

power, besides some submarines and other vessels. Mention should also be made of the remarkable coastal motor boats which were used with success off the Belgian coast and in the attack of Cronstadt.

A frequent contributor to the *Transactions of the Institution of Naval Architects* and other technical societies, Sir John Thornycroft was elected a fellow of the Royal Society in 1893, and in 1902 received the honour of knighthood. For some years past he has resided at Bembridge, in the Isle of Wight, engaged in the study of the problems in naval architecture to which he has made so many notable contributions. He married in 1870, and had two sons and five daughters. His eldest son, Sir John Edward Thornycroft, the present managing director of the firm, was knighted in 1918.

A DISTINGUISHED naval architect has favoured us with the following appreciation of Sir John Isaac Thornycroft :

Sir John got most of his early technical training from his father, who was a keen amateur engineer with a sound knowledge of mechanical principles. Sir John spent some time at South Kensington and was a contemporary there of Sir Philip Watts. Unlike some of his famous contemporaries, he did not serve an ordinary apprenticeship. He was at the University of Glasgow in the engineering class under Prof. Rankine, and took the natural philosophy class under Lord Kelvin. The class of naval architecture and marine engineering was not then founded, but Prof. Rankine's lectures included much that was the foundation of the science of marine engineering, and young Thornycroft no doubt owed a great deal of his scientific knowledge to the lectures of Prof. Rankine.

Like his co-worker in the development of small high-speed vessels, Sir Alfred Yarrow, Thornycroft began to make high-speed vessels when scarcely out of his teens. He produced the *Miranda*, which attracted the attention of the Admiralty; he built for the Norwegian Government in 1873 a 14-knot boat. Other governments ordered vessels of 18 knots, and the British Government ordered from him in 1878 the first torpedo-boat built for the Navy, the *Lightning*, of 80 ft. length and 18 knots speed. He built this vessel in a small yard on the Thames at Chiswick, and there built many other torpedo-boats, and ultimately the *Speedy* in 1893, which was almost too large for the capacity of the works. Later, the development of the torpedo-boat destroyer, which gradually grew to be too large for the scope of the Chiswick works, caused the acquisition of the present Thornycroft yard at Southampton early in this century, where the traditions of the firm are maintained and where the latest destroyer for the British Navy still holds the high record which has been continuously maintained since Sir John I. Thornycroft first created it in his almost boyhood days.

Thornycroft's early work was associated with the locomotive boiler in ships, but the pressure for higher speed led him to develop the Thornycroft

water-tube boiler, which is to-day the steam producer in all the destroyers built by his firm. He devoted himself also to high speed in smaller vessels, and developed the form of small high-speed vessel known as the 'hydroplane,' which by a series of two or more inclined planes in the form of the bottom of the vessel forces her out of the water, and so reduces the resistance and increases the speed. This principle was of great value in the War, and was applied by Thornycrofts in the building of 40-knot coastal motor boats which carried torpedoes and attacked successfully larger ships which their speed enabled them to evade.

Sir John I. Thornycroft had for many years given up the commercial management of the Thornycroft business, and had left it to his son, Sir John E. Thornycroft, devoting himself to the technical and scientific side of ship design and research. He will be remembered as one of the three pioneers in light high-speed vessels and machinery of the last half of the nineteenth century; of the other two, Normand has passed away, but Yarrow is with us still. Sir John I. Thornycroft himself appeared less in the public eye than the other two, preferring the rôle of the scientific worker to that of the commercial man, but his work for his time did not suffer thereby. He was taking a keen interest in engineering and scientific matters to the end.

PROF. LAUNCELOT HARRISON.

THROUGH the untimely and unexpected death of Prof. LaunceLOT Harrison on Feb. 20 last, at the early age of forty-eight years, Australian zoology has lost one of its most distinguished exponents, and the University of Sydney a brilliant and stimulating teacher, who had made his influence felt both inside and outside the university walls.

Harrison was born at Wellington, N.S.W., in 1880, and was educated at the King's School, Parramatta. Taking up a business career, it was not until 1911 that he found it possible to enter the University of Sydney as a science student. He was already imbued with that profound love of natural history which had been fostered by years of active membership of the Field Naturalist Club and remained with him to the end. After a distinguished undergraduate career, he took the B.Sc. degree in 1913 with first class honours and the University medal in zoology. In the following year he was awarded the John Coutts and the 1851 Exhibition Scholarships and proceeded to Cambridge, where he gained a research exhibition at Emmanuel College and the B.A. degree by research in 1916. In the same year he was selected as advisory entomologist to the Mesopotamian Expeditionary Force with the rank of lieutenant and later of captain, a position he was thoroughly well qualified to fill through his work in Prof. Nuttall's laboratory and by his own investigations on ectoparasitic insects. He did splendid work in the field, but unfortunately he himself fell a victim to both typhus and malaria, and he never fully recovered from their effects.