

in that line, as Mr. Gooch did, under a similar engineering arrangement, in the case of the Trent Valley. The Act for the North Staffordshire was passed in 1846, when Mr. Forsyth was appointed resident engineer to a large section of the line, and had charge of the construction of that section, which was wholly or partially opened in 1848, and he remained as the resident engineer for the railway company, taking charge of the entire line on its completion, including the canal belonging to the company, until 1853. In that year the then manager, the late Mr. S. P. Bidder, resigned that appointment to go to Canada, when, after great pressure and with much reluctance, Mr. Forsyth was prevailed upon to accept, at a small increase of salary, in addition to his position of engineer, that of manager, and he held the two appointments until 1864, when he resigned both offices. On this occasion he was presented with a testimonial by the members of his staff, and with another by his friends the traders of the district, and he was appointed consulting engineer and engineer for the construction of new lines, so that the company did not lose entirely his valuable services, and both of these appointments he held until his death. During this period the following lines and branches were made, viz., the Leek, Macclesfield Bollington and Marple joint line of the North Staffordshire, and Manchester Sheffield and Lincolnshire Railway Companies; the Silverdale, Madeley, and Market Drayton; the Audley, Newcastle, and Silverdale widening; and the Potteries loop line. When these lines were under construction his health failed, and he was obliged to be absent from business for several months together, but with the assistance of his brother, Mr. Joseph Forsyth, whom he took as pupil in 1857, the works he had in hand were completed.

Mr. Forsyth was elected a Member of the Institution of Civil Engineers in 1853. He was also a Member of the Institution of Mechanical Engineers, and a Fellow of the Royal Microscopical Society. He was a man who had thoroughly at heart the interests of those whom he served. He died on the 15th of February, 1879, at his residence, Marsh House, Newcastle-under-Lyme, deeply regretted by all, especially by those who had served under him for so many years on the North Staffordshire railway and canal.

MR. THOMAS SOPWITH, M.A., F.R.S., was born at Newcastle-on-Tyne, on the 3rd of January, 1803. He was the only son of Mr. Jacob Sopwith, an extensive cabinet-maker in that town. He was educated at private schools in Gateshead and Newcastle, and

duly apprenticed to his father, whose business was then, and had been for many years, large and prosperous. In early life he evinced much taste for drawing, and for scientific and literary pursuits; and was remarkable for great industry, early rising, and perseverance in the acquisition of technical knowledge in all that related to the mining districts and to the practice of surveying. When eighteen years old he commenced to keep a diary, or journal, and for fifty-eight years, viz., to January 3rd, 1879, he systematically and carefully recorded the incidents of his life and local and general events. These diaries comprise one hundred and seventy volumes, written in the most beautiful and legible style; and from them the greater portion of this notice of his life and labours has been taken. At this time he worked at the bench from 6 A.M. to 6 P.M., and frequently till 8 or 9 at night; but still he found intervals of leisure to study architecture, and the use of optical and philosophical instruments. In 1822 he prepared plans and drawings for a new gaol for Newcastle, for one hundred and eighty-four prisoners, and afterwards a plan for one hundred and twenty-five prisoners, illustrated with drawings and models; and for these, and his clear and fluent explanations, he was complimented by Mr. John Bell, the Mayor, and Mr. John Clayton, the Town Clerk, and the sum of ten guineas was voted to him by the committee. When twenty-one years of age his father consented to allow him to leave the business, and to engage himself to Mr. Joseph Dickinson, mining and land surveyor, of Alston, who was then employed in surveying the lead-mining properties of the Commissioners of Greenwich Hospital. In 1826 he made and published two plans of the interior of All Saints Church, Newcastle-on-Tyne, with historical and descriptive notices, and he became a member of the Eclectic Society of Newcastle. Mr. Dickinson at the end of the first year took him into partnership, giving him one-third of the profits of the business; and for four years he was engaged in surveying at Alston and the neighbourhood. He was sworn a burgess, and admitted a freeman of Newcastle, on the 20th of October, 1823, and his certificate, signed "Wm. Wright, Mayor," and "Clayton, Town Clerk," is carefully preserved. He also records that, "having taken the oath and kissed the Testament, he was instructed to kneel on the right knee, and present the mayor with a silver coin," and thus became a "freeman." The fees paid by him on this occasion amounted to £2 6s. 11d.; and he observes that the fees paid by his father in 1792 were only £1 16s. 6d.

