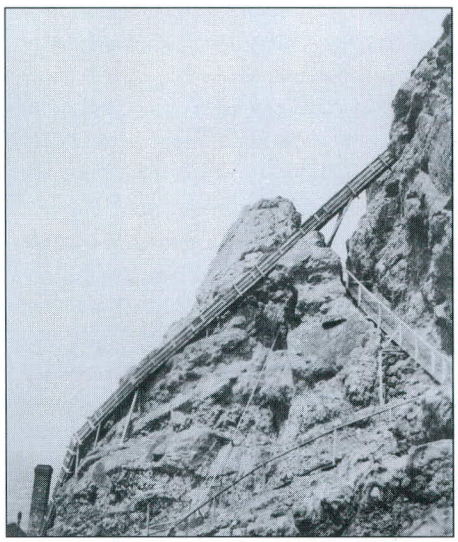
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Congress had appropriated $2,500 for a fog signal at Point Reyes as early as 1860. Planning did not begin in earnest until the lighthouse was under construction in the summer of 1870. Two major design considerations had to be contended with: first, the height of the signal, which determines its effectiveness, had to be decided and an appropriate and feasible location found on the precipitous ledge; and second, the fact that no water source could be found within two miles of the proposed steam-powered fog signal, a fact which proved to be costly in more ways than one.

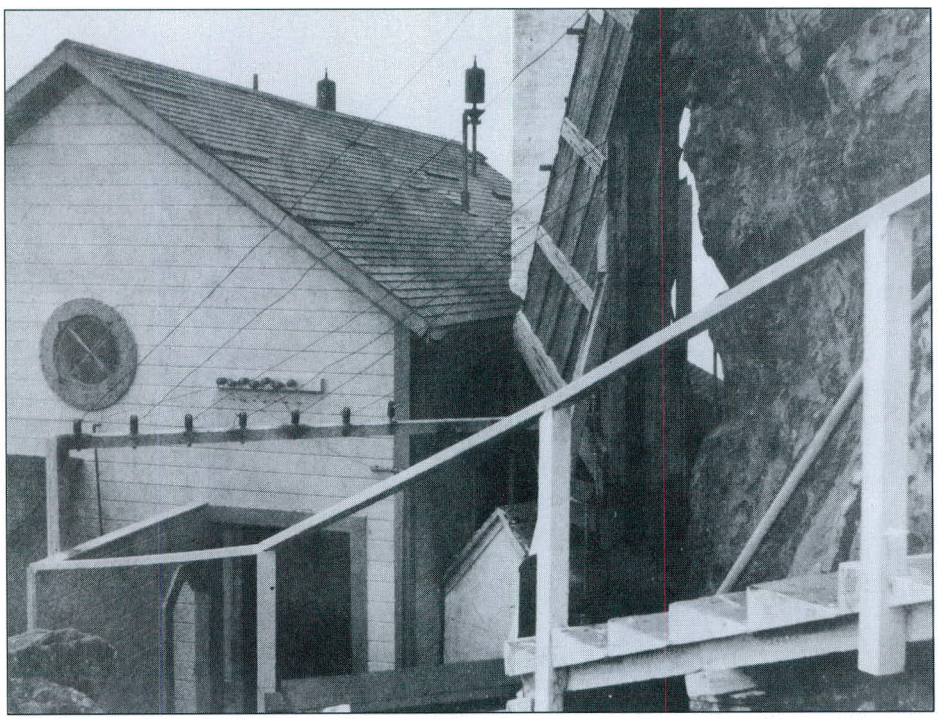
While engineer Williamson wanted to being construction of the fog signal as soon as possible, his superiors in Washington asked that he wait until the next spring when the weather would improve. Williamson, as well as members of the Coast Survey, mindful that Point Reyes held the record as the foggiest point on the West Coast, also objected to the Lighthouse Board's insistence that the facility be driven by steam, stating that, "this Point, above all others on the coast, should have a first class fog signal." Williamson also felt that the water shortage at Point Reyes would create an impossible situation, and that a system involving a coal-driven engine powering a compressor which sounds a fog trumpet was a superior design. The Lighthouse Board did not agree, and early in 1871, construction began on a coal-fired, steam-powered fog signal under contractor Marston. Upon completion of the project the Board published a report of the construction. The report stated:

