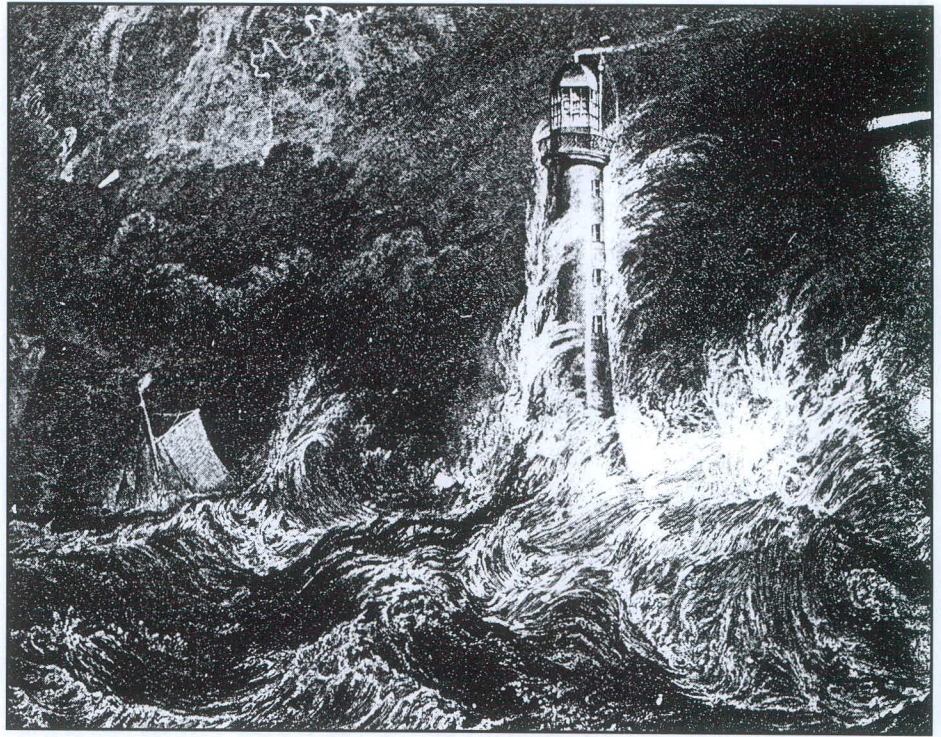


In the last issue we left Robert Stevenson and his crew of 32 stranded on Bell Rock with the tide rising. His barracks ship had parted her moorings and drifted away. One of the three boats used to ferry the men to the ship had left to check the moorings of the barracks ship, *Smeaton*, recovered her and took her in tow. However, at this stage of the tide, they were too far away to reach Stevenson and his crew before the tide had covered the rock to a depth of 12 feet. When the water reached the smith's forge and extinguished the fire, the sound of that occurrence and its great billows of steam signaled the men it was time to stop work and head for the boats...then they realized their predicament and turned to Stevenson, their leader. Stevenson's mouth was so dry from realization of the gravity of the situation that he couldn't speak.



A Lighthouse for

Bell Rock

Part II

by Robert Stevenson
as told to Wayne Wheeler



I bent and scooped a handful of sea water from a crevice. It was most foul tasting, but it did restore moisture to my mouth. I rose to speak and tell the men of the only plan that I had been able to formulate when someone (I think it was the smith's assistant, Mac Leash), called out, "A BOAT, A BOAT!". I turned and sure enough t'was either a mirage or a miracle. I could discern a large boat making her way through the haze toward us. The timely visitor was the Bell Rock pilot, James Spink, who had come to deliver letters. That evening I wrote in my journal, "There can be little doubt that the appearance of James Spink, with his boat, on this critical occasion was the

means of preventing the loss of life at the rock this morning." For his action, I ensured that the Lighthouse Commissioners pensioned him in his old age.

In September we finally erected the first beam of the temporary beacon. I was quite worried about starting this part of the operation so late in the season; if it were not sufficiently far enough along, even a small storm could very well blow up and carry the work away. On the 19th of the month we erected a derrick of some 30 feet, supported with guy ropes and attended with a winch and tackle. Upon raising of the derrick all hands on the rock spontaneously gave three hearty cheers. Next we erected the six principal beams of the beacon, each 16 inches

square and 50 feet in length. Each beam was 'stepped' into the holes which had been prepared for it. The beams converged from a base diameter of 33 feet to the apex of a cone some 45 feet above the rock, and were fitted into a piece of beech and secured temporarily with rope. During the next week heavy weather did not allow landing on the rock and one day a gale blew up, but upon its completion, the beacon was found undamaged. When we once again gained the rock we had the memorable experience of moving smith foreman Mr. Dove's forge to a platform on the upper part of the beacon. Also, dinner was cooked on our schooner and sent by boat to the rock where the men, for the first time, dined on the rock. We continued to work on the beacon even when the tide was high and work progressed much more rapidly. Finally the beacon was finished and a large flag on a staff was raised at the top of the structure.

