

way from any over-estimate of his own ability, nor from any incapacity of working smoothly with those around him, for few men were more heartily genial and sympathetic, and ready to take suggestions into fair consideration; but he was eminently an enthusiast, and would struggle to the last in favour of what he had arrived at as the fit thing: witness his action in the question of changing the gauge of the Punjab Northern State Railway. His pleasant, manly bearing and genial temper made him extremely popular all around, whether in business or socially.

---

JAMES ROBERTSON, the son of a Scotch farmer, was born at Blair Athol, Perthshire, on the 16th of February 1818. He was educated at the High School at Perth. At the age of fifteen he entered the office of the late Mr. Alexander Mitchell, then practising as an engineer and surveyor at Perth, where he acquired the first rudiments of his profession.

At this time the late Mr. Joseph Mitchell, who had been appointed Government Engineer for the construction and opening out of new public roads through the north of Scotland, having seen young Robertson at his brother's office, offered to take him as a pupil, and accordingly in 1834, when sixteen years of age, he entered that eminent engineer's service. In a country where the rivers were large and numerous, where trickling mountain streams were liable to become fierce and swollen torrents in a few hours, and where the contour of the land was rugged in the extreme, the difficulties of road construction were naturally very formidable. Into this work young Robertson entered with indomitable energy and perseverance, and soon became noted for the care and accuracy with which he carried out any work entrusted to him, as well as for the skill and neatness he displayed as a draughtsman.

In 1838 he became connected with his first piece of railway work, being appointed, at the age of twenty, assistant to the Resident Engineer, the late Mr. Thomas Telford Mitchell, to supervise the construction of the Slamannan Railway from Coatbridge to Manuel, now forming part of the North British system, the late Sir John Macneill being the Engineer-in-Chief, and during that time he was also engaged on the survey for the extension to Boness on the Firth of Forth.

When the Slamannan Railway was completed, at the end of 1840,

Mr. Robertson obtained a situation in the Mining Estate Office at Dudley; he found, however, that, contrary to his expectation, his work lay chiefly underground, which, in addition to being distasteful to one who had hitherto passed a more than usually free and open life on his native mountains, affected his health, and he therefore decided to abandon it at once and try his fortune in London. His father, who was in easy circumstances, hearing of his intention and the state of his health, wanted him to return home, but Mr. Robertson was of too enterprising a nature to do that, and accordingly to London he went in May 1841, knowing no one there and with only slender means at his command.

He was obliged to content himself with a situation as one of the assistants to the Superintendent in the outdoor department of the Locomotive Works of the London and South Western Railway Company at Nine Elms, which placed him in a sphere of occupation, less genial to his taste than he had been brought up in. He remained there for three-and-a-half years, acquiring a very practical insight into the construction, working, and management of locomotive engines and other rolling stock, an experience which he often said was of the greatest value to him afterwards, when holding responsible positions in the working of railways.

In the Autumn of 1844, the late Mr. Joseph Locke, M.P., Past President Inst. C.E., found himself burdened with an unusually heavy parliamentary session, and in need of more assistants to help in the preparation of the surveys and plans to be lodged that year. He therefore applied to Mr. John V. Gooch, the Locomotive Superintendent of the London and South Western Railway, to lend him any one in his service who could be of use on such work. Among those selected was Mr. Robertson, and so satisfied was Mr. Locke with the way in which he carried out his work, that after the deposits for that year had been made, he kept Mr. Robertson engaged on other matters, and shortly afterwards took him on his staff.

In March 1845, owing to his recent mechanical training, Mr. Locke sent Mr. Robertson to Ireland to examine and report on the working of the Atmospheric Railway between Dublin and Kingstown, and later on he used frequently to watch the experiments and working of the London and Croydon Atmospheric line. Attention was given to this system, because in the memorable contests which took place between the Great Western and South Western Companies for the Devon and Cornish traffic, Mr. Brunel proposed to work some at least of his lines on the atmospheric principle, and Mr. Locke held that this system would be a failure.

