

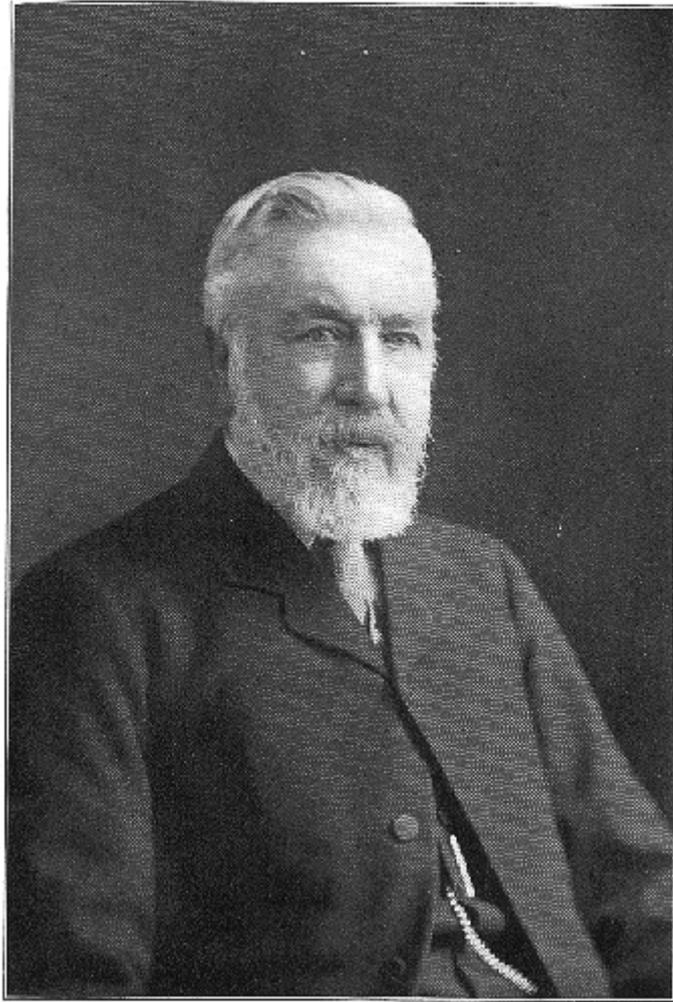
LIFE OF WILLIAM DOUGLASS M.INST.C.E.

FORMERLY ENGINEER-IN-CHIEF TO THE
COMMISSIONERS OF IRISH LIGHTS

BY THE AUTHOR OF

"THE LIFE OF SIR JAMES NICHOLAS
DOUGLASS, F.R.S."

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WILLIAM DOUGLASS.

[Frontispiece.]

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CHAPTER I

THE subject of the following memoir was born in London on January 10th, 1831, at which date his father, Mr. Nicholas Douglass, was associated with an engineering and shipbuilding firm on the Thames. The Douglasses came, however, from an old Scottish border family which had been settled in Northumberland since the thirteenth century, and has been connected with Blaydon and Winlaton since the latter part of the seventeenth century, as shown by records in Ryton church. It was in Blaydon that Mr. Nicholas Douglass was born, and in Newcastle-on-Tyne that he served his engineering apprenticeship with a Mr. Burnett. He and both his sons were freemen of the city.

In 1839 Nicholas Douglass was engaged by the Trinity House as a constructive engineer - rising in course of time to be its superintending engineer. And here a short account of that " Guild, Fraternity, or Brotherhood" whom he and his two Sons had the honour of serving for an aggregate period of nearly a century may not be without interest to a reader unacquainted with the subject.

The Honourable Corporation of Trinity House, whose offices are on Tower Hill, London, is the chief of the three great British and Irish Boards whose duty it is, in the words of the Act of Parliament, to preserve "ancient sea marks and to erect beacons, marks and signs of the sea. Dating its existence back to the reign of Henry VII, though at first its functions mainly related to the pilotage of ships, it was, in the reign of Henry VIII, incorporated by royal charter, which was modified in several successive reigns until, in the time of James I, its status and powers were practically defined as they now exist.

In Pepys's Diary there are numerous references to the Trinity House, with which Institution that interesting personage was long connected, first as a Younger Brother, and eventually as its Master. One of those entries quaintly alludes to the reading of a fresh charter (which contained, however, little that was new) granted in 1660-6r by Charles II, when Pepys left Sir W. Batten and Captain Rider his " chine of beef for to serve" in honour of the occasion. Pepys's contemporary and friend, Evelyn, has also, in his equally famous Diary, many allusions to the Trinity House, of which he was sworn a Younger Brother in 1673, when "there was a greate collation."

It was not until 1680 that the Trinity House possessed lighthouses of its own. Previously those structures were erected as a private speculation, by persons who were fortunate enough to obtain for the purpose the necessary patent from the King, like the astute Lord Grenville who waited, as he himself records, until his monarch should be in a good humour" in order to "ask him for a lighthouse," and, by levying dues on the ships that passed the lights, huge fortunes were frequently and easily made. Easily because, though the lights provided might be of the feeblest description, payment was exacted for them all the same. And of the feeblest description they not unusually were.

In 1836 an end was put to this state of things by the Merchant Shipping Act of that year, which totally abolished private ownership in our lighthouses, and empowered the Trinity House to buy up all of those buildings - at least in England and Wales - that had not previously belonged to it. And an expensive process this was, for over a million pounds sterling had to be paid for the proprietorship of only five of those structures-a sufficient proof of the "good business" that had been done by their previous owners. The revenue for maintaining the coast-marking system is derived from the taxation of shipping entering and leaving our ports.

The Trinity House is also entrusted with the licensing and supervision of pilots, and is required by the terms of its charter to assist the Judge of the High Court of Admiralty in cases where nautical experience is needed, two of the Elder Brethren attending on each of those occasions. And this suggests a little-known story of the late Lord Justice Bowen, the author of so many clever and witty sayings. Called upon in an emergency to preside over the Court, with the technical business of which he was not practically acquainted (and being unaware, or forgetting, that he would be advised by the Elder Brethren), he muttered in affected dismay at the prospect:

"And may there be no moaning of the bar
When I put out to sea."

(Tennyson's little poem had just appeared).

The Duke of Connaught is the present Master of the Corporation; Captain Sir Herbert Acton Blake, K.C.M.G. etc., is the Deputy Master; the working Board is composed of those Elder Brethren who are retired commanders in the Royal Navy or Merchant Service, one of the best known of whom is Captain Sir Arthur Wellesley Clarke, K.B.E., a member of the Port of London Authority, and Chairman of the Marine Society (the others being honorary Elder Brethren). Mr. M. K. Smith, O.B.E., is the secretary, and Mr. D. W. Hood, C.B.E., is the engineer-in-chief.

