

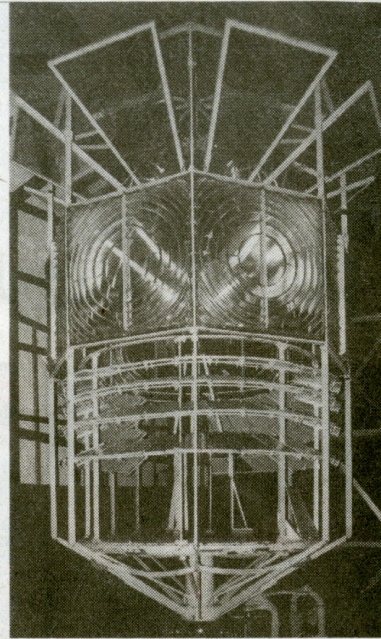
# A Fourth Order Fresnel Lens For Patos Fog Signal Station

By: Edrie Vinson

The lens that lit the way around the world was invented by Augustin Fresnel (1788-1827), a young man from Normandy, a genius at the physics of light. He was the first to believe that light was not a particle, but a wave. (Actually it is both). While he experimented with light and diffraction patterns for various shaped edges, he recognized that he needed a system of lenses in steps, using "dioptric" - refraction, and perfection of "catoptric" - reflection. Operating in a time before the industrial revolution in France, with literally a horse-power turnstile, he struggled to have manufactured the vision he applied to paper. Using inferior crown glass, rather than flawless, heavier, and more expensive flint, he needed blemish free glass in sizes and shapes never before made, including the first flash panel with polygonal prisms and trapezoidal lenses. Because he was plagued with defective glass, imprecise manufacturing and poorly-cast pieces, he resorted to doing some of the work himself. Ultimately he produced his first lens in 1823 for the Cordouan Lighthouse. Lauded for its brilliance, he continued to strive for excellence, combining both the refraction and reflection - the catadioptric lens. His goal was to construct or relight 51 lighthouses all along the coast of France.



Fresnel died of tuberculosis, with unresolved questions about improvements he hoped to bring about. His younger brother Leonor took over his quest and worked for the next 20 years to bring these dreams to fruition. The lights he created were from the largest (First Order) visible for more than 40 miles,



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to smallest (Sixth Order) for small harbors. In 1855 the Paris Exposition Universelle unveiled the First Order, fully revolving, premier catadioptric lens, a bust of Augustin Fresnel, and a fresco by Jean-Leon Gerome, depicting sixteen countries where Fresnel lenses were in place. Within a hundred years, more than 10,000 such lenses were in operation.

Meanwhile in 1853 the U.S. Lieutenant James Alden (for whom Alden Point is named) commanded the surveying steamship Active (for which Active Cove and Active Pass are named), prior to the settlement of the international boundary, was first to identify Patos Island as the likely place for a lighthouse. While the Patos Island Fog Signal Station was installed there 40 years later, it took another 15 years for the fourth order Fresnel Light to arrive.

According to Clarence "Tee" Titterington, a "Coasty" on Patos from 1951-1953: "The light had glass prisms, a 300 watt bulb, floating mercury to keep it level, produced 40,000 candle power and could be seen 7 miles away." He thought it was one of only two lights like it, the other on the east coast.

Today it has a modern lens, automated in 1974 which flashes a white light once every six seconds and has two red sectors marking dangerous shoals off the island.

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