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Lighthouse Administration

The Early Years

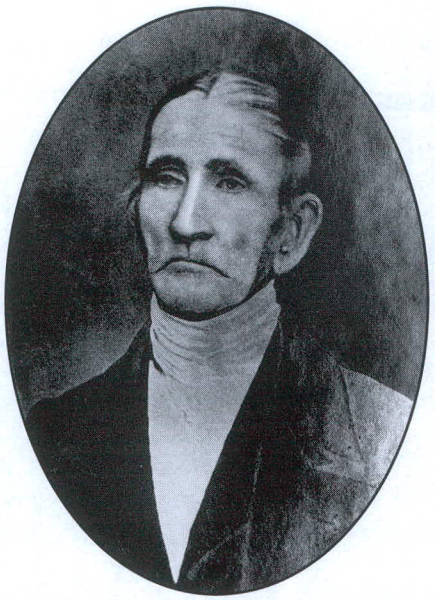
By Leslie Blanchard

The first public works act of the first U.S. Congress on August 7, 1789 (the 9th Act) involved the transfer of the existing 12 light stations, along with all buoys and pier head lights, from the individual states to the federal government. The aids were placed under the Department of Treasury and Alexander Hamilton. Although other maritime nations charged light dues to vessels arriving at and leaving port, Hamilton told President Washington that he thought aids to navigation should be funded solely by the government and be " . . . free as the air." Washington agreed.

During the three years after the passage of the Act, Hamilton personally supervised our aids to navigation system. However, he apparently did not take any important action without the approval of the President. The first three presidents were active in the approval of the placement of lighthouses and the appointment of keepers. As an example Washington wrote to Hamilton from Mt. Vernon on October 12, 1790. "Sir: I have received your letter of the 5th instant. The public service requiring the service which you have made relative to the lighthouses of Newport and Portland, they are perfectly agreeable to me, and receive my approbation. I am sir, you most obedient servant. Geo. Washington."

As the nation grew, and our aids system expanded, it became impossible for the President, or even the Secretary, to be involved with the minutia of aids to navigation. In 1792, Hamilton created under him the Commissioner of Revenue to which he assigned the management of our aids to navigation system.

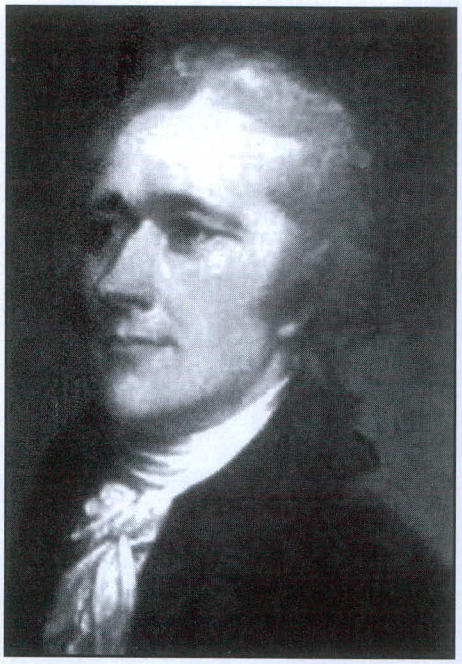
Eight years later, Treasury Secretary Gallatin abolished the Commissioner of Revenue position and assumed control of aids to navigation. However, he soon realized he lacked maritime knowledge and with his "plate full," he recreated the office of Revenue in 1813 and assigned the aids to navigation to that office. Then, on December 23, 1817, Congress again abolished the office of Revenue and returned the aids to navigation to Treasury under the 5th Auditor; the Act to be effective in 1820.



Stephen Pleasonton. National Archives photo.

In 1820, the Fifth Auditor (and General Superintendent of Lights) was Stephen Pleasonton. Although he knew nothing about lighthouses or other aids to navigation nor generally anything about the maritime industry he was, unfortunately, in charge for the next 32 years!

