

to give even the titles of his numerous Papers, of which we may hope to see the most important published in a separate form; and for scientific men and engineers, such a collection would be very useful, as the volumes of the scientific societies in which they are now published are not always accessible. To foreign engineers, who highly appreciate the labours of Eaton Hodgkinson, and who have acknowledged their value in very flattering terms, such a publication would be a great boon.

In 1847 Mr. Hodgkinson was appointed Professor of the Mechanical Principles of Engineering in University College, London; and he subsequently removed from Manchester to the metropolis, to fulfil the duties of his post. He delivered several courses of lectures with success; but his health had already suffered, and during later years his labours were only intermittent. It has been stated that his works were highly appreciated by foreign scientific men; to such an extent was this the case that, in 1851, his name was placed upon the list for nomination as a Corresponding Member of the Institute of France; and strenuous efforts were made by eminent men who recognised his merits, to secure his election.

He was unanimously elected an Honorary Member of the Institution of Civil Engineers in 1851, and nowhere could his practical merits be better appreciated. He was a constant attendant at the meetings, and not unfrequently took a prominent part in the discussions. He was personally held in high esteem by the Members, with a large number of whom he was on terms of intimacy. He was acknowledged to be perhaps the most laborious and careful experimenter who had ever devoted himself to the study of the laws which regulate the strength of materials, and his unselfish conduct in gratuitously giving to the world the result of his investigations was generally admired. He was attached to science for its own sake, and he was well versed in other branches than that to which he specially devoted himself.

In private life he was singularly simple and guileless; and his kindly disposition endeared him to all who had the good fortune to make his acquaintance.

His decease occurred on the 18th of June, 1861, at Eaglesfield House, near Manchester, in his seventy-second year, regretted not only by all who knew him, but by those who had professionally benefited by his labours.

GENERAL SIR CHARLES WILLIAM PASLEY, K.C.B., F.R.S., &c., was born on the 8th September, 1780, at Eskdale-Muir, Dumfries, where he received the rudiments of a good useful education; and in the year 1796 he was appointed to the Royal Military Academy at Woolwich where he pursued his studies
[1861-62. N.S.]

with energy, and obtained a commission in the Royal Artillery on the 1st of December, 1797. He was transferred to the Royal Engineers on the 1st of April, 1798, and on the 2nd of August, 1799, he received a commission as first lieutenant in that corps.

For the next ten years he was actively engaged in Minorca, Malta, Naples, and Sicily, and other places, and was intrusted with several confidential missions, and employed in many important services; among others, conveying communications between General Villette and Lord Nelson, in 1804.

Having attained the rank of second captain on the 1st of March, 1805; he was still more actively employed, and served, in 1806, under the Prince of Hesse-Philippsthal in the defence of the fortress of Gaeta, when it was besieged by the French. In the same year he was with Sir John Stuart at the battle of Maida, in Calabria.

He was at the siege of Copenhagen, under Lord Cathcart, in 1807, and was transferred to the division of Major-General Leith, at Oviedo, in September, 1808; where he was employed on dangerous reconnaissance duties for some time, until he was appointed extra aide-de-camp to Sir David Baird, in consequence of his knowledge of the Spanish language, in addition to his professional attainments. He was soon after attached, in the same capacity, to the staff of Sir John Moore, of whom he was a devoted admirer; but he blamed the general principles of his retreat, and he advocated his turning upon his pursuers before his arrival at Corunna, whence, in case of being worsted, there was no retreat save by sea.

His next service was in the expedition to Walcheren; and in 1809 he took part in the siege of Flushing, where he was seriously wounded whilst leading his men to the attack of a battery.

During the forced temporary "inglorious ease" consequent upon his wound, he occupied himself in acquiring a knowledge of the German language, and in reading up his former studies.

In November, 1810, he produced the "Essay on the Military Policy and Institutions of the British Empire," which by the plain common sense view which it took of public matters, at a period of unnecessary despondency, and its manly and cheerful tone, deservedly attracted the attention and elicited the encomiums of the best men of the day.

At this period the Duke of Wellington made strong representations to the home authorities respecting all branches of the army; but more especially as to the defective condition of the Engineer Department in the field. This had long been perceived by Captain Pasley, and whilst in command at Plymouth, he had commenced a system of education of the royal military artificers, which had proved most advantageous to the service. In spite of

the usual routine opposition, the system of education advocated by him, and laid down in a treatise written at the time for the use of that department of the service, was adopted at Chatham; and he was appointed Director of Field Instruction with the rank of Brevet-Major, which was followed by the steps of Brevet-Lieutenant-Colonel in 1813, and Lieutenant-Colonel in 1814.