On February 1 the work of preparing a site for the Steam Fog signal at this station was commenced. A large cistern was constructed, which, with a basin around it, will hold 100,000 gallons. A watershed, ten thousand square feet in area, was made, from which water enough will be collected in a year to fill the cistern, even in a season in which the rain fall will be much below the average.

The water from the cistern is conducted to the Fog signal by means of a galvanized iron pipe, which is securely fastened to the sides of the cliff. A chute has been built from the site of the tower to the fog signal. The chute is constructed in the most substantial manner, and is for the purpose of conveying fuel to the Fog signal. A winding roadway has been constructed from the cliff to the signal site. Much blasting was done before it was completed. The work of preparing the site for the signal-house, coal shed, &c, was very slow, difficult and dangerous. Huge masses of rocks overhanging the signal site had to be blasted off, so that at the rear of the signal is a vertical wall of rock, one hundred feet high. An iron railing was put around the edges of the plot prepared for the signal, to keep any one from rolling off into the sea, as on all seaward sides of the signal the cliff is very steep and jagged.



The stairs from the tower to the fog signal building pass under the coal chute. The fog signal building courtesy of the National Park Service.



The second fog signal building on the original site, circa 1915. Whistle signals can be seen on the roof. Next to the signals is the chimney and the end of the coal chute. The wires are part of a call system connecting the fog signal building with the tower and quarters. Photo courtesy National Park Service.

On June 12 the work of taking the boiler and signal apparatus from the top of the cliff down to its position was successfully accomplished. The boiler was put in position, the apparatus fitted to it, and on June 14 the signal was tried and found to work satisfactorily. On June 30 the work of housing the boiler and signal apparatus was completed.

The signal is now ready for operation, and can be started as soon as the rains of next winter shall have sufficiently filled the cistern with water. The work of establishing this fog signal has been, from the nature of the location, very expensive and dangerous.

The 1880 county history described the operation of the fog signal in great detail:

The fog-whistle is located one hundred feet lower down on the cliff (from the lighthouse) in a little notch hewn out of the face of the rock. The building is twenty-four by

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thirty, and there are two boilers, each sustaining a pressure of seventy-five pounds. The blasts recur once every minute, and last eight seconds. The arrangement is automatic and governed by a small engine. The whistle is constructed on a principle similar to ordinary locomotive whistles, only on a much larger scale, the bell or cap being twelve inches in diameter. Everything is duplicated so if any piece of machinery should give away, no loss of time would be sustained. Fuel saturated with petroleum is kept in the furnace at all times so that steam may be gotten up at a moment's notice night or day, and the whistle set to going a very short time. The water supply pipe connects direct with the boilers from the tank which is three hundred and fifty feet above, and the pressure is two hundred and thirty-six pounds to the inch. The fuel and all supplies are sent down on a chute from the top of the cliff. There are a series of stairs leading from the keeper's house to the lighthouse and fog-whistle, in all of which there are nine hundred and sixty-five steps. Along most of the stairway a guard rail has been set up to prevent the wind from carrying the keepers into the ocean in their passage up or down.

The signal went into operation as planned, but a fire reportedly caused by spontaneous combustion suddenly silenced it on the night of April 28, 1872. The fire destroyed the building and damaged the machinery. On June 10, $10,000 was appropriated to make repairs, which were soon commenced. A Mr. Wheeler and his five-man crew arrived July 7 on the U.S. steamer *Fern* and spent almost two months rebuilding the fog signal. The operation included blasting a large overhanging rock that threatened the site. Then, in September, a storage building containing 600 sacks of coal burned and was a total loss.

