

The Eddystone

Part II: Rudyerd's Tower

by Wayne Wheeler



Ed. note—In the last issue we printed the story of the first Eddystone lighthouse. That structure, built by Henry Winstanley, was completed in the summer of 1699. It was destroyed by a storm in November of 1703. The keepers, a work party and architect Winstanley were lost.

A few nights after the destruction of Henry Winstanley's lighthouse a merchantman, the *Winchelsea*, arrived at the southern coast of England. She was loaded with tobacco from Virginia and had weathered the terrible storm that engulfed southern England a few days earlier.

The Captain altered course late in the afternoon after the "crows nest" sighted Lizard Point (the southwesterly-most point of England). Now it was well after dark and he and many other hands on deck were straining to pick up the glow of the Eddystone. The Captain was becoming increasingly nervous as the hours passed without sight of the lighthouse. The men on deck were also becoming apprehensive. The seas had calmed somewhat, they had beaten the storm, the long voyage was almost over. Soon they would be in Plymouth. Plymouth!... Home! Some of the crew to loved ones, others to the nearest ale house...terra firma at last. But where was the Eddystone?

The lookout was the first to sight the spray about the rocks, but by then it was too late. The *Winchelsea* ground between two of the talons of the reef and the currents pushed and pulled the fat merchantman along the rough edges of the Eddystone. Only two members of the crew managed to escape in a boat, the rest perished.

The effect of this disaster was shattering to the people of Plymouth. For five years not a single ship sank on the Eddystone. The mariners plying these waters had in fact become complacent. Now this...just two days after Henry Winstanley and his remarkable structure were destroyed

the Eddystone was back to its old tricks. There was no question that the lighthouse must be rebuilt. But who would undertake the task?

After three years of red tape (yes, even at that early age it took time to secure a patent, warrant or charter) the next conqueror of Eddystone was announced. He was one John Rudyerd, a London silk merchant.

Rudyerd was born to a ragtag family of thieves and beggars in



Cornwall. Unlike his family he disdained robbing and begging and was consequently shunned by the other members of his family. He ran away to London at an early age and obtained a job as a domestic servant. His intelligence and eagerness to work were not lost on his wealthy employer. John Rudyerd was, in time, treated more like a son, sent off to school and finally set up with his own business in the silk trade. Not too much is known of his life, but it is apparent that he had a flair for problem solving. Although he wasn't an architect or an engineer he did have advanced schooling. In that age the few people who had completed school had a great deal of general knowledge. In any event John Rudyerd was given the warrant to construct the second Eddystone lighthouse.

Rudyerd studied Winstanley's design and saw that Winstanley had attempted to challenge the sea with weight and mass. The lower third of his structure being of granite. Rudyerd would use wood. He would

construct a vertical ship of wood using skilled shipwrights. Winstanley's design employed a large mass in an attempt to "fight" the seas that constantly beat on the structure. Further, he employed a ten sided lighthouse which presented a flat side to the seas no matter which direction they came. Rudyerd would build a slim conical structure, round and smooth with very little surface for the seas to strike. Winstanley's design incorporated frills and railings and ornaments, all tempting and vulnerable to the seas that continuously beat on the structure. Rudyerd would present a slick wooden cylinder with windows that could be shuttered flush with the structure. It would taper toward the top and flair out just beneath the lan-

