

Mr. Tanner was elected an Associate on the 6th of December, 1876. He died at Belput, on the Kandahar line, on the 29th of June, 1881, from heat apoplexy, after a few hours' illness, and was buried in the cemetery at Jacobabad. At the time of his death he had attained the rank of third grade executive engineer.

MR. HAMILTON ELA TOWLE was born at Lee, New Hampshire, on the 24th of June, 1833, and was the son of Mr. Gardner Towle, a prominent man in that part of the State. In 1848 he acquired his first interest in Civil Engineering by serving as general utility boy with a party making the surveys for the Portsmouth and Concord Railroad. Under these conditions he began his preliminary studies in mathematics with the view of becoming an engineer. In 1852, after having spent nearly three years in the office of Mr. W. Q. Dow, engineer of the basin and railway works constructed for the United States Government at Portsmouth navy-yard, as a pupil and assistant, he was engaged as first assistant at the basin and railway works, Pensacola navy-yard, where he remained for a year, when he resigned in order to study higher branches of engineering. After a few months' preparatory course under a private tutor, he entered the engineering school of Harvard University (known as the "Lawrence Scientific School"), from which institution he graduated with the degree of Bachelor in Science (B.Sc.) at the end of two and a half years. He then accepted the position of assistant engineer, with entire charge of the construction for the Government of Fort Montgomery, of one hundred and thirty-one guns (with pile foundations requiring the construction of cofferdams, and pumps, &c.), at the head of Lake Champlain, New York State, where he remained for two years.

In January 1857, he went to Austria, residing there during the construction of the dock basin and railway works at Pola, a period of three and a half years. He personally made all the designs and calculations for the contractors, Messrs. J. S. and A. H. Gilbert. Of this work Mr. Towle in 1871 presented a full account to the Institution, for which he received a Telford Premium.¹

After six months' travel and inspection of the seaports of Northern Europe, Mr. Towle, in the latter part of 1860, returned

¹ *Vide Minutes of Proceedings Inst. C.E.*, vol. xxxii., p. 65.

to America, and in 1861 again visited England and France on professional business. While returning to New York by the "Great Eastern" in September 1861, he was able to render valuable advice and assistance under the following circumstances. Consequent upon a great storm, the rudder-head had broken below the tiller, and the ship lay unmanageable in the trough of the sea. A "drag" or spar towed from the stern was of no avail in assisting to steer the vessel, when Mr. Towle suggested a device that was ultimately successful in causing the ship to answer her helm. Two 15-fathom lengths of the great chain cable were dragged aft: one end of each of these chains was made to take a turn round one of a pair of bollards and the other ends were similarly secured to the rudder-post; then, by slacking out a link on one side, and hauling in on the other, sufficient play was given to the rudder to keep the vessel fairly on her course. The ship was put about and entered Cork Harbour in safety nine days after leaving Liverpool. For this service Mr. Towle's fellow-passengers presented him with a gold watch, and the Life-Saving Benevolent Association of New York awarded him a gold medal and an address.

From 1861 to the time of his death Mr. Towle was in practice on his own account as a Civil Engineer, during which time he laid out and constructed a branch mineral railroad for the "Tilley Foster Iron Mines" of New York, and arranged a plan for working the mines, and designed and superintended the construction of an entirely new plant—consisting of pumps, steam-engines, narrow-gauge tracks, ore wagons, &c.; he likewise superintended the construction of the Mineola and Glen Cove branch of the "Long Island Railroad Company, New York." He was consulting engineer to the "New York Belting and Packing Company," and was frequently engaged in examining and reporting upon various machines. Mr. Towle invented and constructed many machines appertaining to the arts, among others a loom for weaving heavy fabrics, for the manufacture of which a company was started, known as the "United States Loom Company," of which he was the manager. He was elected an Associate of the Institution on the 5th of March, 1872.

In December, 1874, Mr. Towle went to South America in the interests of the Colombian Government to examine and report upon the bed of the Magdalena river. In 1877 his health broke down, and by the advice of his physicians he made a prolonged tour in Europe. Returning to New York in October 1878, he was soon after again compelled to cross the Atlantic. From this time he gradually grew weaker, and died on the 2nd of September,

1881, at the residence of his son-in-law, at Upper Norwood, near London, in his forty-ninth year.

Mr. Towle's predominant qualities were great inventive faculty, quick, ready ability to provide for sudden emergencies, and simplicity and thoroughness in the measures adopted for meeting them.

Mr. JOHN HAMILTON WICKSTEED, born at Leeds on the 21st of January, 1851, was the fifth son of the Rev. Charles Wicksteed, B.A., and nephew of the late Mr. Thomas Wicksteed,¹ M. Inst. C.E., the well known waterworks engineer. When young Wicksteed was three and a half years old, his father removed to Hafod-y-Coed, near St. Asaph, owing to failing health, and here his education was conducted till he was fourteen, when he was sent to University College School, London. Two years later he was articled to Mr. Edward Filliter, M. Inst. C.E., of Leeds, with whom he remained as pupil and assistant for ten years, and by whom he was employed on several works of water-supply and sewerage. While thus engaged he came under the notice of Mr. Hawksley, Past-President Inst. C.E., whose good opinion he secured, which proved invaluable to him during his ensuing brief career. When only twenty-six years old, Mr. Wicksteed received the appointment of resident engineer for waterworks to the municipality of Port Elizabeth, Cape Colony. As the inconvenience sustained at this place for want of water was very great (the commodity sometimes selling at 3*d.* or 4*d.* a quart), and as much disappointment was felt by the inhabitants at the miscarriage of some previous efforts to obtain a supply, Mr. Wicksteed lost no time in preparing himself for this undertaking. Landing at Port Elizabeth on the 29th of December, 1877, he had, within four hours of the vessel anchoring in the bay, seen the mayor and town clerk, and was in the saddle for a rough ride of thirty miles under a blazing sun, to the source of supply. The Government Hydraulic Engineer, Mr. John G. Gamble, M. Inst. C.E., residing at Cape Town, gave his entire approval to the plans and specifications prepared for the undertaking by Mr. Wicksteed, upon whom of necessity rested, almost individually, the execution. His personal supervision was minute throughout the progress of the work, the difficulty and strictness of which proved often very trying to the men. But Mr. Wicksteed had an easy

¹ *Vide* Minutes of Proceedings Inst. C.E., vol. xxxiii., p. 241.