

WOLF ROCK LIGHTHOUSE

By Wayne Wheeler

In 1855, after a three-year absence, James Douglass returned to Trinity House as the Chief Engineer. Trinity House is the corporation in charge of aids to navigation for England. During the next five years, he oversaw the construction of several lighthouses, many situated on shore, and one, *The Smalls*, a feat of some ingenuity. As it turned out, constructing *The Smalls* was good practice for what Trinity House handed him next. It was to be one of the most difficult and challenging that he or any other lighthouse builder was ever called on to undertake. This project was the construction of a lighthouse on the dreaded Wolf Rock.

This bleak and dour pinnacle, which thrust its rounded hump out of the water, is situated some 8 miles off Land's End, the southwestern most point of England. Unlike Bishop Rock, which was beyond most of the coastal traffic, Wolf Rock is situated almost squarely in the center of the primary offshore trading routes. Composed of hard, dark felspathic porphyry, its highest peak was only 17 feet above low water, and only two feet above high spring tide; the rugged surface, which made landing on it impossible except during the calmest weather, fell off to 20 fathoms (120 feet) or more, except on the southeasterly side, which was only some 30 feet deep some 600 feet away. Thus, like the similarly sculpted Bishop Rock (*Keeper's Log* Vol. 14, No. 3) and Dhu Heartach Reef (*Keeper's Log* Vol. 16, No. 1), it was subjected to tremendous waves. In times of storms the seas around it rose to a chaotic fury every bit as awesome as around Bishop.



Changing the crew at Wolf Rock Lighthouse.

From times immemorial this rock has been a boon to the Cornish wreckers who reaped an incredibly rich harvest from ships that had the misfortune of becoming fog bound while rounding Land's End and striking it. During heavy gales, however, the Wolf was not nearly so feared, since nature, in one of her uncharacteristically charitable moments, had furnished it with a hollow area below water that tapered up into a small orifice near the highest point. When waves were driven into the small cave, air was compressed and escaped from the constructed vent with a long drawn-out wail that resembled the howl of a wolf and thus, the name.

The Wolf might have gone on howling its mournful warnings indefinitely had it not been silenced by the enterprising Cornish wreckers. Rankled by the fact that its ululations were depriving them of plunder from ship wrecks, at least during clear weather with the seas running heavily, several Cornish wreckers rowed out to the rock with a boat load of boulders and stuffed them into the opening. Thus silenced, the rock proceeded to supply what appeared to be an endless season of prosperity for the Cornishmen.

But the British government and its maritime interests viewed the matter differently. When an increase of coastal traffic brought with it a disproportionate rise in shipping casualties, marking this deadly rock became a matter of increasing priority.

Several attempts had been made to mark the Wolf with day marks during the last two

decades of the 18th century. But the sea invariably made short work of them. Lt. Henry Smith, builder of the first Longships Lighthouse, tried to revive the Wolf's silenced vocal chords with the aid of a fantastic contraption of copper and brass in the shape of a wolf with distended jaws, which was suppose to give out with a distinctive howl whenever the wind rose. However, this, too, got short shrift from the sea. In 1795 Smith made another attempt to place a daymark on the Wolf and on some nearby rocks called the Rundlestones. Wrought iron piles 4" in diameter and 20 feet long were sunk into holes made into the rocks and fixed in place with molten lead. But, it was the same old story, the first storm swept them both away

The question of placing a mark or lighthouse on the Wolf appears to have been first raised in 1812. The Admiralty requested that Robert Stevenson (of Scottish lighthouse fame) examine the Wolf and report on the feasibility of building there. On October 14 Stevenson departed Plymouth on the brig *Orestes*. The vessel stood off from the rock on the morning of the 17th and Stevenson gingerly pulled up to it in a boat. The soundings he took around the rock revealed for the first time just how steeply the ocean bed fell off on all sides. While trampling about the constricted surface he discovered traces of one of the former beacons.

Returning to Bath he composed his report. The project, he conceded, might be regarded as feasible, but it would be exceed-

ingly costly and very difficult. He estimated that to construct a tower similar to the Bell Rock would cost between £80,000 and £90,000 (up to \$2,700,000) at a bare minimum. This would include the construction of a keeper's dwelling in nearby Cornwall. Thus, the construction of a lighthouse at this location was temporary shelved.