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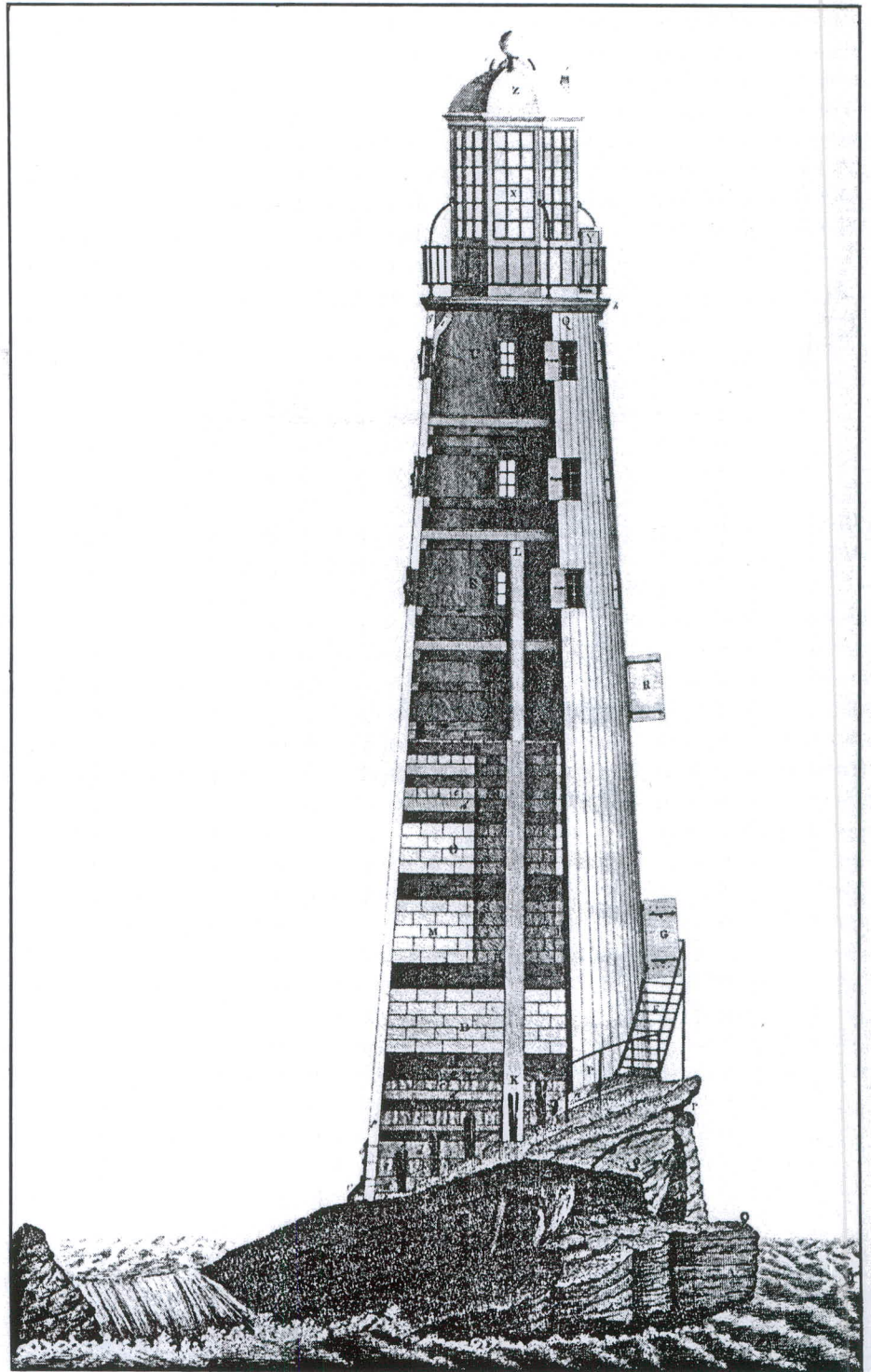
ternroom. This flaring was to direct the waves that ran up the smooth wooden sides away from the structure. The finest of English oak was employed and the entire structure ballasted with alternating layers of granite and oak. Through the center of the structure he placed a wooden mast from the ballasted base to just below the lanternroom. This gave flexibility to the structure as it swayed during heavy storms. John Rudyerd's design was aerodynamic and quite revolutionary for the age.

When the design was completed a work crew was hired and the finest oak trees of England selected and felled. Now it was his turn to wait the capricious weather of the Eddystone area. When he and the work party finally managed to gain access to the reef they noted that Winstanley had worked on the existing slope of the rock. Secondly, the twelve iron bars that had secured the base of his structure to the rock had not been properly leaded in and were loose and rusted in their sockets.

Rudyerd first had the men attempt

to cut the rock into seven steps. However, the Eddystone wasn't about to yield to this effrontery. So he settled for a rough hewn compromise. Next he copied Winstanley's idea to tie the structure to the reef with iron bars. Only he used two concentric circles of slots for a total of 36 with two placed in the center to secure the central mast to the rock. The slots were cut into the rock so that they formed a long vertical triangle, the bottom wider than the top at the surface of the rock. Each iron tie consisted of two 6 foot long pieces each weighing 500 pounds. The first bar flared at the bottom, the second was tapered. After every possible bit of water was removed from the dovetailed hole boiling tallow was poured in. Then the irons were heated to 550 degrees and plunged one after the other into the hole. The second iron forcing the bottom of the first into the dovetail. The wax that remained acted as a seal until molten lead was added, securing the irons to the rock as surely as they had been there for centuries.

The first section of the tower, the ballasted base, consisted of a layer-cake design of granite and oak courses. First, to develop the area from the lowest to the highest part of the slope he installed opposing layers (or courses) of oak all glued and strapped and nailed together and fastened to the jutting iron arms. Then came five layers of granite all dovetail into one another then two courses of 1 foot square wooden beams. This first section was 18 feet high from the lowest section of the rock and 9 feet from the highest. From here a semi-solid section elevated the tower 18 more feet. This section also consisted of layers of oak and granite, but had an entrance door at the bottom and a central shaft for the stairway and the mast that pierced the center of the structure. When this section was completed Rudyerd had a 36 foot tall base weighing 273 tons.