CHAPTER II

THE nature of Mr. Nicholas Douglass's duties necessitated his leading an itinerant life; and William and the elder son, James, generally accompanied their parents to the various seaside places that happened to be most convenient for a shore depot in connection with the father's rock operations. There they would remain for greater or lesser periods according to the magnitude of the work upon which he was engaged. They had consequently runny schoolmasters or private tutors; and their education was perhaps none the less effective for being so varied. Sometimes too the tuition was quite good. Thus at Bridgend they studied under a brilliant mathematician, and at Penzance William attended for several years the high-class school of Mr. Barwis. Many boys who were educated at that establishment attained considerable distinction in later life. The brothers, under the circumstances described, were fortunate moreover in imbibing an early love of the sea with which, in future years, they were to have so much to do. His schooling over, William was apprenticed to the engineering firm of Robert Stephenson & Co. Newcastle-on-Tyne, and studied under the great George's son Robert (almost equally great). He had previously as a boy, when staying with an uncle and aunt at Blaydon, watched the "Puffing Billy" rattling along the Wylam wagonway, and doubtless saw it a good many times afterwards. The "Puffing Billy" ceased running about 1860, and is now in South Kensington Museum. William Douglass was a diligent apprentice, not only working in the factory from 6 a.m. to 7 p.m., but studying at home until bedtime.

In 1847 Mr. Nicholas Douglass was selected by his employers to erect the first lighthouse on the Bishop Rock, situated about seven miles from St. Mary's, Scilly Isles. There are over a hundred islands or rocks forming the Scilly group, many of them highly dangerous to shipping; and the Bishop, until it was lighted, was among the most perilous of all. It was on the Bishop and Clerk that in 707 the "Association," carrying the flag of Sir Cloudesley Shovell, then Commander-in-Chief of the British fleets, struck and broke up, with the loss of eight hundred lives. Two other ships of the squadron - the "Eagle" and "Romney" - were wrecked at the same time; the total loss of life from these disasters being about two thousand. And a visitor to the island of Tresco is confronted with tangible proofs of the deadly character of the surrounding rocks and reefs; for in the Abbey grounds thereat is a ghastly array of figure-heads of various ships that have foundered locally during subsequent years.

The first Bishop lighthouse was an open structure of wrought and cast iron, but at the end of the third working season the building (practically completed) was, during a terrific storm, entirely swept away. Mr. James Walker, F.R.S., engineer-in-chief to the Trinity House, was then commissioned to design a massive granite tower in lieu of the demolished structure; and some of the lower courses of the new building had been set when, in 1852, William was appointed as his father's assistant. The elder son, James, afterwards Mr. Walker's successor, had preceded William at the Bishop but, desirous of obtaining fresh professional experience, had just joined an engineering firm on the Tyne.

Mr. Walker is scarcely remembered now, but he was one of the most eminent engineers of his day. In addition to his connection with the Trinity House, he had an extensive general practice, chiefly as a dock and harbour engineer. Indeed, since the death of the illustrious Telford in 1834 he had stood at the head of his profession, and for nearly eleven consecutive years was President of the Institution of Civil Engineers.

Nicholas Douglass was a man of iron nerve and tireless energy - qualities which the nature of his calling specially demanded. Of the brave Smeaton the poet's lines might have been written:

"He holds no parley with unmanly fears;
Where Duty bids, he confidently steers;
Faces a thousand dangers at her call,
And, trusting in his God, surmounts them all."

Nor have any of our most successful rock lighthouse builders since Smeaton's day been deficient in similar courage and persistence (if they had, they would not have been successful). The following is one out of many instances in which these men have always imitated the example of their great predecessor. "I always," says Smeaton in his Narrative of the building of his lighthouse, "made it a rule not to put another upon doing what I was afraid to do myself." It is wonderful - the affection and loyalty which such conduct inspires among the rank and file.

Despite his pluck, Nicholas Douglass was never rash, and consequently carried out with remarkable immunity from serious accidents the several dangerous engineering operations that were entrusted to him. Dr. Smiles, in his book "Duty," tells the story of Mr. Walker once presenting Nicholas Douglass to the great Duke of Wellington, with the remark:

"Here is a man who has fought as many battles as your Grace, but he has never lost a single life." "I wish I could say the same" was the Duke's reply.

It should further be mentioned of Nicholas Douglass that he was one whom it was never safe to trifle with. Fearing no foe, he not only contended valiantly with the angry winds and waves, but held his own on several occasions (while engaged in erecting the Bishop lighthouse) against even the great Mr. Augustus Smith, then lord of the Scilly Isles. That gentleman was an autocrat, to which fact the Scilly Isles owed much of their prosperity, for his lordly rule was, on the whole, a beneficent one. Sometimes, however, his arbitrary methods brought him and the lighthouse engineer into conflict, when the latter, in defence of the interests committed to his charge, would courageously withstand the mighty man.

The construction of the second Bishop lighthouse was a work of immense difficulty and danger. The rock is covered at high-water, ordinary spring tides, and afforded only just sufficient base to receive a stone tower of adequate strength to withstand the tremendous Atlantic billows to which the site is

exposed. Throughout the early stages of the work there was no shelter whatever from the heavy seas which would suddenly submerge the rock - the men at such times clinging for safety to stanchions fixed for the purpose, or even to one another. To get on to the rock was generally difficult, and to get off, frequently more so - many of the company being often detained there until late at night, owing to the surf preventing the landing boats from approaching near enough to remove them. To plunge into the sea and be hauled to the boats was then a quite ordinary occurrence. In all such scenes William Douglass (like his brother before him) was an intrepid and capable lieutenant to his father; and it was in no small degree due to the younger, and therefore more agile, man that the tower, after eight years' excessive and arduous labours, was successfully completed and lighted, namely in September 1858. "A magnificent building!" said the Royal Commissioners who were then prosecuting their laborious enquiry on Lights, Buoys and Beacons. The structure was surmounted with a powerful dioptric illuminating apparatus, which has since been superseded by one of considerably increased intensity. The granite blocks for the building were dressed by stonemasons in the workyard at St. Mary's, Scilly, and mainly conveyed to the rock in barges towed by a steam tug. During the summer seasons, however, the two engineers and the working staff resided in barracks on the otherwise uninhabited island of Rosevear, situated about two miles from the rock, which latter they could thus quickly reach in boats when there was a prospect of effecting a landing.

The cost of the tower was £34,500, and that of the iron structure which was destroyed £12,500.

