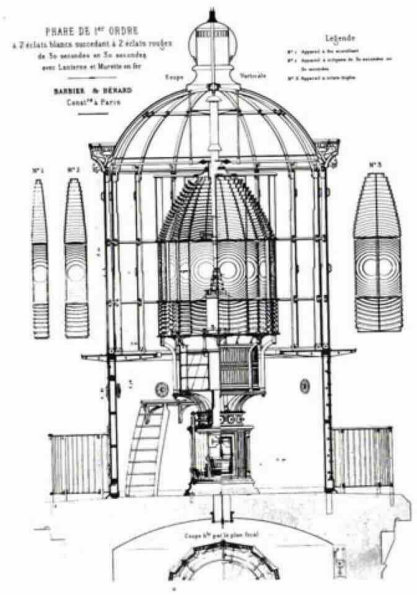


French plan for a 1st Order Lens

FRENCH JEWELS

A light station must be readily identifiable from the water, and for this reason many beams flashed in a coded pattern. To create this effect, the lens at Point Reyes was mounted on wheel-like bearings and revolved by a clockwork mechanism. The revolution took two minutes, so the 24 separate panels in the lens caused the light to appear to flash every five seconds. The mounting was driven by the slow descent of a 79-kilogram (175-pound) weight which the keeper had to hoist 5.3 metres (17 feet) by hand every 2 hours and 20 minutes to wind the mechanism. Because of the gears, the job was not physically difficult, merely tedious.

Using only the weak light from four wicks that burned a highly refined lard oil, the wondrous lens could cast a beam 24 nautical miles out to sea. This 2.7-metric ton (3-ton) lens is beautiful in its intricate and extraordinary craftsmanship. It was cast in 1867 by the Paris firm of Barbier and Fenestre after the design of August Jean Fresnel. The basis for such beauty does not lie in artistic principles, but in the revolutionary deductions of this 19th century French physicist who became commissioner of lighthouses in France. He eliminated mirrors as reflectors and obtained circular polarization using a complex pattern of lenses. In the Point Reyes lens, light is focused through 24 panels, each an intricate assembly of hand-cut and polished crystal prisms and bull's-eyes — over a thousand pieces of glass in all — mounted in a brass framework.

Fresnel classified his lenses by order. The largest, or first order, like that at Point Reyes, was approximately 2.4 metres (7'10") high and 1.9 metres (6'1") in diameter, and the smallest, or sixth order, was approximately 1.4 meters (1'5") high and 0.3 metre (1') in diameter. To the genius of Fresnel we owe both the effectiveness and the beauty of Point Reyes' "French jewels."

Even the descent from the sleeping quarters to the lighthouse could be a terror. In 1887 another visitor wrote, "...this beacon is reached by an exposed stairway of seven hundred and fifty steps. When the storms are at their worst spray dashes up two hundred feet, ... and the poorly paid servants of a prosperous but ungrateful republic stand erect at the risk of their lives when going from their post of duty. Their only safety is in crawling on hands and knees up and down those seven hundred and fifty steps." Along most of the way there was a guard rail to keep the men from being blown directly into the ocean. The wooden stairs were constantly repaired and replaced, and the current concrete set of 300 steps and additional ramps were poured in the early 1960's.

The Principal Keeper's Log for the early years records mostly weather conditions, storm damage, visitors, and maintenance — the eternal polishing of glass and brass and the whitewashing of buildings. More fascinating are its glimpses of the human beings who were confined there.

For months in 1875-76 Principal Keeper Wadsworth contended with his unruly assistants. Third Assistant Parker regularly neglected to show up for watches, left his post in dense fog, "went to Olema and took the government horse with him and returned to the station drunk and unable to perform his duty that night." Parker left, but Wadsworth's troubles did not end. "1st Assistant Rowe is a grumbling nusence ... He is all the time finding fault with someone at the station and never satisfied." Wadsworth left orders to repair the road, but Rowe refused to work. Another day records, "1st Assistant Rowe shamefully abused me by calling me vile names, saying he would never stop until he or I was removed from this station." Both were removed. The beleaguered Wadsworth was relieved by a new principal keeper, who then discharged Rowe.

