

founded, after having withstood the storms of a century, was removed in 1881 and re-erected on Plymouth Hoe.<sup>1</sup> On the completion of the Eddystone, Mr. Douglass received the honour of knighthood.

The subject of this memoir, from the earliest period of his connection with the Trinity House, devoted special attention to lighthouse illumination, and it is mainly to his exhaustive experiments, carried out in connection with Faraday and Tyndall, that the many improvements in the character and power of the present optical apparatus and fog-signals established on the coasts are due. In 1879 he presented to the Institution a valuable Paper on "The Electric Light applied to Lighthouse Illumination,"<sup>2</sup> for which he was awarded a Watt medal and a Telford premium.

Sir James Douglass was elected a Member of the Institution on the 5th February, 1861. In 1881 he was elected a Member of Council, and a Vice-President in 1892, which office ill health compelled him to resign in 1894. He was a Fellow of the Royal Society dating from 1887.

He died at his residence, Stella, Bonchurch, Isle of Wight, on the 19th June, 1898.

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THOMAS MUDD, born in the Yorkshire village of Kirby Fleet-  
ham on the 15th April, 1852, was taken by his parents, at the age  
of four years, to West Hartlepool, which was at that time beginning  
to show promise of its present importance. His engineering career  
commenced in 1868, when he obtained employment in the works  
of the Darlington Forge Company. Two years later he became a  
draughtsman in the North-Eastern Railway Company's office at  
Darlington, and in 1872 he returned to Hartlepool and entered the  
marine engine works of Messrs. Thomas Richardson and Sons as a  
draughtsman. He remained for seven years in the drawing office of  
that firm, gaining an extensive experience of the design of engines  
and boilers for the merchant service. In 1878 he became Assistant  
Manager to the firm, which position he held for four years.

Mr. Mudd's connection with the Central Marine Engineering  
Company, which grew out of the old shipbuilding firm of William  
Gray and Company, commenced in 1882, in which year he was  
appointed Manager of that Company's marine engine works at  
West Hartlepool. During 1883 and 1884 he designed and super-

<sup>1</sup> Minutes of Proceedings Inst. C.E., vol. liii. p. 247, and vol. lxxv. p. 20.

<sup>2</sup> *Ibid.*, vol. lvii. p. 77.

intended the erection of the whole of these works, which cover an area of 10 acres and include foundries, forges, engine- and boiler-shops, and pattern, smith and copper shops. The works were fully described by Mr. Mudd in a Paper read before the North-East Coast Institution of Engineers and Shipbuilders.<sup>1</sup> In 1887 he became a partner in the private limited company into which the firm was converted, and in 1894 he was elected a Director, still retaining the management of the Central Engine Works in conjunction with Mr. G. H. Baines.

Amongst the most noteworthy productions of these works may be mentioned Mr. Mudd's five-crank engines, which were fitted to the s.s. "Inchmona" in the summer of 1896. The "Inchmona" has been stated to be the most economically-engined vessel afloat at the present time, having run for over twelve months on an average of 1·15 lb. of coal per I.H.P. per hour in sea service. Mr. Mudd recently effected some further developments in these five-crank engines. He devoted also much attention to the improvement of marine boilers, and devised a preserver sleeve for the tail-end shafts of marine engines which considerably prolongs the life of such shafts.

Mr. Mudd was a Member of the Institution of Mechanical Engineers, of the Institution of Naval Architects—to which he presented a Paper "On Some Details of Marine Engineering"<sup>2</sup>—of the Iron and Steel Institute, and of the North-East Coast Institution of Engineers and Shipbuilders, and a Fellow of the Society of Arts. He was elected a Member of this Institution on the 2nd April, 1889.

In addition to his work as an Engineer, Mr. Mudd devoted much time to municipal affairs. In 1889 he became a member of the Town Council of Hartlepool, and in 1895 was elected Mayor. He was made a Justice of the Peace in 1897. Mr. Mudd died at his residence, Greencliffe, Hartlepool, on the 17th May, 1898, in the forty-seventh year of his age.

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GEORGE NEUMANN, born in Liverpool on the 8th August, 1817, was the youngest son of Mr. Charles William Neumann, of Dantzic, a merchant. In 1831 he went to Orbe, Canton Vaud, Switzerland, to study under Mr. Burtin, where he remained until 1833. Having

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<sup>1</sup> Transactions North-East Coast Institution of Engineers and Shipbuilders, vol. iii. p. 55.

<sup>2</sup> Transactions Institution of Naval Architects, vol. xxxii. p. 212.