been afterwards found on the rock, and part having come ashore on the neighbouring coast. During the survey of the rock also, many instances were discovered of the extent of loss which this reef had occasioned, and many articles of ships’ furnishings were picked up on it, as well as various coins, a bayonet, a silver shoe-buckle, and many other small objects. Impressed with the great importance of some guide for the Bell-Rock, Captain Brodie, R.N., set a small sub­scription on foot, and erected a beacon of spars on the rock, which, however, was soon destroyed by the sea. He after­wards constructed a second beacon, which soon shared the same fate. It was not, however, until 1802, when the Commissioners of Northern Lights brought a bill into Parliament for power to erect a lighthouse on it, that any efficient measures were contemplated for the protection of seamen from this rock, which, being covered at every spring tide to the depth of twelve feet, and lying right in the fare- way to the Firths of Forth and Tay, had been the occasion of much loss both of property and life. In 1806, the bill passed into a law, and various ingenious plans were suggest­ed for overcoming the difficulties which were apprehended, in erecting a lighthouse on a rock twelve miles from land, and covered to the depth of twelve feet by the tide. But the suggestion ofMr. Robert Stevenson, theengineer to the Light­house Board, after being submitted to the late Mr. Rennie, was at length adopted ; and it was determined to construct a tower of masonry, on the principle of the Eddystone. On the l7th of August 1807, Mr. Stevenson accordingly landed with his workmen, and commenced the work by preparing the rock to receive the supports of a temporary wooden py­ramid, on which a barrack-house, for the reception of the workmen, was to be placed ; and during this operation, much hazard was often incurred in transporting the men from the rock, which was only dry for a few hours at spring tides, to the vessel which lay moored off it. The lowest floor of this temporary erection, in which the mortar for the building was prepared, was often broken up and removed by the force of the sea. The foundation having been excavated, the first stone was laid on the 10th July 1808, at the depth of sixteen feet below the high-water of spring-tides, and at the end of the second season, the building was five feet six inches above the lowest part of the foundation. The third season’s operations terminated by finishing the solid part of the structure, which is thirty feet in height ; and the whole of the masonry was completed in October 1810. The light was first exhibited to the public on the night of the 1st of February 1811. The difficulties and haz­ards of this work, were chiefly caused by the short time during which the rock was accessible between the ebbing and flowing tides ; and amongst the many eventful incidents which render the history of this work interesting, was the narrow escape which the engineer and thirty-one persons made from being drowned, by the rising of the tide upon the. rock, before a boat came to their assistance, the attend­ing vessel having broken adrift. This circumstance occur­red before the barrack-house was erected, and is narrated by Mr. Stevenson in his account of the work, published at the expense of the Lighthouse Board in 1824, to which we may refer for more minute information on the subject of this work, and the other lights of the coast of Scotland.

The Bell-Rock Tower is 100 feet in height, 42 feet in diameter at the base, and 15 at the top. The door is 30 feet from the base, and the ascent is by a massive cop­per ladder. The apartments, including the lightroom, are six in number. The light is a revolving red and white light, and is produced by the revolution *of* aframe containing twenty Argand lamps, placed in the foci of parabolic mirrors, arranged on a quadrangular frame, whose alternate faces have shades of red glass placed before the reflectors, so that

a red and white light is shewn successively. the machi­nery, which causes the revolution of the frame containing the lamps, is also applied to tolling two large bells, to give warning to the mariner of his approach to the rock in foggy weather. Plate I. fig. 6, shews a section of the Bell-Rock Lighthouse, and an elevation of the temporary barrack-house, which was removed on the completion of the work.

The most remarkable lighthouse on the coast of Ireland is that of Carlingford, near Cranfield Point, at the entrance of Carlingford Lough. It was built according to the de­sign of Mr. George Halpin, the Inspector of the Irish Lights ; and was a work of an arduous nature, being founded twelve feet below the level of high-water on the Hawlbowling Rock, which lies about two miles off Cranfield Point. The figure is that of a frustum of a cone, 111 feet in height, and 48 feet in diameter at the base. The light, which is fixed, is from oil burned in Argand lamps placed in the foci of parabolic mirrors. It was first exhibited on the night of the 20th December 1830.

The Commissioners of the Northern Lighthouses have lately taken measures for erecting a lighthouse on the rock of Skerry vore, which lies in the channel between the Western Isles of Scotland and the north of Ireland. The solid rock is only about 40 yards square, and is about 13 miles from the near­est point of the Island of Tyree. It is exposed to the unbroken fury of the Atlantic, there being no land between it and the coast of America. The works were commenced last season on the rock, by the erection of part of a wooden barrack for the reception of the workmen, during the building of the tower of masonry. This barrack, which resembled that of the Bell-Rock, shewn in Plate I. fig. 6, disappeared on the night of the 3d November 1838 ; and when the writer of this article visited the rock, on the 16th of the same month, only a∙single beam remained. Several spars of a large vessel, and some of the beams of the barrack, afterwards came ashore on the Is­lands of Tyree and Coll ; a circumstance which has led to the belief, that the fabric had sustained some injury by the collision of some heavy body in motion. From the tremendous height to which the sea was observed to rise on the rock, there is, on the other hand, some reason to suspect that the fury of the waves alone may have demolished the unfinished structure of the barrack. The works were resumed in the spring of 1830.

There are various other lighthouses which, in themselves, are sufficiently deserving of a separate notice, were it not that they have, more or less, something in common with those already described, which are unquestionably the most remarkable edifices of the kind. We shall, therefore, now proceed to consider the methods of illumination, which have been adopted in lighthouses ; a subject to which much attention has of late years been directed, and which is the most important consideration connected with those esta­blishments, whose utility depends solely upon the distance at which the light can be seen, and the facility with which the mariner can recognise their individual appearance as indicative of a particular part of the coast.

There can be little doubt, that down to a very late period, the only mode of illumination adopted in the lighthouses, even of the most civilized nations of Europe, was the combus­tion of wood or coal in a chauffer on the top of a high tower. It is needless to enlarge upon the evils of such a method ; they need only be named to be understood ; for it is diffi­cult to conceive how an efficient system of lighting a coast could be managed under such disadvantages. The uncer­tainty caused by the effects of wind and rain, and the im­possibility of rendering one light distinguishable from ano­ther, must have, at all times, rendered the early lighthouses, in a great measure, useless to the mariner.

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1 From the Greek *κaτoπτρov, a mirror,* a compound of κατα, *opposite to,* and *ὄυπτoμαι*, *I see.*