

The Eddystone Lighthouse

A tale of triumph, tragedy and genius in four parts

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The Problem

Hidden rocks in the sea are a hazard at the best of times, but when they stand at the entrance to a busy port they are particularly dangerous. In good visibility and with accurate navigation, the three Eddystone reefs thirteen miles off Plymouth could be avoided but at night dozens of ships and hundreds of men were lost before the first lighthouse was built in 1697. Daniel Defoe set out the problem in his customary style.

In the entrance to this bay lyes a large and most dangerous rock, which at high water is cover'd but at low tide lyes bare, where many a good ship has been lost, even in the view of safety, and many a ship's crew drown'd in the night, before help could be had for them.

A proposal to build a tower on the rocks with a light in it had first been made in 1664 by two Plymouth gentlemen – Sir John Coryton and Henry Brunker – but nothing had happened. It was only when two of his own ships were wrecked on the reefs that an Essex businessman, Henry Winstanley, travelled to Plymouth to investigate.

The Saffron Walden Showman

Winstanley was an unlikely builder of Britain's first lighthouse. An inventor, a draughtsman and an entrepreneur, he had built a house near Saffron known as Winstanley's Wonders where visitors paid a shilling to enter a house full of jokes and tricks, including the Restoration equivalent of a ghost train. One visitor described the experience.

One chair, as my cousin Tresillian, sat in it descended perpendicularly about ten feet in a dark and dismal place. Another as he sat in it ran the length of a small orchard and over a moat, jumped in a tree, then descended and in a very little time stopped. A seat in ye garden was changed into several shapes. We gave a shelling to see ye house."

His next project was at Hyde Park in London where Winstanley's Waterworks – a funfair of fountains and waterspouts – drew crowds for thirty years. But a much bigger challenge now faced him at Plymouth.

He paid £5,000 to join a syndicate of investors but the biggest problem was getting out to the rock in the first place. Winstanley and his workmen had to leave Plymouth at high tide to catch the ebb flow to the Eddystone, a journey that could take between three and six hours, hopefully arriving when the rocks were exposed. They then had just two or three hours to do any work before the sea surged back over the reef. Winstanley set out the difficulties himself

Nothing could be attempted to be done but in the summer season yet at times the weather would prove so bad that for ten or fourteen days together the sea would be so raging about these rocks that though the weather should seem to be calm in other places yet here it

would mount and fly more than two hundred foot. And therefore all our works were buried or exposed to the mercy of the seas.

Winstanley had designed a whimsical structure that looked more like a church tower or a fairground helter skelter than a modern lighthouse. A circular drum of masonry sixteen feet high was anchored to the reef by 12 iron stanchions. Above this rose an octagonal tower of stone and prefabricated sections of wood and metal. After two years and against all the odds the structure was beginning to take shape.

A woodwork gallery was decorated with iron balustrades. Above the octagonal lantern, glazed with small glass squares, was a tangle of decorative ironwork and an ornamental weathervane.

But in June 1697 a group of French pirates, presumably seeking ransom money, captured Winstanley from the Eddystone and took him back to France. Far from being delighted, as they had hoped, Louis the Fourteenth – the Sun King – was furious. Although France was at war with England, Louis knew only too well the danger that the Eddystone Rocks posed to French as well as English shipping. “I am at war with England but not with all mankind,” he is said to have remarked, as he ordered Winstanley to be returned, apparently giving his personal guarantee for the safety of the men working on the lighthouse.

By the winter an octagonal tower forty feet high had been completed and the sixty candles in the light were lit for the first time on November 14th 1698. During the first winter the light was regularly swamped by waves and the keepers were terrified by the way the tower shuddered in storms. The concrete had failed to set properly so Winstanley set to work to strengthen the structure and stop it being top-heavy, widening the base and raising the light by another forty feet.

Next year Winstanley strengthened the lighthouse but in doing so made it even more flamboyant with platforms, more ornamental ironwork and Latin inscriptions, one of which described the architect as an Essex gentleman. Inside – to use his own words – was a very fine bedchamber with a chimney and closet, the room being richly gilded and the outside shutters very strongly barred.