In this latter year he commenced the publication of his useful work on "Military Instructions," which was completed in 1817; and in 1818 he published a volume of "Standing Orders," containing a perfect code of military rules for the duties of all ranks in the army.

At this period his pen was scarcely ever idle, and he produced a number of very valuable treatises for the use of the army, some of which have been reproduced abroad.

In 1831 he brought out a volume entitled "Observations on the Expediency and Practicability of Simplifying and Improving the Measures, Weights, and Money used in this Country without materially altering the present standard," wherein he advocated the decimal division; but he strongly opposed the introduction of the unit or the denominations adopted in France.

The peculiar nature of his military duties almost naturally directed Colonel Pasley's attention to civil constructions, and in 1838, he published his very useful and well-known work "Observations on Limes, Calcareous Cements, Mortars, Stuccos, and Concrete, and on Puzzolanas natural and artificial," which has run through many editions, and has been translated into most of the modern languages. It has also powerfully contributed to the foundation of large commercial establishments for the production of Portland and other cements.

The experience he had attained of exploding gunpowder under water led to his being consulted by the Conservators of the Thames, respecting the removal of two wrecks which materially affected the navigation. Colonel Pasley undertook, and successfully accomplished the work, for which he received the thanks of the Municipal Authorities, and the Freedom of the City of London in a gold box. This success led to his undertaking the removal of the wreck of the "Royal George," at Spithead, and the "Edgar," at St. Helens. During portions of six successive summers, between 1839 and 1844, he devoted himself to these labours, which were ultimately completely successful, not only in clearing the anchorage-ground, but in recovering such a quantity of valuable material, that the operations cost nothing to the nation; for all these services, however, Colonel Pasley neither asked nor received any reward from the Admiralty.

The following characteristic note was written to the compiler of

this Memoir, when seeking, for a foreign correspondent, information on firing charges of gunpowder under water.

“MY DEAR SIR,

9th February, 1855.

“My operations against wrecks will be found in what is now called ‘The United Service Magazine,’ but was formerly styled the ‘United Service Journal.’ The numbers for September, 1838, and the ‘Editor’s Portfolio,’ for October, 1838, page 271, contain the account of my operations for blowing up and removing the wrecks of the brig ‘William,’ and schooner ‘Glamorgan,’ the former sunk in the Thames near Tilbury Fort, the latter nearly opposite to East Tilbury Church, towards the eastern extremity of Gravesend Reach. In June, 1839, of the same journal, page 183, are further observations on my subaqueous explosions in the Thames. In November, 1839, is a Paper by Captain Basil Hall, R.N., on the capstan of the ‘Royal George’ recovered by me in September of that year. In January, 1840, page 72; and in February of the same year, page 149; and in March of the same year, page 164; my first operations in the removal of the wreck of the ‘Royal George’ are described, which were continued every summer till the end of 1843; but no more of my operations were published in the ‘United Service Journal,’ because the Editor made difficulties about the length of them, and I would not curtail them, as I always noticed the Royal Engineers’ officers and privates, of the sappers and miners, as well as the civil divers, and the riggers, or dockyard-men who were more useful, as well as the excellent officers of Engineers Captain Symonds and Hutchinson, which was a great incentive to zeal and activity on the part of all the workmen thus distinguished. In 1844, I removed the wreck of the ‘Edgar,’ blown up and sunk by accidentally catching fire, off the Mother Bank, at Spithead, in the early part of the last century when not a man was saved of those on board. Lieutenant (now Captain) Barlow, R.E., with the same excellent military workmen, dockyard-men, naval pensioners, and riggers were employed in 1841; but no civil divers were employed as in the commencement of our operations at Spithead. Your correspondent must not attempt simultaneous explosions, or to make use of one conducting wire, trusting to the water for completing the circuit. These expedients were tried repeatedly, in 1843, by Captain Hutchinson, who was very zealous about them; but we lost a great deal of powder by the first, as we never succeeded in firing more than two charges simultaneously out of a greater number, and the cases containing a second charge were generally burst, and the powder spoiled, by the explosion of the first that happened to prove successful. The second of those expedients gave more trouble, and required a battery of double the power to produce the

same effect. We, therefore, in all cases, used a separate voltaic battery, and *two* conducting wires to every charge in our operations against the 'Edgar' in 1844.