By the time Pleasonton became involved with lighthouses, a former sea captain had already been involved with our system for over ten years. His name was Winslow Lewis.



Alexander Hamilton from a portrait by John Trumbull (c. 1806)

Lewis was born in 1770 to a family with a long seafaring tradition. Eventually he commanded several trans-Atlantic vessels. But in 1807, President Jefferson's embargo greatly affected the industry and Lewis was soon looking about for a new career. He focused on lighthouses, realizing from his visits to foreign shores that our lighthouses were inferior to those of Europe. He first appropriated Swiss scientist Amee Argand's design for a hollow wick lamp and parabolic reflector. At the time a device called a spider lamp illuminated our lighthouses. This apparatus was a small, metal, circular or rectangular reservoir with several holes on the top surface into which solid wicks were placed. The oil (whale oil most likely) was drawn to the flame by capillary action. This apparatus gave off a weak light and a lot of fumes that burned the keeper's eyes and deposited soot on everything.

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The Argand lamp burned brighter and far cleaner. The parabolic reflector, placed behind the lamp, directed the lamp's rays seaward in a concentrated beam. This reflector system consisted of multiple lamps with reflectors arranged in banks on a chandelier. Originally the banks were fixed and each pointed to a different direction. Eventually a system was devised to rotate the chandelier and create a flashing light characteristic.

In 1808, Winslow Lewis patented this invention as his own and placed a convex green lens to the front of the lamp. This 'improvement' actually reduced the strength of the light.

In 1810, with the help of the Collector of Customs at Boston (Henry Dearborn), Lewis arranged for a demonstration of his invention at the Boston Lighthouse before Treasury Department officials. The new lamp was brighter than the spider lamp and burned about half the amount of fuel. Next, Dearborn convinced Secretary Gallatin to conduct a second test using the twin towers of the Cape Ann Light Station. Again, Lewis's lamp impressed the witnesses. Then Gallatin persuaded Congress to pass a law purchasing Lewis's invention for $60,000 ($1.5 million in today's dollars). Lewis secured a contract to construct the lamp system for the government, install them in our lighthouses and to furnish the stations with oil and other supplies on an annual basis.



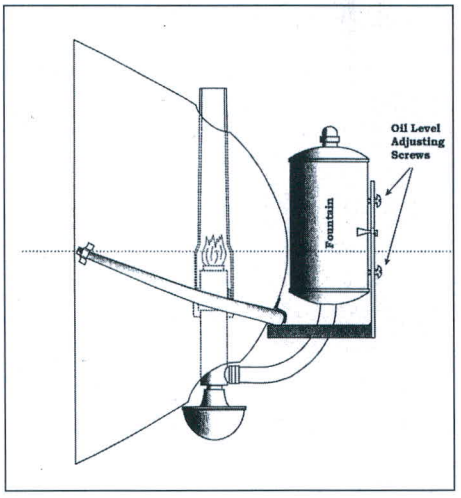
Winslow Lewis. Library of Congress photo.

However, Lewis's optical apparatus was a far cry from those in use in Europe. The lamps were of poor quality and the so-called parabolic reflectors were so far from being mathematically parabolic that they were referred to as being like a "baby's wash basin." The silvering of the reflectors was so thin that after being polished several times the silver completely wore off. Even the frames holding the reflectors were weak and soon bent out of shape.

So, when Stephen Pleasonton came on the scene, Winslow Lewis was well entrenched in the bureaucracy of the government. This, coupled with Pleasonton's lack of maritime, engineering or scientific knowledge, caused Pleasonton to lean heavily on Lewis. Lewis took full advantage of the situation, and he soon received contracts to construct lighthouses as well as furnish the lighting equipment and supplies. In January 1816, he obtained the contract to supply whale oil to light stations, to inspect them and make any repairs. This arrangement made him de facto the superintendent of lighthouses.