The Elder Brethren not only bore emphatic testimony to the heroism and zeal displayed by Mr. Nicholas Douglass in the conduct of these undertakings, but were so impressed with the sterling qualities of the younger engineer that they forthwith selected him to construct a granite lighthouse on the Hanois Rock, at the south-west extremity of Guernsey - a dangerous site that badly needed lighting.

This work, which does not call for detailed description, was less difficult than the Bishop, but demanded similar pluck and patience on the part of the resident engineer and his staff. The workyard was situated in Portelet Bay, where the granite blocks for the lighthouse were dressed, and whence they were conveyed in barges to the rock. The undertaking was completed, and the tower lighted from a dioptric illuminating apparatus, in 1862 - the total cost being rather over £25,000 - when the services of William Douglass were requisitioned by his employers for a much more hazardous enterprise. But at this stage we must go back a little in our story.

CHAPTER III

It has been mentioned that in 1852 James Douglass left the service of the Trinity House to take up an engineering position on the Tyne. Here he remained only three years when, an opportunity occurring for resuming lighthouse work, he was glad to avail himself of it. Not but what he had been highly successful in the north and had won golden opinions from his principals, for, like his father and brother, he was a man who did with his might whatsoever his hand found to do but his mind was cast in a mould too heroic to permit of his resting satisfied for long with duties of a more or less prosaic nature. So we next find him entrusted by the Trinity House with the erection of a new lighthouse on the Smalls Rock, off the coast of Pembrokeshire.

The history of the first lighting of this site forms a fascinating narrative, but is not quite relevant to our immediate purpose. Suffice it to say that it was here that the famous old lighthouse designed and built by Henry Whiteside - a born engineer, though by profession a maker of violins, spinets and upright harpsichords - stood for eighty-five years. This structure was originally intended to be erected on cast iron pillars, but these were soon abandoned for eight of English oak - the latter material being more elastic than metal, though metal would probably be preferred by present engineers. The vibration of the building was considerable in rough weather (though this really constituted its safety), being sufficient to affect with sea-sickness an occupant unused to the motion. It was here also that the tragic incident occurred of one, out of the only two light keepers then stationed there, dying, and the survivor being alone with the dead body for two months, during which time he gallantly kept the light burning every night, until the weather admitted of relief from the shore.

It has been stated that the architect and builder of the old Smalls lighthouse was a musical-instrument maker. It is a remarkable fact that, like him, every one of the designers of the first three lighthouses that stood upon the Eddystone Rocks was without any previous training or experience calculated to fit him for the work with which his name is associated. Winstanley was a private gentleman Rudyerd was a silk-mercantile, and Smeaton was a philosophical instrument maker. Well does the poet say:

"Talk not of Genius baffled. Genius is master of man.
Genius does what it must, and Talent does what it can."

CHAPTER IV

SOON after the successful completion in 1861 of the new Smalls lighthouse to supersede the old oaken one, James Douglass was appointed to erect a granite tower on the Wolf Rock, situated about halfway between the Land's End and the Scilly Isles - the workyard being established at Penzance, where the granite blocks for the building were dressed.

The Wolf Rock had long been a terror to mariners. Exposed to the full force of the Atlantic Ocean, it was among the roughest of spots, and near it on one occasion three of the Elder Brethren of the Trinity House were drowned when making an official visit. There had stood on the site since 1840 a beacon, which in lighthouse phraseology is a mere day mark; and even this took five years to build, and cost £11,000 - so infrequently could landings be effected on the rock. The Corporation of Trinity House - ever on the watch to guard by a lighthouse, a lightship or (latterly) by a lighted buoy, dangerous rocks and shoals - at length instructed Mr. Walker to prepare a design for a granite tower to mark this perilous position; and James Douglass was, as aforesaid, selected to carry out the work.

He arrived at Penzance in October 1861 with the executive staff, steam tug and plant that had been employed at the Smalls; but a schooner of one hundred tons register, to act as a floating barrack for the rock party, in lieu of the less suitable vessel employed for a similar purpose at that work, was specially built for the Wolf. No landing on the rock (submerged during half the tide in all weathers) was possible until the following March, when the resident engineer and the working party got there and commenced the necessary excavations for the foundations of the building and in September the last landing for the season took place. Between those dates, only twenty-two landings altogether, representing eighty-three hours of work, were possible, which sufficiently shows the magnitude of the undertaking which James Douglass had begun, but was destined not to finish for in October 1862 Mr. Walker died, and James Douglass was promoted to the (position of engineer-in-chief to the Trinity House. Once again his brother William became his successor (the Hanois lighthouse being now completed) and took up his duties at Penzance forthwith.

CHAPTER V

IT is unnecessary to describe in detail the progress of the difficult and protracted work of erecting the Wolf lighthouse. To show the onerous nature of the enterprise it may, however, be stated that it was not until three years from its commencement that the foundation pit could be got ready and the first stone laid, after which the construction of the building occupied another five years. The insecurity of the foothold, James Douglass once explained, and the constant breaking of surf over it, rendered great precaution necessary for the safety of the workmen. Heavy iron stanchions were sunk into the rock, and each man worked with a safety rope lying close beside him, one end being attached to the nearest stanchion. When waves seemed likely to sweep the rock, the men would hold on, head to the sea, while it washed over them. Picks, hammers and jumpers - some exceeding twenty pounds in weight - were frequently found to have been washed away when the waves had passed and were followed by a lull. But, in spite of every obstacle, the tower was completed by the end of 1869, at a cost of £63,000; and, a few nights afterwards, the first-order dioptric light was exhibited, showing white and red flashes alternately.

As at the Bishop and the Hanois, William Douglass regularly accompanied the working party to the rock, and was always foremost in times of danger. His men had unbounded confidence in him - his courage and resource being equal to every emergency.

There lives at Penzance a former Trinity House outdoor official in the person of Mr. William Williams, who has a fund of reminiscences - with which he often interests his friends and neighbours - "of most disastrous chances, of moving accidents," in connection with rock lighthouse construction. Apprenticed in youth to Mr. William Douglass, he was employed at the erection of both the Wolf and the new Eddystone towers. He was then entrusted with the construction of many shore or island lighthouses under Sir James Douglass or Sir Thomas Matthews, who succeeded the latter; and, though now elderly and living in retirement, is still able to serve occasionally in various, if necessarily restricted ways, the present engineer-in-chief to the Trinity House, Mr. D. W. Hood.