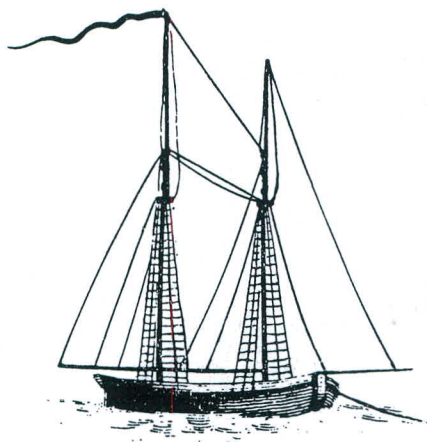
I ceased operations for the season on October 7, 1807. We had made, I

thought, a good start although only 133 hours had actually been expended on the rock.

During the winter the men were engaged in cutting and preparing the stones for the tower. They were laid out exactly as they would be on the rock, holes made in them and each block numbered.

The season having ended on the rock, and things well in hand at the yards in Arbroath, I was availed of the chance to spend some time with my lively family. Thus I returned to Edinburg and our house on Baxter Place with its large yard. My delight at being with my family was soon eclipsed by the death of my darling little Janet. Cold clammy winters of Scotland coupled with chin-cough, scarlet fever and small pox caused a high rate of infant mortality. As my grandson Robert Lewis Stevenson later wrote, "The Lillies, and Smiths, and Stevensons fell like moths about a candle." I will tell you that it took all my religious convictions to weather this storm.

As much as I would have liked to have spent the entire winter at home such was not to be. I made forays around the country side searching for sources of stone for the tower, checking conditions at the yard and occasionally, when the weather was just so, visiting Bell Rock to check on the condition of the beacon. It was holding, much to my relief. But I did, literally, discover a small marine creature which was attacking the timbers. It was named *limnoria terebrans*.



Sir Joseph Banks

In 1808 season began in May with a new schooner, *Sir Joseph Banks*, for use as our barracks ship. It provided more room for the men and greatly increased morale. The season lasted from May to September but a total of only 22 ten hour days could be worked. The beacon was unharmed from Winter storms and we soon moved the smith's forge to the lowest platform of that structure.

In June, while on the rock, I learned that my darling young twins died from scarlet fever. My wife, Jean, was of course deeply distressed and, making matters worse, was seven months pregnant. Our work was at a stage that I dared not leave the rock to console her, but, rather issued a flurry of letters to provide, as best I could, loving advice and religious quotations. My sadness increased the guilt that I felt in staying with the work at hand and it wasn't until late Fall that I left for home. I was, however, greeted with our new baby, a most healthy and robust child.

It was in this year that the 42 foot diameter foundation pit was excavated to a depth of 14 inches. As we increased the volume of the excavation we added more work to each turn of the tide. Now each time we landed after a high water, the excavation, which would later contain the first tiers of the tower, had to be pumped dry of water.

As the cargo of cast iron rails and timber was brought from *Smeaton* to the rock, excavated pieces of Bell Rock were taken to *Smeaton* for ballast and to

remove loose debris from the site, which I feared might shift about in heavy seas doing damage to our work. Mr. Pool, the Captain of *Smeaton*, later related to me that his crew was amused with the ballast as it was no doubt the first ship ever to ballasted by stone from Bell Rock. He also stated that when the excess ballast was off-loaded in Arbroath, numerous townspeople made off with chunks of it as specimens of the terrible Bell Rock. He rather thought that we should have taken it to the Cross of Edinburgh where we might have sold samples for a penny.

In June we placed a (second) forge on another level of the beacon and this greatly facilitated the work at hand. I had, early on, decided to construct a small railway on the rock to transport the large stones from the most suitable landing area to the tower site. The rail would be permanently affixed to the rock and, with small rail cars, would ensure that the large granite blocks were easily and safely moved. It was most important that the stones, each cut to precise measurements, were not damaged. A damaged block would require replacement and would greatly delay construction as work could not proceed until it arrived. The smiths were engaged in preparing rails, sharpening picks and irons for the masons and other aspects for the railway. The landing masters and millwrights were laying the rails and the sailors employed as jacks of all trades: everything from handling the boats to boring holes and carrying material about the site.

And what a busy site it was: two forges flaming, one above the other, the resounding of the anvils being struck, pick axes ringing as they bit into the hard rock, wash of waves and screech of gulls—all combining into a great deal of color, so far at sea. Several times during this and the next year ships came close aboard to render assistance, thinking that our beacon flames spewing forth was a ship burning.

In early June we had a severe gale which halted work and caused several days of very unpleasant living aboard the *Sir Joseph Banks*. The subsiding of the heavy weather showed our works on the rock to be intact. Then thick fog cloaked the area. One evening, returning to

the ship, we near-missed our mark had it not been for the sound of the barking of the ship's dog. I also learned, during periods of thick weather, that the report of the ship's gun, fired at intervals to assist location of the vessel, proved very unsatisfactory. The report of gun fire is sharp but dies quickly, too soon for one to ascertain the proper direction of the sound. I found that a horn or constant ringing of a bell to be more suitable for direction finding in thick weather...and I decided to equip the Bell Rock Tower with a bell fog signal.

On the 9th of July we laid the first foundation stone with a masonic ceremony, benediction and three hearty cheers. The foundation of 123 stones was completed by mid August, and by the end of the season three tiers, or courses were laid, all dove tailed and joined by stone joggles.