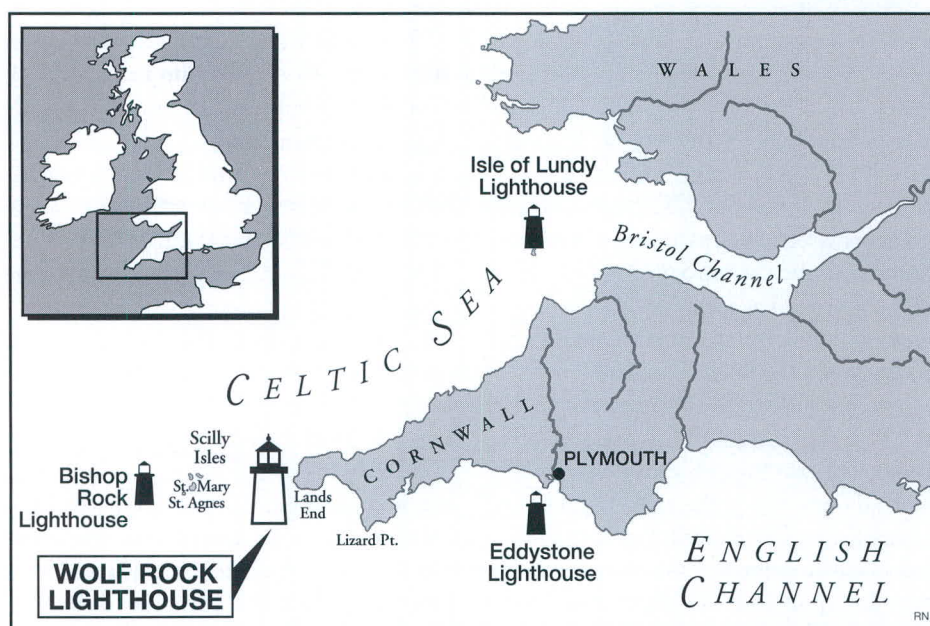
Not so easily shelved, however, was the fact that the volume of shipping coming to a violent end on the Wolf was reaching downright scandalous proportions. A lighthouse being apparently out of the question, Trinity House decided to try once again to install a less costly daymark on the rock. In 1836, Trinity House gave the project to James Walker.

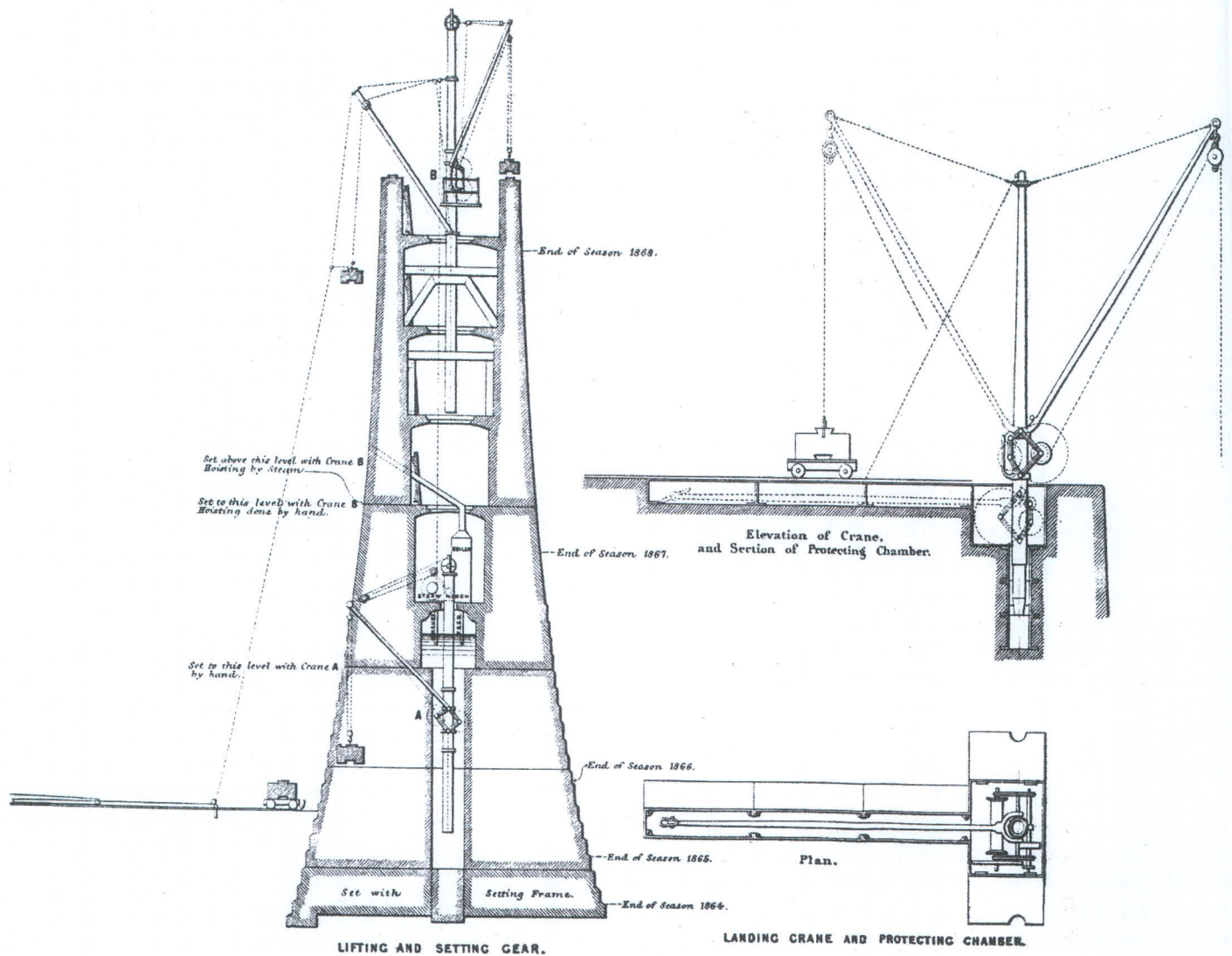
The new beacon was a 12" diameter oak mast placed in a foundation hole and surmounted by an open 6-foot diameter wrought iron globe. The project took five working seasons (1836 to 1840) and cost \$322,000.

