

MEMOIR OF MR. THOMAS SOPWITH.

BY THOS. J. BEWICK.

THOMAS SOPWITH, M.A., F.R.S., was born in Newcastle-upon-Tyne, on the 3rd of January, 1803, and received his education at private schools in that town and in Gateshead.

He was first apprenticed to his father, who carried on with success a large cabinet-making and joinery business in Newcastle, and although retaining an interest therein for many years, he did not long continue to practically follow it. He had much taste for drawing, and became a rapid and correct sketcher, in which he excelled all his life. He likewise devoted himself much to scientific and literary pursuits. He rose early; was active, industrious, and persevering; and thus it was, whilst still at the bench from early morn to late at night, he found time to study architecture and the use of optical and philosophical instruments, in which he became proficient. Thus in 1822, when only nineteen years of age, he designed a new gaol for his native town, and illustrated it by models and plans, which secured for him the commendation of the authorities, and a gratuity of ten guineas was voted to him.

On attaining manhood he, with his father's consent, left the business, to study land and mining surveying at Alston Moor, and in this he soon made himself so competent that Mr. Dickinson, under whom he had studied, took him into partnership.

Having made mine surveying and engineering a special study, he quickly became noted for the correctness of his surveys, and the neatness and detail of the plans and sections which he prepared therefrom.

During the four years he remained at Alston he, in conjunction with his partner, prepared detailed plans and sections of the lead mines in Alston Moor, belonging to the Commissioners of Greenwich Hospital. He was also during this period engaged in making surveys and plans for

the Corporation of Newcastle and others. These occupations did not, however, prevent him following the bent of his mind, for in 1826 he published his first book, being an account and plans of the interior of All Saints' Church, in Newcastle-on-Tyne, and made sketches of various public buildings and private works, the latter principally those of a mining character.

It was during this time that some etched plans and sections of the great Hudgill Burn Lead Mine, which he had prepared, came to the knowledge of Dr. Buckland, the celebrated professor of geology, and led to an intimacy ending only in the doctor's death.

While at Alston he made the acquaintance of the late Mr. Hugh Lee Pattinson, so well known as the inventor of the de-silverizing process bearing his name, and a close friendship continued until the death of Mr. Pattinson.

Having established himself as a civil and mining engineer in Newcastle, he soon found much occupation in the profession he had adopted. In 1830 he surveyed and levelled a new road between Newcastle and Otterburn, and was consulted by many of the county gentry on various matters affecting their estates.

In 1832 he entered upon new offices in the Royal Arcade, which he continued to occupy until 1845, when he received the appointment of chief agent of the W. B. Lead Mines in Northumberland and Durham.

In these thirteen years he was occupied professionally on many local undertakings, such as the new streets and improvements of Newcastle, carried out by Mr. Richard Grainger; the coal and iron mines of the Forest of Dean, of which he made detailed surveys, and prepared sections, and a model of the entire Forest, showing the beds of coal and workings therein, and reported thereon to the Woods and Forests Department of the Government; the Newcastle and Carlisle, the Great North of England, the Newcastle and Berwick, the London and Brighton, and other railways in England, as well as the Sambre and Meuse Railway in Belgium; a road from Newcastle to Shotley Bridge, and an extension to Middleton-in-Teesdale; works connected with the improvement of the River Tyne; and many others of a similar but less extensive character. Whilst occupied on these undertakings he made the acquaintance of many eminent men, professional and otherwise. Amongst others may be named the late Messrs. George and Robert Stephenson, Mr. John Buddle, Mr. Nicholas Wood, Mr. Richard Grainger, Sir William Cubitt, Mr. I. K. Brunel, Mr. J. M. Rendel, and Mr. Bryan Donkin.

After 1845, although not taking an active part publicly in the pro-

fession, he yet, in conjunction with the late Mr. Marcus Scott, his brother-in-law, and Mr. T. Macdougall Smith, carried on an extensive practice as civil and mining engineers in London.

Having previously been engaged in connection with the mines of the Forest of Dean, he was, under the Act 1 and 2 Vict., c. 43, for regulating the opening and working of mines and quarries in the Forest of Dean, in the County of Gloucester, which received the Royal assent on 27th July, 1838, appointed by the Government Commissioner on behalf of the Crown, his colleagues being John Probyn, Esq., of Gloucester, selected by the Free Miners, and John Buddle, Esq., the eminent colliery viewer, who was the third Commissioner or Umpire.