I must sadly relate the loss of a fine young man on the 21st of September. *Smeaton* crewman James Scott (aged 18), along with Mate Thomas Macurich, were in their boat making fast a hawser to the top of a buoy, preparatory to transporting needed cargo to the rock. The tides, being extremely strong on this day, had pulled the buoy's mooring chain over the bottom rocks fetching it up and dragging the buoy under water so just the mooring ring showed above the surface. While they were engaged in making fast to the buoy, the chain apparently worked free of its obstruction and the seven foot long nun buoy shot upwards upsetting the boat and dumping Mr. Macurich and young Scott into the water. The mate managed to seize the gunwale of the boat and was thus saved. But Scott appeared to have been struck on the head as he floated nearby, among debris, insensible nor able to assist himself; before anyone could come



to his assistance he was carried away by the current and disappeared. I must say young Scott was a great favorite among the crew and, thus, a gloom pervaded our crew, and operations, for several days. His mother was not only very distressed but in dire straits as her husband, a seaman, had been in a French prison for three years. Now her sole means of support, her son, was gone. I suggested to our landing master that, if he approved, we take James Scott's younger brother into the crew. He agreed. I was also able to convince the Commissioners to grant the mother an annuity of 5 Pds.

In late September (the tower now four courses high) I called for an end to the working season. The seas were colder now and more often rough than smooth.

In 1809 we transformed the beacon into a barracks for the workmen with a small cabin for me to live in. Additionally, we acquired the services of the sloop *Patriot* to help convey the enormous amount of stone to the site.

On the first of June, after the first work period of that day, we left eleven men on the beacon. Shortly thereafter the wind,

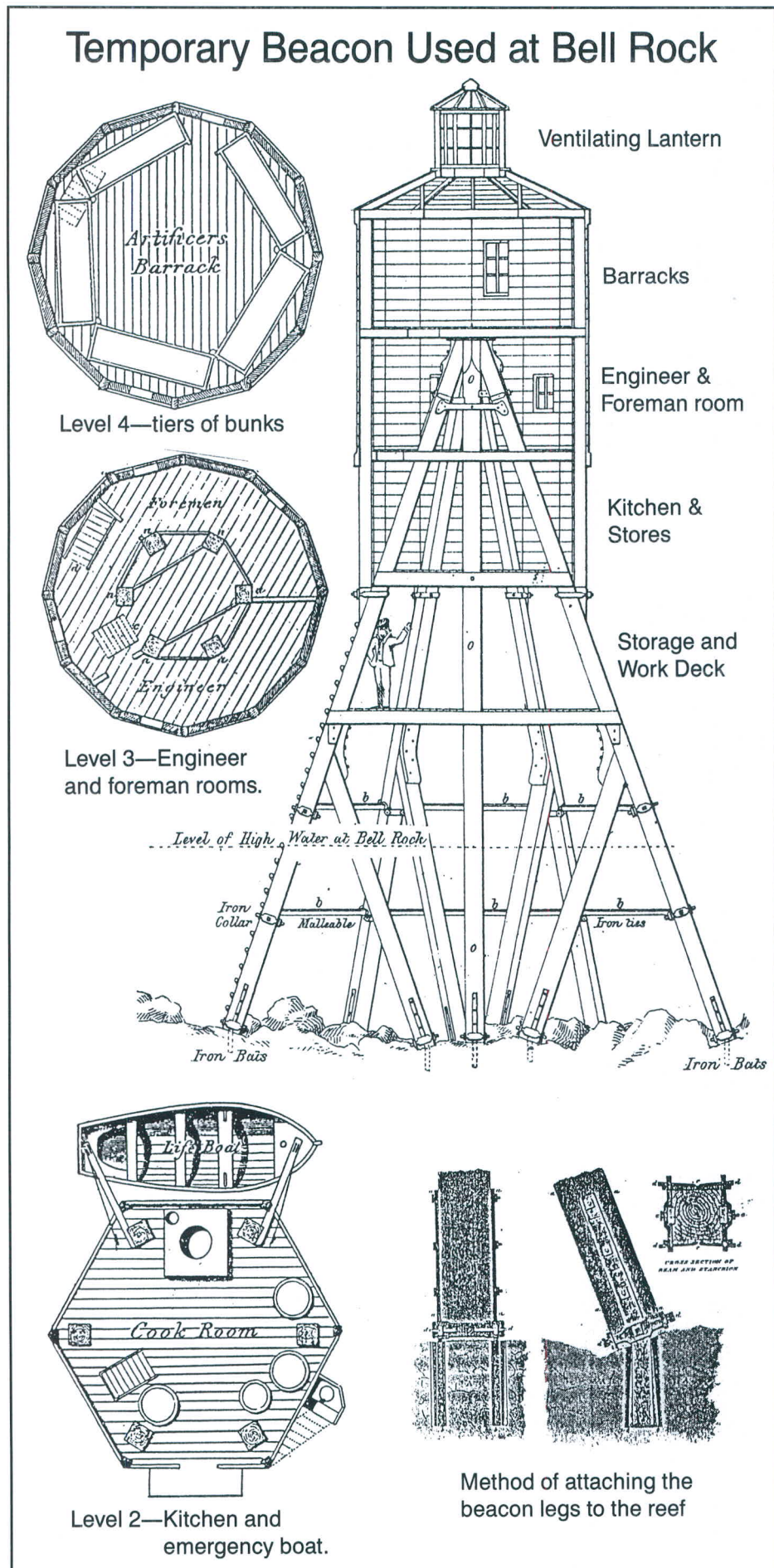
which had been displaying fresh breezes, shifted and in very short order the seas were running so high that the Master of *Smeaton* decided to make a run for the Firth of Forth to prevent the vessel from 'riding under.'

