and until within a few days of his death was engaged in professional duties connected with a limited private practice, which he had entered on after his retirement.

Devotion to duty was Mr. Johnstone's leading characteristic. As a parliamentary witness he was calm and collected, and he was much in request as a professional arbiter, for which his business, not less than his professional abilities, eminently qualified him.

In 1857 the Institution of Engineers in Scotland, now the Institution of Engineers and Shipbuilders in Scotland, was formed mainly through the exertions of the late Professor W. J. Macquorn Rankine and Mr. Johnstone, and he was elected President on the 4th of September, 1861, and held office for the two following sessions. He was elected a Member of the Institution of Civil Engineers on the 4th of December, 1866. He died at his residence in Glasgow, on the 27th of April, 1877, leaving a widow, two married daughters, and an only son, who is following his father's profession.

MR. THOMAS PAGE, the eldest son of Mr. Robert Page, solicitor, was born in London on the 26th of October, 1803, and passed his youth at Romaldkirk, on the banks of the Tees. He was educated for the sea service, but at the suggestion of the late Mr. Thomas Tredgold he studied civil engineering. His first employment seems to have been as draughtsman in an engine works at Leeds, where he remained for two years. He subsequently entered the office of Mr. Edward Blore, the Gothic architect, for whom he made a measurement of Westminster Abbey, discovering, during his researches, the passage leading from the transept to the crypt of the Chapter House. In 1835 he was appointed one of the assistant engineers on the Thames Tunnel works, then in progress under Sir Isambard Brunel as Engineer-in-Chief. On the retirement of Mr. Beamish, in 1836, Mr. Page became acting engineer, and, on the completion of the tunnel in 1842, received a vote of thanks in these words:—

"At a General Assembly of Proprietors of the Thames Tunnel Company, it was resolved—

"That the cordial thanks of this Assembly are due, and are hereby presented to Thomas Page, Esq., the Company's Acting Engineer, for the great ability and zeal devoted by him in the prosecution and completion of the Works of the Thames Tunnel.

"(Signed) BENJAMIN HAWES, *Chairman.*"

In 1842 Mr. Page made designs for the Thames Embankment from Westminster to Blackfriars, his plans entering into competition with those of Messrs. Walker and Burges, Sir Charles Barry, Colonel French, and others.

The Metropolis Improvement Commissioners, under the Presidency of the late Duke of Newcastle, having adopted Mr. Page's design, the Government established the Thames Embankment Office, in Middle Scotland Yard, in connection with the office of Woods and Forests, which was put under Mr. Page's control, who thenceforth became the Consulting Engineer to that department. A question having been raised as to the respective rights of the Crown and the Corporation of London to the bed and soil of the river Thames, proceedings were taken in Chancery, which resulted in an arrangement that no permission should be given by the Corporation for embankments or other works affecting the river until the plans had been submitted for the approval of the Crown, and in every case these were laid before Mr. Page to report upon. In the sequel, however, some difficulties connected with the coal dues prevented the execution of the proposed work, and deprived him of the opportunity of associating his name with the great work which has since become one of the chief ornaments of London.

In all cases in which railways or other works interfered with or affected Crown lands or property, Mr. Page was consulted, and such works were frequently modified in accordance with his suggestions. This was especially the case with that portion of the Southampton and Dorchester railway which passed through the New Forest, and of the Windsor branch of the South-Western line, through the Old Deer Park at Richmond and the Home Park at Windsor.

Mr. Page made a survey of the Thames from Battersea to Woolwich, and in his letter to the Earl of Lincoln, in January 1844, illustrated fully the tidal action of the river between Sheerness and St. Katharine's Docks. In 1845 Mr. Page prepared plans for bringing the principal lines of railway to a central terminus, to be built upon land proposed to be reclaimed from the Thames between Hungerford Market and Waterloo Bridge. This was to be effected by two schemes: one the "Great Western, Brentford, and Central Terminus railway," and the other the "Thames Embankment railway." The first started from Hungerford Bridge, and followed more or less the line of the present District railway as far as Kensington, and thence proceeded through Hammersmith, Brentford, and Isleworth, to the Great Western railway at Hanwell, thus bringing in the Great Western, and, by means of the line

