

and he seemed to feel a pleasure in materially aiding those that needed help. His charity was liberal, without a particle of ostentation, and discriminate, without a tinge of selfishness. In religious belief Mr. Field was a Nonconformist, but of such enlarged Christian views, that he frequently contributed to churches and schools in connexion with the Establishment. Few, indeed, were the cases of private or public want brought under his notice that he did not readily, and often liberally, respond to; and as a short summary of his character, it may be said, that he was a truly good man in private life and a great man in his professional career.

---

MR. JOSEPH GLYNN, F.R.S., was a native of the North of England, whence have proceeded so many men eminent in mechanical and engineering pursuits. He was the son of Mr. James Glynn, of the Ouseburn Iron Foundry, Newcastle-upon-Tyne, and was born in Hanover Square, in that town, on the 6th of February, 1799. To Mr. John Bruce, of the Percy Street Academy—himself a mathematician of considerable attainments, who taught the rudiments of mathematics to the late Robert Stephenson, and who turned out many pupils attaining eminence in many walks of life—is due the credit of the intellectual training which afterwards enabled Mr. Glynn to apply to useful purpose the mechanical talents which seemed to be innate rather than to have been acquired by after education. Mr. Glynn's career was nearly cut short in early life, by an accident which exercised much influence in turning his mind in a direction where it was afterwards most actively employed. His father was also a shipowner; and in a schoolboy visit to one of his father's ships, Joseph, with two of his brothers, was severely burned, and otherwise injured, by an explosion of gunpowder. He made several voyages to sea to recover his health, and thus acquired a knowledge of seamanship and of the construction and qualities of sea-going ships, which he afterwards turned to good account. He continued at the Ouseburn Foundry, as his father's assistant, until the year 1820, when he executed his first engineering work, which was the erection of a steam-engine for the Earl of Carlisle, to drain the Talkin Colliery, near Brampton, Cumberland. He was assisted in the execution of the work by two young mechanics, then workmen, who have both since attained great eminence, the late Sir Peter Fairbairn and Mr. Robert Hawthorn (M. Inst. C.E.) In the following year, 1821, the introduction of coal gas having rendered the inhabitants of Berwick-upon-Tweed discontented with the old system of lighting, Mr. Glynn was called in to design and execute the gas works for that borough, and from 1821 to 1859 the establishment served its original purpose without altera-

tion. The success of the Berwick Gas Works was so complete, that he was applied to soon afterwards by the inhabitants of Aberdeen to design gas works for that city, and he furnished reports and plans, though his other engagements prevented him from superintending their execution—he having, in the interim, become Engineer to the Butterley Iron Company, Derbyshire.

From that time Mr. Glynn's individual reputation almost merged into that of the Butterley Company, with which for more than a quarter of a century he was intimately connected. At that period the marine steam-engine, though a sturdy infant, gave little promise of the giant stature to which it has since grown. Steam vessels, which have since been eclipsed by the later achievements of science, industry, and skill, were then new and hazardous experiments, requiring boldness to undertake and sagacity to plan. Steam navigation was represented by a few Thames steam-boats, gradually but successfully competing with sailing ships and barges, and ocean navigation by steam, though it had been attempted, had not extended widely; stationary engines of small power were employed in drawing to the surface of the earth its buried treasures, from depths which were then thought formidable, but which are now insignificant. The dimensions of these Mr. Glynn gradually increased until they reached 200 H.P. The locomotive was struggling into being, through the efforts of Trevithick and Brunton, and was being matured in the brain of George Stephenson. In his visits to Killingworth, with his schoolfellow, Robert Stephenson, young Glynn "sat at the feet of Gamaliel," and the seed sown in these interviews afterwards ripened into works of solid practical utility. The Butterley Company undertook and executed works, of whose merit it will never be known how much was due to their Engineer, and how much to them as contractors. Following the example of the late Mr. John Rennie, to whom is due the merit of the great introduction of cast iron into structures, and who drew his supplies chiefly from the Horseley Iron Works, then belonging to the late Mr. Aaron Manby, the great Engineers of that day found useful auxiliaries, in the extensive resources of the Butterley Iron Works. Sir John Rennie (Past President Inst. C.E.) was at that time employed by the Government to complete the Royal Naval Establishment at Sheerness, and Sir Edward Banks undertook the works as contractor for a sum of nearly one million sterling. A great part of the ironwork for this extensive contract was executed at Butterley. The same engineer and contractor undertook the building of the new London Bridge, and the steam machinery for keeping out the water, while the works proceeded, was supplied from the same source, which had already furnished the ironwork of Vauxhall Bridge, over the

river Thames, erected from the designs of the late Mr. James Walker (Past President Inst. C.E.); for at that time large ironworks, capable of executing extensive contracts, were few, and the great industrial establishments which have since sprung up for the manufacture of machinery had no existence.