My chief concern was for the eleven men that we had left aboard the beacon. We were unable to approach the beacon at the next low tide and then night was upon us. At this point in the project the cabins of the beacon were not yet completely enclosed, there was no fireplace or bedding aboard the structure, and scant provisions. Experiencing the wild bucking and rolling of our vessel, with the wind shrieking in the rigging, I was fearful for the lot of the men on the beacon. At dawn we could see that the structure was unharmed and as the winds had somewhat abated, a small boat made for the beacon with cooked provisions and a kettle of mulled port wine. The men on the beacon had not had a regular diet for about 30 hours. The boat managed, with a great deal of difficulty, to bring back the artificers. They stated that three of the large stones recently laid had been partially lifted from their beds.

Along about this time we managed to enclose the beacon so that working and remaining overnight in that structure was more comfortable. A roof was laid of tarpaulin and hot tar, the exterior painted with three coats of white lead paint, the wall timbers stuffed with moss as insulation and the entire interior



Temporary Beacon Used at Bell Rock



covered with green baize cloth.

A rope bridge (termed a Jacobs ladder by the seamen) was established between the beacon house and the tower. As the tower rose, so too, did the angle of the bridge. On July 8 the tower reached the elevation where it was no longer under water during high tide and this sparked a momentous celebration. Now work could continue even when the rock was under water. I noted in my journal "...Flags were accordingly hoisted, on the beacon house, and crane on the top of the building [Keep'—tower], which were repeated from the floating-light, lighthouse yacht, tender, *Smeaton*, *Patriot*, and the two praams [Keep'—flat-bottomed boats]. A salute of three guns was also fired from the yacht at high water, when all the artificers were collected on the top of the building; three cheers were given, in testimony of this important circumstance. A glass of rum was then served out to all hands on the rock, and on boat of the respective ships."

I was most pleased that construction was proceeding apace. One day 78 blocks of stone were landed, of which 40 were laid. Before we ended the season the solid portion of the tower had been completed to the 26th course, some 31 feet above the rock and 17 above high water. The tower was, at this point, comprised of 1,400 tons of stone. On the 30th I closed the operation for the season and we made sail for Arbroath. We decorated the ship with colors and fired three salutes upon approaching the harbor.

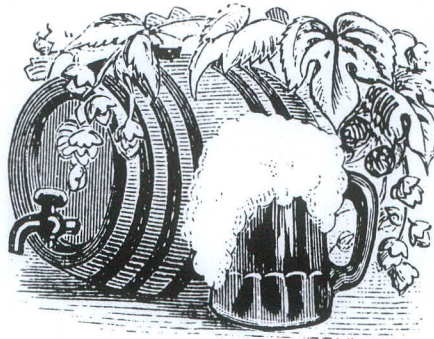
In 1810 we completed the remaining 66 courses of the tower. Operations got very dangerous at this point as heavy weights had to be lifted to great heights, and as the tower narrowed it became restrictive to the workers. My foreman carpenter, Francis Watt, came up with a remarkable invention which I termed a balance beam. It operated on ball bearings and was able to be easily moved to the top of each new storey; hence, operations were greatly facilitated by this invention. Many notable events occurred in rapid fashion; it was in this season that our first Sunday service was held in the tower and I received a "formal" welcome aboard when the workmen escorted me through the newly hung 1½ ton entrance door.

The 1910 season began on the 10th of May. The tower and beacon house were in perfectly good condition, although, as you may imagine, the rooms of the beacon house were somewhat mildewed and musty. Work proceeded apace and without incident. On the 4th of June we decorated the vessels, beacon and tower with colors and flags in celebration of our revered Sovereign, King George III, who was in the 50th year of his reign. At noon we fired a salute and all hands drank to the King's health. On the 14th of June the first apartment (room) was covered and setting up my writing desk therein I wrote the first letter from the Bell Rock lighthouse, which I addressed to my wife. I felt a great deal of pleasure in dispatching it aboard the *Patriot* which sailed to Arbroath that evening.

As the tower became taller dangers increased. The spaces were smaller and thus crowded, the height made accidental dropping of tools a hazard to those below and we had to construct scaffolding off the side of the tower which was exceedingly dangerous. But, while more danger was about, the work at hand was vastly easier than before and generally under more comfortable conditions. It was at this time that I wrote, "It is a strange, though not uncommon, feature in the human character, that, when people have least to complain of, they are most apt to become dissatisfied, as was now the case with the seamen employed in the Bell Rock service about their rations of beer." I sent for the landing master, Captain Wilson and Mr. Taylor (the commander of the tender) and talked the matter over with them. They felt that the daily ration was ample in every respect and since the work was lighter now, the men had no ground for complaint. Mr. Taylor added that if those who now complained 'were even to be fed upon soft bread and turkeys, they would not think themselves right.' During the next high tide, while I was on the beacon, a small boat arrived, unrequested, from the tender and delivered to me a note from the crew:—"Sir, We are informed by our masters that our allowance is to be as before, and it is not sufficient to serve us, for we have been at work since four o'clock this

morning, and we have come on board to dinner, and there is no beer for us before tomorrow morning, to which a sufficient answer is required before we go from the beacon; and we are, Sir, your most obedient servants."

