

illness. In 1866 he established himself in general practice in Melbourne, Victoria, and in that year was consulted by the Queensland Government in connection with railways for the colony. He was also engaged as chief engineer for the Launceston and Western railway, in Tasmania, in partnership with Messrs. Major and Willett, and directed the preliminary survey of the main line of railway in the same colony, besides constructing a bridge of 190 feet span over the South Esk river, near Launceston. In 1869 he was appointed Consulting Engineer to the Government of Western Australia, which colony he visited for a short time to report on public works. In fact, during his sojourn in Melbourne, he enjoyed as much practice as his shattered health admitted of his undertaking; being occasionally consulted by the Governments of Queensland, of South Australia, and of Western Australia, besides doing other work. He died at Melbourne on the 29th of September 1877. Mr. Doyne was a clever and painstaking engineer, a good mathematician, geologist, and analytical chemist, and was unusually well read and informed on most subjects. He was of a sanguine temperament, brilliant, cheerful, and of great conversational powers. Understanding thoroughly the duties of his profession, and having capacity to undertake them, he never shrank from responsibility, more than his due share of which he was always ready to take. This, combined with his social qualities, caused him to be much endeared by his subordinates. In those undertakings in which he was associated with others, he insisted on responsibility being so apportioned that in the event of any failure in the conduct of affairs "the saddle might at once be put on the right horse," as he used to say.

Mr. Doyne was elected an Associate of the Institution of Civil Engineers on the 6th of March 1849, and was transferred to the class of Members on the 9th of November, 1852.

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Mr. ROBERT JEFFREY (Bey) was born on the 9th of February, 1813, at Shilbottle, near Alnwick, Northumberland. He was never actually apprenticed, but in the year 1834, when about twenty-one years of age, he entered the service of Messrs. Robert Stephenson and Co., and at their Engine Works, South Street, Newcastle-on-Tyne, then under the able direction of the late Mr. Hutchinson, he soon became an expert workman.

In December 1839, he was selected by the late Mr. Robert Stephenson, M.P., Past-President Inst. C.E., to act as foreman [1877-78. N.S.]

over a portion of the works at La Ciotat, near Marseilles, which Messrs. Louis Benet and Co. intended to devote to the construction of locomotive engines. When the first three engines were finished, he took them to Naples, where he erected them upon the line, and for a time superintended the locomotive service between Naples and Torre del Greco. After completing his contract time of service at La Ciotat, he returned to Newcastle. In November 1841, he became temporary locomotive superintendent on the Leeds and Selby railway. In April 1842, he took charge for Messrs. Robert Stephenson and Co. of the two first long boiler engines constructed by the firm for the Düsseldorf and Elberfeld railway. On arrival, he found that line almost at a standstill for want of motive power, but he soon improved the rolling stock, and with the aid of the new engines placed the traffic on a sound footing. The Directors demonstrated their satisfaction by a substantial pecuniary recompense. In December 1842, he was sent by Messrs. Robert Stephenson and Co. to Naples in charge of six locomotive engines for the service between that city and Caserta; and on this line, in spite of severe opposition from rival engineers, both English and American, he was successful in demonstrating the good quality of the engines entrusted to him. In June 1843, he was appointed to the position of Locomotive Superintendent on the Leghorn and Florence railway, where he had almost everything in the way of machinery to create, and by incessant and intelligent attention to his duties, and indomitable courage, he overcame all the difficulties of the position with credit to himself and advantage to the railway company. In March 1857, he returned to Newcastle, with further marks of the satisfaction of his employers.