In 1824 he records the delivery of his first bill for "surveys

and plans for the Corporation of Newcastle, per Jno. Clayton, Town Clerk, £16 16s." His reflections on arriving at manhood are a good example of the facility he possessed in expressing his thoughts, and show a correct appreciation of the work and duties of his future life. In 1828 he made sketches, which he afterwards etched, of the church and rectory of Whitfield, then held by his friend the Rev. Anthony Hedley, the learned divine and antiquary. His business increased very rapidly, and he prepared geological and mining plans of Hudgill Burn and Holyfield, and was much gratified to receive an order from Dr. Buckland, of Oxford, for six copies of the same. This proved the commencement of a friendship which continued till Dr. Buckland's death. He also prepared isometrical plans of Nentsberry, and surveyed and engraved plans of the Silver Band and other lead mines. In 1829 he engraved plans of Mexican mines for Mr. John Taylor, and he wrote a detailed account for the 'Newcastle Courant' of the burning of York Minster. This year he visited Mr. Crawhall, the manager of the great lead mines at Allenheads belonging to Mr. Beaumont, with which, fifteen years afterwards, he became so intimately connected. In 1830 he laid out a new road from Newcastle to Otterburn, which was considered equal, if not superior, to those made by the then well-known road-maker Macadam; and he was employed and consulted by Sir John Swinburn, of Capheaton, Sir Charles Monk, of Belsay Castle, Mr. Hodgson, Mr. Ord, and others; and this year he visited London for the first time. In 1832 he engraved a map of the "Colliery Districts," and read a Paper at the Natural History Society of Newcastle on "Isometrical Perspective;" took new offices in the Royal Arcade, and spent much time with Mr. Grainger in considering the contemplated improvements of Newcastle. The cholera was very prevalent in Newcastle during this year, and in connection with precautionary and preventive measures he made the acquaintance of Dr. D. B. Reid, and had frequent conferences with Mr. W. C. Trevelyan, of Wallington, Mr. John Clayton, the Town Clerk, and Mr. John Buddle, M. Inst. C.E. This year, also, in surveying the mines and taking levels for sections in the Forest of Dean, he designed and constructed a new levelling staff, which saved much time and secured greater accuracy than the staff then in use.

In 1833, on his thirtieth birthday, he was consulted by Mr. Buddle, on the instructions of Mr. Alexander Milne, of the Woods and Forests Department of the Government, on a proposed survey of the mines in the Forest of Dean, and had subsequent conferences with Lord Duncannon, which led to his preparing a report to that

department. It was "highly approved," and a few years afterwards he received his appointment as "Crown Commissioner." This year he was a witness before a committee of the House of Commons on the Derwent Road Bill. On the 7th of May, 1833, he was, on the proposal of Mr. Telford, the President, Mr. Turnbull, and Mr. Buddle, elected a Member of the Institution of Civil Engineers. His diary for this year contains a description of the riotous and disorderly conduct of the people at the parliamentary election for Leeds, and a suggestion that "if Members must be dependent for their election on the amount of money they can expend, it might be arranged to elect the man for whom, or in whose name, the greatest amount could be raised in any way or by any number of persons, and apply the money in reduction of the rates and taxes." In the same year he published "An Account of the Mining Districts of Alston Moor, Weardale, and Teesdale."

In 1834 his large treatise was issued on Isometrical Drawing, with thirty-four engravings on copper, which went through several editions. In this year he was engaged on several important cases of reference, in company with Mr. Buddle and Mr. Nicholas Wood. In 1835 his isometrical plans of Mr. Grainger's new buildings, and elevation of new streets in Newcastle, were published. About the same time appeared geological sections of lead mines in Alston and Teesdale, eight views of Fountains Abbey, an account and plans of Alston Moor and Weardale district, and plans and sections of a railway, or tramroad, from Blaydon to Spittal, which he had surveyed in connection with Mr. John Blackburn.

In 1836 he prepared plans for Mr. Grainger, which were afterwards published, for concentrating the termini of the Newcastle and Carlisle, the Great North of England, and the proposed Edinburgh railways. He records the cost of his journey from Newcastle to London as having amounted to £6 2s. 3d., inclusive of £4 10s. for the coach fare, per the Highflyer, the time occupied being thirty-four and a half hours.