I wrote the landing master, "I have just now received a letter purporting to be from the landing master's crew and seamen on board of the *Sir Joseph Banks*, though without date or signature, in answer to which I enclose a statement of the daily allowance of provisions for the seamen in this service which you will post up in the ship's galley, and at seven o'clock this evening I will come aboard to inquire into this unexpected and most unnecessary demand for an additional allowance of beer..."



Beacon House, 22nd June 1810—Schedule of the daily allowance of provisions to be served out on board of the *Sir Joseph Banks* tender: 1½ lb. beef; 1 lb. bread; 8 oz. oatmeal; 2 oz. barley; 2 oz. butter; 3 quarts beer, vegetables and salt no stated allowance. When the seamen are employed in unloading the *Smeaton* and *Patriot*, a draught of beer is, as formerly, to be allowed from the stock of these vessels. Further in wet and stormy weather, or when the work commences very early in the morning, or continues till a late hour at night, a glass of spirits will also be served out to the crew as heretofore, on the requisition of the landing master. Robert Stevenson"

At seven I left the beacon, after a stay of four weeks, and traveled to the *Sir Joseph Banks* via the *Smeaton's* small boat. There was a fairly heavy swell running and, having been on a stable platform for several weeks, it took me a few moments, once aboard the *Sir Joseph Banks*, to gain my sea legs. I called the

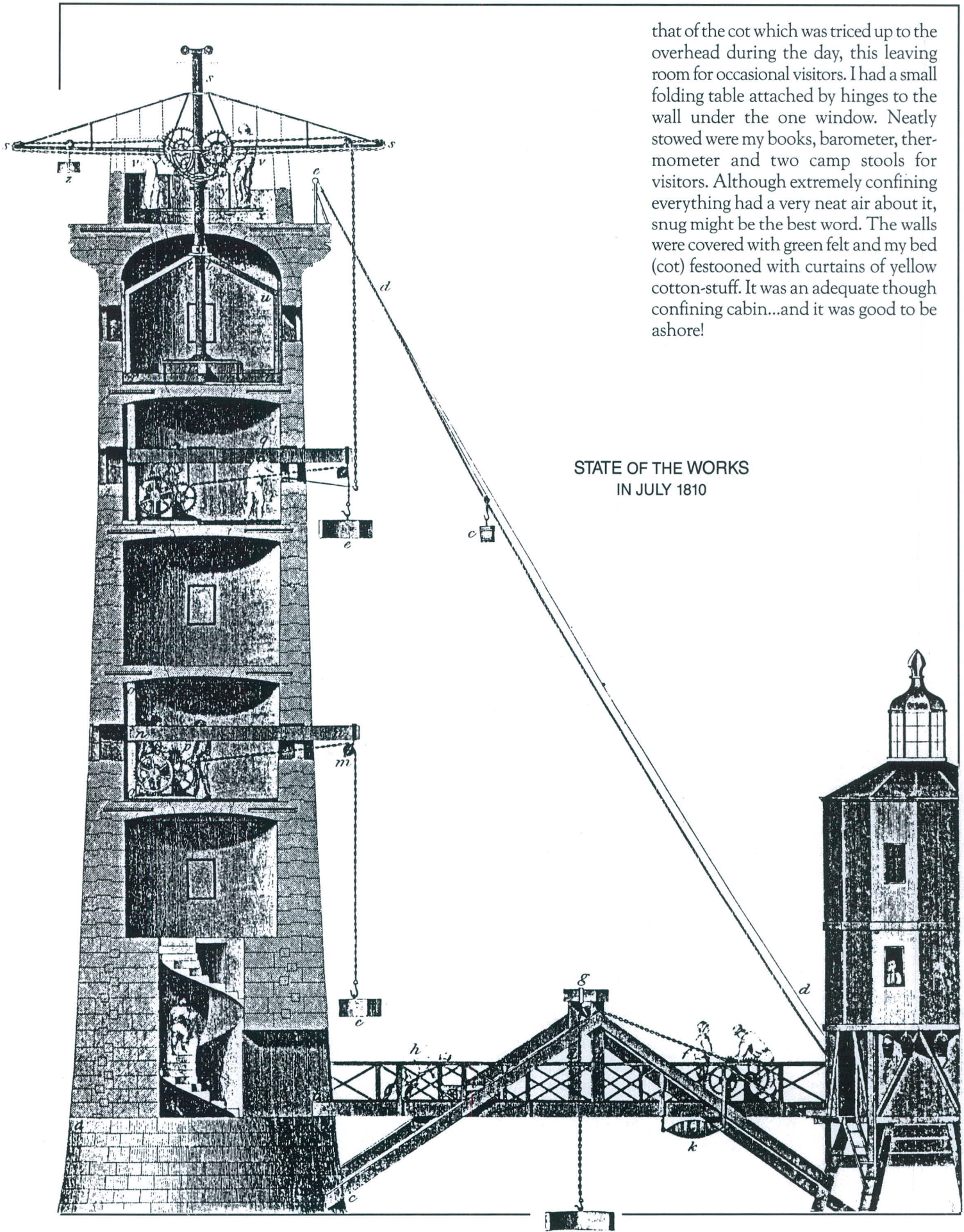
master of one of the pram boats on deck and asked him if he had read my statement which had been posted and if he agreed with it. Yes, he said, he had read it—but did not agree with it. I immediately ordered him into the *Smeaton's* boat. The next man called on deck was of the same mind and he, too, was ordered into the boat. Then I walked to the hatchway, where I knew that the remainder of the crew was gathered (below) listening to the proceedings on deck, and I informed them that the two had been dismissed. I asked that if any others had a like mind they, too, should come up on deck and board the boat. I felt certain that they knew I had no wish to interrupt the work at this stage. They no doubt felt that I, having no wish to season a new crew at this late stage, so close to completion, might be pressured to acquiesce to their demands. But they also knew that their option, if I didn't yield, was to be dismissed from work or placed on a man-of-war. Hearing of the results of my confrontation with the first two, no others came forward.