The General Steam Navigation Company, after a severe struggle, in which Sir Edward Banks and his partner, Mr. William Jolliffe, took an active part, finally succeeded in establishing their merchant navy; and though they have since been surpassed by larger and more powerful bodies, supported by the public purse, they were the pioneers of this new arm of civilization. The 'George IV.' and the 'Duke of York,' made their first voyages to Lisbon in 1826, with great success. The late Mr. Joseph Miller (M. Inst. C.E.), afterwards the partner of the late Mr. Barnes (M. Inst. C.E.), and the head of the well-known firm of Messrs. Miller, Ravenhill, and Salkeld, who was Mr. Glynn's predecessor at Butterley, had previously built some very good marine engines, and had commenced those of the 'Lord Melville,' which were completed by Mr. Glynn; this vessel was followed by the 'Earl of Liverpool,' the 'Attwood,' the 'Sir Edward Banks,' the 'City of London,' the 'Royal Sovereign,' the 'Brocklebank,' and the 'Ramona,' for all of which the engines were designed by Mr. Glynn. The Gainsborough and Hull packet, and the 'Trent,' plying on the Humber, were also the precursors of a system of river navigation by steam for the conveyance of merchandize, which the 'Rob Roy,' with engines designed by him, carried to Hamburgh.

The engineering skill of Mr. Glynn was also called in from time to time to repair and reconstruct several steam vessels built elsewhere. The 'Victoria,' of which the boilers twice exploded, killing nine men on the former and six on the latter occasion, was rendered a seaworthy vessel by his alterations. The 'Harlequin,' the 'Columbine,' the 'Superb,' the 'Hilton Jolliffe,' the 'Rapid,' the 'Talbot,' the 'Belfast,' the 'William Jolliffe,' and the 'Mountaineer,' all passed under his hands, and were altered and made effective by the Butterley Company. The 'Firefly,' and the 'Firebrand,' for the English navy, and the 'Jason,' and the 'Colchis,' for the Russian Government, were fitted with engines from his designs, as were the 'Nicholas I.' and the 'Alexandra,' the first steamers from Lubeck to St. Petersburg under the Russian flag. The Butterley Company also fitted out steam dredging vessels, for the State of Lubeck, for the Hanoverian Government, and others. The iron roofs, mills, and heavy machinery, which were executed from Mr. Glynn's designs, and which were despatched from Butterley to all parts of Europe, to the colonies, the East and West Indies, and the continent of America, bore testimony to his industry, as well as to the fertility

of his invention, though his modest labours seldom came before the world. About this time he sent out to Spain a complete iron work, executed for Don Manuel Heredia, of Malaga, which subsequently became the parent of many others. The number of powerful steam-engines made at Butterley for mining purposes was very considerable; one of these, a winding engine, was erected at Leasingthorne Colliery, near Ferry-hill, for the Durham County Coal Company. Mr. Glynn was an advocate for the use of water as a moving power, and he erected some water-wheels of large dimensions. His name, however, will be chiefly associated with the employment of the water-wheel or scoop-wheel, as it is called, for draining marshes and fens by steam power. A water-wheel driven the reverse way by a steam-engine, where the object is to lift a large quantity a short distance, has been found in many localities superior to any system of pumps; and this plan was used by Mr. Glynn with great success in the fen country in England, and also in Hanover and Holland, a 'polder' near Rotterdam having been thus drained. He was in correspondence with his late Majesty the King of the Netherlands, concerning the application of this system to the Lake of Haarlem, when the abdication of his Majesty transferred the execution of the project to other hands, and it has since been successfully carried into effect by pumping engines, erected from the designs and under the direction of the late Mr. Joseph Gibbs (M. Inst. C.E.), and Mr. Dean. Mr. Glynn also drained by steam power the following districts, amounting to many thousand acres:—Deeping Fen, near Spalding, Lincolnshire; Misterton Soss, with Everton and Grindley Cars; Littleport Fen, near Ely, Cambridgeshire; Magdalen Fen, near Lynn, Norfolk; Middle Soham Fen, Cambridgeshire; Soham Mere, Cambridgeshire; Sutton and Mepal, near Lynn, Norfolk, altered by him in 1861; Waterbeach Level, Cambridgeshire; March District; March West Fen, Cambridgeshire; the Bennimoor District, Mildenhall, Suffolk; and Lakenheath, Suffolk. For all these works the Butterley Company manufactured the engines from his drawings. Also for the Hammerbrook drainage, near Hamburgh, of which Mr. Lindley (M. Inst. C. E.), was the Engineer, under the Hamburgh Government.