There is probably no more graphic illustration of just how violent and destructive the seas off Land's End can be than the fact that this project completed in the summer of 1840 was swept away by a gale in November of that year. A second attempt was made using a 7-5/8" diameter wrought iron pile in lieu of the oak pole. It was completed in 1842 and storms that winter bent it into a grotesque fish hook (1843) and finished it off the following winter.

In July 1845, another attempt was made again using a wrought iron pile, reducing the size of the globe to 4 feet, thus showing less resistance to the waves. All to no avail, as it lasted only three years before the ocean added it to its rich harvest.

Recognizing at last that anything that was to stand on the rock for very long would have to be far more substantial. Walker designed a conical structure made of cast iron plating and filled with cement rubble. This was further secured by iron baffles fastened to the inside of the cone and secured firmly to the rock. The structure had a hollow tube into which a solid iron mast was inserted. It was surmounted by a 3-foot diameter ball. Completed in 1850, this fourth beacon turned out to be a charm. It weathered the gales of subsequent winters, and for the first time in history identified this dangerous rock with a marker that not even the mightiest seas could wash away.





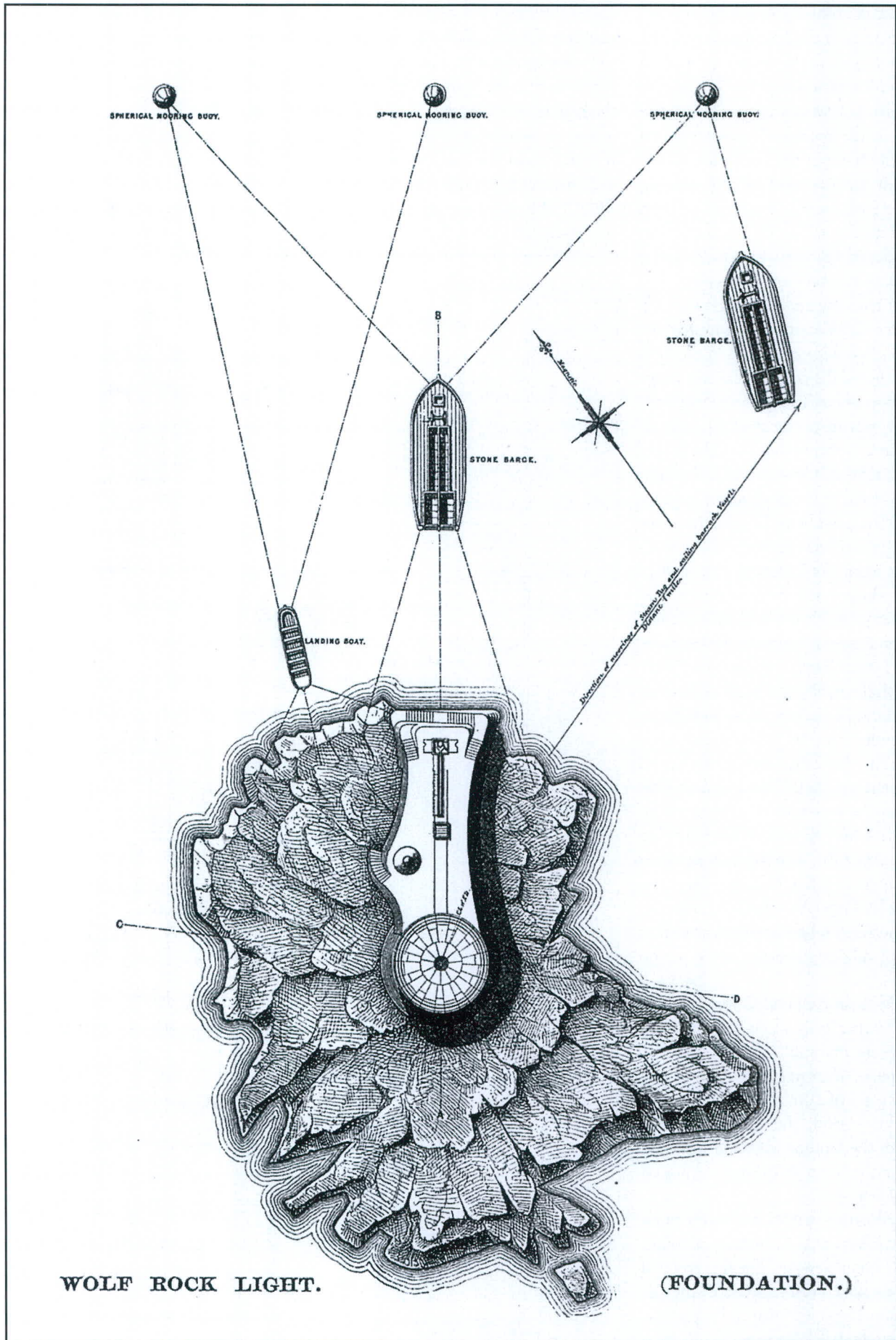