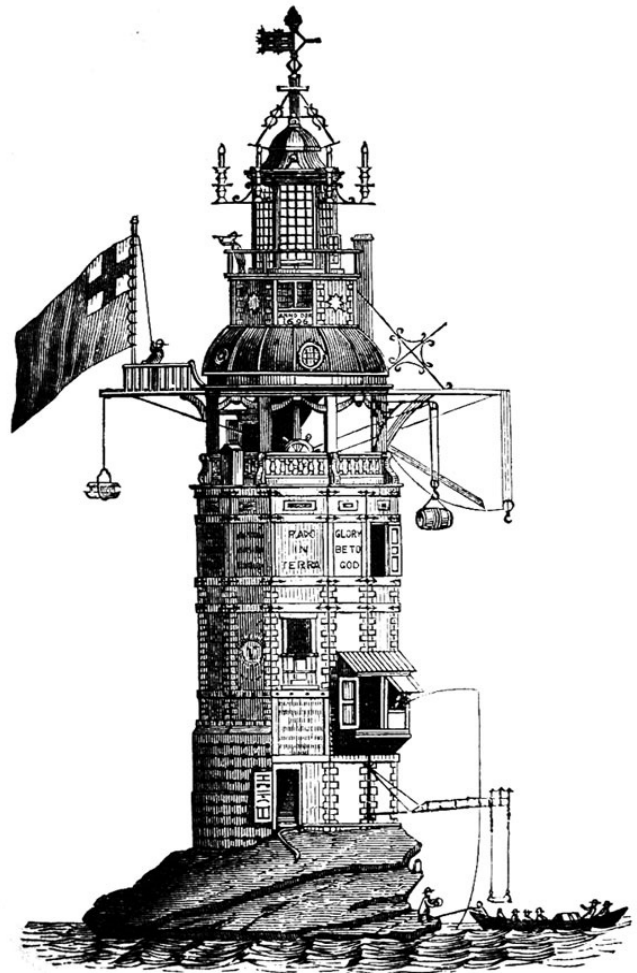
Winstanley was so proud of his creation that he sold drawings of it and included himself fishing from an upstairs window.

Let Daniel Defoe take up the story again.

The famous Mr Winstanley undertook to build a lighthouse for the direction of sailors and with great art and expedition finished it which work stood to admiration and bore out many a bitter storm. Mr Winstanley frequently strengthened the building by new works and was so confident of its firmness and stability that he said he only desir'd to be in it when a storm should happen for many people had told him it would certainly fall if it came to blow a little harder than ordinary.

He soon had his wish fulfilled. He was in Plymouth in 1703 to carry out maintenance. After two weeks of terrible gales there was a lull on November 25 and Winstanley – no seaman – set off for the lighthouse in the early hours of the morning. Shortly before midnight the wind veered to the south west and the tempest that came to be known as the Great Storm had begun. Daniel Defoe, writing the following year, described what happened.

The tempest blew with such violence and shook the lighthouse so much that Mr Winstanley would fain have been on shore. He made signals for help but no boats durst go off to him. On the Friday morning when the tempest was so redoubled it became a terror to the whole nation the first sight seaward that that people of Plymouth were presented with was the

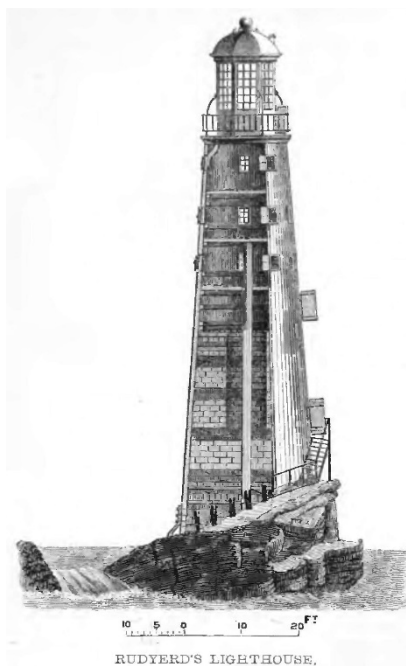


WINSTANLEY'S EDDYSTONE LIGHTHOUSE.

bare Eddystone, the lighthouse being gone, in which Mr Winstanley and all that were with him perished and were never seen or heard of since.

A few days after, a merchant ship call'd the Winchelsea – homeward bound from Virginia – not knowing the Eddystone lighthouse was down, for want of the light that should have been seen, run foul of the rock itself and was lost with all her lading and most of her men.

The Winchelsea was on her way to Plymouth with a cargo of tobacco, and the sinking of yet another vessel showed the importance of a light on the Eddystone. Three years later a Cornishman, John Rudyerd, took charge of the building of a new lighthouse. By profession he was a London silk merchant, with no more qualifications for building lighthouses than Winstanley, but he had the assistance of two shipwrights from Woolwich dockyard, which is why the new structure more closely resembled what we recognise as a lighthouse.



It was a conical structure built from granite and oak and slotted into the reef by 36 iron rods. The slots were first filled with tallow which melted as the hot rods were hammered into it. Then molten pewter was poured into the remaining gaps to seal them. While the lighthouse was being built the Navy stationed four warships nearby to protect it from any fresh French incursions.

