

The General Introduction to the Zoological Series of the Reports of the Voyage of the "Challenger." Vol. i, "Zool.," 1880.

Note.—Sir Charles Wyville Thomson had also undertaken to write the "Report on the Crinoidea" of the voyage of the "Challenger" in conjunction with Dr P. H. Carpenter.

MR THOMAS WILLIAM RUMBLE. By William Connor Steel
Rumble.

MR THOMAS WILLIAM RUMBLE was born in London, 26th December 1832. He received part of his education at the Reading Grammar School, under the celebrated Dr Valpy. At an early age he was transferred to the office of his father, an architect in good practice, where he was taught the rudiments of his future profession. Tiring of the dull routine of the drawing-office, he left home to try his fortune across the Atlantic, where, after many adventures, he was appointed in November 1850 assistant engineer on the Central Railroad of New Jersey, under J. Laurie, Esq., C.E., he being then not quite 18 years of age. He remained in America till June 1852, during which time he was actively engaged in laying out the Erie and Forest Lawn Cemeteries, superintending the building of the Berks County Baths, the Buffalo Public Wash-houses, &c., and occasionally giving lectures on architectural and engineering subjects. Dr Calvin Fairbanks, in a letter dated 1st October 1851, speaks thus of his ability as a lecturer:—"I must say I was gratified with the clearness with which you presented the necessity of developing the yet undeveloped facts in architecture, in your last evening's lecture. It would have been happy had there been a more general interest at an earlier period. I hope, Sir, it may be convenient for you to favour us again with a repetition of the same, followed by illustrations and remarks."

Almost immediately on his return to England, Mr Rumble obtained work in Kensington, superintending the building of All Saints' Church and the laying out of the Kensington Park Estate.

In October 1853 he went out to Bombay, as assistant engineer on the Bombay, Baroda, and Central India Railway, then in course of construction. An attack of fever obliged him to return on sick

leave to England, where he arrived in February 1854. He next obtained the post of engineering superintendent of the Arthington Extension Waterworks under Mr Hawkesley, with whom he remained till the completion of the work, when he received a flattering letter from Mr Alderman Hepper, chairman of the Leeds Water Works Committee, expressing the great satisfaction of that body with the manner in which he had conducted the works. Returning to London, Mr Rumble experienced some difficulty in finding employment to his taste, and was, for short periods, draughtsman in the offices of Messrs Conybeare and Brikshaw, the London and South-Western Railway Company, the Admiralty, &c., till in 1857 he was appointed engineer to the Atlas Steel Works, then entirely in the hands of Mr (now Sir) John Brown, in which capacity he was entrusted with the conduct of many transactions requiring much tact and diplomacy. In 1858 Mr Rumble was elected Fellow of the Society of Engineers; in 1860 a member of the Institute of Mechanical Engineers; in 1861 a member of the Institute of Naval Architects; and in 1866 a Fellow of the Royal Microscopical Society, in the proceedings of which body he was always deeply interested.

During these years Mr Rumble had opened an office in Westminster, and was practising as a civil and mechanical engineer, and was fortunate enough to secure much good work. In 1869 he paid a second visit to the United States, and spent six months visiting many engineering shops and acquiring a thorough knowledge of the recent mechanical improvements. Shortly after his return to England, Mr Rumble had the honour of two interviews with his late Majesty the Emperor Napoleon, who was pleased to express his satisfaction with the plans, drawings, &c., submitted for his approval. On New Year's Day, 1872, Mr Rumble was again in New York, and visited the various Safe Deposit Companies in that and other cities, with the view of obtaining information for the National Safe Deposit Company, then about to be formed in London. He visited Philadelphia, Boston, Halifax, &c., and the ruins of Chicago, then scarcely cold after the great fire, and examined the vaults and safes remaining intact. He returned to London on the 28th January, and was for the rest of the year employed in designing the safes, strong-rooms, buildings, and other arrangements of the National Safe Deposit Company, which were afterwards carried out under his superintend-