Mr. Williams never wearies in testifying to the heroic qualities displayed by his honoured chief in the conduct of the rock operations at the Wolf. Mr. Douglass, he says, was always the first to land on the rock, and the last to leave; and when it was necessary for the workmen to be hauled through the surf (in the manner already mentioned), "the good master invariably saw that the line was securely fastened round the waist of each before following the last man. The narrator often tells of one occasion in particular, when some of the workmen were living in the nearly finished tower, completing the internal fittings, and for four months, owing to continued rough weather, could not be relieved. Their supplies of food and water, it was known, were nearly exhausted; and time after time did the steam tug, with the resident engineer and relief party on board; leave Penzance for the Wolf (a distance of seventeen miles) only to find, on arriving there, that a landing was quite

impossible. At length (the weather moderating a little), Mr. Douglass determined, at whatever risk, to deliver the stores. When off the rock it was seen that the surf still admitted of no landing, but taking charge of a boat, with a crew of four men, of whom the narrator was one, he steered her right into the midst of the seething cauldron, and with infinite coolness and skill manoeuvred her there - though she was in momentary danger of being swamped - until, after a long and anxious time, success was attained. Obeying the master's order, the men on the gallery-course threw a line with an empty oil drum attached- which, after great difficulty, those in the boat got hold of - when the badly needed supplies were safely sent up.

CHAPTER VI

THE following is a brief, if somewhat technical description of the Wolf lighthouse. Its exact height is 6 feet 4 $\frac{3}{4}$ inches, its diameter at the base 41 feet 8 inches, and near the top, at the springing of the curve of the cavetto under the lantern gallery, the diameter is 17 feet. For a height of 39 feet 4 $\frac{1}{2}$ inches from the base the work is solid, with the exception of a space forming a tank for fresh water. At the level of the entrance door the walls are 7 feet 9 $\frac{1}{2}$ inches thick, whence they gradually decrease throughout the whole height of the shaft to 2 feet 3 inches at the thinnest part near the top. The shaft of the tower is a concave elliptic frustrum, the generating curve of which has a major axis of 236 feet, and a minor axis of 40 feet. The building contains 44,506 cubic feet of granite, weighing about 3,296 tons; and its centre of gravity 15 feet 36 inches 2 $\frac{1}{4}$ inches above the base. In consideration of the exposed position of the work, each face stone was dovetailed vertically and horizontally, in accordance with the system suggested by Mr. Nicholas Douglass, and first adopted at the Hanois lighthouse. This method consists in having a raised dovetailed band, 3 inches in height, on the top bed and one end joint of each stone. A corresponding dovetailed recess is cut in the bottom bed and end joint of the adjoining stones, with just sufficient clearance for the raised band to enter it freely in setting. The system also offers great protection to both horizontal and vertical joints against the wash of the sea when the work is first set. In addition to the security afforded by the dovetailing, each stone of the first and second courses of masonry is fastened to the rock by two gun-metal bolts, 2 inches in diameter, each bolt being sunk 2 inches into the rock, and fox-wedged at each end a portion of the hole at the top and the bottom being made conical for the purpose. From the 3rd to the 20th courses inclusive, each face stone is secured to the course below by two gunmetal bolts, 2 inches in diameter, and each internal stone by two bolts of galvanized puddled steel, also 2 inches in diameter. Each bolt in these courses is sunk 9 inches into the course below. The masonry, to the level of high-water spring tides, was set in fresh Medina Roman cement, Portland cement being used for the work above high water. Just over the entrance, there is first a space provided for coals then come the store room, oil room, living room, bed room, service room and lantern with its illuminating apparatus.

The foregoing description, in the main, applies to, and may be considered typical of the rock towers afterwards constructed under the Trinity House, except that, in the case of the new Eddystone (and one or two other recent instances) James Douglass, in his design, provided for a vertical base. This base is about eighteen feet in height, at which point the curved shaft commences, and has a set off or projection of 4 feet - the lighthouse proper thus standing on a cylindrical pedestal.

James Douglass, before designing his most famous work, had given great attention to the question of arresting the force of a large ocean wave on such a structure, and came to the conclusion that a vertical base was the proper form to be adopted. As might have been expected, such a deviation from what had hitherto been generally accepted as the perfection of a rock tower - that of Smeaton - did not escape professional criticism. But experience has fully

justified this bold innovation; and the vertical base forms moreover an admirable landing place - greatly facilitating the relieving of the light keepers, and the placing of stores and provisions in the building.

On the completion of the Wolf lighthouse the following, among other professional tributes, were borne to the success and importance of that achievement.

Captain Sir Frederick Arrow (Deputy Master of the Trinity House) "I have passed, as a seaman, many an anxious night in its vicinity, thinking of the danger, and seeking to avoid it. Great personal as well as moral courage has been displayed in carrying out this work, which was so beset with difficulties and dangers that the people engaged upon it might be said frequently to have carried their lives in their hands."

Dr. W. Pole (the eminent engineering professor) I bear my tribute of admiration to this undertaking."

Mr. W. Parkes (another eminent engineer) "It was in the perseverance from day to day, and in watching every opportunity, even with risk to life, to get a few hours' work at a time on the rock that this work was completed."

Mr., afterwards Sir Hutton Gregory (Past-President of the Institution of Civil Engineers) All must admire the perseverance and ability displayed in carrying out the work."

Mr. G. R. Stephenson (a future President of the same Institution, and a member of the firm of Robert Stephenson & Co.):

"I have passed the Wolf Rock many times under great trepidation. I know of no site or position for a lighthouse which required more skill, or involved more difficulties and dangers, than was the case with the Wolf Rock structure."

The Wolf lighthouse, like all rock towers though formed of massive granite blocks, is subject to considerable vibration during very heavy gales. Smeaton relates of his own building that one of its earliest inmates quaintly reported, after a severe storm, that the house did shake as if a man had been up in a great tree. The old men were almost frightened out of their lives, wishing they had never seen the place, and cursing those who first persuaded them to go there. The fear seized them in the back, but rubbing them with oil of turpentine gave them relief." Yet wrote Dr. John Mudge, of Plymouth, in a letter to Smeaton describing a terrific hurricane in 1762, which did £80,000 worth of damage in Plymouth Harbour and Sound, but which the lighthouse had triumphantly braved (requiring, as he whimsically put it, only a gallipot of putty to repair the one derangement the house had suffered) "It is now my most steady belief, as well as everybody's here, that its inhabitants are rather more secure in a storm, under the united force of wind and water, than we are in our houses from the former only."

It is certain that when the men get used to the tremor, which they soon do, they experience no fear - knowing that they are quite safe. This point was

referred to in a graphic and graceful little poem that was written more than sixty years ago by a facile rhymers (long since dead), one Sam Dimond, a stonemason who was employed under James Douglass at the erection of the granite tower on the Smalls. As the piece is quite unknown, and cannot but please, it is here given.

LIGHT KEEPERS' LIFE AT A ROCK

Three months at sea and one on shore
Three months at sea, yet not afloat;
The breaking billows round us roar,
Yet own we neither ship nor boat.
Rock-based amid the swirl of foam
The lighthouse stands; it is our home.