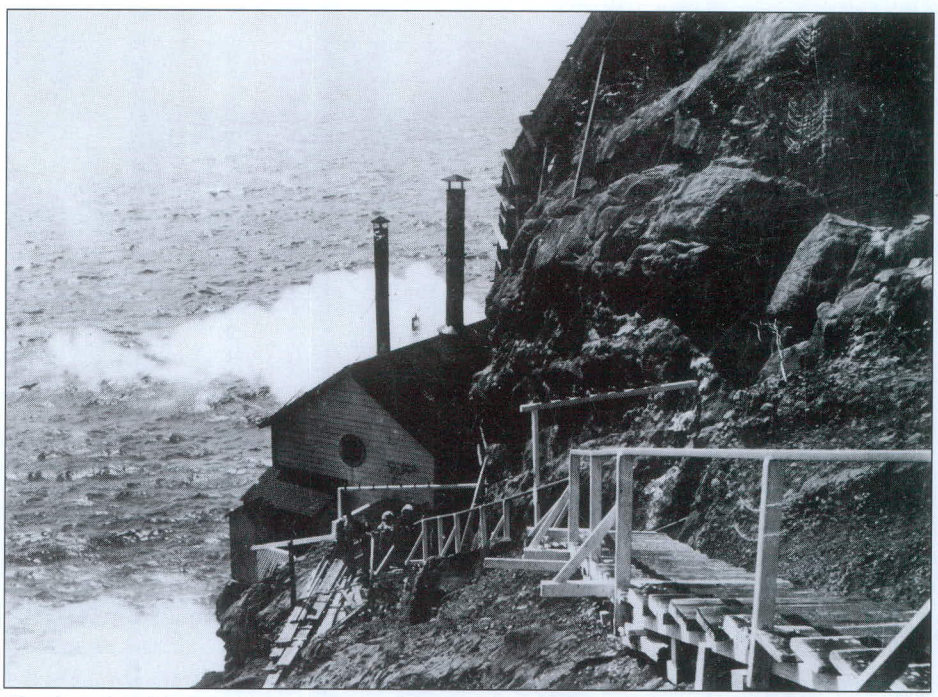
Other problems surfaced, the lack of water being the greatest. The rebuilt fog signal could barely operate during 1873 due to a lack of water. The watershed was enlarged by some 5,000 square feet in 1875, but still the cistern ran out of water during the fall, requiring over 20,000 gallons of water to be hauled to the tank by the local dairyman Hochreuter of A Ranch nearby, working as contract labor. The firing of the boilers required about 140 pounds of coal per hour, or 42 tons during 1875, all of which had to be carried to the precipitous site from the land. At times the whistle could not be heard by passing ships, whether due to adverse conditions or light station crew errors. Technicians improved the machinery in 1877, and duplicate first class sirens replaced the whistle in April 1880. Inspector Williamson urged installation of the sirens when he wrote to the Lighthouse Board:

Great complaint has been made, and is now made of the inefficiency of the signal at this place, which at times cannot be heard a mile distant; this too, when the signal is being properly run with a pressure of from 65 to 70 pounds. I have frequently investigated complaints made by masters of vessels of not hearing the signal when passing within a mile of it in thick weather; and I am convinced that the fault does not lie in the way the signal is run, but something in the signal itself or its locations. Point Reyes is one of the most important points on the coast, and the needs of navigation require that its fog signal should be in efficiency second to none.

After adding more water storage and replacing the boilers to accommodate the new sirens, the fog signal operated relatively well until 1890, when two twelve-inch whistles replace the sirens. Subsequent improvements to the water system included addition of a 35,000 gallon tank in 1896, 6,000 square feet of watershed and a 25,000 gallon tank in 1900 and a massive 40,000 gallon redwood tank in 1907. No serious problems were recorded after the initial mishaps and shortcomings of the signal's first two decades.

