FRANCIS ELGAR, LL.D., F.R.S.,[1] who died suddenly at Monte Carlo, on the 16th January, 1909, was one of the most distinguished representatives of the profession of naval architecture, and the loss will be felt throughout the world of science, in which he had made many friends. Born in 1845 at Portsmouth, he came of a family which had for generations been connected with the great naval arsenal, and was himself apprenticed there at an early age. For nearly 70 years the Admiralty has maintained an admirable system of schools for its apprentices, and has provided facilities by which those who prove capable of benefiting thereby shall receive higher instruction in those branches of mathematics which are used in connection with shipbuilding, as well as in the operations and processes incidental to practical work in drawing offices and mould lofts. Elgar was one of the young men whose progress in the school secured advancement to higher instruction. Fortunately for his career, just at the period (in 1864) when he had completed the preliminary stages of training at Portsmouth, it was decided by the Admiralty and the Science and Art Department jointly to establish the Royal School of Naval Architecture and Marine Engineering at South Kensington. The Admiralty students at this school were selected by competitive examination in which apprentices in all the Royal dockyards took part. Elgar was one of eight young men chosen in this way from a very large number of candidates, and given an opportunity of passing through a three years' course of advanced study in the theory and practice of shipbuilding. This he did with distinction, and was awarded a first-class diploma of Fellow of the Royal School of Naval Architecture in 1867.

Sir Edward Reed, then chief constructor of the navy, and himself a graduate of an earlier school of naval architecture, took a warm interest in the welfare of the graduates from the new school, and appointed Elgar an assistant overseer of the ill-fated turret ship *Captain*, which was then building by Messrs. Laird, of Birkenhead. In the preparation of the designs for that vessel, Captain Cowper Coles, R.N., had collaborated with Messrs. Laird, and Admiralty inspection was limited to supervising the work of construction. In this manner Elgar at an early age supplemented practical training obtained in Royal dockyards by close association with the business of a great private shipyard. About 2 years later he was recalled

[1] This memoir, written by Sir Wm. H. White, K.C.B., Past-President, is reprinted, with slight modification, from *Nature*, 28 January, 1909.—Sec. Inst. C.E.

to Portsmouth, and received an appointment as a shipbuilding officer, being employed on important practical work in that establishment when the loss of the *Captain* took place. The master shipwright of the dockyard was asked to give evidence before the court-martial in regard to the stability of the *Captain*. These conditions were altogether exceptional owing to the extremely low freeboard and heavy sail equipment of that vessel. In the preparation of this evidence, Elgar gave considerable assistance to his superior officer, and in this way began a series of investigations into the stability of ships which extended over many years, and covered mercantile vessels of various types, as well as warships.

In 1871, Sir Edward Reed having resigned his position at the Admiralty and established a private practice, Elgar became his chief professional assistant, and took charge of the London office, in which, during the next few years, novel and important designs for foreign warships and for mercantile vessels were prepared. In all these designs, as well as in the supervision of the work of building the ships, Elgar took an important part, and his services were acknowledged by Sir Edward Reed.

From 1874 to 1876 Dr. Elgar occupied an important position as general manager of Earle's Shipbuilding Company, at Hull; afterwards for 3 years practising in London as a consulting naval architect partly in conjunction with Sir Edward Reed.

A close connection with the Japanese Government, for whom Sir Edward Reed had designed several warships, led to the appointment of Elgar, in 1879, to be their special adviser upon naval construction. He proceeded to Japan, and remained there for about 2 years, dealing with important questions relating to dockyard organization and shipbuilding programmes. This appointment indicated the high reputation Elgar had already achieved. On his return, Elgar practised as a consulting naval architect in London, and continued to act in that capacity until 1886. For the most part his work was of a private character, but it included service as the confidential adviser of leading steamship companies, and was marked by public appearances in connection with special investigations into the causes of accidents to, or the loss of, important vessels. When the Orient liner *Austral* foundered in Sydney Harbour, Elgar investigated the matter, and demonstrated that the accident was due to a lack of proper precaution during the process of coaling the ship. When the *Daphne* capsized while being launched on the Clyde, Elgar exhaustively investigated the circumstances, and gave a rational explanation of the disaster. He also served as a member of the Special Committee appointed by the Board of Trade in 1883, with

Sir Edward Reed as chairman, to propose rules for fixing the load-line of merchant vessels. The work done by this committee included the consideration of the strength and stability of many types of ships, furnished a settlement of a most difficult question, is still bearing fruit, and promises to lead to an international agreement.