In 1860, the prospects of constructing a lighthouse on the Wolf Rock appeared much more auspicious than they had ten years earlier. The success of the Bishop Rock Lighthouse, along with the recent completion of the Smalls on an almost equally exposed site, encouraged Trinity House to try once again to illuminate the Wolf. Late in 1860, James Walker was assigned the task of preparing plans and specifications. The following year the tugs and barges used at Smalls were transferred to the new project. Additionally, a 100-ton schooner was brought to the site to serve as a floating barracks for the workers and a headquarters for the engineering staff. Penzance, 17 miles from the rock, became the base of operations and a facility for dressing and loading stone was established there.

The design for the Wolf Rock tower adhered closely to the traditional dimensions and proportions for wave swept lighthouse towers, but Walker did incorporate one major novelty of construction. The construction stones were dovetailed to each other in every course or layer, as well as to the courses above and below, and the introduction of 2" diameter bolts of yellow metal (an alloy of copper and zinc) which were sunk 12 inches into bedrock and the first two courses.

On July 1, 1861, Douglass journeyed out to the rock to establish the position of the tower. This was the only time it was possible to land on it during the entire season: and even at that, the engineer was fortunate in being able to complete his survey before the seas got up so violently that he had to be dragged off by a rope around his waist.

That experience turned out to be an accurate forecast of what life and work upon Wolf Rock would be like during the early stages of construction.