Operation of the Lighthouse, 1870-1939

Evidently the lighthouse itself had none of the major problems during its 105-year career that the fog signal had seen. The light, a precise mechanism operating a finely crafted lens housed in a sturdy iron tower, was subjected primarily to a rigorous maintenance schedule and improvements in efficiency, none of which radically changed the lighthouse structure itself. A telegraph communication system was created between the dwellings, lighthouse and fog signal in 1876. The tower and illuminating apparatus received "slight" repairs in 1881, and in September 1887 original builder Joseph Bien, working as a Lighthouse Service



The fog signal building circa 1900. Note the blast of steam from the sounding signal and that new chimneys are in place. Jack Mason Museum photo.

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machinist, replaced the lard-oil wick lamps with ones that burned kerosene (mineral oil). The *San Francisco Chronicle* described the new system shortly after it was installed:

The improved mechanism has five circular wicks, varying in diameter from one and one-eighth to four and one-half inches. The flame is of dazzling brilliancy, it being impossible to look at it from the tower without smoked glasses, and the heat inside the lantern is intense. From the single reservoir the oil is forced up by the "plunger," a weight of 120 pounds, through a tube into the wicks. The care of the lamps—thanks to the new apparatus—is a comparatively simple matter. In the morning the keeper has only to fill the reservoir with mineral oil, raised the plunger to the top of the reservoir and close the faucet in the tube. At night he opens the faucet, the plunger descends, the oil is forced up through the tube into the float chamber and from thence to the wicks. The lamp requires no trimming during the night. A little before daybreak the keeper closes the faucet, opens the damper in the draught pipe (which connects with the top of the chimney, and regulates the height of the flame) and lets the light burn itself out. He then removes the chimney, wraps it in flannel until it is entirely cold, wipes the ash from the wicks and all is done.

In 1889 a new coal and oil storehouse was built to replace an older one on a flat just above the tower. This building was in turn torn down in 1928 to accommodate the equipment building. Also in 1889 a steel clock cord replaced the traditional fiber cord. No other major work occurred on the tower until after the turn of the century, when the 1906 earthquake bent the upper and lower guide-roller spindles and displaced the lamp stand in the lighthouse, damage which was repaired immediately.

While most of the construction and improvements during the 1870s centered around the fog signal, the 1880s saw attention focused on the lighthouse reservation in general. The extreme weather at Point Reyes quickly took its toll on buildings and structures. Although assigned thorough and strict maintenance procedures, the underpaid keepers had a great deal of trouble keeping up with the elements. In 1877 an inspector found the station "in anything but a creditable condition showing in many cases want of care and attention."

Extensive repairs and improvements were made at the reservation during 1880 and 1881, including construction of shorehouses at the landing and the lighthouse, additional watershed and water storage tanks, and general improvements to the dwelling, yards, roads and fences. The Lighthouse Board had two new keepers dwellings, called cottages, built opposite the original dwelling in the spring of 1885 at a cost of $5,787.35. The additional housing provided private quarters to each of the four keepers, all of whom had previously lived in the original dwelling; now the second and third assistants would reside in the cottages. Carpenters constructed a barn on the approach road to the reservation in 1887, evidently to house the government horse. Telegraph communications reached the light station in 1888.