ence at the corner of Queen Victoria Street. The extravagance of his partner at this time considerably involved Mr Rumble, and in 1875 he dissolved the partnership. In 1876 Mr Rumble obtained the position of chief engineer of the Southwark and Vauxhall Water Company. His unceasing energy and untiring industry gradually brought this company, from the state of confusion in which he found it, to such a state of order that the dividends rose from $2\frac{1}{2}$ to $7\frac{1}{2}$ per cent. In 1877 he was admitted member of the Institution of Civil Engineers. In 1878 he successfully laid a 30-inch main under the Thames at Richmond without the aid of dams—the only feat of the kind accomplished at that date in England. Under Mr Rumble's direction a trench was dredged across the bed of the river a few feet below Richmond Bridge. The lengths of the pipe, made on the ball and socket principle, were joined on the banks of the river, and in the early morning of July 3rd were shipped on board three barges strongly lashed together, carefully brought into position, and safely lowered into the trench. When the necessary connections at either end were made, the main was charged, and has ever since been in full work. During the year 1879 the Directors of the Southwark and Vauxhall Water Company determined to supplement the supply of water derived from the Thames by sinking a well into the chalk. In conjunction with Professors Prestwich and Ansted, Mr Rumble selected a spot in the Manor Park, Streatham; a trial bore-hole was made, and in 1881 the sinking of the well begun. The work is still in progress, but so far fully justifies the hopes formed for its success. Struck by Mr Rumble's manner of handling the matter, and entirely without his knowledge, Professor Prestwich and Professor Ansted proposed him as Fellow of the Geological Society, into which he was admitted in December 1879. In February 1881 he was elected Fellow of the Royal Society of Edinburgh.

Towards the end of 1881 the excessive overwork and heavy responsibilities of his position began to tell on his health, which steadily though very gradually failed, and he developed symptoms of pernicious anæmia which defied every effort to overcome it. In December 1882 Sir William Jenner recommended immediate and absolute rest of body and mind for six months. Leave of absence being unanimously granted by the directors of the company, various places were visited in search of health, until on the 5th

April 1883 he returned to Bonchurch, Isle of Wight, where he rapidly grew worse, and died on Saturday, 21st April, surrounded by nearly all his family. He was buried in the New Churchyard, Bonchurch, on 28th April.

Mr Rumble was twice married, and has left a large family to mourn his loss. In business Mr Rumble was straightforward and unerringly honest to his employers, often nervous about small matters, but without fear in cases of grave import, when he was always calm and self-possessed. The rapidity and clearness of his perceptive faculties amounted almost to the gift of second sight, and led him to form swift conclusions which rarely proved false. His firmness in dealing with faults in those under his charge was moderated by great kindness to his men when suffering under any affliction, illness, or distress. He was considered by them always more as a friend than master, and they showed their appreciation of his goodness by presenting him with a testimonial on the celebration of his 50th birthday, 26th December 1882. In private life Mr Rumble's genial spirits, shrewd observations, and witty remarks, endeared him to a large circle of friends. Indeed, his critical condition was almost to the last concealed by his courageous efforts to appear better than he was, and thus relieve the anxiety of his family. He possessed a most retentive memory, and had the faculty of readily assimilating those portions of the books he read which were likely to be useful to him in his professional work. His travels over the greater part of Europe and America naturally enlarged his ideas, and he drew full benefit from the varied experience thus acquired. He had deeply studied the legal as well as the technical points of his profession, and so was particularly well fitted to fill the various appointments he held during his lifetime.

JOSEPH LIOUVILLE. By Professor Chrystal.

Joseph Liouville was born at St Omer on the 24th March 1809. He came of a family of Lorrainers, more than one of whom were distinguished for talents beyond the common. Liouville's father held a public office under the Empire, and an elder brother, Felix Silvestre Jean Baptiste, was a distinguished Parisian advocate. Joseph gave early indications of mathematical ability, and entered