In April 1837 he gave evidence before the parliamentary committee on the London and Brighton railway, in favour of the bill. He records his cross-examination by Mr. Wood, afterwards Sir William Page Wood and now Lord Hatherley. This year he was also employed for the Great North of England railway, and was the guest of Dr. Buckland, at Oxford. In 1838 he records the opening, on June 18th, of the Newcastle and Carlisle railway, from Blaydon to Carlisle, a distance of 60 miles, and notes that the first train was run from end to end in 3 hours 43 minutes.

In 1838 he was appointed Commissioner for the Crown, in

company with Mr. Probyn for the Free Miners, and Mr. Buddle as umpire, under the "Forest of Dean Mining Act." This appointment was very gratifying to him, as it had not been sought, directly or indirectly. In this year he contributed to the Transactions of the Cornwall Polytechnic Society, a Paper on "An Easy Means of Recording the State of the Weather." To various sections of the British Association, which met this year at Newcastle, he sent six Papers, viz.: 1. "On Sections of the Mountain Limestone Formation in Alston Moor, exhibiting the general uniformity of the several beds." 2. "On the Construction of Geological Models." 3. "Description of an improved Levelling Stave for Subterranean as well as Surface Levelling." 4. "Description of Instruments to facilitate the drawing of objects in Isometrical Projection." 5. "On an improved method of Constructing large Tables, or Writing Cabinets, adapted to save much time, and secure the systematic arrangement of a great number and variety of Papers." 6. "Suggestions on the practicability and importance of preserving the National Mining Records." The suggestions contained in the last-named Paper led to the appointment of a committee of the Association, consisting of the Marquis of Northampton, Sir Charles Lemon, Mr. Buddle, and Mr. Sopwith, which succeeded in inducing the Government to take up the subject, and resulted in the establishment of the present Department for Mining Records. About this time he wrote a Paper, for the Geological Society, "On the Illustration of Geological Phenomena by means of Models."

In 1839 he wrote a Report on the Mineral Districts of the County of Clare, Ireland, and delivered lectures at Newcastle on "Astronomy," on "Glaciers in Great Britain," and on "Economic Geology." In this year he was again the guest of Dr. Buckland, at Oxford, and records his admiration of the beautiful collection of drawings by Mr. Ruskin. He conferred with Mr. Babbage on the celebrated Calculating Machine, the further progress of which was stopped for want of funds, although it was nearly completed, and £20,000 had been spent on its construction. His social intercourse and correspondence at this time included Sir Francis Chantrey, Sir Roderick Murchison, Professor John Philips, Bryan Donkin, Dr. Buckland, Babbage, Mary Somerville, Rendel, Cubitt, Robert Stephenson, Buddle, and most of the active minds then employed in nearly every department of science and engineering.

In 1840 he exhibited at the Institution of Civil Engineers a model of 36 square miles of the mining district of Gloucestershire, showing its geological formation. In the following year he directed the attention of the members to the geological sections.

opened out by the railway cuttings, and other engineering works then in progress, and he afterwards induced the British Association to vote £200 for securing authentic records of such sections.

In June 1841 a Paper by him was read at the Institution of Civil Engineers, "On the Construction and Use of Geological Models in connection with Civil Engineering." In that communication he treated of the peculiar advantage of models over plans and sections for mining purposes; dealt with the materials for models, their mode of construction, the scales to be employed, and the objects to be represented; and spoke of the conviction they carried to the mind, as well as their general use for all purposes of civil engineering. For that Paper a Telford Medal was awarded to him; and the Council, in their Annual Report, alluded to the mutual advantages to be gained by the geologist and the civil engineer from a more intimate communion of their respective sciences, as brought under the notice of the Institution by Mr. Sopwith. In the same year he dedicated to Dr. Buckland a "Description of a series of Geological Models, illustrating the nature of stratification, valleys of denudation, succession of coal seams in the Newcastle coal field, the effects produced by faults or dislocations of the strata, intersection of mineral veins, &c." His "Account of the Museum of Economic Geology, and Mining Records Office" was printed in 1843. In the following year he published another Paper on "The National Importance of preserving Mining Records."