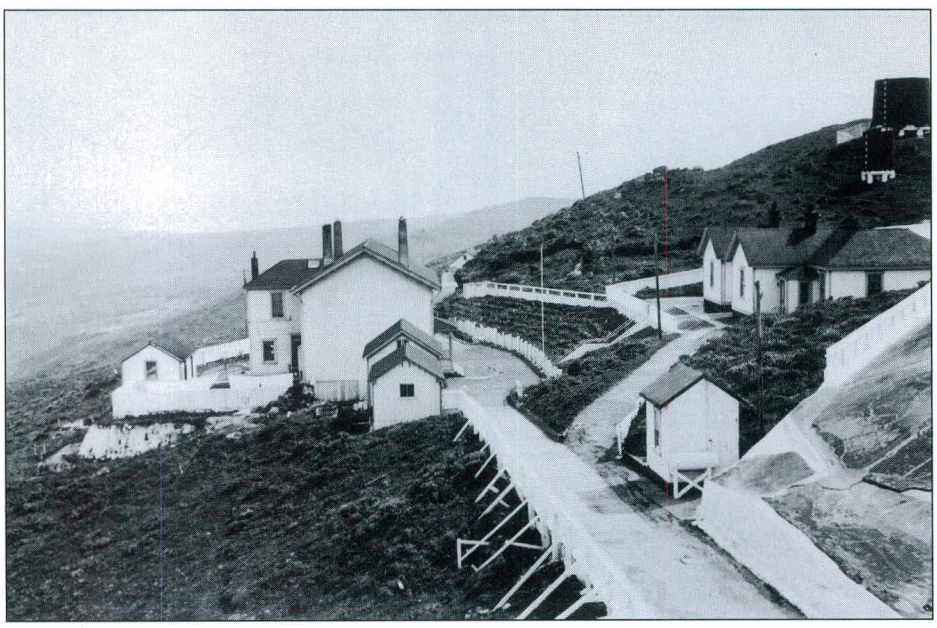
Apparently all went well at the light station until August 20, 1885, when the British bark, *Haddingtonshire* wrecked on Point Reyes Beach just north of the lighthouse. San Francisco newspapers rushed to blame the incident on a poorly equipped lighthouse. The San Francisco *Daily Alta California* charged:

The machinery in Point Reyes lighthouse is old and useless; a wornout iron pulley had been replaced by a wooden one, the siren does not keep its time and frequently fails to blow at all during foggy weather, and the lighthouse employees put in much of their time as farm laborers.

In the article, Lighthouse Inspector Commander J.W. Philip replied:

The machinery in the lighthouse is in good order; the engine is nearly new; the "pulley" complained of is an iron drum, which he directed the keeper at the last inspection to cover with a layer of wood to make its circumference larger and give it additional power; the siren when running, being automatic, must go as regularly as a clock, and the land about the station is not suited to agriculture.

The inspector's comment about agriculture was ill informed, as the lighthouse was located in the heart of California's best and largest dairy industry. Charles Webb Howard's "A Ranch," less than two miles from the lighthouse on the road to the landing at Drakes Bay, traditionally provided contract labor to the Lighthouse Service. The report of keepers earning extra cash as farm laborers (or, more likely, milkers) could have been fact. Incidentally, four years after the article appeared George Hussey, one



Dwelling circa 1941. The original 1870 duplex is at center and the 1885 cottages at right. A cistern can be seen at top right and the edge of the water shed (rain catchment apron) at lower right. Photo courtesy U.S. Coast Guard

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of the tenant dairymen at "A Ranch," became principal keeper at the lighthouse after many years of contract hauling and as an assistant keeper at the station.

The poor conditions at Point Reyes, mainly the isolation and extreme weather, caused continued problems in personnel and, subsequently, maintenance. A new Principal Keeper, John C. Ryan, arrived and soon wrote in the keeper's journal: "In taking charge of this station I must say that it is broken, filthy and almost a total wreck from end to end of it, in the worst condition in every particular of any station I ever saw, in fact, it is more like an old Saw Mill than a Light Station." Ryan's Third Assistant corroborated the statement underneath, but the entire entry was scrawled over with the word, "Rats." Ryan set to work improving the station, keeping all the crew busy cleaning, repairing and painting. The assistants even whitewashed the stairs and coal chute, a somewhat out-of-the-ordinary sprucing up. Nonetheless, Ryan's attempts to get the station into shape proved to be a failure, as he received dismissal orders within a year.

The Presidential Reorganization Act of July 7, 1939 placed the Lighthouse Service in the U.S. Coast Guard under the Treasury Department. After 1951, when the last Lighthouse Service-era keeper Gustav Zetterquist retired, Coast Guardsmen manned the light with various terms of duty; historian Shanks considered that, unlike some others on the coast, Point Reyes was operated in a "vigilant, high quality, very traditional manner right to the end.