Dampened but undaunted, Douglass returned with a crew of workmen on March 17th, 1862 and began excavation of the foundation pit. He soon found that the extreme irregularity of the surface posed security problems even more severe than was experienced on the Bishop. His first order of business was to drive a circle of iron stanchions into the rock and install safety lines. On the approach of a heavy breaker, a lookout stationed on the highest point of the rock (called the crow) would sound the cry. The men would drop their tools, grab the safety line and hang on for dear life as the surf clawed at them.



This accomplished, the workmen started to chip away at the foundation pit. The very inhospitability of the terrain proved an advantage. It was so steep that it was only necessary to cut away a few inches of the hard rock on the low side. The constant foul weather did hamper the operation to the effect that by the end of the season, September 29th, only 22 landings had been made, amounting to just 83 hours of work. But considerable progress was made on the landing platform and foundation pit.

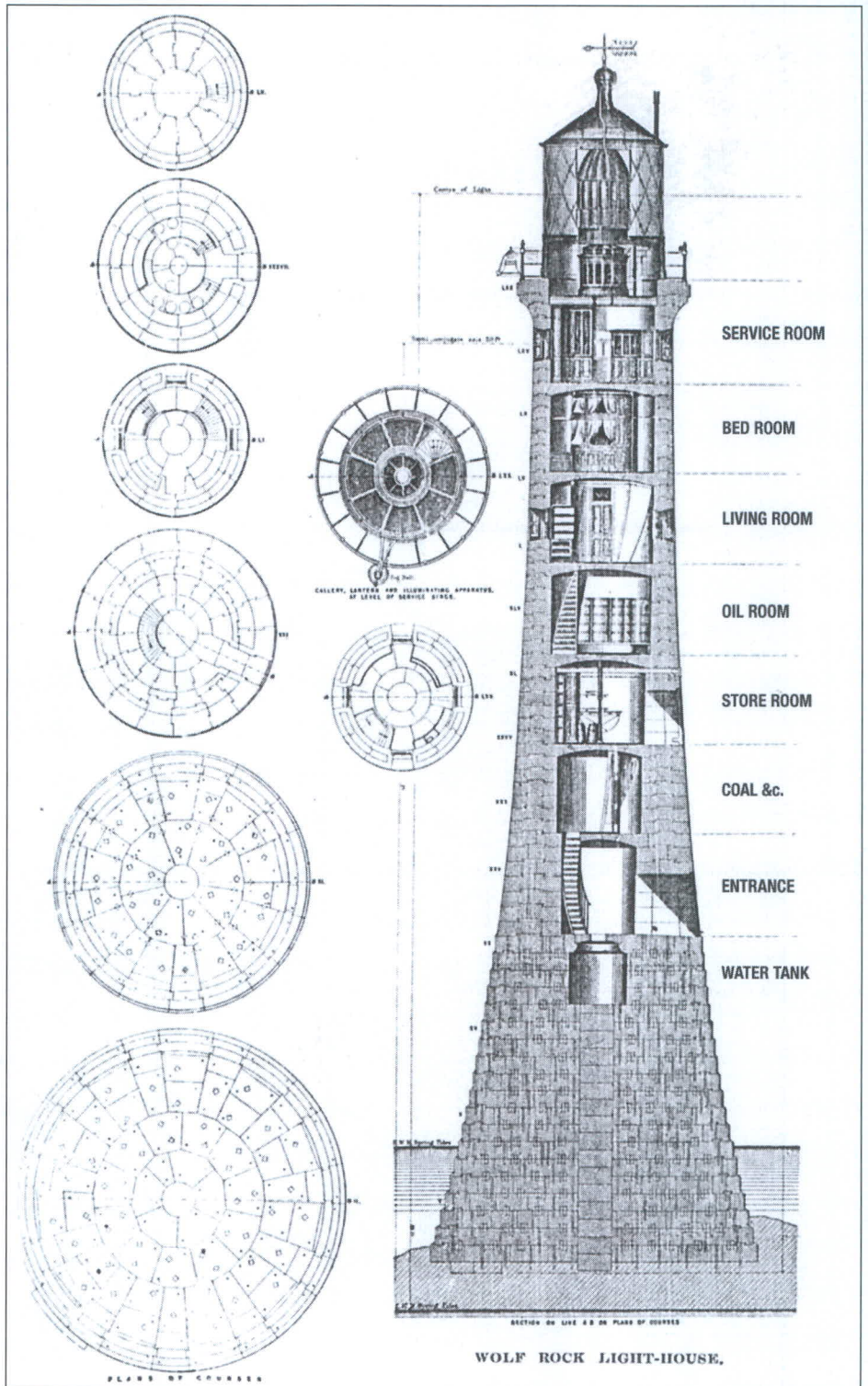
Shortly after the end of the first working season an event occurred that multiplied James Douglass' responsibilities in the near term and altered the course of his life. James Walker, upon whom Trinity House had been exclusively relying on for structural expertise, died in October of that year. His firm of Walker, Burges & Cooper had a de facto monopoly relative to lighthouse construction in England, and James Cooper, the junior partner, who had been in charge of the firm's lighthouse work, died a few months earlier. This left Burges the only survivor and advanced in years. He was well off financially and had no desire to continue the business. Suddenly James Douglass became England's person with the most experience and expertise on lighthouse construction, and Trinity House needed him. So it was to nobody's surprise that the Corporation appointed James Douglass as their Chief Engineer. This meant that he was now in charge of the entire lighthouse system of England. He promptly turned the Wolf Rock project over to his younger brother, William. Over the next decade, James Douglass oversaw the construction of ten light stations, as well as the day-to-day engineering work of the system.