Under Mr. Locke's guidance, Mr. Robertson soon developed the talent he possessed for selecting the best routes for railways through new country, and was constantly employed on the numerous projects that emanated from the office of his chief. In 1845, he laid out the London and South Essex Railway (55 miles), starting from Bow on the Blackwall Railway, and terminating at the mouth of the River Crouch on the East Coast, with branches to Tilbury and Southend, but this line was rejected by the House of Lords on the assumption that there was not enough traffic in the district to warrant its construction. As a somewhat curious incident it may be mentioned that he lived to see, forty years afterwards, extensions of the Great Eastern Railway, and the London, Tilbury and Southend Railway carried through very much the same district he had formerly advocated. He was also engaged this year in the laying out of the Romsey and Redbridge Railway, the Basingstoke and Salisbury Railway, the widening of the Blackwall Railway Viaduct, and assisted in the completion of the survey for the Winchester, Southampton and Poole Railway. He also investigated the method to be adopted for passing the proposed London and South Essex Railway traffic over the Blackwall line, at that time worked by ropes and stationary engines.

In the early part of 1846, he was directed by Mr. Locke to lay out the Exeter, Yeovil and Dorchester Railway, and he finally made a deposit of that line, which, with its branches to Sidmouth, Chard, Bridport, &c., represented a total of 93 miles. The fight over this line (Session 1847) was one of the celebrated contests of the olden time. The Great Western and the South Western Companies each deposited schemes, in November 1846, from the neighbourhood of Yeovil to Exeter with branches to various places. The Great Western Railway had as leading counsel the celebrated Talbot and Serjeant Wrangham, while Mr. Cockburn (afterwards Sir Alexander Cockburn, Lord Chief Justice of England) appeared for the South Western. The closing speech of the latter lasted six days.

Victory rested with the South Western Company, and their opponents' bill was thrown out. There was no time to carry the Bill through both Houses that year, and with others it was specially carried forward to 1848, when it finally passed. In the sequel, the powers obtained were suffered to lapse, in the bad times which followed the railway mania.

Other projects and surveys, on which Mr. Robertson was engaged in 1846, were the Cornwall and Devon Central Railway, the South Western and Oxford Junction Railway, from Overton

through Newbury to Didcot, the Epsom and Staines Railway, and the Guildford and Portsmouth Railway. In 1847, in addition to looking after the schemes already in hand, some of the fresh works he was employed on were the Epsom branch of the South Western Railway, the Exeter and Cowley Bridge Railway, the Godalming and Chichester Railway, and the London and Oxford Railway, which was a bold scheme in opposition to the Great Western, for a line from the South Western system near Brentford, passing through Hanwell, Uxbridge, High Wycombe and Thame. He was also engaged on the London Bridge Extension, a proposal of the South Western to build a station close to the River Thames, near the Borough Market; upon Poole Station enlargements, the Southampton Dock Extension Railway, the Portsmouth and Fareham deviations; and he had the privilege of assisting in collecting and preparing particulars for Mr. Locke's evidence, and Mr. Brunel's cross-examination in the famous controversy on the question of Gauge.

Other projects which passed through his hands later were the Padiham Branch of the East Lancashire Railway, the Metropolitan Extension of the South Western Railway, the Godalming Extension, the Weymouth Branch, and the Royston and Hitchin Deviations. During these years he was constantly giving evidence before Parliamentary Committees.

In 1848, Mr. Locke was called in to advise the Directors of the East Lancashire Railway, who had fallen into a dispute with their contractors, in which an outlay of over a quarter of a million was involved, and he sent Mr. Robertson to report upon the condition of the line, and then deputed to him the task of measuring up and valuing the whole work. Some idea of the amount of labour this required will be realized from the fact, that the arbitration was not concluded till five years afterwards, and that the examination of Mr. Robertson, who had then left Mr. Locke's service, lasted six days. The following year he went as Resident Engineer to expedite the works on the Farnham and Alton, and the Guildford and Godalming lines, and when they were opened, to supervise the completion of the Aberdeen Railway, then in course of construction, undertaking the measuring up and settlement of the accounts with the various contractors, which in some cases were a matter of arbitration. He was also engaged at this time in laying out the Deeside Railway, for which he gave evidence before Parliament.