Mr. Sopwith was elected a Fellow of the Royal Society on the 5th June, 1845. He was much engaged in Belgium about this time with the late Mr. George Stephenson and Mr. (afterwards Sir) William Cubitt, and took an active part in the construction of the Sambre and Meuse railway. He was consulted also by the Belgian Government, and had interviews with the King of the Belgians on the framing of the laws applicable to the future development of railways in Belgium. About this time he was for a few years in partnership with his brother-in-law, Mr. Marcus Scott, and Mr. T. Macdougall Smith, M. Inst. C.E. He became a member of the Society of Arts in 1845; and in the Journal of that Society for Nov. 4th and 11th, 1853, will be found a Paper on "Practical Observations on Surveying and Levelling." In 1846, 1847, and 1848, he was a Member of the Council of the Institution of Civil Engineers, and during those years, as well as before and after, occasionally took part in the discussions at the weekly meetings of the Institution. In 1846 he published "Observations addressed to the Miners and other Workmen employed in Mr. Beaumont's Lead Mines in East

and West Allendale and Weardale." In this pamphlet he describes himself on the title page as a "Member of the Geological Society of France, Commissioner for the Crown under the Dean Forest Mining Act, and Chief Agent to Mr. Beaumont's Mines in Northumberland and Durham." In the same year, in conjunction with Mr. T. M. Smith, M. Inst. C.E., he issued "Reports on the Iron-works, Manufacturing Establishments, and Mineral Property at Couvin, in the District of the Sambre and Meuse, in Belgium." In 1853 he published a pamphlet on "Education; its present state and future advancement, being the substance of a Lecture given in one of the new Schools recently erected by W. B. Beaumont, Esq., M.P., at Bywell, in Northumberland." In 1854, on the occasion of the Educational Exhibition held by the Society of Arts, Mr. Sopwith gave a lecture on "Models and Diagrams." In 1855, at the request of the Council of the Society of Arts, he gave an explanation of the mineral products at the east end of the Annexe at the Paris Exhibition. In the same year he delivered one of the evening discourses at the Royal Institution, "On the Mining Districts of the North of England;" and a little later he delivered an address, in his capacity as President, to the members of the Tyneside Naturalist Field Club. In 1857 he presented to the Institution of Civil Engineers an "Account of the Steam Ferry over the River Nile, at Kaffre Azzyat," which came under his observation when he visited Egypt with the late Mr. Robert Stephenson, M.P. This year he printed a little volume, entitled, "Notes of a Visit to Egypt, *via* Paris, Lyons, Nismes, Marseilles, and Toulon." In this year the honorary degree of M.A. was conferred upon him by the Senate of the University of Durham. The Rev. Temple Chevalier, who presented him to the Senate on that occasion, adverted to his (Mr. Sopwith's) long connection with the University, and the frequent services he had rendered as examiner and steward. He commented on his efforts to advance practical education in the mining districts, to his services as Commissioner of the Town, and to what the Senate had deemed to be services rendered generally to society and science. In 1858 he was elected a Member of Council of the Society of Arts, which position he retained until 1863, and in subsequent years took part in the proceedings of that body, and acted on several occasions as Chairman at the ordinary meetings. The "Proceedings of the Geologists' Association" for 1859, contains a Paper by him "On the Lead Mines of England." In the inaugural address of Sir W. G. Armstrong, C.B., V.-P. Inst. C.E., as President of the thirty-third meeting of the British Association,

held at Newcastle-upon-Tyne in August and September 1863, occurs the following passage: "At the last meeting of the British Association in this town, the importance of establishing an office for mining records was brought under the notice of the Council by Mr. Sopwith, and measures were taken which resulted in the formation of the present Mining Records Office." At this meeting Mr. Sopwith was one of the secretaries of the geological section, and contributed a Paper on "A Section of the Strata from Hownes Gill to Cross Fell," and he also presented a joint report by himself and Mr. T. Richardson, "On the Local Manufacture of Lead, Copper, Zinc, Antimony, &c."

He kept regular meteorological observations at Allenheads and Bywell, which were transmitted to the Registrar-General, and were interesting mainly in consequence of the difference of elevation, which was no less than 1,273 feet, and of the meteorological conditions existing at Allenheads, which is surrounded by a large extent of high and damp moorland. He was for many years a Fellow of the Meteorological Society, and was President during the years 1859-61. He was a member of the Government Commission on the Use of Gun Cotton as a substitute for Gunpowder in Blasting, and was afterwards engaged with Prof. Abel in further experiments, the results of which were printed in a Parliamentary return.