Around this time a successful experiment using natural gas was conducted at the Beavertail Lighthouse in Rhode Island. Because Lewis had a lucrative contract to furnish the government with whale oil, and had an "in" with the whalers of Nantucket, he squashed this new fuel source. He convinced Pleasonton and his predecessor, Commissioner of Revenue Samuel Smith, that *only* whale oil would suffice.

Pleasonton, an accountant, and an honest government employee, was obsessed with economy. Being hoodwinked by the smooth talking Winslow Lewis, Pleasonton's obsession with saving our government money caused our aids to navigation system to lag far behind other countries. It held off the adoption of the Fresnel lens (invented in 1822) for 30 years.



Lewis lamp and parabolic reflector system. Drawing courtesy of Tom Tag.

Although the Fresnel lenses were far more expensive than the reflector system, the Fresnel system employed only one lamp, while the reflector system had as many as 22 lamps — and, remember, Lewis had the contract to furnish the oil and the lamp-reflector system! Fresnel lenses never wore out, whereas the reflectors needed re-silvering from time to time.

Winslow Lewis formulated the specifications for most lighthouses during this period and then bid on the contracts. Not surprisingly he was usually the low bidder.

Because Winslow Lewis was involved with most of the operations of lighthouses he started making critical decisions without consulting the Superintendent. As an example, in 1835 he decided to change the characteristic of the Mobile Bay, AL lighthouse from fixed to flashing without advising mariners or Treasury Department officials.

Only Lewis and the firm, Hooper & Company, of Boston, had the ability to manufacture the reflector system, and Lewis always submitted the lowest bid. This underscored the travesty of the government always having to accept the lowest bid, discouraging competition – the keystone of the capitalist system. The practice led to the sorry state into which the American lighthouse system descended during the first half of the 19th century. For over three decades an enterprising, and not overly scrupulous entrepreneur, improperly influenced a bureaucrat who lacked the necessary knowledge to make appropriate decisions. Or, perhaps, Pleasonton was intimidated by the slick-talking Lewis who had, after all, been on the lighthouse scene some ten years before Pleasonton arrived. Superintendent Pleasonton had an obsessive belief in laissez faire, a preoccupation with economy as an end in itself, a lack of expertise in the technology over which he was expected to control and he presumed and trusted that manufacturers and suppliers "knew best."

The inevitable outcome was the abdication of major responsibility by an official to which it was entrusted and its usurpation by an outsider. Abdication and usurpation are the only words that can adequately characterize what happened to the U.S. Lighthouse establishment between 1820 and 1852.

It was inevitable that with no channels to the customer – the mariner – and little congressional control, complaints would arise from the maritime community. The first strong

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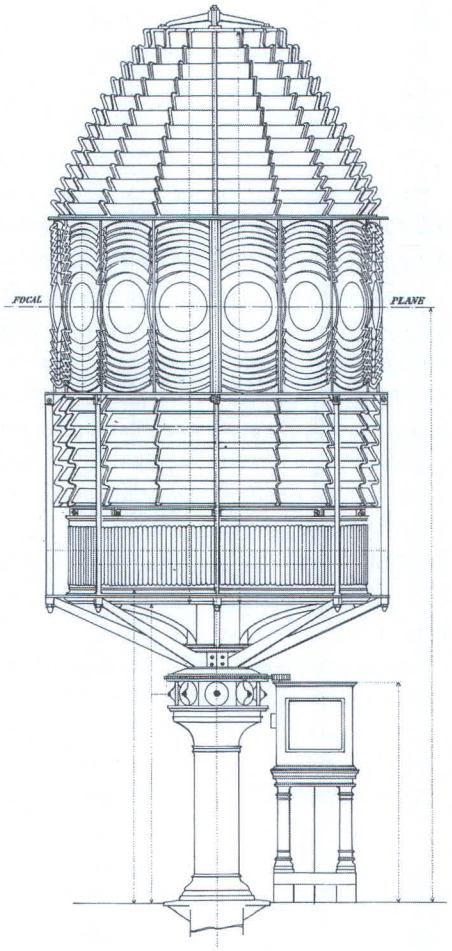
voice was from the Blunt Brothers, publishers of *The Coast Pilot.* Hearing from vessel captains and observing the situation for themselves, the Blunts mounted a sustained assault on the Lighthouse Establishment. Among the complaints was the lack of necessary reports to mariners of changes to the system, poor workmanship and a system woefully inferior to the systems employed in France and England.