At this time the mania for making railways had ceased, and Mr. Robertson, not seeing much prospect of further demand for the services of his profession, determined to turn his attention to the

supervision of lines that were at work. In April 1851, at the age of thirty-three, he obtained the post of General Manager and Secretary, on the Glasgow, Paisley and Greenock Railway. Thus ended his career with Mr. Locke—a chief for whom he entertained the greatest admiration and respect; nothing gave him greater pleasure in the closing years of his life than to be present at the annual dinner at which Messrs. Locke and Errington's old assistants meet, and with his associates there recall the memory of the happiest and most interesting period of his life.

The Greenock line was in good order, paying a small dividend, and could have been much improved had not the imminent prospect of its amalgamation with the Caledonian Railway prevented the directors spending more than was absolutely necessary on it; and when, hardly more than six months after his appointment, this arrangement was actually accomplished, his occupation as Manager died out, and he remained as Secretary only, with no scope to carry out any improvements or enterprises. This was no employment for a man of his ability and energy, and he never rested until, in November 1852, he obtained the appointment of Manager to the Edinburgh, Perth and Dundee Railway Company, in succession to Mr. Archibald Scott, who had left it in order to join the London and South Western Railway Company. On his retirement he received a vote of thanks from the Directors of the Greenock Railway, for the way in which he had conducted the settlement with the Caledonian Railway, and the ability displayed in safeguarding their interests.

The Company with whom Mr. Robertson now found himself was in a very bad financial condition at this time, the line, from its position joining no important place north or south, except by the two ferries of the Forth and Tay, being a hopeless one to work successfully as an independent concern. However, into this new sphere of action Mr. Robertson threw himself with indomitable will and energy, and had the satisfaction, in February 1856, of seeing his labours rewarded by the company declaring its first dividend. In addition to the onerous task of conducting the policy and superintending both the passenger and goods traffic, for some considerable time he also carried out the duties of engineer, looking after the permanent way, engines, harbours, dockyards, workshops and steamers belonging to the Company, where he encountered so very lively an experience in the maintenance of the ferry-boats, that he always regarded steamboat traffic afterwards as a very expensive source of revenue, producing anything but satisfactory returns.

The tremendous competition between the various companies in England and Scotland, for the traffic passing between the two countries, had become at this time so ruinous to all, that in 1855 the first serious attempt was made to come to some agreement between them as to the proportion each should receive. A large general meeting of directors and managers was held at the Railway Clearing House in London, on the 20th of March, 1855, which resolved, "That in the opinion of this meeting the time has arrived when it would be expedient to endeavour to effect a settlement of all the traffic comprehended in the Sextuple and Octuple agreements, and otherwise between England and Scotland," and a committee of eight general managers called afterwards "the Octuple Committee" were appointed to try and carry that resolution into effect. Mr. Robertson was one of those chosen, and at this distant date it is interesting to learn that his colleagues were Captain Huish, of the London and North Western (Chairman of the Committee), Mr. Robert Sinclair, of the Caledonian, Mr. Seymour Clarke, of the Great Northern, Captain O'Brien, of the North Eastern, Mr. (now Sir James) Allport, of the Midland, Mr. Latham, of the Edinburgh and Glasgow, and Scottish Central Companies, and Mr. Stirling representing all the lines north of the Tay. This committee met for the first time on the 11th of April, 1855, and after holding eighteen meetings was able to report, on the 6th of July, that its labours had been so far successful, that it had come to the resolution of reporting to the Boards of the respective Companies concerned the progress made. Judged by the light of time this view would appear to have been somewhat sanguine, as even now it would be hard to say that the questions at issue are finally settled. But to Mr. Robertson, and those associated with him, belongs the credit of having laid the foundation of the arrangements upon which this complicated matter has been from time to time adjusted and solidified.

It was inevitable that the Edinburgh, Perth and Dundee Company should be amalgamated with some of the larger companies near it, and therefore most dispiriting was the management of a line placed in such a defective position; nevertheless Mr. Robertson kept working away in his steady fashion, making some progress but not enough, from the nature of the case, to satisfy an earnest man longing heartily for a more congenial post. In 1856 a quasi amalgamation came with the Scottish Central and the Edinburgh and Glasgow Railways, in the shape of a working agreement, and his appointment became void. Mr. Robertson's directors were loth to lose him, but the preponderating influence

of the larger companies carried the appointment and their own manager with it, and the only thing that remained was to pass a resolution of the Board to that effect, bearing testimony also to their unanimous approval and appreciation of the way Mr. Robertson had fulfilled his duties during his term of office.