The mutiny now suppressed, I ordered Captain Pool to take the two disgruntled men to Arbroath with the following letter to be delivered to the work yard office.

"Dear Sir,

A discontented and mutinous spirit having manifested itself of late among the landing master's crew, they struck work today and demanded an additional allowance of beer, and I have found it necessary to dismiss 'these two men' who are now sent ashore with the Smeaton. You will therefore be so good as to pay them their wages, including this day only. Nothing can be more unreasonable than the conduct of the seamen on this occasion, as the landing master's crew not only had their allowance on board the tender, but, in the course of this day, they had drawn no fewer than 24 quart pots of beer from the stock of the Patriot while unloading her. I remain, yours truly, Robert Stevenson"

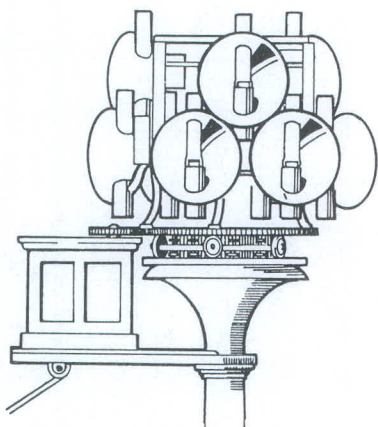
After spending the better part of six weeks in May and June aboard the beacon, I repaired to Arbroath to check on the workings at the yard. I must reflect on my apartment in the beacon. My cabin measured 4 feet three inches in width with a length little more than



STATE OF THE WORKS
IN JULY 1810

that of the cot which was triced up to the overhead during the day, this leaving room for occasional visitors. I had a small folding table attached by hinges to the wall under the one window. Neatly stowed were my books, barometer, thermometer and two camp stools for visitors. Although extremely confining everything had a very neat air about it, snug might be the best word. The walls were covered with green felt and my bed (cot) festooned with curtains of yellow cotton-stuff. It was an adequate though confining cabin...and it was good to be ashore!

Returning to the reef, a heavy fog set in and our ship *Smeaton* almost ran aground on the Bell Rock, were it not for the sound of the smith striking his anvil which warned the Captain and he managed to veer away at the last possible second. As we stood away from danger I had a chance to reflect on my earlier decision to have fog bells installed on the lighthouse. My design employed the same machinery that would rotate the reflector apparatus. By throwing a clutch, a keeper could have the bells automatically run by the same machinery that rotated the optic system of reflectors.



Revolving catoptric light

On 30 July 23 we laid the last course (the 90th) of the tower which brought the masonry portion of the tower to 102 feet 6 inches. Now we turned our attention the light room [Keep'—lantern].