During the twenty-six years from 1845 to 1871, when he was principal agent of Mr. Beaumont's lead mines in Northumberland and Durham, he was resident for the first twelve years almost constantly at Allenheads, in the midst of the two thousand workpeople, and their families, making a total population of about ten thousand. His love of order and punctuality caused many new arrangements to be introduced for the comfort of the workpeople and their families. Their houses were improved, and many new ones built with due regard to health and family comfort. Schools and libraries were established, and exhibitions occasionally held. The schools were open to all denominations alike, and the religious difficulty was removed by the reading of short selected passages from the Bible, to which none could object. The mode of teaching religious lessons, as carried out at these schools, was shown by him in evidence before a Parliamentary Committee, when he illustrated the various lessons a teacher might give from the 19th Psalm. The children were made to think, and every writing lesson was a useful piece of information; punctuality was constantly enforced, and a system which Mr. Sopwith called "drill arithmetic" was successfully carried out. Object lessons, freehand

and geometrical drawing, grammar, composition, geography, and, not least, the importance of punctuality, integrity, and good conduct in every relation of life, were sedulously enjoined, and constantly illustrated and enforced.

When resident at Allenheads he was visited by Michael Faraday, Robert Stephenson, Sir Roderick Murchison, William and Robert Chambers, Prof. Pillans, and many other literary and scientific men. His journal contains frequent allusions to the conversations and intercourse he had with the distinguished men of his time, and these are charming from the unaffected manner in which they are related, and interesting in many cases as chronicles of strong and vigorous expressions called forth by the incidents of an afternoon walk, or occurring in friendly conversation. His journals impress vividly on the reader his candour and honesty with regard to what he wrote, and how ready he was to treasure and profit by the intercourse he held with any distinguished guest; one in particular, Mary Somerville, writes of him in her book of 'Recollections:' "His conversation was highly interesting, and to him I was indebted for much information while writing on physical geography. Many years after, he and Mrs. Sopwith came to see me at Naples, which gave me much pleasure. He was unlike any other traveller I ever met with, so profound and original were his observations."

His love of drawing, and facility in sketching, enabled him to assist Mr. Hodgson in his 'History of Northumberland,' and Mr. Surtees in his 'History of Durham,' and secured him the friendship of these eminent local historians.

In 1870 he records in his Diary the following reflection: "During fifty years I have enjoyed a very large share of domestic comfort, of professional occupation, and, above all, of many most precious and esteemed sources of happiness in family affections and in most valued friendships. Wealth I have never coveted, nor splendour nor power; a fair competency has rewarded my exertions in business and in professional matters."

In March 1871, as previously arranged with Mr. Beaumont, he gave notice to the principal managers of the various departments at the W. B. lead mines of his intention to resign in June next, on the completion of twenty-six years service, and fifty years active duties in his profession. At a complimentary dinner, given to him on his retirement, a service of plate of the value of two hundred guineas, was presented to him by the workmen and agents of the W. B. lead mines, "as a testimonial of their respect and esteem

for his skill and integrity in the discharge of his duties during a period of twenty-six years; and also to mark their appreciation of his zealous efforts in promoting education, and other benevolent objects." Sixteen hundred and twenty-one persons subscribed to this testimonial, and it was accompanied by the following address:

"TO THOMAS SOPWITH, Esq., M.A., F.R.S.

"We, the undersigned, as the representatives of the workmen employed in the extensive lead mining and smelting industries of Allendale and Weardale, on being apprised of your intention to retire from the chief agency of the W.B. lead mines and mills, at once unanimously resolved that we would endeavour in some form to show our very great esteem for you; and we now offer for your acceptance sundry articles in silver, in value two hundred guineas (towards which we have had the contributions of the various agents), and in the present address we wish briefly to indicate the sentiments which have impelled us to offer the gift to you.

"1st. As chief agent we have much to thank you for in the improvement of our position, such as the increase of monthly subsistence-money from 30s. to 40s., the lessening of surface workmen's hours of labour one and a half hours per day, and your constant willingness to promote any plan that has had for its object the welfare of the workmen.