At the suggestion of his old superintendent Mr. John V. Gooch, then at the Locomotive Works at Stratford, Mr. Robertson was induced to apply in February 1856, at the age of thirty-eight, for the position of Superintendent of the out-door and passenger traffic on the Eastern Counties Railway, with which were included the Northern and Eastern, the Norfolk, the East Anglian, the Newmarket and Eastern Union Railways. About this time he also made an application for the post of Superintendent on the Great Western Railway, carrying the negotiations so far as to have an interview with Mr. Saunders, then Secretary of the Company. However, on the 2nd of April, 1856, he was appointed by the Directors of the Eastern Counties Railway, of whom Mr. David Waddington, M.P., was at that time Chairman, to the situation he had applied for, which he retained up to the time of his death, a period of thirty-three and a half years.

He had now entered on a field where there was unbounded scope to bring into play all the resources that his varied experience could command, as well as all the energy and ability he so largely possessed. He came to the railway when its future looked well nigh hopeless and blank, when each of the several companies interested in it had their own board of directors with local interests of course paramount; unenviable indeed was the notoriety it possessed for accidents, unpunctuality and the accommodation it afforded its passengers in the shape of carriages and stations; in fact it is hardly too much to say that it was a by-word for all that was uncomfortable and disagreeable in railway travelling. To put an end to this discreditable state of affairs, to place the working of the traffic on a sound and efficient basis, and to restore to the line the confidence of the public was the herculean task that Mr. Robertson set himself to perform, and right well and ably did he accomplish it. He was among the first to appreciate the benefits to be derived from the use of the block system, and the interlocking of points and signals, giving the most careful and painstaking attention to bring the development of those ideas to a practical issue, a work involving the greatest care and responsibility to ensure that his company should be advised as to the best and most reliable means to be employed. He was one of the witnesses called before the Committee of the House of Lords appointed, in 1873, to

inquire into the Regulation of Railways, with a view to the prevention of accidents, of which the Duke of Somerset was Chairman, when he was able to state that the Great Eastern Railway had been one of the first Companies to introduce those systems twelve years previously in 1861.

In 1862 the various lines in the eastern counties became amalgamated under the title of the Great Eastern Railway, Mr. Horatio Love being the first Chairman; and henceforth the results of the good order introduced by Mr. Robertson began to appear in the improvement of the working, and more especially in the immunity of the line from accidents, for, in drawing up a report for the Directors in December 1873, he could say that for eight years, from 1864 to 1871, no passenger was killed from causes beyond his own control on the line, in 1872 only one, and in 1873 again not one. That such an eminently satisfactory result should have been obtained, speaks volumes for the way in which Mr. Robertson had imbued all around him with his own spirit of discipline, regularity and earnestness of purpose. No more satisfactory climax to these labours could have been afforded than the reading to him, barely twenty-four hours before his death, of the statement which had appeared in *The Times* newspaper a few days previously, asserting on good authority that in the matter of punctuality the Great Eastern Railway stood first and foremost of any line in the country.

Shortly after the amalgamation, the Great Eastern Railway Directors embarked, under the guidance of Mr. Robert Sinclair as Engineer, upon the scheme for their metropolitan extensions, and the removal of their terminus from Bishopsgate to Liverpool Street, that gentleman being succeeded by the late Mr. Edward Wilson, to whom it fell to carry out these large and important works. Mr. Robertson's former experience as a civil engineer now became of the greatest assistance, and the plans for the construction of any part of the line affecting the traffic, such as the arrangement of station buildings and yards, the accommodation to be provided for passengers and goods, and the laying out of all junctions, had in every case to receive his assent and signature before they could be carried out. The whole arrangement of the lines, sidings, platforms, booking-offices, &c., of the Liverpool Street terminus, perhaps the busiest station in London, and certainly one of the most difficult to master, were all carefully considered and put into working order by him, with a measure of success which no one, as he averred, unacquainted with the requirements of a civil engineer's training could possibly have achieved; but entailing

such a vast amount of extra work as to quite affect his health at the time. In the same manner he also took part in the construction of the Great Northern and Great Eastern joint lines from March to Doncaster.