The inquiry extended over three years, and in July, 1841, the Commissioners made their award, which, by order of Her Majesty's Commissioners of Woods, Forests, and Land Revenue, was in the same year published, and the task of preparing the award and accompanying map for publication devolved on Mr. Sopwith.

On frequent subsequent occasions Mr. Sopwith acted professionally for the Government in connection with Crown properties.

From 1845 to 1871, a period of twenty-six years, Mr. Sopwith was chief agent of the W. B. Lead Mines, belonging to the Beaumont family, the representative of which is, and was during the greater part of Mr. Sopwith's connection therewith, Wentworth Blackett Beaumont, Esq., M.P. The first twelve years of this period Mr. Sopwith resided almost constantly at Allenheads, and here, in the midst of the workmen and their families, he was ever busy in promoting the interests of his employer, but in so doing did not forget the well-being of those acting under him, whether as agents or workmen. He took great interest in the comfort of those around him, and in the education of the children whose parents were dependent on the industry over which he presided. In these matters he found in Mr. Beaumont a zealous and liberal chief. The houses were improved, and many new ones built, with due regard to the health and comfort of the inmates. Several schools were erected in the various districts comprised within the limits of the vast property of which Mr. Sopwith had charge. These schools were open to all denominations alike, and the mode of teaching religious lessons, as carried out at these schools, was shown by Mr. Sopwith in evidence given by him 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.

In addition to the schools, miners' rooms were erected, libraries and news rooms established, and benefit societies formed at the different centres on a larger scale than had previously been attempted, all of which tended greatly to the comfort and improvement of the workmen and others.

After 1857 Mr. Sopwith lived in London, but still acted as Mr. Beaumont's chief mining agent. Although less frequently present amongst the workmen, he continued up to his retirement in 1871 to take the same lively interest in the well-being of the people, and devoted much time to their social welfare.

In June, 1871, after holding the appointment twenty-six years, Mr. Sopwith resigned his office of chief agent at the W. B. Lead Mines, and retired from the active duties of the profession, having been engaged in it just half a century.

On his retirement he was entertained at a complimentary dinner, and presented by the agents and workmen of the W. B. Lead Mines and others with a handsome service of plate, "as a testimonial of their respect and esteem of 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." At the same time he was presented with a lengthy address from the workmen, testifying to the great interest he had ever evinced towards them and their families, and expressing in warm terms their gratitude and thankfulness, and their regret that his retirement from the active duties of his profession was the end of a beneficial supervision, and the breaking of the close link which had existed between them for over a quarter of a century.

Mr. Sopwith was the author of several books and papers. Amongst them may be mentioned "A Historical and Descriptive Account of All Saints' Church in Newcastle-upon-Tyne," published in February, 1826, when Mr. Sopwith had only just completed his twenty-third year; "An Account of the Mining Districts of Alston Moor, Weardale, and Teesdale," published at Alnwick in 1833; and in the following year was issued his largest work on "Isometrical Drawing," which went through several editions. Besides these Mr. Sopwith was the author of some books on travel, educational and other subjects, and not unfrequently contributed articles to magazines and newspapers.

On the occasion of the British Association meeting in Newcastle-on-Tyne in 1838, Mr. Sopwith took an active part in promoting its success, and contributed six papers on various subjects, one of which was "Suggestions on the Practicability and Importance of Preserving National Mining Records," which led to the appointment of a Committee of the Association, consisting of the Marquis of Northampton, Sir Charles Lemon, Bart., 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 at the Museum of Practical Geology, in Jermyn Street, London.

When the British Association assembled in Newcastle for the second time, in 1863, Mr. Sopwith was again active in securing its success. He was one of the secretaries of the Geological Section; contributed a paper on "A Section of the Strata from Hownes Gill to Cross Fell;" and, in conjunction with the late Mr. Thomas Richardson, prepared the report "On the Local Manufacture of Lead, Copper, Zinc, Antimony, &c." On this occasion one of the excursions of the members of the Association was to Allenheads, when in spite of a pouring rain a day of great interest and enjoyment was experienced, in which Mr. Sopwith took a prominent part.

In May, 1833, Mr. Sopwith was elected a member of the Institution of Civil Engineers, and at his death there were only twelve members on the list who had been elected at an earlier date. In the proceedings he took much interest, was a member of the Council in 1846, 1847, and 1848, and occasionally took part in the discussions at the weekly meetings of the Institution, the last occasion on which he addressed the members being within a few weeks of his death.