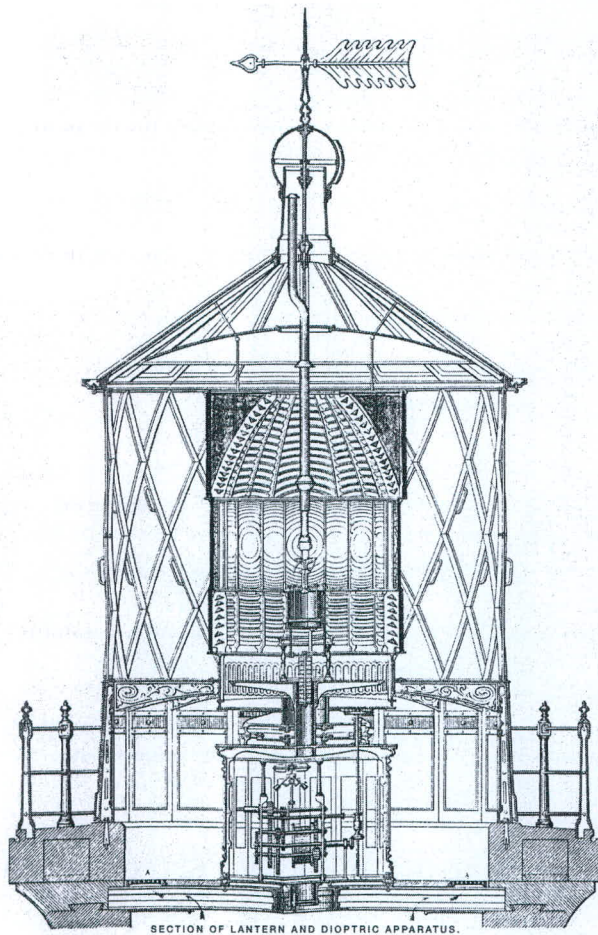
The 1863 season extended from February 20th to October 24th and it turned out to be a far more favorable season than the preceding one. They made 39 landings and worked a total of 206 hours on the rock. During this period, the foundation was completed, the landing platform was half-finished and six courses of stone had been dressed at Penzance.

The following season was even more productive. They made 42 landings, accounting for 267 hours of work. The first stone of the tower was laid on August 6th. By the end of the section, the first course and part of the second were laid. Ten courses of rock were

dressed at Penzance and the vital landing platform was virtually complete. The stones were brought out to the rock by a stone barge. Each stone was laid on elm rollers in the hold in the order they would be needed. When its turn came a stone was rolled into position under the hatch on a truck, and a deck winch lifted it onto the deck. Once on deck, it was affixed to a chain from the landing crane and lifted from the truck over

rollers at the stern of the barge. During this operation, veering tackle (side chains) was used to prevent the stone from being driven against the barge or the rock due to a sudden swell. Since the barge would often surge up and down as much as 12 feet, this operation had to be timed with exquisite delicacy and with no margin of error. Although this method of landing the stones worked very well, occasionally a giant breaker would





ladders and partitions were fashioned of cast iron. Gun metal was used for the doors, windows and storm shutters. A lantern with vertical astragals (bars separating the glass panes) was installed. It had been manufactured by Hodges and Sons and displayed at the 1867 Paris Exhibition. The lens, manufactured by the English company, Chance Brothers, was reported to be the finest ever constructed. It provided the Wolf Rock lighthouse with an alternating red and white flashing characteristic, and was technically designed so that the range of the red and white light was equal (red light can reduce the candle power emitted from the lamp by 70%, compared to a similar lens with a white lens). A 500 pound bell fog signal was hung off the gallery deck and rung by twin hammers operated by machinery. The bell was struck three times every 15 seconds.