Modernizing the Fog Signal

By the turn of the century the fog signal worked with reasonable reliability, but needed constant improvements nonetheless. Water supply continued to be the major concern, coupled with frequent complaints of the signal being ineffective. Crews increased the watersheds in size a number of times and installed larger water storage tanks, including a 35,000-gallon concrete tank built in 1896 perched precariously on the rocks overlooking the lighthouse stairs. The boilers were altered to burn fuel oil as well as coal for a savings in cost. In 1910 a gasoline-powered compressor and a more efficient six-inch siren replaced one of the steam plants and the twelve-inch siren, a move that necessitated rebuilding the fog signal building. The siren, in turn, was replaced with a Canadian-built Type G Air Diaphone in 1915, which was run by 30-horsepower Doak gasoline engines. Mariners agreed that this improvement brought the light station up to date in effectiveness and safety.

The only problem remaining was the distance between the light and the fog signal, some 100 feet of steep and dangerous old trail and stairway. Engineer's partially solved this problem in 1929 when the equipment that powered the diaphones was moved up to the lighthouse. A wood frame power house, the equipment building of this study, had been constructed in late 1928 on the site of the large storage house. The new 875-square-foot equipment building, usually called the "power house" by those stationed there, measured 20' x 46' and was set on a concrete slab that supported the heavy engines. A watch room, used as an office and weather station, and a tool/storage room, in addition to a much-needed lavatory (there had been a patent flush toilet in the lower fog signal building) and work bench were contained in the building, which featured large rolling doors on the east side at the bottom of the stairs. According to historian Shanks, this new equipment building, with its wood paneling, appeared to be fancier than many others on the coast. A circulating water tank outside the building cooled the engines. Moving the equipment to this site permitted lighthouse personnel to control the fog signal from the lighthouse area; the diaphones, still on the cliff 100 feet below, only had to be attended to occasionally.

While this change improved operations a great deal, more could be done. In 1934, engineers moved the diaphones up to a newly built fog signal building directly below the lighthouse to the



The light tower and second coal storage building, circa 1900. This building was later replaced by an equipment building. Note the call bell wires and brackets on the coal building. Jack Mason Museum photo.

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west. The two horns, mounted in what looked a little like a bell tower on the roof of the structure, could be aimed and adjusted for optimum performance. At about this time the south door to the equipment building was moved to the west side, presumably for more convenient access to the diaphones. Five years later, in 1939, commercial electric power reached the light station and one of the Doak engines was replaced with an electric motor and compressor; the other changed over to electrical operation in about 1948. A backup generator was installed about a year after electrification.

In about 1947 the Type G Diaphones were replaced with F2T typhone air horns; these were replaced with "super typhone" dual emitter compressed air horns in about 1962. Two new electric motors and compressors replaced older ones in the power plant and an International Harvester/GE diesel generator plant supplanted a smaller one, for use in the event of power failures. The fog signal operated with this equipment until 1975, when the station was automated and the old equipment subsequently turned over to the National Park Service.

