

lying the incidence and duration of the diatom outbreaks which are often of such serious consequence in the clogging of filter beds. Having shown that their rate of growth could only be correlated with abundance of phosphate and silicate in the early part of the season, he was investigating the causal conditions acting later in the year. At the time of his death he was experimenting along several new lines of diatom culture and improved methods of estimating populations.

Gardiner never lost his interest in the sea. Thinking that animals must materially alter the phosphate content of the water by their excretion, he took a brief busman's holiday on the research ship *George Bligh* and, by the simplest experiments, with live plankton animals taken straight from the sea, at once proved his contention. This important factor in marine ecology had hitherto been completely overlooked, and much more will be heard of it in the future.

Gardiner's work had a splendid quality. After reading the late Sir Arthur Hill's account of his father ("Obituary Notices of Fellows of the Royal Society", vol. 3, 1941), one realizes that he inherited not only his love of biology but also his keen faculty of self-criticism and clear thinking; he was always striving after improved methods and greater accuracy. His most recent paper, published since his death, is typical of him: a critical examination of the pigment extraction method of measuring phytoplankton production.

I cherish many memories of him: of sharing a study at Oundle, of natural history expeditions with him both at school and in the holidays, of grand days together at sea on the *George Bligh* and latterly of his happy married life in London. From his early school days he was a martyr to asthma, to an attack of which he finally succumbed. All his life he battled with his health, but for ever made light of it. What a spirit he had, what courage, what a grand sense of humour! From a sanatorium in Switzerland he was a frequent contributor to *Punch*. When things must have looked their blackest his letters still sparkled with fun. He will be missed by so many, missed for his cheerful good company, for his intellectual honesty and for his sound reliable work. But for his ill-health how much more he would have done; in spite of it, how astonishing that he did so much! It is good to learn that the Freshwater Biological Association is to assist in the bringing of his unfinished work to publication.

Our sincerest sympathy goes to his wife and to his mother.

ALISTER C. HARDY.

Prof. A. A. Read

ARTHUR AVERY READ was born at Honiton, Devon, in 1868 and died at Bournemouth on September 24, where he lived after his retirement from a tenure of forty years of the chair of metallurgy in University College, Cardiff. He was educated at Exeter Grammar School, Owens College, Manchester, and at the University of Sheffield (then the Technical School), where he studied metallurgy under the late Prof. J. O. Arnold. He went to Cardiff from Sheffield in 1894 as the first lecturer in metallurgy, and on his retirement in 1933 he had completed his life's work by the establishment of a department worthy of the University of Wales, housed in a modern building, which had been erected with the financial assistance of the Monmouthshire and South Wales Coal Owners' Association.

Read's enthusiasm for his work was such that the new department flourished, and he had the distinction of training the first man to obtain a B.Sc. degree qualification in metallurgy in Great Britain. Many of his former students have become distinguished men in the metallurgical world.

Read realized that a university has a two-fold obligation—not only to teach but also to prosecute original research; and he managed to keep an even balance between these two while at the same time he worked hard to build and equip his Department. His research work, in collaboration with Arnold, on the chemical relations of carbon and iron with various other elements such as manganese, chromium, vanadium, tungsten, cobalt and molybdenum, which were published over a period of years from 1895 until 1915, have proved of great value in the development of modern alloy steels. His interests in non-ferrous metallurgy resulted in the publication of several papers dealing with alloys of nickel, aluminium and copper, work with which Dr. R. H. Greaves was associated.

Outside College, Prof. Read was interested chiefly in the Volunteers and Territorials, and he received the Territorial Decoration. During the War of 1914–18 he was away from College on national service. After the War the University of Wales, and the College at Cardiff, both young institutions, were faced with serious problems, and Read sacrificed his personal inclination to resume his researches and applied himself energetically to University affairs. He brought to bear on academic matters an administrative outlook which was of inestimable value. His work was recognized by the University conferring on him the degree of D.Sc. *honoris causa*.

Read, always an inspiration to his students, won their respect for his straight dealing and then their affection for his kindness and his readiness to champion their cause.

W. R. D. JONES.

Mr. F. Napier Sutton

FREDERICK NAPIER SUTTON, a former alkali inspector in the Ministry of Health, died on September 24, aged eighty years. He was the eldest son of the late Mr. Francis Sutton, public analyst of Norfolk and Suffolk, and the author of the text-book "A Systematic Handbook of Volumetric Analysis".

Mr. Sutton was, for a very long period, works chemist to Messrs. Baily, Sutton and Co., of Great Yarmouth. In 1885 he was appointed assistant to the chief inspector (the late Alfred Fletcher) under the Alkali, etc., Works Act; he was promoted to sub-inspector in 1892 and to inspector in 1908. He retired on reaching the age of sixty-five in December 1927, having then served for forty-two years, during thirty-five of which he was in charge of the London and south-eastern counties district.

After his retirement and, indeed, up to the time of his death, he continued to take a great interest in the affairs of the Alkali Works Department of the Ministry of Health and in chemical industry generally. During 1892–1916 he was secretary of the London Section of the Society of Chemical Industry.

Mr. Napier Sutton was devoted to chamber and orchestral music, and for many years he was a player in some of the leading amateur orchestral societies. He was an expert trout fisherman and a gifted 'dresser' of trout flies. He was greatly beloved by all his colleagues, and his passing will be widely mourned.