William Douglass left for another position before the lighthouse became operational. Michael Beazeley took over. The lighting was to occur on January 1, 1870. The only items left to complete were to provide furnishings for the keepers, provide supplies and test the machinery. But persistent stormy weather delayed any landing until December 25th. When the seas moderated Beazeley and Douglass made a dash for the rock. Undaunted, the Wolf Rock Lighthouse was lighted for the first time on January 1st. The characteristic is flashing red and white every 30 seconds, with a range of 16 miles. The height of the tower from the base to the gallery deck is 116 feet. It tapers from the base diameter of 42 feet tapering to 17 feet at the top. In recent years a helicopter platform was installed over the lantern to assist with landing supplies and relieving the keepers.

The final cost, in today's dollars, was \$2,740,000.

As sometimes happens when a new lighthouse is established, confusion arises between it and others in the vicinity, sometimes resulting in a shipwreck. This unfortunately occurred in the case of the Wolf. The barque *Manitobah* (698 tons) was sailing from Havre to Brighton on February 1, 1872, just two years after the Wolf went into service. She had a crew of 13 and went down with all hands on the Bucks Rocks. The master mistook the Wolf Rock Lighthouse for the St. Agnus Light on the nearby Scillies.

swoop in and cause the 10" circumference wire rope to part, tying up the whole operation until the damage could be repaired. Once the stone was ashore, they were swung on to a dolly and conveyed to the base of the tower where a tower crane would lift them into place.

The 1865 season, extended from April 11th to December 17th, saw 41 landings, 250 hours of work and the completion of the 4th course and 34 stones in the 5th course. Severe weather in November required the crew to withdraw to the mainland and although every effort was made to secure the stones, a storm of November 24th and 25th swept every one of them into the sea. Flotsam from wreckage was thought to be the culprit, but in any event it was a severe setback for Douglass.

The 1866 season extended from March 5th to October 13th. They made 41 landings, spend 224 hours on the rock, completed the 9th course and had started on the 10th. The setting crane was also installed toward the end of the season. Its post was a cylinder 16" in diameter, 1" thick and 23 feet

above high tide. On returning the following year Douglass and his men were again reminded of just how savage the seas could be in this region. The crane had been broken off flush with the masonry.

In 1867, the tower continued to grow, a new crane was installed and progress was made at Penzance.

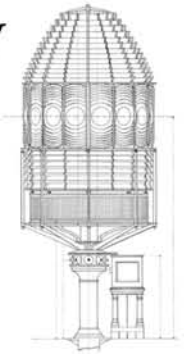
In 1868, a major first in lighthouse engineering occurred when a steam winch was installed. The first application of steam power in constructing a lighthouse reduced the average time for raising blocks from 15 minutes to 2-1/2 minutes.

The final season began on March 16, 1869. On July 19th, Sir Fredrick Arrow, deputy Master of Trinity House, officiated in the ceremonial laying of the last stone. By September 11th, the tower was completed except for the internal furnishings, fittings and the illuminating apparatus. In that month the tower received its first real test when huge seas broke clear over the top producing almost no tremor of the tower.

To minimize fire damage very little wood was used in the construction. All the stairs,



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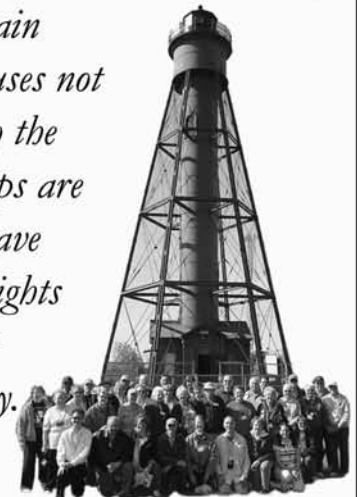
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