Mr. Glynn likewise executed some drainage works by steam power in the colonies, one of which, fulfilling a double purpose, was erected in British Guiana; drainage in the wet season being combined with irrigation in the dry season. His drainage works in the counties of Cambridge, Norfolk, Suffolk, Lincoln, and York were extensive and successful. Mr. Glynn also designed and constructed, from his own designs and those of other engineers, many iron bridges, among which may be mentioned Haddlesey bridge, between Doncaster and Selby; for the Dean and Chapter of Ely Cathedral,

an iron bridge at Ely ; that across the Cam at Gerrard's Hostel, Cambridge, from designs by the late Mr. Mylne (M. Inst. C.E.), after the celebrated bridge (Ponte della Trinita) at Florence ; also, from the designs of the late Mr. Walker (M. Inst. C.E.), the lifting bridge at Selby, on the line of the Hull and Selby Railway.

In an age when the construction of railways frequently amounted to a mania, and the desire to extend them gave rise to speculations of the wildest and most unprofitable character, Mr. Glynn could not be expected to remain a silent and unconcerned spectator of the rapid development of steam communication by land. He was concerned with Mr. Jessop in setting out the Midland Counties Railway, and took an active interest in its affairs, with the working of which in the neighbourhood of Derby he was well acquainted. He was a member of the committee by whom the purchase of the Great North of England Railway was negotiated for what is now called the North Eastern Railway Company. He was the Secretary of the Committee of Investigation into the affairs of the Eastern Counties Railway, and when, in consequence of the report of that Committee, Mr. Hudson and Mr. Waddington resigned, and Mr. E. L. Betts (Assoc. Inst. C.E.), was appointed chairman, Mr. Glynn was elected deputy-chairman of that company. On the retirement of Mr. Betts, shortly after, from the active duties of the board, in consequence of an accident which threatened to deprive him of sight, Mr. Glynn filled the office of chairman for two years.

Mr. Glynn was elected a Member of the Institution of Civil Engineers on the 22nd of April, 1828, and he contributed several Papers to the Meetings ; among those which excited peculiar interest may be mentioned the following :—On the 22nd of June, 1847, “A Review of the Plans which have been proposed for connecting the Atlantic and the Pacific Oceans, by a Navigable Canal.”<sup>1</sup> The Emperor of the French, then Prince Louis Napoleon, having written on the subject, was invited to be present at the reading of the Paper, and to take part in the discussion, when he made an excellent speech, which is recorded in the Minutes of Proceedings. Also, on the 20th of May, 1851, “On the Isthmus of Suez and the Canals of Egypt,”<sup>2</sup> which drew from the late Mr. Robert Stephenson a very interesting account of his travels in Egypt, and his views with respect to the projected canal of the Isthmus of Suez. For the former of these communications a Telford Medal was awarded, and for the latter a Council Premium of Books—marks of distinction which were very highly prized by

<sup>1</sup> *Vide* Minutes of Proceedings Inst. C.E., vol. vi., p. 399.

<sup>2</sup> *Ibid.* vol. x., p. 369.

Mr. Glynn. He had previously contributed several other useful Papers,<sup>1</sup> which are published in the Minutes of Proceedings, and he frequently took part in the discussions.