Three months at sea, a dreary time!
The ship goes gaily on her way;
Now and again a mellow chime
Comes to us through the dash of spray;
The ship will reach the nether zone
While we still pace our lighthouse lone.

While we still pace and list the sound
That comes from yon far village spire,
Where wife and children gather round
The cheery board and crackling fire,
Or seaward gaze at dead of night
To watch our slow-revolving light.

The skipper through the midnight haze
Marks well its gleam and feels its worth;
"God's blessing on the Light " he says,
But gives it still a wider berth;
And so it shines from sun to sun,
A thing to bless, and yet to shun.

And when the tempests howl and rave,
And driving clouds shut out the day,
And o'er the lantern top the wave
Flies skyward into feathered spray,
We laugh - my comrades twain and I -
To feed ourselves so warm and dry.

The lighthouse quivers to its base,
Yet snug within, we know no fears,
Assured its walls will dauntless face
All storms - as oft in bygone years.
Thank God I our lot is not amiss
There's many a life far worse than this.

While at Penzance, in 1868, Mr. William Douglass married Jane, daughter of Henry Hodge, Esq., of St. Levan. Two Sons and two daughters survive from this union, namely Major J. H. Douglass, O.B.E., R.A.M.C., Captain W. N. G. Douglass, late Royal Engineers, Mrs. J. R. Black, of Ceylon, and Mrs. Brownlow-Smith, of Paignton, Devon.

CHAPTER VII

FOR many years before any practical measures were taken in the matter, the necessity for a lighthouse on the Great Basses Reef - situated about eighty miles eastward of Point de Galle - was generally recognized by those who were conversant with the dangers of that locality and in 1856 operations initiated by the Board of Trade, which has jurisdiction over the lighthouses of Ceylon, were commenced with a view to the erection on the reef of an iron tower supported by a granite base. This structure was the design of a now deceased engineer of considerable eminence (though not connected permanently with any Lighthouse Service) and specially experienced in the carrying out of such projects.

The granite base, iron tower, lantern and illuminating apparatus were prepared in England, and delivered and stored at Galle, where the shore depot, though so far from the Basses, had to be established but, after three years, only a few landings had been effected on the rock, and a beacon-mast - a mere day mark - constructed thereon. Up to this time about £40,000 had been expended on the enterprise, and it was estimated that £20,000 per annum for five years would still be required to complete the structure. The works were thereupon suspended by the Authorities, who were not unreasonably alarmed at the magnitude of the scheme, and the matter remained in abeyance for some years.

In 1867 the Board of Trade revived the proposal, and referred the whole question for the consideration and advice of the Trinity Brethren, who placed the matter in the efficient hands of the brothers Douglass, after which all practical difficulties in regard to it disappeared.

The design prepared by James was for a granite structure, in which the base of the lighthouse previously proposed was utilized. His scheme further provided for a light-vessel being moored off the rock, for exhibiting a red revolving light every night during the progress of the new work, and also serving as a barrack for the executive engineer and staff. The idea of the barrack light-vessel was a particularly happy one, as it not only admitted of the workmen being accommodated on board while the tower was under construction, but guarded the dangers of the reef, besides enabling the Government to collect a toll for the light, during the whole period that the structure on the rock was being proceeded with. But, indeed, the entire scheme, and not this feature of it merely, was conceived in a masterly manner.

The Board of Trade having approved these proposals, and requested the Trinity House to undertake the work - which the latter body agreed to do - William Douglass was selected to proceed to Ceylon, as executive engineer, so soon as the necessary preliminary measures in connection with the scheme were completed in this country, by which time, also, it was expected that his work at the Wolf would be practically finished.

Two iron twin-screw steam vessels and the light-vessel, all specially designed, were put in hand, together with the granite blocks for the tower, and the internal fittings, lantern and optical apparatus. The two steam vessels, each capable of carrying one hundred and twenty tons of cargo, at a speed of ten knots per hour, were fitted with the requisite appliances for hoisting and stowing the stones on board, hoisting them again to the deck, and from thence to the rock. William Douglass stated that this arrangement was very successful, and tended considerably to expedite the completion of the work. Although it was necessary, owing to the shallow water, to moor the steamers, when laden, at a distance of thirty fathoms from the rock, stones weighing on an average two-and-a-half tons were hoisted out of the hold, landed, and deposited twenty-eight feet above the rock, at the rate of ten per hour.

William Douglass arrived at Galle in December 1869, and on the 27th of that month made an attempt to reach the Great Basses in a small sailing vessel, but accomplished only one third of the distance in eight days, owing to head winds and adverse current. He therefore returned to Galle to await the arrival from England of one of the two steamers, and on March 5th left with her for the Great Basses, where he landed on the 7th. The first stone of the tower was laid on December 28th, 1870, and by the end of the working season (namely the north-east monsoon from April to November) of 1872 the masonry was completed. The light, a dioptric one of the first-order, emitting red flashes at intervals of forty-five seconds, was exhibited in March 1873.

This important work, so efficiently carried out in a tropical climate, seven thousand miles from their country, by a small number of Europeans (assisted by natives), was executed for the very moderate sum of £62,000, an amount which was soon saved in coal alone by passing steamers, in consequence of their voyages having been shortened by the lighting of what was formerly so dangerous a spot.

The lighthouse consists of a cylindrical base, 30 feet in height and 32 feet in diameter, on which is placed a tower, 67 feet inches in height, 23 feet in diameter at the base, and 17 feet in diameter at the springing of the curve of the cavetto. The thickness of the wall at the base of the tower is feet, and at the top 2 feet. There are six circular rooms, each 13 feet in diameter. The stones forming the walls of the tower are dovetailed both horizontally and vertically, as at the Wolf lighthouse. The tower and cylindrical base contain 37,365 cubic feet of granite, weighing about 2,768 tons.

In the following year Mr. Michael Beazeley, a lighthouse expert who was the resident engineer at the erection of the present granite tower on the Longships Rock - speaking at the Institution of Civil Engineers - said he could not help referring to the miserable failure which caused £40,000 to be spent in doing nothing whatever, as compared with what was accomplished as soon as the work was handed over for execution to the Trinity House. When he was at Galle in 1859 he saw the stones lying on the glacis of the fort, and made enquiries why they had not been placed in position. The only explanation he could get was that there was great difficulty in laying the foundation. That was self-evident, as not a single stone had been put in position but every difficulty

vanished before the courage and ability of Mr. Douglass when he undertook the work.

