

CAPTAIN EDWARD KILLWICK CALVER, R.N. (retired), F.R.S., was born at Southwold on the 6th of December, 1813. At fifteen years of age he entered the navigating branch of the Royal Navy, on board H.M.S. "Crocodile" and for seven years was on foreign service in the East Indies and on the coast of South America. Returning to England in 1836, he joined the Hydrographic Department of the Navy and commenced his long period of service as a marine surveyor on home stations. For thirty-six years, with scarcely a break, he carried out these duties mainly on the north and east coasts of Great Britain. He was employed in this capacity first under the late Commander Slater, R.N., and then under the late Rear-Admiral Washington¹ (subsequently Hydrographer to the Admiralty), in surveying various harbours and rivers and also upon a general survey of the North Sea. From 1847 to 1872, he was in charge of the survey of the north and east coasts of England and Scotland and produced charts of nearly the whole of the eastern coast. The principal rivers and harbours were surveyed, as well as the outlying sandbanks and channels, which owing to their liability to constant change had to be repeatedly examined. He was promoted in 1863 to the rank of Staff-Commander and in 1870 to that of Staff-Captain.

In 1869 the deep waters of the Atlantic were dealt with, soundings and temperatures at depths of 100 fathoms to nearly 3 miles were determined and large quantities of the bottom, with its living organisms, were dredged up under the superintendence of Captain Calver. These operations were continued during the following summer and carried into the Mediterranean as far eastward as Malta. Very full and interesting details of these expeditions were communicated to the Royal Society by Dr. W. B. Carpenter, Mr. Gwyn Jeffreys, and Sir Wyville Thomson in reports² published in 1869 and 1870 of the scientific explorations of H.M. surveying-ship "Porcupine," and an account was also given in Sir Wyville Thomson's "Depths of the Sea." On the completion of a survey of the Wash, he retired in 1872 from active service in the Royal Navy with the rank of Captain. In the following year he was elected a Fellow of the Royal Society.

Captain Calver's constant employment in connection with the rivers and estuaries of the East Coast gave him great experience

¹ Minutes of Proceedings Inst. C.E., vol. xxiii. p. 513.

² Proceedings Royal Society, vol. xviii. p. 397 and vol. xix. p. 146.

in the action of tides, waves and running water, and he devoted much time to the study of the principles to be observed in the improvement of tidal harbours and entrances. His views on this subject were set forth in various pamphlets, the most important being that on "The Conservation and Improvement of Tidal Rivers,"¹ published in 1853. He made several valuable reports to the Admiralty on harbours of refuge, his predictions as to the results of various works having nearly all been verified.

Although Captain Calver had retired from active service he continued to take great interest in all questions relating to the Navy, to harbours, and to the protection of ships on sea-shores. In 1876 he wrote a pamphlet entitled "The Cry for National Harbours, and its Connection with our Defective System of Public Harbour Legislation,"² which attracted much attention, as it was chiefly directed against the then proposed extension of Dover Harbour.

The latter years of Captain Calver's life were passed abroad and he died at Vevey in Switzerland on the 28th of October, 1892. He was elected an Associate of the Institution on the 10th of April, 1866, on the ground that, having made the physical laws in operation round our coasts the subject of special study, and having directed the experience thus gained into a practical channel by his writings, he was enabled to concur with Civil Engineers in the advancement of professional knowledge.

JOHN STINSON FARMER, born in 1827, entered at an early age the service of the London, Brighton and South Coast Railway Company; and in 1849 was appointed Assistant Traffic Manager of that line under the late Mr. George Hawkins.³ He held that post for thirteen years; and during the prolonged absence of Mr. Hawkins, through ill-health, was responsible for the management of the whole of the extensive traffic of the Brighton Company.

In 1862 Mr. Farmer entered into partnership with Mr. John Saxby, a colleague in the service of the London, Brighton and South Coast Railway Company, and with him founded the business for the manufacture of railway signals and safety-appliances which

¹ Library Inst. C.E.

² Library Inst. C.E. and *The Engineer*, vol. xlii. p. 251.

³ Minutes of Proceedings Inst. C.E., vol. xcv. p. 397.