The Gold Isis Medal of the Society of Arts was voted to Mr. Glynn for a communication dated 8th February, 1836, on his application of Steam Power to Draining Fens.<sup>2</sup> This Paper was republished in French; it was also translated into German, by Herr Blohm, Engineer of the Hanoverian Government, and was published in Hanover, and at Mecklenburg; it was likewise translated into Dutch, and published in Holland. Descriptions of cranes for the Royal Dockyard at Woolwich were contributed by Mr. Glynn to the Professional Papers of the Corps of Royal Engineers,<sup>3</sup> as well as other useful and valuable writings. The want of similar publications which he had experienced in his youth had made him feel the shortcomings of many scientific works, and his object in writing was rather to produce a handbook for the daily use of the mechanic and the artizan, than an elaborate treatise of little practical use.

He contributed to Mr. Weale's Rudimentary Series "A Treatise on Cranes," of which work 30,000 copies have been sold, and it has been translated into nearly every European tongue. His "Treatise on the Power of Water" has met with nearly equal success, and has put within the reach of the practical millwright and the mechanical engineer, the information which a few years since was confined to the abstract mathematician.

On the 16th November, 1836, Mr. Glynn was elected a Member of the Society of Arts, and subsequently a Member of the Council, and a Vice-President. He was at the same time elected an Honorary Member of the Literary and Philosophical Society of Newcastle-upon-Tyne, being the only person upon whom the Society had ever conferred this privilege. On the 8th February, 1838, he was elected a Fellow of the Royal Society.

The opinion of Mr. Glynn, as a sound practical man, was much valued by the profession, and his evidence was sought in many cases of disputed patents; his judgment in the arbitration and settlement of disputes where mechanical matters were concerned was highly esteemed. He was examined before the Royal Commission on the use of iron for railway structures, and reported on the overland route to India, and the competing scheme of the

<sup>1</sup> These are—"Description of a Sawing Machine for cutting off Railway Bars," read March 26, 1839; "On the Use of Mica, as a substitute for Glass, in the Windows of Workshops," read March 31, 1840; and "On the Causes of the Fractures of the Axles of Railway Carriages," read April 23, 1844.

<sup>2</sup> *Vide* Transactions of the Society of Arts, &c., vol. li.

<sup>3</sup> *Vide* "Papers on Subjects connected with the duties of the Corps of Royal Engineers," vol. iv., p. 221, and vol. v., p. 194.

[1863-64. N.S.]

Euphrates Valley, and gave evidence before committees of the Lords and Commons on various railway and other projects.

He died in London, on the 6th of February, 1863, aged 64, having gained the confidence of his professional brethren, and the warm esteem of a large circle of private friends.

**MR. MARK JONES** was elected a Member of the Institution of Civil Engineers on the 4th of December, 1849. Previous to that date he had, according to the statement of qualifications inserted in the form of application for admission into the Institution, "after serving a regular period of pupilage as a mechanical engineer, entered the service of the Honourable East India Company, and for sixteen years was the Chief Superintending Engineer of the Government Steam Foundry, Calcutta." His death occurred at Oldbury, near Birmingham, early in the year 1863, when in the 59th year of his age; but it has not been possible to obtain any other particulars.

**CAPTAIN WILLIAM SCARTH MOORSOM**, the third son of the late Sir Robert Moorsom, was born, in the year 1804, at Upper Stakesby, the residence of his father, near Whitby, in Yorkshire. Being intended for the army, young Moorsom entered the Royal Military College, at Sandhurst, in 1819, and quickly rose to a high position among the cadets of that establishment, chiefly in consequence of his attainments in fortification and military surveying. On the 14th of June, 1822, he was presented with a sword by the gentlemen cadets of his (C) Company, "as a token of their sincere regard and esteem." After passing examinations in double courses of the highest classes, he joined, in the following year, the 79th Regiment, then stationed in Ireland; and, while pursuing the ordinary duties of the garrison in Dublin, he found time to make a trigonometrical survey of the whole of that city and neighbourhood, extending over an area of about 150 square miles. This survey was the one used in the Quartermaster-General's office, at the Horse Guards, until it was superseded by the large Ordnance Survey of Ireland. Having, through this work, been brought under the notice of the Adjutant-General (Sir H. Torrens), a lieutenantancy, by purchase, in the 7th Fusileers, was soon offered to him. Shortly after he joined that regiment, he was ordered to the Mediterranean, and four companies were formed into a reserve, the adjutancy of which was given to Lieutenant Moorsom. On the promotion of its Colonel, Sir Edward Blakeney, to be Major-General, the 7th Fusileers were placed under the command of Lord Frederick Fitz-Clarence, who, upon Lieutenant Moorsom quitting the regiment on promotion to an unattached company,