The whole structure was covered in wooden timbers, waterproofed like those of a ship, which enabled it to flex with the waves. The lighthouse did its job for almost fifty years, despite the need to constantly replace the timbers damaged by woodworm. What did for the Eddystone light this time was not storms or ferocious seas but fire.

In December 1755 a blaze started in the wooden lantern room. Fuelled by the accumulation of spilled wax, the fire destroyed the top of the lighthouse and forced the keepers to escape to the reef, where they remained for many hours before being rescued. The fire burnt for five days and the lighthouse was completely destroyed.

The Tragic Lighthouse Keeper

One of the keepers was Henry Hall, who was 94 years old and had been the first keeper of the Winstanley lighthouse sixty years earlier. As if lighthouse keeping was not difficult enough, he had already been traumatised when one of his fellow keepers had died. He did not want to risk burying him at sea lest he was accused of murder, so he strapped the body to the gallery surrounding the lantern. The corpse continued to rot until a relief boat came to take it away.

Now he was one of the three keepers in Rudyerd's burning lighthouse. As the fire grew out of control the lead of which the cupola was made melted and some dripped into the old man's mouth as he was throwing water onto the flames. Hall survived 12 days, repeatedly

telling the doctor what had happened, even though most people did not believe him. On his death an autopsy revealed a piece of solidified lead in his stomach weighing seven ounces. It is now in the Scottish National Maritime Museum.

While plans for a third lighthouse were prepared, the newly formed Trinity House put a lightship at the reef to keep ships away. Trinity House did not have a monopoly that it does today. Any businessman could petition the monarch for permission to build a light and reclaim their investment by charging fees on passing vessels, collected as they put in to neighbouring ports. The lease on the Eddystone was then held by a syndicate led by Robert Weston and they sought the advice of the Royal Society in choosing who should build the third lighthouse.

Smeaton Takes Control

Step forward John Smeaton, sometimes called Britain's first civil engineer. A Yorkshireman, he had already designed canals, bridges and harbours and been elected a Fellow of the Royal Society for his investigations into wave and wind power. The Eddystone now had a "professional" in charge after two gentlemen amateurs. He looked carefully at the strengths and weaknesses of the first two buildings. Winstanley's elegant tower offered too many corners where the waves could take hold. Rudyard's timber-clad light was too combustible.

Smeaton followed nature. He saw that a mature English oak, wide at the bottom and tapering above, withstood the worst storms. Leaves and branches may be blown away but the tree itself remained standing, anchored by its roots, weight and low centre of gravity. The oak tree became the template for the new lighthouse. He decided to build in stone, and not any stone, but one of the heaviest. Granite.

As if this was not ambitious enough, he recognised that to withstand fierce winds and waves the granite blocks must be interlocked, not just joined by pins or mortar. He saw the solution when wandering around London streets. New kerbstones were dovetailed together to prevent them becoming dislodged. So it would be on the new Eddystone light.

At Millbay in Plymouth Smeaton established a dedicated yard and a jetty. Granite from Bodmin Moor was chiselled into blocks weighing up to five tons. The masons who carved



the shaped blocks were given Eddystone tokens by the Admiralty to signify the importance of their work to stop them being pressed into naval service.

Equally important were the Cornish miners employed by Smeaton to move the granite from the quarry to the masons yard to the Eddystone reef, a journey of fifty miles. If there was no wind, they had to row the granite blocks before dragging them on to the rocks. The whole operation had echoes of the construction of Stonehenge, using nothing but ropes, pulleys and hard labour.

The lowest part of the tower was half reef and half stone – the rocks were laboriously shaped into a series of steps into which the dovetailed granite blocks were fixed. From the sixth layer, or

course, the tower was all stone and to ensure added solidity the stones were joined to the courses above and below with marble dowels and layers of mortar. Above were four simple rooms with narrow passageways and a staircase.

An elegant lantern with 24 candles crowned the lighthouse and on October 16th 1759 they were lit for the first time. It had taken three years to build what became the model for most other rock lighthouses around the coast of Europe. It stood for 120 years and it was cracks in the reef, not the lighthouse, which led to its replacement.

A hundred years later the tower was painted with the now familiar broad red and white horizontal bands to make it more visible in daylight and in 1872 a five hundredweight bell was installed which sounded rapidly five times every half minute in foggy weather.

But erosion to the rocks under Smeaton's tower was starting to cause it to shake from side to side whenever large waves hit and William Douglas was asked to supervise the construction of a new lighthouse. There was already a Trinity House daymark on Plymouth Hoe and Plymouth Council petitioned for Smeaton's tower to be dismantled and put up in its place. . Trinity House agreed and the lantern and the upper four rooms of the old Smeatons tower have been the city's most famous landmark ever since.

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*Smeaton's Tower (left)
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*Douglass Lighthouse (right)
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