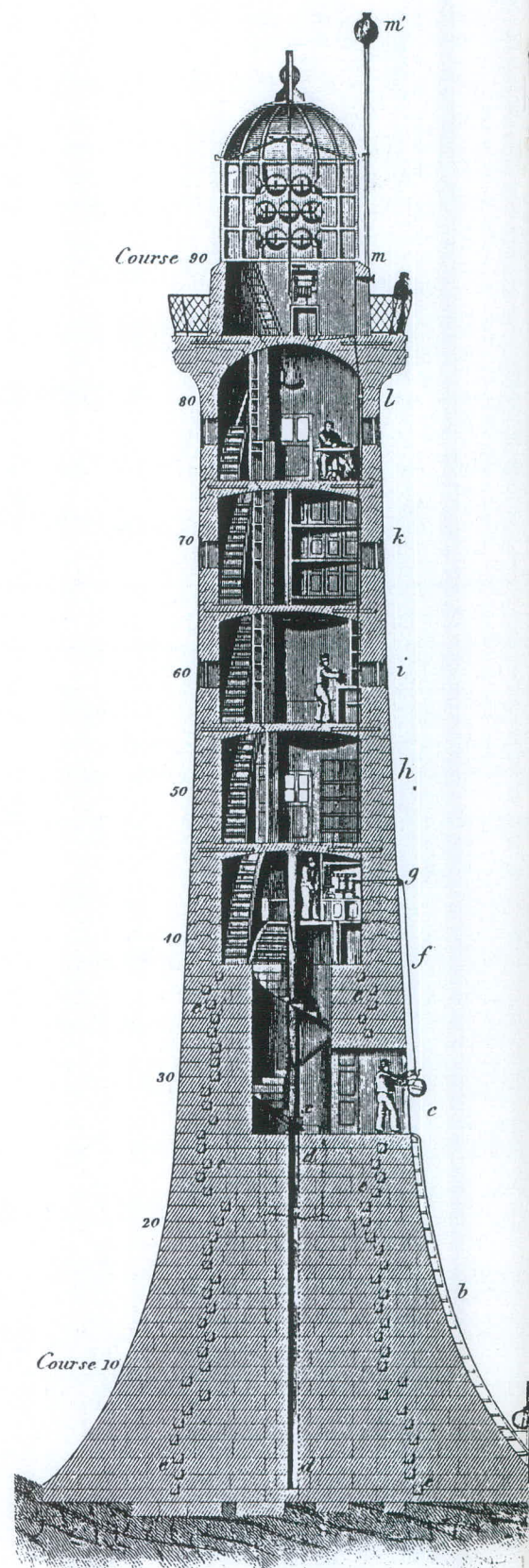
Mid August a gale occurred with such fury—as though King Neptune was to have the last word concerning the efronterty of our improvement upon Bell Rock—that we were forced to sail *Smeaton* into the Firth of Forth until the weather subsided. It was necessary to leave 17 men in the beacon house during the height of the storm; it must have been frightening to them, knowing that a rescue vessel was not at hand. We later ascertained the seas to have risen to a height of 80 feet on the building. The tower windows, still without shutters, were stove in and seas carried over the top of the masonry of the tower, 90 feet above high water. On the beacon, the

floor of the smith's gallery was burst up by the force of the seas, and the cast iron motor tubs, iron hearth of the forge, bellows and even the anvil were thrown down to the rock. But the storm finally subsided, and by the 23rd of August we were engaged in delivering the sash frames of the lantern room (eight in number weighing 254 lbs. each).

On October 19 an unfortunate incident occurred at the end of work period. It was dark and two young men, Charles Henderson and Henry Dickson, raced each other from the lantern room down the tower and across the rope bridge to the beacon house. Henderson led the way, and they were yelling back and forth until they reached the rope ladder. When Dickson reached the cook room he inquired as to Henderson. But when told he had not arrived an alarm was given, and artificers, with torches, descended the legs of the beacon as close to the water as they dared, but nothing...Henderson must have fallen through the ropes and perished. As you can imagine, a gloom descended over our work force for a number of days. And the sad part was, he was about finished with his portion of the lighthouse and due to return to the mainland soon.

On October 23, the gilded ventilator ball was affixed to the dome of the lantern room and a salute of seven guns was fired in honor of the occasion. We left a crew of two in the tower for the season, until the lighting apparatus could be delivered. Then the complement would be four, with never less than three in attendance. Bell Rock was finally lighted on February 1, 1811, much to my joy and the satisfaction of all who had taken part in this monumental structure. The lightship was discontinued with the lighting of Bell Rock.

The optical apparatus was a revolving rectangular frame, with seven parabolic reflectors on the long side and five on the short sides with red glass in front of them. The characteristic, then, was one of alternating red and white...the first colored characteristic in a Scottish lighthouse. The rate of visibility for the light was 15 miles.