On the 5th June, 1845, he was elected a Fellow of the Royal Society, and in 1857 had conferred upon him the honorary degree of M.A. by the Senate of the University of Durham. He was also from 1845 a Fellow of the Society of Arts, and from 1858 to 1863 was on the Council; a Fellow of the Geological Society and other kindred institutions, and to all, or nearly all, the societies with which he was connected he contributed papers. He took a warm interest in local institutions, and actively promoted lectures to the working classes, and exhibitions of works of art and industry in his native town.

Of our own Institute he became a member in 1853 and continued until 1877, when, living as he then was far from the scenes of our labours, he retired, leaving his only sons (Mr. Thomas Sopwith and Mr. Arthur Sopwith) on the list of membership. He contributed in 1865 a paper on "The Lead Mining Districts of the North of England."

Amongst Mr. Sopwith's intimate friends, are to be numbered Professors Buckland, Sedgwick, Conybeare, John Philips, Faraday, and Pillans, George and Robert Stephenson, Robert and William Chambers, Sir Roderick Murchison, Sir Francis Chantrey, Charles Babbage, John Buddle, Sir William Cubitt, and Mary Somerville the authoress, with each of whom he carried on friendly and scientific correspondence.

He had considerable mechanical and geological knowledge, and in the latter more particularly was frequently consulted on important matters, whilst in the former he was the inventor of the Telescopic Levelling Stave and the Monocled Cabinet, an ingenious and admirable arrangement of writing desk and drawers combined under one key. He likewise designed the series of geological models, now so well known by students and others, constructed of different coloured woods as representing various beds of rock, and showing with extreme clearness the effect resulting from dislocations, denudation, etc. An excellent model of the Forest of Dean, showing the surface and the more important beds of coal, was prepared from the designs and under the direction of Mr. Sopwith for the Commissioners of Woods and Forests, and is now placed in the Museum of Practical Geology in London. Somewhat similar models were constructed by Mr. Sopwith of the Ebbw Vale and Sirhowy Iron Company's property and mines of coal and iron in Monmouthshire, and of lead and other mines in different parts of the country.

The well-known hydraulic machinery for pumping, winding, crushing, and other purposes at the W. B. Lead Mines was designed and erected by Sir W. G. Armstrong, acting under Mr. Sopwith's instructions.

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 line before he had attained his twenty-seventh year. It was not however railways to which he especially devoted his attention: from the first he appears to have laid out a course for himself which eventually placed him in the front rank of metalliferous mining engineers. Great industry, exactness in details, clearness of expression, methodical to a fault, and conscientious in all his transactions, were characteristic of Mr. Sopwith. He was a fluent speaker and a ready and precise writer, as is proved by his journals, which consist of 168 volumes, containing interesting descriptions of places and people, interspersed with numerous and amusing pen-and-ink sketches which would do credit to a professional artist. This journal was begun when he was eighteen years of age, and continued to within a fortnight of his death, a period of fifty-eight years, with the same characteristic neatness and exactness.

Up to within a few months of his death, which occurred at his residence in London, on the 16th of January, 1879, at the age of 76, 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 long be remembered with feelings of satisfaction by those whose advantage it was to have the pleasure of his acquaintance.

The writer's connection with Mr. Sopwith dates from January, 1836; he served his articles of apprenticeship with him, and continued as his assistant until 1846, from which time until 1866 he acted under him as engineer of the W. B. Lead Mines, and subsequently a more or less close professional and friendly intercourse continued to exist up to Mr. Sopwith's decease.

Much of the preceding is within the writer's personal knowledge, but he has in addition been greatly indebted to a memoir of Mr. Sopwith, published in the Transactions of the Institution of Civil Engineers, recently issued, and from which, with the permission of the writer, he has freely copied, and for which he heartily offers his acknowledgments.

Mr. STEAVENSON thought that the meeting would agree with him that their time had been well spent in listening to the record of a useful life such as had just been so attractively described by Mr. Bewick, and he had great pleasure in moving a vote of thanks to that gentleman.

Mr. COOKE seconded the motion, which was unanimously carried.

The following papers were then read:—"Notes on the Mueseler Lamp," by Mr. A. R. SAWYER, and "Improved Safety-lamps on the Davy and Mueseler Types," by Mr. JAMES ASHWORTH.

As these papers contain many allusions to the Mueseler lamp, it has been thought advisable to print a translation of a report of a committee