The incidents did not stop, however. Other keepers also recorded work refusals, abusive language, and abrupt resignations. Given the working conditions, it seems inevitable that in 1889 an assistant "went crazy and was handed over to the constable in Olema."

A keeper's heroism did not necessarily stop with his standing by his light until the end. Once, in winds of 80 mph, a fishing boat smashed onto the rocks below the lighthouse. The three survivors clutched the rocks for 13 horrifying hours. Finally, Keeper Fred Kreth was able to lower himself partway down by rope and pull them up to safety one by one.

Slowly, equipment, accommodations, and conditions improved. In 1880 the light station acquired telegraph communication with San Francisco. By 1888 there was a complex of buildings — keepers' cottages, a blacksmith shop, barn, storehouse, lime house, coal house, and a signal building. In that year also, the lamps were switched

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How soon would I taste you again.

E.G. Chamberlin, Principal Keeper
Principal Keeper's Log, 1885



In 1871 the fog signal was installed below the light, but its history of problems began just one year later when the building burned to the ground. Steam-powered, the signal had operated only one season after the rains filled the cistern at the top of the cliff. No sooner was it rebuilt than a drought stopped it again in 1873 because the cistern had run dry. During a five-week period a contractor hauled over 20,000 gallons of water trying to keep the station functioning. The watershed was then considerably enlarged, guaranteeing the operation of the fog signal with as little as 8" of rainfall a year. But the challenge of lowering the required 140 pounds of coal per working hour continued.

Over the years, the type and location of the signal was changed several times in an attempt to make it more effective. In 1880 the Lighthouse Inspector reported, "Great complaint has been made, and now is made, of the inefficiency of the signal at this place, which at times cannot be heard a mile distant . . . . 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." Hoping to increase the effectiveness of the signal, the Lighthouse Service removed the original signal in 1880, substituting steam-driven sirens (also fueled by coal), then, in 1890, replaced those with larger steam whistles.

As a record for the light station the fog horns later included a timing device which noted every hour of the day the horns were on. This record was the keepers' protection in the event they were ever accused of not having the signal operating when needed. Now Point Reyes seemed equipped to change its history of shipwrecks and disaster.

1875 November 18 — In letting Coal down today the belaying pin bent. The truck or hand car went with violent speed down the track broke through the end of the shed and sleeping room and also doing serious damage to the car.

Principal Keeper's Log



Steam whistle fog signal and coal chute, Eadweard Muybridge, 1873
(Bancroft Library)

The Point Reyes Light Station is considered by this office to be the most undesirable one in the district . . . . No keepers ever volunteer to transfer to Point Reyes, and almost without exception the keepers on the station are the ones who have entered the service there. This office has great difficulty in getting keepers to accept appointment to this station, and still greater difficulty in keeping them in the service after they have reported there.

Superintendent of Lighthouses
San Francisco, 1926

MEN OF THE LIGHTHOUSE

The Lighthouse Service set high standards for keepers. The Lighthouse Board reported in 1894: "The discipline of the service is somewhat rigid, and has been from the beginning ... Now the class of men from whom keepers are selected is so good that the punishment of dismissal is infrequently inflicted. But it follows swiftly in two cases. A keeper found intoxicated is not only summarily dismissed from the service, but he is instantly ejected from the station; and a keeper who allows his light to go out is dismissed without regard to his record of previous good conduct. The Board holds that it is the duty of every light-keeper to stand by his light as long as the lighthouse stands. For him to desert it when it is in danger is as cowardly as for a soldier to leave his guns on the advance of an enemy ...."

But it was hard to uphold such standards at Point Reyes. Duty there seemed designed to test the ability of human beings to survive. Furious winds battered shelter and senses. Fog silently blotted out the rest of the world for days and weeks at a time. Life consisted mostly of routine maintenance jobs, and the pay was poor — $1,000 a year for principal keepers and as low as $500 for assistants. The isolation may have inspired meditation and study as the Lighthouse Board romantically believed, but in the early years at Point Reyes, the everpresent loneliness and monotony were oppressive.

The fog signal blared about one-third of the time. It is small wonder that a reporter for the *San Francisco Chronicle* wrote in 1887, "The sirens had been in operation for 176 consecutive hours and the jaded attendants looked as if they had been on a protracted spree."