The successful construction of this tower caused the Board of Trade to decide on proceeding with the erection of one upon the Little Basses Reef, which also stood in urgent need of lighting whereupon they requested the Trinity House to undertake the carrying out of this project likewise, in which course the Elder Brethren readily acquiesced. A design was then furnished by James Douglass for this second structure, which was erected by his brother with the same staff, vessels and plant that had been employed at the Great Basses, and generally in a similar manner. This work was of even greater difficulty than the previous one, the Little Basses Reef being twenty miles farther from Galle than the Great Basses, and awash only at low water; but precisely the same satisfactory results attended its execution. The lighthouse, which does not much differ from that at the Great Basses, was completed in the early part of 1878, and illuminated in March of that year by a first-order dioptric apparatus, showing two white flashes in quick succession every minute - the entire cost of the undertaking being about £88,500.

Thus both these fine granite towers were erected and lighted at an aggregate expenditure very little in excess of the estimate for the iron building for the Great Basses alone; an estimate which judging from the practically negative result of the three years' operations on the site in connection with the latter structure, would probably have been exceeded before the edifice - an unsuitable one, by the way, for such a position - could ever be completed.

It is needless to say that the same indomitable qualities previously displayed by him were shown by the resident engineer in the execution of these two undertakings; and the success that attended them demonstrates more forcibly than any words could do the pre-eminent fitness of the brothers Douglass for enterprises of this nature.

CHAPTER VIII

ON the termination of his duties in Ceylon, William Douglass was appointed engineer-in-chief to the Commissioners of Irish Lights, thus closing his twenty-six years' service under the Trinity House.

But before dealing with his labours in Ireland it should be stated that the talents of the Douglass family as lighthouse builders descended to the third generation. Sir James's son, William Tregarthen, was his father's representative at the construction of the new Eddystone lighthouse; and it was while engaged in taking down Smeaton's building (now erected on Plymouth Hoe) that he was hurled from the top of the tower - through the breaking of a chain attached to the shears - and fell about seventy feet on to (it was fully expected) the rocks below, but, a wave rising at the very moment, he fell into the water instead, and, unhurt, swam back into safety.

After completing the tower on the Eddystone, William Tregarthen Douglass was entrusted with the very difficult work of enveloping the lighthouse on the Bishop Rock in an outer casing of masonry, and increasing its height, which undertaking was successfully completed in five years at a cost of £65,000.

This youngest Douglass was possessed of all that energy and pluck which one naturally associates with his name; and his premature death from heart-failure, through prolonged swimming after the capsizing of a sailing boat, was a pathetic ending to his adventurous career.

It is a singular coincidence that there have also been three generations of Stevensons - the eminent engineers to the Scottish Lighthouse Board - the fame of whom is worthily maintained in the person of the present chief engineer to the Board, Mr. D. A. Stevenson, the cousin of Robert Louis. The latter himself, as is well known, was a member of that family "who early and late, in the windy ocean, toiled to plant a star for seamen" (to quote his own characteristic description). Trained to follow in the same profession, Ac also might have become famous as a lighthouse builder, but, preferring literature, succeeded by his books in rearing memorials to his genius not less enduring than his father's granite towers.

CHAPTER IX

As already said, Mr. William Douglass was appointed engineer-in-chief to the Commissioners of Irish Lights in 1878. Mr. C. W. Scott, who succeeded him in that capacity and had previously been assistant engineer to the Commissioners, has very kindly furnished the following comprehensive statement - which is reproduced precisely in his own words - of Mr. Douglass's professional labours while in Ireland. It should, however, be explained that the new Fastnet lighthouse is only just mentioned by Mr. Scott because a full account of it is given later.

Mr. Douglass's first works were to install a rocket fog signal at Tuskar; to replace a Daboll steam horn by a siren, driven by Crossley's Otto gas engines, at Howth Bailey, and to complete the new lighthouse at Straw Island and the steam siren fog signal at Poer Head, all of which had been started by his predecessor, John H. Morant. He also completed the installation of a siren driven by caloric engines on the Coningbeg lightship (the first lightship to be fitted with a siren in Irish waters). Two additional ships were fitted in the following year and a siren signal established on the Codling station.

In 1879 he commenced the alteration of lighthouse burners to use mineral oil in place of colza oil - a gradual change which was not completed until 1897, Trinity House pattern burners being used.

He completed the erection of the quadriform first-order gas light at Galley Head in this year, and recommended the erection of a new gas lighthouse, with triform first-order apparatus and siren fog signal, on Mew Island in place of the old lighthouse on Copeland Island; the building of new lighthouses in place of old ones on Tory Island and Fanad Point; that a beacon should be erected on Mugglins, the installation of a biform first-order oil light at Tuskar and of a lightship off Barrels Rock.

He built Mugglins beacon in 1881; Mew Island lighthouse and fog signal station, with shore dwellings at Donaghadee, 1882 to 1884; erected a new lantern and biform first-order apparatus on Tuskar lighthouse, and substituted a cotton powder explosive signal fired from a jib on the lantern for the old rocket signal, also built shore dwellings for the Tuskar keepers' families at Ballygeary, 1883 to 1889; built a new tower carrying a triform hyper-radial apparatus and 128 jet Wigham gas burners at Tory Island, with fog siren driven by Crossley gas engines, gas works and two new dwellings, 1885 to 1888; erected a new tower and second-order apparatus with occulting oil light at Fanad Point, 1886 to 1887; and the lightship was installed off the Barrels Rock in 1880.

In the winter of 1881 the Calf Rock lighthouse was washed away (as the Commissioners had advised the Board of Trade that it would be, when the latter insisted on its erection on the Calf).

Mr. Douglass immediately erected a temporary light on Dursey Head and prepared plans for a lighthouse and explosive fog signal on Bull Rock, at an

estimated cost of £21,000. Heavy rock excavation was necessary to enable the light to be erected sufficiently near the sea level and to permit the light to be visible at Skelligs and up the Kenmare River. The work was carried out from 1881 to 1889, and the light was a biform hyper-radial apparatus, with 10-ring Douglass oil gas burners supplied by a Pintsch oil gas plant.

In 1882 and 1883 the single-flashing light at Inishtearaght was replaced by a new double-flashing first-order apparatus, in consequence of a shipwreck stated to have been due to mistaking Inishtearaght light for Fastnet. The old Inishtearaght apparatus was installed at Rathlin O' Birne, replacing the old catoptric light.

In 1887 he built the shore dwellings at Greencastle for the keepers at the Carlingford leading lights.

In 1890 he built shore dwellings at Blacksod Point for the Blackrock, Mayo, lightkeepers, and two dwellings at Howth Bailey; and in 1892 he replaced the old catoptric light with a fourth-order fixed oil light at Blackrock, Sligo.