Rudyerd's Tower. The dark vertical slashes are the iron branches securing the base to the rock. The light horizontal sections are granite and the dark sections are timber courses or layers. Note the central mast which penetrates the tower to the ceiling of the livingroom. Below the living room is a store room and above is the bedroom. The room just below the lantern is the kitchen. The foundation (consisting of courses of granite and timber) weighed 273 tons.

Now they brought the specially selected and seasoned oak planks to the reef. These boards were bevelled and tapered, thick at the bottom and thin at the top. They ranged from 10 to 20 feet in length and were staggered as they sheathed the structure. The planks continued 34 feet above the 36 foot base to form the four living compartments. The lowest was a store room, next a living room, then the bedroom and finally the kitchen. The thick ceiling of the kitchen would support the lantern and bring the total height of the lighthouse to 91 feet. The structure was 22 feet 8 inches in diameter at the base and 14 feet 3 inches at the top.

The finished lighthouse was caulked, like a ship, and all exterior surfaces liberally coated with pitch. Then the wood and lead lantern room was constructed and a chandelier of 24 candles installed and lighted. It was 1708, three years after the demise of Winstanley's tower. The Eddystone was again conquered. Rudyerd had built his conical "ship." Soon after completion he vanished without a trace. It is speculated that his frail health coupled with the arduous task of working in the Eddystone environment caused an early death.

The new structure weathered most storms. Wood-worms proved to be the new enemy requiring extensive repairs in 1723 and 1734. In 1744 a fierce storm stripped away 30 of the 71 upright planks that sheathed the tower. However, the basic structure endured and repairs were effected in 10 weeks. By the early 1750s the Eddystone Lighthouse and its keepers had assumed a role in folklore. The keepers were assigned in pairs and paid the princely sum of 25 lbs. a year (probably about \$7,000 in today's money). Incidentally, the first keeper of the Boston Lighthouse was paid 50 pounds in 1716.

There was little for the men to do save keep the tower clean, wipe the spray from the lantern panes and ready the candles for

the night. They spent most of their off-duty hours in the 14 foot diameter kitchen, the only room with a stove. During the night they took turns tending the candles in four hour shifts.

One keeper remarked, when asked if it was a comfortable existence, "Yes, very comfortable if we could have the use of our tongues. But it has been a month since my partner and I have spoken to each other."

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On one occasion one of the keepers died. Fearing that he might be accused of murdering his partner the remaining keeper decided that he would keep the body in the store room until assistance arrived. He hoisted the distress flag but a winter storm delayed the relief boat for a month. In spite of this unpleasant situation the remaining keeper managed to maintain the light throughout the period. After this occurrence Trinity House assigned three keepers to isolated lighthouses.

During the summer of 1755 tragedy struck John Rudyerd's ship-like tower. The stormy seas were beaten and the borer worms tamed, although the structure did require repairs from time to time. This time the enemy came from within. Fire!

At midnight on the first of December 1755, 94 year old Henry Hall relieved his fellow keeper and assumed the mid-watch. He would be responsible for tending the lanternroom until 4 a.m. when the 3rd keeper would relieve him.