Additionally, engineer I.W.P. Lewis, a nephew of Winslow, conducted an inspection of northeast light stations. He noted numerous defects and denounced his uncle's administration handiwork and character. Although Pleasonton and Lewis countered the many complaints, their rhetoric could not stem the tide. The mariner had, after all, been to Europe and had seen the light.

On March 3, 1837 Congress appended a rider to a lighthouse appropriations bill which ordered a board of naval commissioners to scrutinize the need for and proposed location of additional facilities, to investigate the system in place and to make suggestions. The resulting report negated the construction of 31 proposed new lighthouses and strongly recommended that two Fresnel lenses be imported and tested against the existing system. The investigation caused an Act to be passed in 1838 that divided the country into eight lighthouse districts; six on the Atlantic & Gulf and two in the Great Lakes. The Act called for a naval officer to be assigned to oversee each district. He was to inspect the lighthouses under his charge and make recommendations for establishing additional lighthouses and to eliminate any deemed unnecessary for the needs of navigation.

The resulting reports clearly illustrated the condition of our system. They revealed that in some places lighthouses were bunched together, while in other areas there was a lack of aids. They stated that the quality of construction and maintenance varied widely, the plano (green) lenses were cracked, reflectors out of true and lacking silver. Fully 40 percent of all lighthouses were found to be defective in some respects.

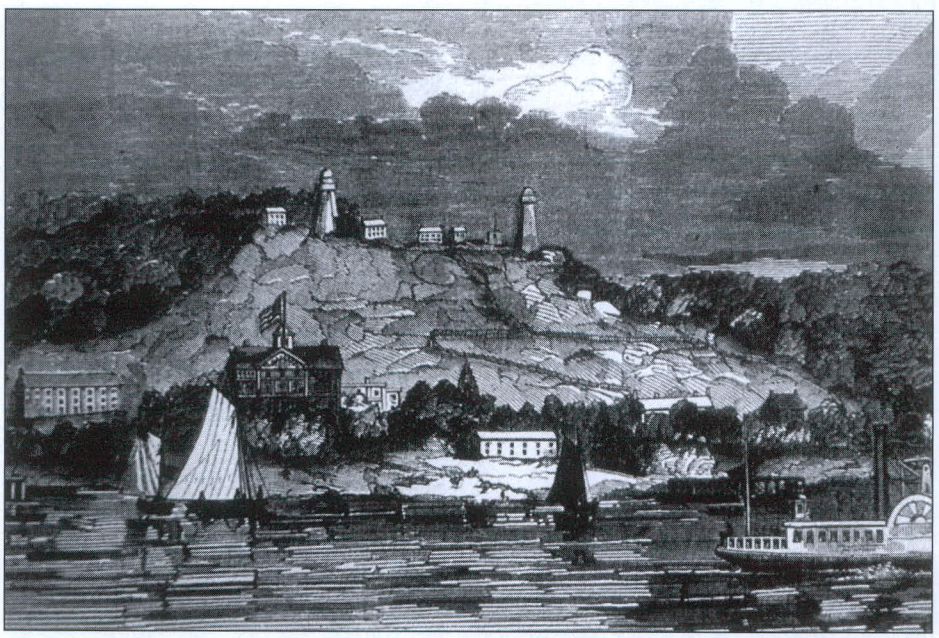
Pleasonton met this flood of criticism with "confession and avoidance." Perhaps, he said, some aspects of the administration could be tweaked, and defective lighthouses would be repaired as soon as funds were available, but Congress was the real culprit by not supplying ample funds. He reluctantly agreed to import two Fresnel lenses for experimental use. He had inquired about Fresnel lenses back in 1830, but the cost of $5,000 for a 1st order and $2,000 for a 2nd order made him apoplectic, clutching his accountant's heart.