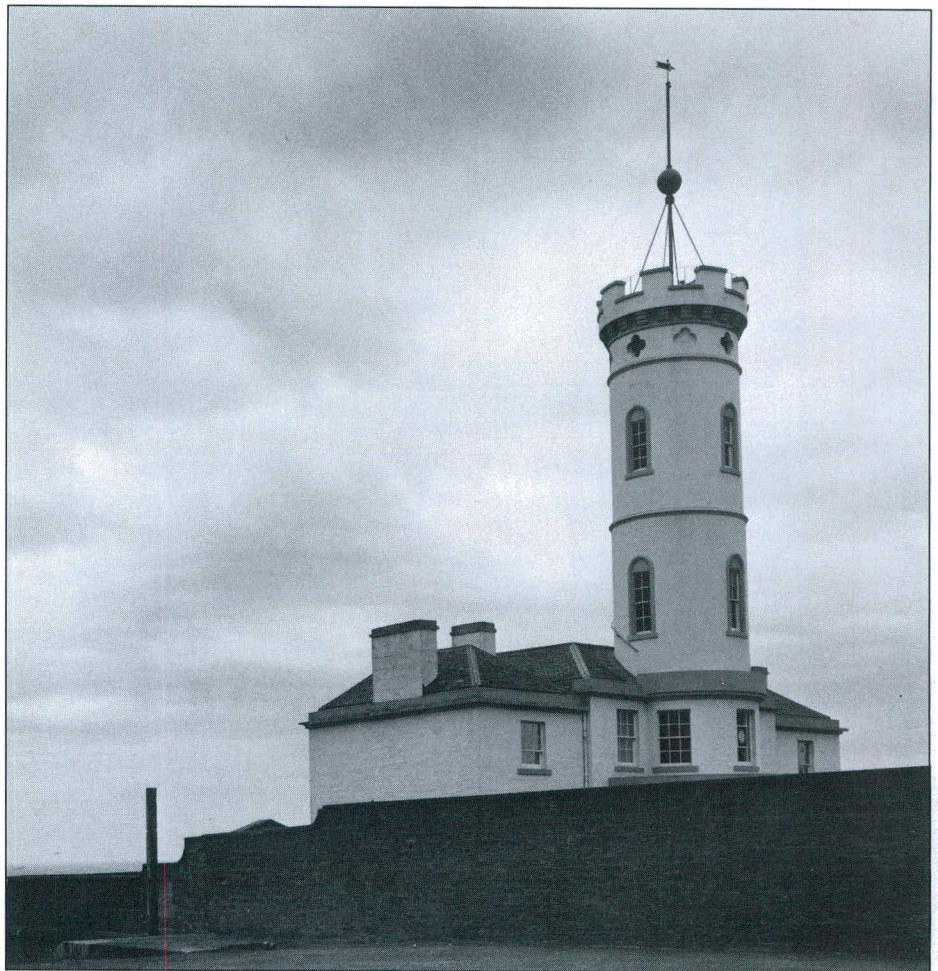
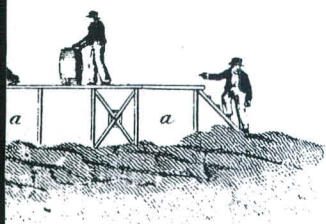
In 1812 I had the temporary beacon removed and the following year we constructed the light keepers' houses and the signal tower at Arbroath. The *Smeaton*, until 1816, and then a new *Pharos* of 5 tons, were the supply and relief vessels employed. If all was ready for a landing at the rock, a large copper ball was hoisted on the Bell Rock tower, between 9 and 10 in the morning, or between 1 and 2 p.m. if cloudy in the morning. The keeper on shore acknowledged the signal by raising a similar ball on the signal tower. If, for any reason, the signal ball was not raised at a designated time the tender immediately made for the tower to learn the reason.

I was amazed, and quite impressed, that 500 visitors boarded the lighthouse during 1812. During one inspection trip Sir Walter Scott accompanied us and I later wrote.

When it came round to Sir Walter, Mr. Erskine laid his hand on the page (of the guest book) and said, "Now, Scott, you must give us something more than 'Walter Scott' ". He wished to decline for the present and rather seemed uneasy at the proposal—and rising from the table he turned to one of the windows for a short space and again took his seat, Erskine still remonstrating, when Sir Walter at length took up the pen and with a somewhat grave expression wrote the following beautiful and most expressive lines—

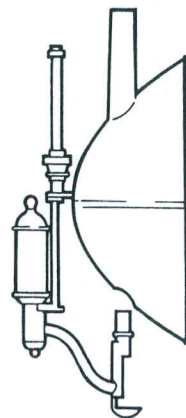
PHAROS' LOQUITUR

*Far in the bosom of the deep
O'er these wild shelves my watch I keep;
A ruddy gem of changeful light,
Bound on the dusky brow of Night,
The seaman bids my lustre hail,
And scorns to strike his timorous sail.*



The signal tower at Arbroath constructed in 1813. The gilded ball was raised and lowered to signal, or answer signals from, Bell Rock. Note the ball signal on the bell Rock lighthouse drawing on the opposite page, it's just right of the lantern room. Northern Lighthouse Board photo.

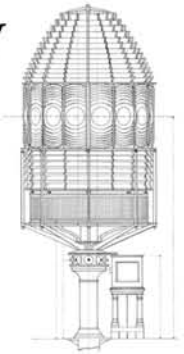
In September of 1987 the Bell Rock lighthouse caught fire threatening the lives of the three keepers on duty. The fire started in the kitchen, near the top of the tower blocking the men (who were below the kitchen level) from the fire fighting apparatus located above the kitchen. As the fire spread downwards the keepers locked each section, threw flammables out the windows and sealed off ventilators allowing themselves time to escape. The fire melted the radio transmitter but the Principle Keeper, James Mackay, was able to contact the Fifeness Coast Guard station via cellular phone. After several anxious hours an Arbroath lifeboat arrived on scene and hove to off the tower. But the men were unable to use their raft to transfer to the lifeboat due to the high winds and heavy seas. Finally a RAF helicopter arrived and lifted the men off the tower. Bell Rock was undergoing automation so the damage to the living quarters was negligible.



Oil fountain lamp and metal reflector, 1787



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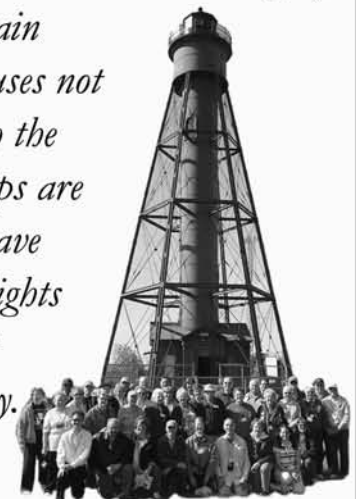
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