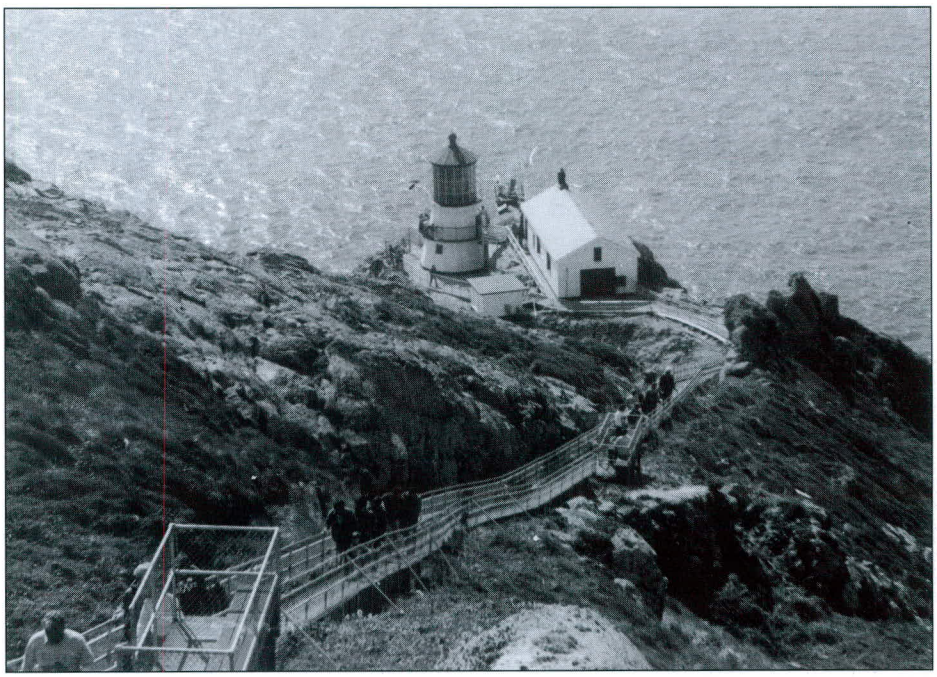


Modernizing the Lighthouse, 1910-1975

While the fog signal operated with many problems over the years from relying on rainfall to run it, the lighthouse operated smoothly, with few obstacles. Safety was always a concern at any lighthouse, as flammable materials were used for many purposes at a reservation and fires could start easily, as they had at Point Reyes. At the turn of the century Point Reyes still lacked a safe storage building for kerosene. The Secretary of Commerce and Labor wrote to the Secretary of the Treasury on December 10, 1904:

It is necessary for the safety of the light-station at Point Reyes, California, and especially to the safety of the large quantity of mineral oil which it is necessary to keep at that important and isolated high-class light-station, that more secure and less dangerous storage facilities for it be provided. This mineral oil is now stored in an oil room, attached to the light tower, which was originally designed to store lard oil. This is dangerous not only to the mineral oil but to the light tower. Therefore it is recommended that an isolated brick oil-house be built in which this inflammable illuminant can be stored. A building of the size in which to keep safely the large quantity of oil needed for this first-order light can not be built for $550, the sum named as the maximum for building oilhouses in the general appropriation for oilhouses.

It is estimated that an oilhouse suitable for this station can be built for $1,500, and the Light House Board recommends, and in that recommendation this department concurs, that an appropriation of this amount be made therefor.



Above – It's a long, and often windy, walk from "up there" down to the tower. The "modern" fog signal building is in the foreground, then the tower, oil house, and equipment building. USLHS photo.
Right – It's not the walk down to the lighthouse, it's the 308 steps back to the top that gets you. Note the two rest platforms that have been installed to assist the less athletic visitor. Point Reyes is an excellent spot from which to view the migration of gray whales. Darell Rowe photo

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After much pleading from the district, a small concrete oil house measuring 10' x 11' was built in 1910 near the old frame storage house for safely storing the fuel for the light.

The light source went through its second upgrading in 1911, when an incandescent oil vapor light replaced the old oil wick light. Some years later the light power was increased from 80,000 candles in 1924 to 160,000 candles in 1926. A Lighthouse Service publication noted that the Point Reyes light was seen from a ship thirty-nine and a half miles out to sea in 1925. Electrical power was brought to the station via lines and poles across Point Reyes in 1939 at a cost to Pacific Gas & Electric Company of $30,000; that year a 1/18 horsepower electric motor was fitted to the mechanism pedestal and the old weight system was put aside for emergency use. A 1500-watt bulb (later reduced to 1000 watts) replaced the incandescent oil vapor light, but during power outages when the auxiliary power also failed, a Coleman lantern was hung in its stead; this practice continued until the light was automated in 1975. The light power was increased to 170,000 candles in 1954 and to 1,350,000 candles in 1966. The update services to mariners the Coast Guard installed a Class D radiobeacon with a range of seven to ten miles in 1949.