First Order rotating Fresnel lens. Lighthouse Society drawing.

The lenses arrived in 1841 with two French mechanics who installed them in Navesink Light Station's twin towers. The total cost for this experiment was $24,000. The experiment was a resounding success. The lenses were clearly superior to the optic installed in the nearby Sandy Hook tower. Even Pleasonton waxed poetic about their beauty and efficiency. But, he insisted that it was the Carcel burners in the lenses that caused the brilliance. He stated that those burners were far too complicated and delicate for our lighthouse keepers to master. This advice, probably from Winslow Lewis, had the effect of, once again, delaying the importation of Fresnel lenses in this country until 1852. Only two other lighthouses received Fresnel lenses between 1841 and 1852; Sankaty Head on Nantucket Island (2nd order) and Brandywine Shoal in Delaware Bay (3rd order).

Again, a new fuel came on the scene. In 1844, Benjamin Coston, of the U.S. Navy, conducted tests of coal oil fuel, manufactured on the spot, at the Christiana Lighthouse in Delaware Bay. Coston provided fuel to the lighthouse's ten burner, 15-inch reflector system. The resulting light, visible for 14.5 miles, was found to be both intense and economical. Over a period of 22 days the cost for the coal-rosin gas was $3.85 as opposed to $14.85 for whale oil for the same period.



Woodcut of the 1828 twin-towered Navasink Light Station in which the Fresnel lenses were tested. The station was rebuilt in 1862. Society archive drawing.

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Coston urged more experiments, and as usual Pleasonton dragged his feet. He argued caution and circumspection. He cited a major accident in 1833 at the Irish Holyhead Lighthouse that killed one person, injured several others and destroyed the gashouse. Finally, a Congressional directive required an investigation. Pleasonton invited a committee of scientists to Christiana Creek to conduct tests. Although their report was generally positive, Pleasonton vetoed the report and the experiment was not followed up.

Meanwhile, the Blunt Brothers continued their harangue against Pleasonton in *The Coast Pilot* and mariners wrote their Congressmen. The hue and cry caused Congress to have a Commerce Committee examine lighthouse expenditures since 1816. Pleasonton's testimony to the Committee resulted in a mild endorsement of Pleasonton and his department. Nothing came of this investigation or I.W. P. Lewis's 1843 report. Still the complaints continued. Unable to stem them, Secretary of Treasury Robert Walker dispatched Lt. Thornton Jenkins and Richard Bache to Europe on a fact finding trip to ascertain what was happening overseas. They were to, "... procure information which may tend to the improvement of the lighthouse system of the United States and as it is alleged that important improvements have been made to the lighthouse systems of Europe ... the department wishes to understand fully what those improvements are, and if they are adapted to introduction in our country."

The two naval officers spent a year in Britain and France and then toured local lighthouses. Their report, which was issued June 22, 1846, urged a thorough reorganization of our Service, with professional engineers and opticians in charge of the technical end. Further, the nation's coastline was to be divided into ten lighthouse districts, each under the charge of a naval officer who was to superintend the inspections of lighthouses and make recommendations for new aids to navigation.

By the late 1840s, various journals started publishing articles castigating our system of aids to navigation. Finally, under a withering barrage of complaints, newspaper and magazine articles, Congress acted. The Treasury appropriation Act passed March 3, 1851 directed the Secretary to convene a special board consisting of two high ranking naval officers, two Army engineering officers, a civilian of high scientific attainment and a junior officer of the Navy to act as recording secretary.

On January 3rd, 1852, the Board issued its report. It contained a compendium of European lighthouse knowledge and practices that existed at mid-century. Its 760 pages and 40 plates were filled with detailed information on lighthouse construction and placement, experiences of England, Germany and other European countries adapting Fresnel lenses to their needs and all the details of how other countries administered their systems.