" I remain, my dear Sir,

" Yours very faithfully,

" C. W. PASLEY."

"P.S. My operations from 1840 to 1844, inclusive, were published in a Portsmouth weekly paper, of which I think Harrison was the editor, but I have no copy of them."

In the year 1841 he was removed from Chatham, and was appointed Inspector-General of Railways, the somewhat invidious duties of which he performed with great uprightness and conscientiousness, if not always for the benefit of the public service. He had some "bloodless encounters" with his civil brethren, in which controversial opinions were stoutly maintained on both sides; but amidst all that occurred, Colonel Pasley was universally respected and esteemed, and he certainly did his utmost to perform his duties as well in his civil as in his military capacity. He resigned the post in the year 1846, when he was made a K.C.B. for his services, and henceforth devoted himself to re-editing his various works, and to the introduction of useful apparatus for the Military Engineering service, as well as in advocating the Decimal Coinage system.

His higher steps in the army were Brevet-Colonel in 1830; Colonel of Engineers in 1831; Major-General in the army in 1841; Lieutenant-General in 1851, and General in 1860. The degree of D.C.L. was conferred upon him at Oxford in 1844.

He had been a fellow of the Royal Society since 1816, and he belonged also to the Astronomical, the Geographical, the Zoological, the Statistical, and other Societies; and of the Institution of Civil Engineers, he became an Honorary Member so early as the year 1820, on the proposition of Mr. Telford, seconded by Messrs. Palmer, Field, Maudslay, and Jones—four out of the five founders of the Institution. He was a constant attendant at the meetings, and frequently took part in the discussions, exhibiting a pertinacious determination not to be out-manœuvred, or to be beaten in a fair stand-up fight, if by any tactics or strong argument he could prevent defeat. Among the Civil Engineers he was almost universally popular; and he devoted himself to his civil duties with as much energy as he had previously done to the practice of his own profession.

He was equally popular at the East India Company's Military College of Addiscombe, where he held the position of Public Examiner for sixteen years, up to the year 1855; and the high

standard which was reached and maintained by that establishment may, in some degree, be attributed to the energy infused into the officers, and others connected with it, by the good example of Colonel Pasley.

His constitution began to give way for only a short time before his decease, and he may be said to have been well up to within a week before his death, which occurred at his residence, in Norfolk Crescent, Hyde Park, on the 19th of April, 1861, deeply regretted by his relatives; and his memory will long be cherished by his numerous friends, as a most useful and worthy member of society, and a very distinguished and meritorious officer.

MR. WILLIAM ALLCARD, a descendant of a family well known and esteemed in the Society of Friends, was born in London, on the 30th of June, 1809. At an early age he was placed as a pupil under the late Mr. George Stephenson, at the Steam Engine Manufactory at Newcastle-upon-Tyne, which has since attained such a high reputation. He was there occupied in the Drawing Office, and occasionally assisted in levelling and surveying on the projected lines for the Leeds and Selby and the Newcastle and Carlisle Railways.

In the year 1826 he was transferred to Liverpool, and was placed in charge of the preliminary operations for draining and for forming the Liverpool and Manchester Railway across Chatmoss; and he then had intrusted to him a portion of the works in construction at the Bolton end of the Bolton and Leigh Railway. Early in the year 1828 he was appointed the Resident Engineer, for the middle portion of the Liverpool and Manchester Railway, including the Sankey Viaduct, consisting of nine arches, each of 50 feet span and about 70 feet in height, and the Kenyon Cutting, containing about 400,000 cubic yards of excavation. In the prosecution of these works he remained until the completion of the railway and its formal opening on the 15th of September, 1830, at which he assisted, and took charge of the 'Comet' locomotive engine, with one of the trains forming the procession from Liverpool to Manchester on that memorable and eventful day.

Although at that time he was only twenty-one years of age, yet the responsible positions in which he had been placed, in common with all the pupils of George Stephenson at that period, and the anxious and important duties which devolved upon him, had given him a bearing and a manner much above his years, and had called forth very early his great powers of self-reliance.

Soon after the railway was opened, Mr. Joseph Locke and Mr. Thos. L. Gooch having both left it for other works, the Directors made an arrangement by which the management of the