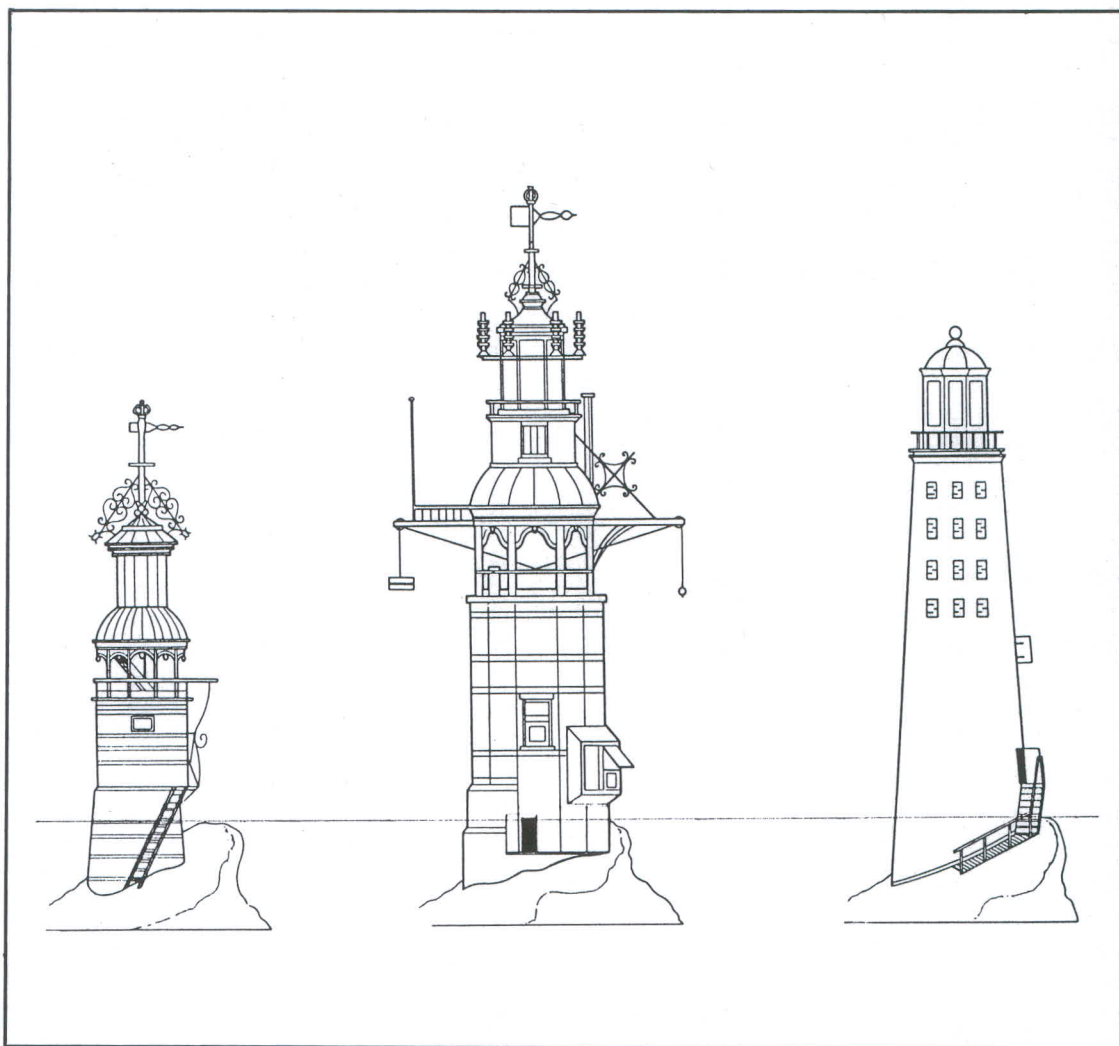
There was a storm blowing, not a real rip roaring storm, but enough to make the tower shudder as waves crashed against the base and ran up the sides of the tower. The warm lantern was comfortable. The heat from the candles added to that from

the copper chimney that went from the coal fired stove in the kitchen (one floor below) to the roof of the cupola above. However, after a spell the acrid smoke began to water Henry's eyes and he repaired to the kitchen. All the candles were properly trimmed and a few replaced. Around 2 a.m. Henry shook himself from a slumber and climbed the ladder to the lanternroom. When he opened the door he was greeted by a cloud of black smoke, the lanternroom was on fire! (a subsequent investigation found that sparks probably escaped from the copper chimney and ignited the soot encrusted roof of the lanternroom).

Henry grabbed leather buckets of rain water on the gallery and attempted to toss the water up, over his head, at the burning ceiling. He also called out to his fellow keepers who were fast asleep two floors below. Finally the other two arrived and ran from the store room, where they lowered buckets into the sea, and the lanternroom where old Henry was desperately trying to throw water on the ceiling of the lanternroom. It was a futile effort and soon the entire lanternroom was on fire. The wooden struts supporting the lead cupola acted as torches and the lead began to drip in large globs. Henry still trying to throw water on the inferno let his mouth gape open as he looked up and on one occasion felt a searing pain in his throat. At about that time the lanternroom began to cave in and Henry was forced to retreat to the kitchen. And then he and the other keepers were forced to retreat down the inside of this 70 foot torch as the fire worked its way down, crackling and sputtering. If only, they thought, the wind would shift to the west, its usual haunt. Westerly winds drove waves up the tower. But no, not tonight... tonight the winds were from the east and the waves broke harmlessly on the steep side of the Eddystone.