1885 September 21 — Fog Fog and nothing but fog
had no mail since 9th visit. Getting short of Provisions.
1892 December 25 — Christmas Day Fog Watch Man all day.
1893 January 1 — Happy New Year to all. Cleaned Lens Mod. N.W. wind clear and pleasant.

Principal Keeper's Logs

Oh, what is the bane of a lightkeeper's life,
That causes him worry and struggles and strife,
That makes him use cuss words and beat up his wife,
It's Brasswork.

Principal Keeper's Log

from lard oil to mineral oil. The mule and horse-drawn carts quickly chewed into the roadway, as they annually carried everything from food and water, to 200,000 pounds of coal and 760 gallons of refined lard oil. Later, trucks faced the same impassable conditions. Roads of wooden planks were constructed to control the deep mud and fences were erected to help curb shifting sands.

By the turn of the century, frequent tourists and guests visited the light station and helped considerably to enliven the days of the keepers. Gradually the telegraph, telephone, radio, automobile and electricity (brought to the station in 1939) improved the quality of keepers' lives and allowed them closer contact with society.

Despite the presence of a light on Point Reyes and some heroic keepers to man it, ships continued to run aground and lives were lost. There were nearly forty shipwrecks during the first 65 years of the lighthouse's operation. The first shipwreck occurred just three years after the fog signal was installed.

But for the time, all had been done that could be done to prevent accidents. The government then began systematically trying to save the lives of those who managed to survive the persistent wrecks. The Lifesaving Service, created in 1860, built a lifesaving station on Point Reyes Beach in 1888. A flagpole flew coded flags to distressed ships, and a bell in the front yard warned vessels in foggy weather. Personnel walked the Great Beach to the north and south in four-hour shifts, and the station's crew held dangerous weekly drills in rescue boats. The chaotic Point Reyes surf even made victims of the rescuers. Four members of those lifesaving teams have their graves in a stand of eucalyptus trees near Point Reyes Beach where they died.

Operations of the Lifesaving Service eventually shifted to the relative calm of Drakes Bay, where it built an auxiliary boathouse in 1912. After the Coast Guard took over the duties of the Service in 1915, a better station was built north of Chimney Rock, and in 1927 the Point Reyes Beach site was abandoned. By the end of World War II, advances in technology — improving both navigation and rescue — had made such lifesaving stations obsolete, and no more crews plunged into the wild surf.

At the lighthouse, wicks and lard gave way to incandescent oil vapor about 1877, and to electricity in 1939. Eventually a 1,000-watt light produced a one million-candlepower beam, visible up to 24 nautical miles, and a small electric motor was used to rotate the lens apparatus instead of the original clockwork mechanism. In 1949 a radio beacon was installed, and in 1975 the lens itself was retired in favor of the automated light on the roof of the building below the first site. However, the original lens and its rotation mechanism are still in operating order. Combined with a Coleman-type lantern, they can be used in the unlikely case that both commercial power and the emergency generator fail.

The fog signal, too, has seen change. In 1915 the steam-driven signals were replaced

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Principal Keeper's Log, 1885



by a two-tone diaphone signal which makes the familiar drawn-out sound we associate with fog horns. During the NPS tours in 1966, eleven of the twenty-seven tours had to be cancelled because the ear-deadening foghorn was in operation. This signal was later replaced by the current electronic diaphone foghorn. Each of the three navigational aids — rotating light beacon, electronic foghorn, and radio beacon — emits a coded signal unique to Point Reyes.

The Coast Guard took over the Lighthouse Service in 1939 and, nationwide, this altered the character of the light stations. Younger military attendants rotated often, so some of the former feeling for the stations was inevitably lost.

Automated in 1975, Point Reyes became a ghost station. Attendants were no longer necessary. In 1977 the historic buildings were transferred to the National Park Service.

Today, the spectacular beauty of the natural setting draws people to Point Reyes. Many species of birds rest on the cliffs, and plant life provides a rich palette of texture and color. Sea mammals can be seen at the water's edge; in fact, the headlands afford one of the best places on the West Coast to observe the California gray whale migrations. But at the heart of most visits is the allure of the light station itself, a silent monument to centuries of seamen who risked their lives in these waters and to the long-suffering keepers who stood by in loneliness to warn and save them.