For some time H.H. Said Pasha, then Viceroy of Egypt, had been discontented with the management of the locomotive department of the Egyptian Government railway; whilst the complaints of the British Government and of the Peninsular and Oriental Steam Navigation Company were incessant as to the defective service on the railway. His Highness, therefore, through the late Mr. Hugh Thurburn—then of Alexandria—applied to the Council of the Institution of Civil Engineers to select a competent person for the post of superintendent of the locomotive engine and carriage department. Sixty-five applications were received, and after careful investigation of the qualifications and experience of all the candidates Mr. Robert Jeffrey was selected in November 1857. He immediately started for Egypt and commenced the great work of his career. He found the whole establishment at

Boulac, for the repairs of locomotive engines and carriages, an Augean stable of the worst description; but, nothing daunted, he set to work "with a will," and in spite of passive and active opposition he soon made his mark. Mr. Hugh Thurburn never failed, on occasions of difficulty, to place any correct statement before H.H. Said Pasha, who appreciated the sturdy qualities of Robert Jeffrey, and accorded to him the utmost confidence. At first the labour was excessive. The locomotive and carriage-shops at Boulac were but scantily provided with useful tools, and the distribution of the establishment was entirely without system; whilst the engines, carriages, and wagons were of many different types, as the Viceroy never hesitated to give an order to supply something for the unfortunate railway to any one who was merely presented to His Highness. Patient labour, however, eventually prevailed, and Jeffrey persuaded the authorities to adopt certain types of engines and rolling stock, and to adhere to them. In this vital principle, however, he was only partially successful. The next great difficulty was the conduct of the European drivers of the engines, who were of all nationalities, and generally inefficient. A staff of Englishmen was selected for the service, and sent over, upon good pay and under stringent rules; but the climate and the love of strong drink overcame them. Then, after trying everything in favour of his countrymen, Jeffrey proposed to H.H. the Viceroy to attempt to train native Arab drivers for the service. The suggestion was adopted, and it was agreed that Jeffrey should receive a premium of £100 sterling for every Arab driver he could train to pass the examination of a competent committee. The experiment was successful, and there are now only a few English drivers in the service.

At the time of the International Exhibition of 1862, Mr. Jeffrey accompanied H.H. Said Pacha, the Viceroy, to Europe, and selected many articles required for the Egyptian railway service. Soon afterwards the Viceroy died; but the merits of Mr. Jeffrey were too well established to permit him to be disturbed. Moreover, he had impressed H.E. Nubar Pacha, who then held the position now so efficiently filled by General Marriott, C.S.I., and who had long known him, with the valuable character of the services he could render; so that when an enlightened and liberal superior like H.E. Nubar Pacha was appointed Minister of Public Works, Mr. Jeffrey felt satisfied that every useful suggestion would be laid before H.H. Ismael Pacha, the present Khedive. Careful private reports upon the line and works were made by an engineer

who enjoyed the confidence of H.H. the Khedive. Improvements were effected in every branch of the service; the all-essential point of unity of type of engines and rolling stock was, as much as possible, enforced, and the railway assumed almost an European aspect. The energy and physical powers of Jeffrey were severely taxed, but he was equal to the occasion; and he had the satisfaction of finding that his services were recognised by increased remuneration, and in 1864 he received from H.H. the Viceroy the title of Bey.

Once, when the line was so blocked by cotton bales and other merchandise that an entire stoppage of the traffic was imminent, he was appealed to by H.E. Nubar Pacha. His response was to commence systematically with powerful gangs, to remain day and night upon the scene of action for upwards of a week, and not to leave until every bale was cleared away.

When an outbreak of cholera occurred, and the majority of the employés, workmen, and drivers abandoned the railway and the works, Jeffrey with his secretary, Mr. C. G. Harison, remained true to their trust. They rallied the few English drivers who could be found, reassured them by example, kept them up to their work, and maintained the passenger service of the line throughout that dreadful visitation.

Time and hard work in such a climate had, however, made certain ravages upon his naturally strong constitution, and when, in 1866, he resigned his appointment and returned to England, he was comparatively only the shadow of his former self. He, to a certain degree, regained his health and was enabled to travel frequently on the Continent, but the seeds of disease could not be got rid of, and at length, feeling more than usually unwell, he went to Manor Farm, Ilford, Essex, for change of air, and within a few weeks died peacefully on the 21st of December, 1877, in the arms of his only remaining son, Thomas Jeffrey, who had recently returned from Canada at the invitation of his father—his two daughters being in South America.

Mr. Robert Jeffrey was elected a Member of the Institution on the 3rd of December, 1861. He was a well-developed specimen of the good old-fashioned type of the British workman; strong physically and mentally, and determined to do his duty under all and any circumstances.

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