"2nd. As a philanthropist, in the libraries, news-rooms, benefit societies, improvement classes, &c., &c., and, above all, in the establishment of excellent schools (open to all sects), by means of which the workmen's children obtain the great boon of a sound and useful education at a trifling cost, we have abiding testimony of your energetic promotion of the social and intellectual welfare of the inhabitants of these dales; and we cannot forego this opportunity of expressing our gratitude to our honoured and distinguished employer, W. B. Beaumont, Esq., M.P., for so heartily joining in carrying out all those schemes, both by his munificent donations thereto, and by his well-known desire to further any plan that has for its object the improvement of his workmen and their families, in respect both to their religious, moral, and social interests, without distinction of sect or creed. The admirable working and flourishing condition of these institutions in the various localities testify to your ability in having them based on sound principles, and to the constant and cordial interest you have always taken in them. We would here express our belief that the

establishment of so many philanthropic institutions, your great thoughtfulness in recognising merit and helping its promotion to places of honour and respectability, and your constant advocacy of temperance and good habits, have had an immense effect in the diminution of vice and drunkenness, once so prevalent in these districts.

“3rd. As a scholar, we wish to express our appreciation of your talents and ability, and the pride we feel in knowing the eminent position you have worthily attained in the scientific and literary world.

“4th. In your private character, and that of your esteemed family, we have always had examples of kindness and geniality of disposition, which we cannot cease to remember with feelings of pleasure and endearment.

“It is with great regret that we think of your retirement from the active duties of your profession as the breaking of the close link which has existed between yourself and the many workmen over whom you have for upwards of a quarter of a century exercised so beneficial a supervision; but in this our parting interview with you to-day, we would most sincerely add that the wish of all of us is that you (with Mrs. Sopwith and your family) may be long spared in health and happiness; and as all the blessings you have bestowed have been highly appreciated, so we feel sure that you will meet with the reward promised to all who do such good.”

Mr. Sopwith said, in acknowledging the presentation, that “when he came, twenty-six years ago, there was certainly not that amount of quiet comfort and respectability amongst the working classes generally that they now saw existing. . . . The mines, which were supposed to have been nearly exhausted, and said by some when he first came to be nearly at their last end, had been wrought to considerable advantage, and had been the means of employment to large numbers of people. He believed that there were yet wide and untried fields, where enterprise might make its way and discover the means of occupation and of comfort for many years to come. One such district was in Weardale, and two or three in Allendale, and he trusted that the measures which had been taken on a large scale, more especially by the prosecution of the Blakett level, would produce for many generations that prosperity which had now for upwards of a century largely existed, and which had for three or four centuries existed, although upon a smaller scale. Having alluded to this

prospective view, he would briefly mention his deep obligations to those who had been associated with him in the management of that property. Any man who looked honestly into his own heart, and had the capability of discernment, must know very well that in the management of a large property he could not succeed unless ably assisted by all hands. This was especially the case in a property extending over more than 200 square miles, embracing a population in round numbers of from 10,000 to 12,000 people directly or indirectly interested in mining pursuits, and from 2,000 to 3,000 people actually employed therein. There had been many great operations during his agency, and he might say that he had looked forward to prospective benefit rather than to the circumstances of immediate produce and advantage. The mining operations had been satisfactory and steady, for, looking over the returns for the last twenty-five years, and taking averages each five years, he could not help observing the steady and regular return of produce. There was one thing more than any other to which he wished to advert, and he need scarcely tell them that that was how deeply affecting it was to his feelings to leave a district to which he was so much attached. He liked the district, he liked the people, and he was deeply grateful, as he was bound to be, for the attention, the willing obedience, the constant friendship, and cheerful assistance of all who had been associated with him. . . . He could gladly refer to one and all in terms of commendation. Alluding to the comparatively few accidents which had happened in connection with the works, it might be said that the average number of accidents was less than what usually occurs on the surface amongst a similar number of people. Mr. Sopwith referred to the subject of education, taking some small credit to himself for assisting in establishing schools which were an honour to the district. He considered that it was owing to the care taken in the training of the young that they had so much happiness and propriety of conduct in that district. It seemed almost impossible for the children to go wrong after they left schools where so much pains had been taken by their teachers. He next spoke of the good which had been achieved by Benefit Societies during the last twenty years, the advantages of which had attracted attention even beyond the particular sphere for which they were established. He begged to thank them in the warmest manner he possibly could for the kind sentiments of friendship they had expressed towards him. In thus thanking them let him also express his best wishes for their comfort, welfare, and prosperity in every way. They acted under an employer who would warmly