During this period of his career, Elgar was appointed the first university professor of naval architecture in Great Britain. This Chair was established at Glasgow in 1883 by the munificence of Mrs. John Elder, and the selection of Elgar to fill it gave universal satisfaction, and afforded fresh evidence of his high professional reputation. The inaugural address which he delivered at the commencement of his work not merely attracted a large and representative audience, but was in itself a most excellent performance. In 1885 the University conferred upon him the honorary degree of LL.D. Early in the following year, however, the Admiralty created the new post of Director of Dockyards, and sought out a man to fill it who should combine experience in private yards with an intimate knowledge of warship-building. Dr. Elgar was selected, and accepted the great responsibility of making proposals for reorganization of the dockyards and giving practical effect thereto, with the view of increased economy and rapidity in the work of construction and repair of the ships of the Royal Navy. This was no light task: it was well performed, and voluntarily terminated in 1892, when Elgar accepted an invitation to become a director and consulting naval architect to the Fairfield Shipbuilding and Engineering Company, of Glasgow. This business had been first established by John Elder and others, had been greatly developed by Sir William Pearce, and after his death was in need of a capable and thoroughly trained professional head. The connection which thus began was terminated by his own choice about 2 years ago, with the intention to obtain and enjoy a well-earned leisure. From this retirement, however, he soon emerged in order to undertake the chairmanship of the great industrial enterprises belonging to Cammell, Laird and Company, including steel works, armour-plate factories, shipbuilding and marine engineering departments, and mining operations. Immediately after his accepting this position, it was associated with that of chairman of the Fairfield Shipbuilding Company. When Elgar assumed these responsibilities, a radical reorganization had to be undertaken in the establishments and staffs of Cammell, Laird and Company. In carrying out this heavy and delicate task, Elgar gave remarkable proofs of ability and energy, and necessarily made demands upon his strength which may

have tended to bring about the unexpected and sudden death so widely mourned. He had taken a holiday on the Riviera at the close of the year; a slight accident occurred, but there was no thought of consequent danger, and the end came suddenly.

Dr. Elgar united practical experience with a wide knowledge of science and strong literary tastes. His papers on professional subjects, contributed to various scientific societies, furnish illustrations of these qualities, and contain much original work. In 1907 he was selected to deliver the James Forrest Lecture before The Institution, and dealt with "Unsolved Problems in the Design and Propulsion of Ships" in a manner which excited admiration amongst those familiar with ship design, while it proved interesting to engineers generally. He was elected a Fellow of the Royal Society in 1895. With the Institution of Naval Architects he was closely connected, serving on the council for 25 years, as well as representing the society on other bodies and filling the offices of treasurer and honorary vice-president at the time of his death. He also served on the council of the Royal Society of Arts, in the affairs of which he took an active interest, and was a member of many engineering and scientific societies at home and abroad.

Dr. Elgar did good work in connection with the British commissions for international exhibitions at Chicago, Paris, and elsewhere, and his services were recognized by his appointment as Chevalier of the Legion of Honour. His last work in this department was done for the Franco-British Exhibition, where he served as chairman of the shipbuilding section, and organized one of the most remarkable collections of ship-models ever brought together. Busily engaged as he always was, Elgar had little opportunity for extensive literary work. He presided over "The Sette of Odd Volumes" some 15 years ago, and was the author of an interesting book on "The Ships of the Navy," in which, as in various papers, he displayed an intimate knowledge of the earlier history of shipbuilding. He was intimately concerned also with the production of the review, *Naval Science*, founded by Sir Edward Reed and published between 1872 and 1875. Dr. Elgar was a man whose interests were wide and varied; his personal qualities secured for him a multitude of friends who mourn his loss; but, above all, he will be remembered as a brilliant example of the modern naval architect in whose work were embodied the results of thorough training in both the science and practice of his profession, which training was supplemented by ripe and varied experience, and bore fruit in original investigation, the solution of novel and difficult problems, and valuable contributions to the development of a great British industry.

Dr. Elgar was elected a Member of The Institution on the 27th May, 1884, and served on the Council from 1903 until his death.

WALTER WILLIAM FIDDES, who died at Bristol on the 15th August, 1908, aged 62, was the son of Mr. Walter Fiddes, who has survived him by only a few months. Both father and son were associated during the whole of their professional careers with the Bristol Gas Company, occupying in succession the post of Chief Engineer of the undertaking. The subject of this notice entered the company's service in 1862, as an articled pupil to his father. Seven years later he was selected for the position of Engineer to the Calcutta Gas Company, but was induced to remain at Bristol on receiving the appointment of Assistant Engineer to the company. He retained this position until 1888, when, on the retirement of his father, he succeeded to the office of Chief Engineer. After 38 years' continuous service, he in his turn retired in 1901, owing to failing health. During his connection with the gas undertaking, its output and operations greatly increased, necessitating large extensions of the plant, for which Mr. Fiddes was responsible; and after his retirement, he continued to act as Consulting Engineer to the company.

Mr. Fiddes was the joint inventor, with Mr. Aldridge, of the Fiddes-Aldridge simultaneous charging and discharging machine for gas-retorts, and a form of gas-meter, designed to register correctly at any temperature, also owes its origin to him. The scientific aptitude which he displayed in early life, attested by his winning a National prize for science at the age of 14, equally distinguished him in after years. In 1865 he obtained one of the National medals for inorganic chemistry, and 2 years later, he was elected a Fellow of the Chemical Society. He was also a Member of the Institution of Gas Engineers.

Mr. Fiddes was elected a Member of The Institution on the 1st December, 1896.

JOHN MUIR HETHERINGTON, who died at Bournemouth on the 25th February, 1908, in his seventy-sixth year, was, up to within a few years of his death, chairman of John Hetherington and Sons, Ltd., machine makers, of Vulcan, Phœnix and Ancoats Works, Manchester. Having served 6 years' pupilage to his father in the works and drawing-office of the firm, he was taken into partnership in 1854, and continued to take an active share in the