At some time between 1905 and 1915 an eight-sided concrete sidewalk was laid around the lighthouse. Also, the doors were replaced at an unknown date, the lower gallery door having been replaced with wood some time after 1951. A wind vane appears on the lighthouse roof in historic photos from around 1915, but had been removed some time after 1941. At an unknown date, considered by some historians and lighthouse men to be near the beginning of World War II, the roof and lantern were painted red. Historian Shanks speculates that the color change could have been an attempt to alleviate any confusion by mariners with the Point Bonita light to the south, which had and still has a painted black lantern.

In 1959 the Coast Guard undertook a major project at the light station: replacement of the old wooden stairway with 304 concrete steps and a cart track. The stairs were built in the same location but with ramps at two portions. An electric winch at the top of the stairway controlled a cart capable of hauling equipment and, if necessary, personnel.

In 1960 a modern apartment complex and garage replaced the old dwellings after almost a century of use and adverse weather. Ten years later an earthquake slightly damaged the light's clockwork mechanisms, resulting in uneven wear on the carriage wheels that continues today. In 1975 the Coast Guard poured a concrete sidewalk from the equipment building deck down to the lighthouse deck, as access to the automated light building gate.

Point Reyes Light Station has traditionally been open to visitors during specified hours. A visitor register dating to 1892 has been preserved. During the 1960s visitors could see the station with a Coast Guard guide on weekends. Because of staffing problems, however, the Division Chief ordered the station closed to visitors effective May 15, 1967. Although the public protested, the Coast Guard never relented as long as it controlled the station and only by special permission could a nonservice visitor see the lighthouse.

The light station was automated in 1975 as part of a servicewide modernization program. The Coast Guard erected a concrete building on the site of the fog signal building directly west of the lighthouse on which it put a revolving reflector light, a new radiobeacon and electronic tone fog signal, all controlled by timers and computers. The last keeper, Thomas Smith, turned off the venerable old light on June 12, 1975, after 105 years of faithful service. By this time most of the historic buildings and structures on the reservation had been replaced with modern ones; only the lighthouse, equipment building, oil house, cisterns, watersheds and various sheds and outbuildings remained. Two years later the lighthouse and its 83 acres of land were transferred to the National Park Service for inclusion in Point Reyes National Seashore. The Coast Guard retained fee title to two tiny parcels in the reservation and the concrete transformer house. After construction of safety barriers, restrooms and a visitor center, the historic light station was reopened to the public in 1977.

The preceding is from a Historic Structures Report published by the National Park Service, Point Reyes National Seashore. The author, Dewey Livingston, is a historian with the Point Reyes National Seashore.

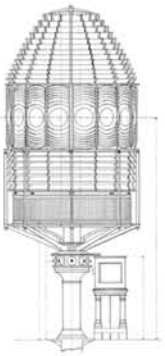


Opposite – Keeper polishing the Point Reyes 1st Order lens, circa 1927. Note the hand holds on the exterior of the lantern room. Photo courtesy National Park Service.

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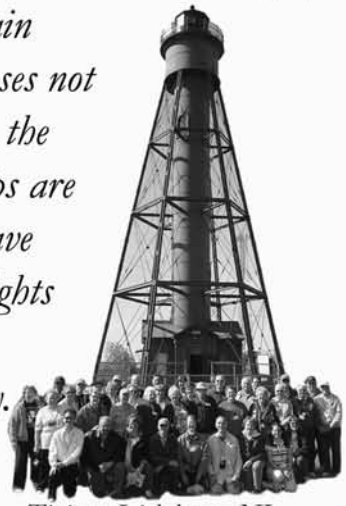
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