from Wormwood Scrubbs to Kensington, the London and North-Western railways. The "Thames Embankment railway," starting from the Central Terminus, ran along the Embankment to Blackfriars Bridge, and thence to join the Blackwall railway terminus, in order to bring in the Eastern Counties line, with a bridge across the Thames nearly on the site of the present Blackfriars railway bridge, having branches right and left to connect the London Bridge terminus of the Brighton and South-Eastern lines and the Waterloo terminus of the South-Western railway. In the same year, in connection with the late Mr. Samuda, he designed a railway, to be worked on the atmospheric system, to connect the Brighton system with that of the Eastern Counties Company, by a line to pass through the Thames Tunnel and under the London Docks. He also prepared and deposited plans for a line of railway from Lincoln, through Horncastle to Wainfleet, with a branch to Boston. In 1846 he examined and reported upon the relative merits of Holyhead and Porth Dynllaen as packet stations for the Irish mail service, and he prepared plans for the construction of harbours at each of those places; also for docks at Swansea, for the construction of which an Act was obtained in the following session, after a strong opposition from the Swansea Harbour Trustees. In 1848–49 he designed and constructed new roads and bridges between Windsor and Frogmore, and built the Victoria and Albert Bridges, near Old Windsor, which greatly improved traffic facilities, and opened out a considerable area of the Home Park at the foot of the slopes for the use of the public.

At the instance of the Government Mr. Page prepared plans and estimates for the embankment of the southern side of the Thames, between Vauxhall and Battersea Bridges, including the construction of a public carriage road along the margin of the river, and the Chelsea Suspension Bridge across it, with a road therefrom leading to Sloane Square. These works were subsequently carried out under his direction. In May 1854 Westminster New Bridge was commenced, and was built in two sections to obviate the necessity of a temporary structure, the old structure remaining while the first half of the new one was built, and the second half being completed after the first was open to traffic. It was constructed without cofferdams or centres, and caused no interruption to the traffic by land or by water for a single hour. With relation to this work Mr. Page was examined at great length before the Select Committee on New Westminster Bridge, Messrs. Simpson, Rendel, and R. Stephenson being also examined in opposition. The result, however, was the bridge now spanning

the river at the Houses of Parliament. His plan for Blackfriars Bridge, for which he was invited by the Corporation of London to send in a design, in competition with seven others, was accepted and recommended for adoption by the Committee of the Bridge House Lands, but by a vote in the Common Council Mr. Cubitt's was afterwards adopted. The Lendal Bridge at York, and the bridge at Thornton were also designed and executed by Mr. Page. He was engineer for Wisbeach, and one of his most able and important reports was written in 1860, with reference to that town. In it he proposed to widen and improve the river Nene, from Peterborough to the sea, and by advocating it successfully in Parliament he is credited with having saved the port of Wisbeach from partial destruction. As Engineering Surveying Officer he held courts, and reported upon proposed improvements for Cheltenham, Taunton, Liverpool, Falmouth, Folkestone, and Penzance, and in conjunction with Sir John Rennie, he reported to the Corporation of London on widening London Bridge; and again on the treatment of the Thames as a navigable river. In 1859 he prepared a most careful and exhaustive report upon the eligibility of Milford Haven for ocean steamships, and as a naval arsenal. Mr. Page interested himself largely in all naval matters, especially gunnery; and amongst other contrivances he invented a system for firing guns under water. In 1853, in connection with Dr. Arnott, he made a report, ordered by the Secretary of State, on the prevalence of disease at Croydon, and on the plan of sewerage. In 1867 he inspected various canals in the South of France, and reported on them. In 1870 he read a Paper before the Society of Arts on the submarine tunnel between England and France, in which he proposed a submerged tube.

Besides the bridges which Mr. Page constructed, and which have been alluded to, he made numerous designs, amongst which may be mentioned one for a bridge of one arch to span the Thames at the Tower, and others for bridges for crossing the Golden Horn at Constantinople, the Rhine at Cologne, and the Danube at Pesth.

Mr. Page was elected an Associate of the Institution on the 2nd of April, 1833, and was transferred to the class of Member on the 18th of April, 1837. He died suddenly at Paris on the 8th of January, 1877, in his seventy-fourth year.

MR. EDWIN BARTON was born at Wath, in Yorkshire, about the year 1831. His father, who conducted a school for the sons of