No. 1598.—"Note on the Eddystone[1] Lighthouse." By JAMES NICHOLAS DOUGLASS, M. Inst. C.E.

For several years the safety of the Eddystone Lighthouse has been a matter of anxiety and watchful care to the Corporation of Trinity House, owing to the great tremor of the building with each wave stroke during heavy storms from the westward, more especially when from west-south-west. The joints of the masonry have frequently yielded to the heavy strains imposed on them, and the sea water has been driven through them to the interior of the building. The upper part of the structure has been strengthened on two occasions, viz., in 1839 and again in 1865, with strong internal wrought-iron ties, extending from the lantern floor downwards to the solid portion of the tower. On the last occasion it was found that the chief mischief was caused by the upward stroke of the heavy seas acting on the projecting cornice under the lantern gallery, which lifted the portion of the building above this level. After reducing the projection of the cornice about 5 inches, and well fastening the stones together with through bolts, no further serious leakage has occurred at this part. The tower is now in a fair state of efficiency; but, unfortunately, the portion of the gneiss rock on which it is founded has been seriously shaken by the incessant heavy sea strokes on the tower, and the rock is considerably undermined at its base. It has therefore been determined to erect a new lighthouse, for which a good foundation has been found, near low water level, at a distance of about 127 feet from the existing tower. The present lighthouse exhibits a fixed white light, with its focal plane at an elevation of 72 feet above high water, affording a useful range for the mariner of about 14 nautical miles.

Unfortunately, however, the waves rise during stormy weather considerably above the summit of the lantern, thus frequently eclipsing the light and altering its distinctive character. In 1872 the lighthouse was provided with a fog-bell, weighing 5 cwt. This bell is fixed on the lantern gallery, and is sounded by machinery placed in the lantern. The distinctive character of the signal is five strokes sounded in quick succession every half minute,

[1] In Smeaton's "Narrative," published in 1791, this is spelt "Edy" stone, and this orthography was followed for many years. Now the Admiralty and Trinity House have officially adopted "Eddy"stone.—J. N. D.

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Although this was the best arrangement that could be suggested under the circumstances and the limited space available, it is not to be considered as an efficient first-class fog signal.

In the New Lighthouse it has been determined that the elevation of the focal plane of the light shall be 130 feet above high water, by which the range of the light will be increased from 14 to about 17½ nautical miles, so as just to overlap the range of the new electric lights at the Lizard. The new lighthouse will be provided with a first order light, and a fog signal of maximum intensity, but the distinctive characters of these have not yet been decided upon. The new tower, which is to be constructed entirely of granite, will consist of a cylindrical base, 44 feet in diameter and 22 feet high, having its upper surface 2½ feet above high water of spring tides. From this base will spring the shaft of the tower, 35 feet 6 inches in diameter at the commencement, and 18 feet 6 inches in diameter under the cornice, the top of which will be 138 feet above the rock. On the cylindrical base there will thus be formed a level margin 4 feet 3 inches wide for a landing platform. The tower is to be a concave elliptic frustrum, the generating curve of which has a semi-transverse axis of 173 feet, and a semi-congugate axis of 37 feet. The tower is to be solid, with the exception of a water-tank, to the level of 25½ feet above high water spring tides. At this level the walls will be 8 feet 6 inches thick, diminishing to 2 feet 3 inches at the top. The tower will contain nine apartments, 10 feet in height, in addition to the lantern, the seven uppermost being 14 feet in diameter. The whole of the work is to be dove-tailed and cemented, both horizontally and vertically, on the system already adopted at the Hanois, Wolf,[1] and Longships Rock Lighthouses. The total net quantity of granite in the work will be about 69,100 cubic feet. The cost of the work is estimated at £78,000.

On the completion of the new lighthouse it is intended to take down the present lighthouse to the level of the top of the solid base, 29 feet above high water of spring tides.

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[1] *Vide* Minutes of Proceedings Inst. C.E., vol. xxx., p. 1.

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