The men retreated floor by floor. There was a shelter, a cave in the rock, but it was only accessible at

The tower on the left was the original 80 foot high Eddystone completed by Winstanley in 1698. Although it survived one winter, Winstanley rebuilt the light house as depicted in the center. The reconstructed tower was completed in 1699 and stood 120 feet high. It was destroyed by a storm in 1703. The tower on the right is Rudyard's 91 foot high Eddystone which was completed in 1709 and destroyed by fire in 1755.



low tide and at the moment the tide was high. They left the lowest floor of the structure and huddled on the rock waiting for the tide to ebb as burning pieces of the lighthouse rained about them. Luckily the fire slowed when it reached the solid lower portion of the structure. This bought the men valuable time. The tide finally ebbed sufficiently for them to gain access to the cave. However, it was a wet and cold shelter where they awaited rescue.

Some fishermen were the first to spot the blazing torch that had been the Eddystone Lighthouse. When they finally arrived they could not approach the reef because of the direction of the ground swell. After awhile they anchored and rowed a small boat toward the men huddled in the cave. A line (rope) was tied between the stern of the small boat and the fishing vessel. When the

small boat got as close to the reef as the fishermen dared, they threw a rope to the men. They instructed the keepers to, one at a time, tie the rope around their waist and jump into the water (cold December water I might add!). After all three burned, wet, cold and exhausted keepers were aboard the small boat, the fishing vessel hauled the boat away from the reef.

When they reached Plymouth a doctor examined the men. The two younger keepers were not harmed. However, poor 94 year old Henry Hall had taken a beating. He had been badly burned, drenched, and exposed to cold air for hours. He could barely speak and when he did so he kept mumbling about swallowing some lead. The attending doctor doubted his statement. After all he swallowed the

medicine he had given him. Then on the sixth day he seemed to improve and took solid and liquid food. However, on the 12th day keeper Hall worsened, lapsed into convulsions and died. The doctor performed an autopsy and discovered a 7½ ounce piece of lead in the pit of his stomach!! That piece of lead is on display in the Royal Scottish Museum in Edinburgh, Scotland.

And so the Eddystone won another round. It is rather ironic that the destruction of the tower by fire provided the grandest light that had ever been displayed on the reef...but only, of course, for one night.

In the next issue we will relate the story of Smeatons Lighthouse and the final taming of the reef.



The U.S. Lighthouse Society Financial Statement May 31, 1985

The U.S. Lighthouse Society Statement of Financial Condition May 31, 1985

Assets

Cash	\$3,685
Investments	<u>6,194</u>
Total Assets	<u>\$9,879</u>

Liabilities and Fund Balance

Accounts Payable	\$8,010
Fund Balance	<u>1,869</u>
Total Liabilities and Fund Balance	<u>\$9,879</u>

The U.S. Lighthouse Society Statement of Revenues and Expenditures for the Year Ended May 31, 1985

Revenues

Member Dues	\$26,368
Advertising	1,035
Donations	1,025
Interest	<u>177</u>
	\$28,605

Expenditures

Printing	\$15,149
Equipment	4,163
Postage	2,337
Stationery	1,580
Independent Contractors	1,530
Promotion	1,002
Library	322
Utilities	266
Travel and Entertainment	200
Miscellaneous	<u>187</u>
	\$26,736

Excess of Revenues Over Expenditures	<u>\$ 1,869</u>
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The U.S. Lighthouse Society Statement of Changes in Fund Balance for the Year Ended May 31, 1985

Fund Balance, June 1, 1984	\$ 0
Revenues	<u>28,605</u>
Total	28,605
Expenditures	<u>26,736</u>
Fund Balance, May 31, 1985	<u>\$ 1,869</u>

The U.S. Lighthouse Society Statement of General Fixed Assets May 31, 1985

Assets Held	
Computer	\$3,584
Slide Projector	240
Filing Cabinet	179
Telephone Answering Machine	99
Typewriter	45
Slide Case	<u>16</u>
Total Fixed Assets	<u>\$4,163</u>



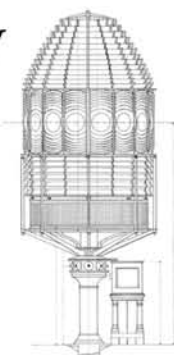
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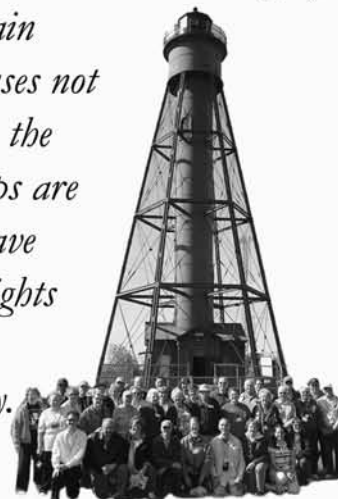
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