appreciate whatever was done in his service; and so long as this upright industry and correct feeling prevailed, all would be well. He trusted that the absence of these qualities would never be felt. . . . He did not think there was in Great Britain, or he might say in Europe, if even in the world—an equal number of persons, on an equal area of ground, such as in this and the adjacent mining districts, where there was so little poverty, where so little distress was to be met with, or where a greater amount of civility of manners and propriety of conduct would be met with than in those mining dales. He spoke generally of Alston Moor, Teesdale, and Weardale, as well as Allendale. From his experience of these places, he believed that there was a greater number of persons well-clad, well-behaved, well-intentioned, honest and contented, than they could find in any equal area of any other part of the world containing an equal number of people. (Applause.) He felt great pleasure in addressing them on that occasion, more especially in addressing to them sentiments which it would be his greatest happiness to know had their concurrence and approval."

Mr. Sopwith entered on his career when the engineering profession was, it may be said, in its infancy. The Stockton and Darlington railway was opened when he was twenty-two, and the Liverpool and Manchester before he had attained his twenty-seventh year. It was not, however, railways to which he specially devoted his attention, as from the first he laid out a course for himself which eventually placed him as one of the foremost of engineers in metalliferous mining. Great industry, exactness in details, clearness of expression, the observance of method to a fault, and conscientiousness in all his transactions, were characteristic of Mr. Sopwith. He was a fluent speaker and a ready and precise writer, as is proved by the journals already referred to, which contain interesting descriptions of places and people, interspersed with amusing pen-and-ink sketches which would do credit to a professional artist. At a very early period Mr. Sopwith evinced a great appreciation of organ music, and this faculty was cultivated and developed, and formed a constant source of pleasure and relaxation in after life.

Up to within a few months of his death, which occurred at his residence in London on the 16th January, 1879, Mr. Sopwith enjoyed excellent health. He was fond of travelling, and visited many places on the continent, and few localities of interest in the British isles were unknown to him. With his natural flow of high spirits, conversational powers, and well-stored and retentive

memory, he was a genial companion and a good friend, and will be long remembered by those whose advantage it was to have the pleasure of his acquaintance.

Amongst the pupils who studied under Mr. Sopwith may be named Sir George Elliot, Bart., M.P; Mr. Joseph Dickinson, Her Majesty's principal Inspector of Coal-mines, and Mr. Thomas John Bewick, M. Inst. C.E., the latter of whom was upwards of thirty years in close connection with him, and ably assisted him in the introduction of Sir William Armstrong's improved hydraulic machinery into Mr. Beaumont's extensive mining districts and other great mechanical and social improvements.

Mr. Sopwith was elected a Member of the Institution on the 1st of May, 1833, and there are now only twelve members on the list who were elected at an earlier date. The last occasion on which he took an active part in its proceedings, was so late as the 5th of November, 1878, and many who were present on that occasion will testify to the admirable effect of his address then, clearly expressed and fluently delivered, in a conciliatory spirit well adapted to the object in view. He concluded by expressing his sense of the high character and honourable standing attained by the Institution, and said that at the close of his life, which in the nature of things could not be far distant, he looked forward with pride to a record being made over his grave that Thomas Sopwith had been a "Member" of the Institution.

SIR WILLIAM FOTHERGILL-COOKE was born in 1806, near Ealing, Middlesex. He commenced his professional career in the Indian army. In 1835-36, being on furlough from his regiment, his leisure time was devoted to the study of medicine and anatomy, both at Paris and at Heidelberg. Whilst engaged at the latter place in modelling dissections for the museum of his father (then Professor of Medicine and Anatomy in the rising university of Durham), Mr. Müncke, Professor of Natural Philosophy, showed him a model which Baron Schelling had previously exhibited at Bonn. By this instrument, two movements of a magnetic needle at a distance were rendered visible by an electric current. The idea of electrical communication immediately took possession of Mr. Fothergill-Cooke's mind, and a deep conviction of the practicability and incalculable utility of an electric telegraph. Relinquishing other pursuits, he resigned his commission, and devoted himself at once