

Stephenson had expressed his dissatisfaction at a wooden bridge which had been erected. The contracts did not then minutely specify the works as they now do. Sir Morton, on his own authority, adopted a drawing from the office, and an iron bridge was substituted. Stephenson expressed his surprise, and said he had not ordered it; but on the contractor's reminding him that he was bound to execute the work to the satisfaction of his chief, and that he had had his previous dissatisfaction in mind, Stephenson expressed his pleasure, and thus commenced a friendship which lasted till the great engineer's death.

Sir Morton Peto was a member of the Baptist denomination, and benefited the same by providing the funds for the erection of Bloomsbury and Regent's Park Chapels; but his was no narrow mind, and his catholicity was shown when he restored the parish church on his estate at Somerleyton, and his liberal creed was acknowledged by a Clergyman and a Nonconformist minister joining in performing the burial service at his grave—a not unfitting testimony to the spirit of the author of the Burials Bill. Sir Morton's large nature was exhibited in the manner he bore his misfortunes, which disappointed his hopes of retiring from business and continuing his parliamentary career. He was never known to brood over the past; but to the last was employed in charitable work in connection with his denomination and as one of the trustees of Lady Hewley's Charity, and nothing gave him more pleasure than being instrumental in starting young men in their career, especially when in connection with engineering works. Just before his retirement, Lord Beaconsfield (then Mr. Disraeli) paid a tribute to his character, saying he had recognized with admiration his enterprise and energy, and added "the House must also sympathise with an Hon. Member who has sat among us for so many years, and who has shown so many high qualities which entitle him to our respect." Mr. Gladstone echoed the tribute paid to the Hon. Member for Bristol: "A man who has attained a high position in this country, by the exercise of rare talents, and who has adorned that position by his great virtues."

Sir Morton Peto was elected an Associate of the Institution on the 26th of February, 1839.

EDWARD CROFT GREENWAY THOMAS was an Indian civil servant, who, deeply impressed with the conviction that extensive engineering works, constructed and maintained by Government, could alone cope with the evils of constantly recurring famines,

devoted much of his time and resources to the acquisition and diffusion of exact information on this all-important subject. He joined the Indian service on the 17th of September, 1851, and after passing the prescribed examinations in Telegu and Tamil, was posted as assistant to the collector and magistrate of Coimbatore. Thence he rose steadily and continuously until, on the 27th of August, 1869, he was appointed judge of Vizagapatam, on the Malabar Coast. He occupied this position for thirteen years, and threw himself heart and soul into a scheme for creating a large harbour at Vizagapatam, and constituting it the port for the Central Provinces of India. Taking for his text the axiom, "Nature is always at work, and man's mission is to turn her powers to his own account," he urged that it was the duty of the Government to regulate the Indian rivers, in their upper portions, where they were still amenable to gentle means, so as to prevent their beds from becoming the depositories of furious torrents during three months of the year, and vast stretches of burning sand during the remainder. By statistics he showed that famines were becoming more and more frequent, and were directly traceable to the neglect of replanting the forests on the mountain slopes. Briefly, his proposed remedy was this:—Plant trees wherever they can be got to grow, but plant systematically. Where the river is young, *i.e.* where it is born in the mountains, its bed should be thickly planted. As the river descends in its course the trees should be at less intervals, till at last, where it becomes navigable, a clear channel in the middle should be left unimpeded, while the rest of the bed, which in many Indian rivers may be more than a mile wide, and also the banks, should be thickly planted. By this means not only would the monsoon water be retained in the river bed over a much longer period, but, the rains being much more frequent, would cause the flow to be perennial, and the climate would be greatly benefited. Also cheap irrigation channels could be constructed, so as to allow of certain crops being produced over regions that are now barren, and the whole country could be intersected by canals which would convey produce in the most economical manner. As a proof of this he instanced the native boat used on existing Malabar canals. "Perhaps the most economical application of power in the conveyance of goods in the world is that which is to be seen in the canals of Malabar. There a tree, 60 feet long, and $2\frac{1}{2}$ feet in diameter, is hollowed into a canoe, the opening above not wider than a plank would cover; this canoe will carry with ease much more than 6 tons of grain, it floats in the water like a duck, requires little depth and little width. A boy sits at the helm steering, and a

man propels it by walking along the plank with a punting-pole against his chest. This man and the boy take this boat containing twelve ordinary cartloads of grain, 30 miles in the twenty-four hours. Thus for 6 annas (9*d.*), doing three days' work of twelve carts with their pairs of bullocks and their drivers."¹ Mr. Thomas estimated that in the flat country around Vizagapatam, such channels 6 feet wide, and 2 feet deep, could be constructed for Rs. 240 a mile. His enthusiasm induced him to urge these views, perhaps with more persistence than discretion. He claimed for them that they were those of a public servant of twenty-six years' service over seven districts, an Anglo-Indian in feeling from his birth (a feeling not unnaturally inherited from two previous generations who had spent their heartiest energies, and the greatest part of their lives in the Civil Service of India), and one intimately acquainted with the natives, and desirous of benefiting both them and their rulers. There can be no doubt of the sincerity of his motives.

In 1881 Mr. Thomas retired from the Indian Civil Service and came to reside in England, devoting the greater part of his time to the development of a form of floating breakwater, which he believed would prove of great value in securing quiet water off seaports and river estuaries, if he could once get its merits practically tested. He lacked the engineers' knowledge of construction and constructive details, and although he worked with untiring energy, and occasionally sought the assistance of engineers, he overlooked the importance of essential details in his eagerness to get the principle tested. After his return to England he may be said to have devoted his life to amateur engineering and inventing. In the latter somewhat unpromising field he appears to have found considerable delectation, for in less than seven years he took out thirteen patents ranging over a variety of subjects, from breakwaters and harbours to door-handles, from armour-plating to table implements for holding asparagus! He was also the author of the work on Vizagapatam previously referred to, and of one entitled "Famine, and other Indian Topics," published at Madras, and of various contributions to the engineering press.

Mr. Thomas died on the 13th of September, 1889. He was elected an Associate of the Institution on the 1st of December, 1885.

¹ "Vizagapatam; the Port for the Central Provinces." By E. C. G. Thomas. Folio plates and photographs. Madras, 1877.