The report contained numerous letters from masters of vessels and numerous pages detailing the results of inspections of our lighthouses. Overall, it was a damning and total indictment of the manner in which our lighthouse service had been administrated for the previous 32 years. The report contained reams of evidence on the superiority of the Fresnel lens and of the aspects of various oils. Instances were cited and documented of poor workmanship, slovenly maintenance, reflectors scoured down to base metal, wicks in poor condition and untrained and incompetent keepers. One keeper didn't think it was necessary to light up until it ". . . got good and dark." Another, a retired blacksmith couldn't read and write, which probably didn't matter as there were no instructions. No logs were kept; lantern rooms leaked; stations wanted painting. In one case the keeper was missing and a twelve-year-old boy was left in charge.

The report also made suggestions for sweeping changes. It recommended the establishment of a nine-member permanent Lighthouse Board. It was to consist of Navy and Army officers, scientists and recording secretaries. The board was to have complete control over the country's aids to navigation system and would be charged with the direct supervision of the work of keepers, contractors and District Inspectors. The report recommended the installation of Fresnel lenses in all new lighthouse construction and replacement of the reflector system in all existing lighthouses. It outlined numerous reports that were to be maintained by the keepers, that keepers needed to be able to read and write, that instructions be written for the keepers and adhered to and that periodic inspections be made of light stations.

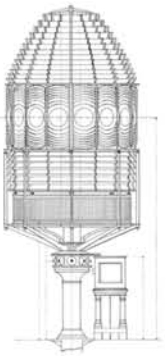
The establishment of a Lighthouse Board was incorporated into the 1852 Lighthouse Appropriation Bill and signed into law by the President on August 31, 1852. As recommended by the ad hoc committee, the Board was to be composed of nine members with the Secretary of the Treasury as ex-officio. Commodore Shubrick, USN was appointed chair. Scientist A. D. Bache and Joseph Henry, Secretary of the Smithsonian Institution, were the two civilians appointed to the board. Naval and Army officers made up the remainder of the members.

At the first meeting, October 9, 1852, the Board divided the country into twelve districts, each superintended by a Naval inspector with an officer of the Army Corps of Engineers to assist him with engineering duties. A central depot was established on Staten Island with other depots around the country to serve the districts.

The militarization of the Lighthouse Service ensured that future work was of high quality, and that stations (as well as depots and vessels) were operated effectively and efficiently. This could not have been ensured with political appointments. The new board got off to a fast start. Instructions were quickly issued, various keepers replaced, certain reports to be kept were devised and officers were assigned to the various districts.

Funds were appropriated to purchase numerous Fresnel lenses from France. By the outbreak of the Civil War almost every lighthouse in the country had Fresnel lenses installed and old towers were fitted with new lanterns that replaced the antiquated "bird cage" style lanterns. At last, America had caught up with other maritime nations in furnishing the latest aids to navigation for our mariners. At the end of the Civil War the Board began experiments with new lamps, oils and sound (fog) signals.

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Thomas Point Shoal Lighthouse, MD

The U.S. Lighthouse Society has donated to many lighthouse preservation projects throughout the U.S. Most recently we were honored by being presented with the Preserve America Stewardship Award from The White House for our restoration work at Thomas Point Shoal Lighthouse.

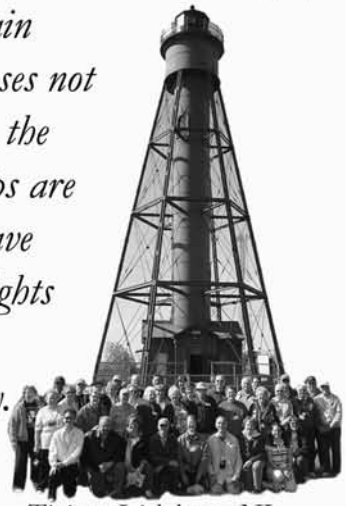
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