In 1891 the first oil engines to be used on the Irish coast were installed at Poer Head, a pair of Priestman engines, with air compressors, to sound the siren; and in 1895 Campbell oil engines with compressors and siren were installed on the "Kittiwake" lightship. In 1896 similar engines were installed for a new siren fog signal at Roches Point, followed in 1898 by a similar signal at Inishowen. In the same year the gas plant at Mew Island was increased in capacity and a more powerful siren fog signal plant, with Crossley gas engines, installed, the two sirens being moved up to the top of the tower and in 1899 a siren, driven by Campbell engines, was installed on Bull Rock, in lieu of the old explosive signal.

In 1891-1893 he built a new high tower, in place of the old low one, at St. John's Point, Co. Down, enlarged the gas plant, built two new dwellings and installed a triform first-order revolving light with Douglass gas burners, and a siren fog signal driven by Crossley gas engines.

The lower station on Eagle Island having been wrecked in a storm in the winter of 1894, it was dismantled, and the upper light altered from catoptric to a first-order occulting light with red sectors; and in 1896 the south lighthouse at Slyne Head was dismantled and a new lantern and first-order fixed light, in biform, with red sectors and condensing prisms, were installed on the north tower while in 1895 the tower at Kingstown East was raised in height, the old lantern re-erected and a double-flashing third-order apparatus with four-wick burner installed; a new lantern and sixth-order fixed light apparatus with one-wick burner being erected at the same time on the small tower at Kingstown West.

In 1899 a new lighthouse station was built at Blackhead, at the north side of the entrance to Belfast Lough, with a first-order apparatus and six-wick burner showing a single flash every three seconds, and a cotton powder explosive

fog signal. Shore dwellings for Eagle Island were built at Termongarragh, and for Inishtearaght and Skelligs at Valencia Island in the same year.

From the end of 1896 nearly all his energies were expended on the design and execution of the Fastnet Rock lighthouse. His health broke down in 1898. and during the following two years he was able to do very little, and eventually resigned his post at the end of 1900.

Mr. Douglass was a very hard working energetic man, with a thorough knowledge of the details of the building of lighthouses on difficult rock stations, and his structures were well designed and well built; but the Fastnet lighthouse, the Mugglins beacon and the boat landing at Bull Rock were the only opportunities he had in this Service of doing what is commonly understood as rock lighthouse work, founded near the water level in exposed positions.

So ends Mr. Scott's statement; but it should here be added that, during the years 1891-2, William Douglass co-operated with the engineers to the English and Scottish Lighthouse Boards in a series of elaborate experiments, conducted at the South Foreland, with the view of ascertaining the exact intensity of every description of burners and optical apparatus used in the respective Lighthouse Services. The purpose of these experiments was to inform the mariner (which is now done), in the Admiralty List of Lights and similar publications, what the precise power of every light is (expressed by a "pyre" of one thousand candles). The seaman consequently not only knows from its individuality what light he is looking at, but also what intensity it possesses, and is thus greatly assisted in calculating his distances.

CHAPTER X

AND now we come to the consideration of the greatest engineering work that William Douglass designed, namely the new Fastnet Rock lighthouse. Here again we are indebted to Mr. Scott, for, from his most interesting and superbly illustrated printed Narrative of that undertaking, the following account is, with his permission, mainly compiled.

The Fastnet Rock is a pinnacle surrounded by deep water on all sides, and is situated about four-and-a-half miles south-west of Cape Clear. The site is exposed to the full fury of the Atlantic Ocean, and the water around it is seldom sufficiently smooth to enable a man to step on to the rock from a boat.

A cast iron lighthouse, which was designed by Mr. George Halpin, engineer to the Port of Dublin Corporation, had stood on the site since 1853, and cost about £20,000 to build. This structure remained in its original condition for ten years, when grave fears for its stability, and for the rock itself, began to be entertained. During gales from the northwest, west, and south-west the building trembled to such an extent that on one occasion a cupful of coffee was thrown off the table in the uppermost room.

In 1865-6 the advice of Mr. C. P. Cotton, consulting engineer to the Dublin Port Corporation, was sought, and later that of Messrs. Stevenson, of the Scottish Lighthouse Board, and Mr., afterwards Sir James Douglass; with the result that extensive works were commenced for rendering the lighthouse safe. These consisted mainly in increasing its diameter at the base by an external casing of cast iron, and filling up a dangerous chasm at the west end of the rock - works that were completed in 1868 at a cost of about £6,000.

In November 1891 the Irish Lights Board resolved that the light on the Fastnet was not sufficiently intense, and should be replaced with a bifurcated oil light of the most powerful description. They accordingly applied for the statutory sanction of the Elder Brethren of the Trinity House to the undertaking stating that, in order to carry out the scheme, it would be necessary to build a new tower, but that the Commissioners considered that, the Fastnet being the principal landfall light on the south-west coast of Ireland, any expenditure that might be necessary to make it the best possible light would be fully warranted. The Elder Brethren sanctioned this proposal, adding that they concurred with the Irish Lights Board that the Fastnet should be made as powerful as circumstances would admit.

William Douglass was thereupon instructed to submit a design for the new structure, which he did after the necessary survey of the rock had been made. He proposed to build a granite tower 42 feet in diameter at the lowest course, and 147 feet in height, with the focal plane of the light at 159 feet above high-water mark, ordinary spring tides, and the bottom of the lowest course 6 inches below high-water.

His scheme also included the construction of a landing pier, and a level causeway leading therefrom to the site of the tower, with rails laid on it so that

the stones, etc. could be readily removed on trucks from the landing to the site; a second level causeway to be formed leading to the door of the tower, 56 feet above high-water; the granite blocks of the tower to be dovetailed horizontally and vertically as at the Wolf; the old lighthouse, on completion of the new one, to be removed. After much correspondence and negotiation, the design and these recommendations were approved, and operations were begun in 1896.

When the drawings for the tower were proceeded with, and some quarrying had been effected on the site for the foundation, Mr. Douglass decided to increase the diameter of the proposed structure from 42 feet to 52 feet, and to modify his original design in some minor respects.



THE NEW FASTNET ROCK LIGHTHOUSE.

CHAPTER XI

FOR the Fastnet shore depot and stone-yard, Rock Island, in Crookhaven Harbour, was selected; and Mr. F. R. Foot, who had had much previous experience in lighthouse construction, was appointed resident engineer of the work, to attend on which, and convey the workmen and materials to the rock, a special steamer was built. The setting and hoisting gear was similar to that formerly employed by William Douglass in the erection of English and Ceylon lighthouses, and, says Mr. Scott, proved "very speedy and satisfactory in use.