To the signalling, throughout the whole line, he gave the most assiduous care, his arrangements for difficult junctions and yards having called forth special commendation from the Government Inspector on more than one occasion. He always considered it the most important element in the safe working of the traffic, would allow no one to share the responsibility with him, and was most careful in his selection of signalmen.

In March, 1865, he was offered by Mr. Seymour Clarke, then General Manager of the Great Northern Railway, the post of Superintendent of that line, but Mr. Robertson's Directors, recognizing the value of his services, acknowledged them in such a substantial way as left him no inducement to leave the work he was so engrossed in, and by that time had so thoroughly mastered.

To Mr. Robertson's manner of dealing with the men may, perhaps, be attributed the success which attended his tenure of office. He had the faculty of gaining the affection as well as the respect of every one he came in contact with, and there was hardly a man on his own staff, and they numbered in late years about eight thousand, who was not inclined to credit his chief with some mark of personal kindness.

At the meetings of Superintendents at the railway clearing-house, Mr. Robertson's opinion was always listened to with the greatest deference and attention, as coming from one who spoke with large experience and sound judgment. He played a considerable part in preparing the revised and improved code for the public and private working of railways issued by the special committee of Superintendents, appointed at a general conference, of which he was one.

Mr. Robertson was elected a Member of the Institution on the 5th of December, 1854, and a Fellow of the Royal Scottish Society of Arts in the same year. He was a captain in the 8th Essex Volunteers from 1859 to 1864.

Mr. Robertson was well known to H.R.H. the Prince of Wales, having made all the arrangements in connection with the royal visits to Sandringham from their commencement, and he had the honour of being invited on several occasions to garden-parties at Marlborough House. The Prince wrote from Athens when he heard of Mr. Robertson's death, deeply regretting the circumstance, and directing that his condolence should be sent to the family.

An excellent constitution enabled Mr. Robertson to attend without remission to his duties almost to the end of his life. The illness which terminated in his death, on the 7th of October 1889, lasted only ten weeks, and he can fairly be said to have died in harness at the age of seventy-one. Perhaps no higher tribute can be paid to his memory than the injunction given to a meeting of the official staff of the Great Eastern Railway by the Chairman, who ended an allusion to Mr. Robertson's career among them by saying, "Go thou and do likewise."

---

GEORGE WILSON STEVENSON was born at Derby on the 10th of April, 1825. He became a pupil of Mr. Hawksley, at Nottingham at the age of seventeen, and remained with that gentleman until the expiration of his articles. In 1847, Mr. Stevenson went to the United States, but returned to England within two years. He was soon appointed Surveyor to the Local Board of Loughborough, from which he retired to enter into partnership with Mr. William Lee, an Inspector under the Public Health Act. During this partnership he carried out several sewerage and water schemes. In 1856, he received the appointment of Borough Engineer to the Corporation of Halifax. He had almost at once to advise the Corporation in reference to the proposed purchase of the gas undertaking. The parliamentary fight was very keen, and the manner in which Mr. Stevenson bore himself under the severe cross-examination at once brought him forward as an expert witness. The Halifax gas-works, which were on the side of a steep hill, had to be entirely rebuilt, and great skill was shown in constructing the buildings upon the slope of the hill, so that the coal was brought in at the highest point, and the coke taken out at the lowest point of the works with a minimum of handling. Throughout the ten years of his residence in Halifax, Mr. Stevenson was largely consulted by Companies and local authorities in reference to gas and water undertakings, until he was compelled by increase of business to remove to London in 1866, since which date, until within a year of his death, he was in constant practice as consulting engineer for gas, water, and sewerage matters. He published in 1879 a book on "Precedents in Private Bill Legislation affecting Gas and Water Undertakings." He designed new gas-works for West Bromwich, Scarborough, Colchester, Peterborough, and several