During 1897 the pier, workshops and barrack at Rock Island, with other works, were completed, while on the rock a masonry store, barrack for workmen, etc. were constructed, the pier and tramway were nearly completed, and the quarrying for the foundation of the tower was commenced. The sea, however, was so rough during the latter half of the summer that the men were very seldom able to get down to do any work at the foundation.

In 1898 a number of Cornish quarry-men and stone-cutters, who had been engaged for the purpose, succeeded in completing most of the heavy quarrying, and in cutting out the beds for a considerable number of the lower partial ring courses. The tramway and pier were completed, the big steam landing-winch and boiler erected, further accommodation for the workmen was built, and a good deal of work done at the boat-landing.

Rock operations were started again at the end of March 1899, but, owing to continued bad weather, the completion of the cutting of the rock for the lowest courses was delayed. "At the end of May," says Mr. Scott, "Mr. Douglass went to personally superintend the work, and see whether his great experience in similar work would not enable him to push it on somewhat more rapidly." On June 9th the first two stones were landed and set, on the 13th five more, and on the 16th, 22nd and 27th sixteen others, thus completing the first four partial courses.

"The weather again becoming rough," says Mr. Scott, "and all hands now thoroughly understanding the work, Mr. Douglass returned to Dublin, and, having overtaxed his strength at the rock, was compelled to take several weeks sick leave."

By the end of August the foundation was ready for the first solid course, and during September this course, No. 14, consisting of seventy-three stones, was completed - the best day's work for the season being the landing and setting of twenty-two stones on the 2nd of this month. The total number of stones landed and set for the year was two hundred and sixty-eight. The weather being now completely broken, no attempt was made to set more stones that season.

At the end of September Mr. Douglass returned to the office to resume work, but, says Mr. Scott, "soon knocked up again, as he had completely overworked himself, and, after making two further attempts to resume duty, he finally resigned in September of the following year (1900) to the great regret of

the Commissioners and all concerned in the undertaking, as there was probably no man in the world so well fitted by experience to carry through this important and difficult piece of work. He had, however, so thoroughly mapped out the methods to be employed in the completion of the masonry that the writer, on whom devolved the duty of carrying on the work, found it quite unnecessary to depart from the lines he (Mr. Douglass) had laid down - in any important particular."

Good progress was made in 1900, and at the date of Mr. Douglass's resignation the 35th course was completed. It naturally caused the latter very keen disappointment to be obliged to resign his duties before his great work had reached its final stage; but Mr. Scott conducted the further operations with remarkable energy and ability till at length the undertaking was brought to a successful issue.

The permanent lantern and optical apparatus, also the arrangements for the temporary light, when the greater height of the building in progress would obscure the light from the old tower, and the various internal fittings for the new structure, were designed by Mr. Scott, who also devised the incandescent petroleum burner installed in the permanent optical apparatus.

Mr. Douglass was able to land on the rock at the end of September, and expressed himself as highly pleased with the progress made, and the manner in which the work had been executed.

All the stones of the tower, varying in weight from 1 3/4 to 3 tons, were set by June 1903, and the works were finally completed in another year. The building has eight rooms; it contains 4300 tons of granite; the light (a single flash recurring every five seconds) has an intensity of 750,000 candles; there is a cotton powder explosive fog signal; and the total cost of the whole undertaking was £79,000.

As showing the zealous, self-sacrificing services often rendered by even subordinate workers engaged in projects of this nature, it should here be stated that the foreman, James Kavanah, lived on the rock, by his own desire, continuously from ten to twelve months each year from August 1896 to June 1903, and set every one of the two thousand and seventy-four stones of the tower with his own hands. At the end of the latter month he came on shore complaining of illness, and died a few days afterwards.

On July 22nd, 1904 the Commissioners of Irish Lights, accompanied by their Inspecting Committee, Sir Robert Ball, F.R.S. (their scientific adviser) and Messrs. Douglass and Scott, landed on the rock and made a careful inspection of the tower, lighting arrangements, and all other matters connected with the station. They found that everything had been finished in the most satisfactory manner; and took the opportunity of expressing their great appreciation of the services rendered to the Board, and to the lighting of the coast of Ireland, by Mr. William Douglass, in designing and commencing this most important work, and by Mr. Charles Scott in so successfully carrying it to completion, and in preparing and designing the powerful and distinctive

light now exhibited. They also expressed their approval of the efforts of Mr. Foot, the resident engineer, and Captain Fleming, who commanded the special steamer "Ierne" during the entire time that the work was in progress.

Sir Robert Ball, in his report to the Commissioners, praised the new structure enthusiastically, and stated in conclusion: "I may say it is a matter of congratulation to everyone concerned that the Fastnet is now at length provided with a monumental tower and a superb light, well worthy of the position of this lonely rock, as being, from the navigator's point of view, the most important outpost of Europe."

CHAPTER XII

ALTHOUGH, as before stated, Mr. Douglass resigned his post in Ireland because of failing health, he lived for more than twenty-two years afterwards. On his retirement he settled at Penzance (where he eventually died) in a comfortable detached residence ("Stella") which his father had built, and for some time inhabited. Here - his health fairly restored, and with unimpaired mental vigour - he was able to live over again in thought his former strenuous activities, and to ponder many an interesting mechanical problem. "When the Great War broke out," says his son Major J. H. Douglass, "he took a serious view of the submarine menace, and forwarded early in the War designs for bombing submarines - very similar to those adopted later on; for which he received the thanks of the Admiralty." With his books, his flowers, and his many pleasant human companionships, his old age, until the cloud of War darkened it, was certainly serene and bright." His death occurred on March 10th, 1923, in his ninety-third year.

Mr. Douglass was personally a man of the highest honour, greatly respected by all who knew him, and respected most by those who knew him best; for he was quiet and reserved in speech - often maintained, indeed, a golden silence. Thus many of his finest qualities were, by the outer world, discerned but gradually, if at all. Only in his capacity of husband and father were they habitually revealed.

There is perhaps no truer estimate of a man's character than that formed by his servants; and by his servants Mr. Douglass was revered. Especially should mention be made of his faithful housekeeper, Mrs. Mabel Cooper (nee Mabel Lutey), a true Cornishwoman, who assiduously nursed his invalid wife in her last illness, and himself (when necessary) in his retirement up to his death.

Mr. Douglass's nature was essentially a religious one, though, as will be gathered from what has been written, he was never voluble on the subject, practised more than he professed - showed his faith by his works.

He was not only one of the bravest, but one of the most modest of men. That the State never bestowed any honour on him in recognition of his distinguished public services would cause him no concern, for he might always have said with truth in the words of the familiar passage:

"When I'm not thanked at all, I'm thanked enough, I've done my duty, and I've done no more."