

to take up new lines of research. As a designer of instruments he saw the essential functional requirements and found the most direct way of solving the problems. In his contacts with people Siegbahn was a man of few words, but what he said was always to the point and his quiet manner was not to be taken as a sign of timidity. On the contrary, he possessed the large amount of contagious self-confidence needed for bold enterprises. Siegbahn took little interest in formal teaching and he gave his research students a great deal of freedom in their work, at the same time keeping them aware of his generous encouragement.

Bengt Edlén

E. A. Moelwyn-Hughes

WITH the death, on 10 September 1978, of Emyr Alun Moelwyn-Hughes, Fellow of Darwin College and for many years Lecturer in the University of Cambridge, the world of chemistry has lost one of its luminaries.

He was born in Cardigan in 1905 one of the six children of the Rev. Dr J. G. Moelwyn-Hughes, a well known Welsh Presbyterian minister and hymnologist. After a remarkable career as a student in the University of Liverpool, who awarded him a DSc at the age of 28, and where his interest in kinetics was first aroused by Prof. W. C. McC. Lewis, he went to Magdalen College, Oxford as 1851 Exhibitioner.

It was there, alongside C. N. Hinshelwood with whom he collaborated, that his work on solution chemistry and the comparison of the rates of change in the gaseous and liquid state first flourished. His interests soon encompassed ionic reactions, enzyme catalysis, the isotope effect and the general theory of solutions. The first of his classical texts *The Kinetics of Reactions in Solutions*, which greatly influenced the subsequent development of the subject, was published in 1933, at about the time when he embarked on a year's collaboration with K. F. Bonhoeffer at the Institut für physikalische Chemie, Frankfurt.

In 1934 he moved to the University of Cambridge where, apart from the war years when he was associated with the Ministry of Supply, he remained for the rest of his life, except for short visits abroad. He held the Messel Fellowship of the Royal Society from 1936 to 1940, and later became a Vice President of the Chemical Society.

As a teacher in Cambridge, and as an extraordinarily successful author of several standard texts, he influenced the careers of countless young sci-

entists. One of his own research associates (J. C. Kendrew) became a Nobel laureate, and many others reached distinguished heights. They were taught at the time when his own experimental contribution was at its apogee: at a time when he wrote the often-quoted 'the complete physical chemist blows his own apparatus and solves his own equations.'

But he will be remembered best for his scholarly authorship of texts which were widely acclaimed. Moelwyn-Hughes wrote about his chemistry with the consummate skill of the accomplished creative artist. His dignified fluency, together with his wit, perception and perspective, was altogether refreshing in its originality and impact. Molecules, and other inanimate entities of the physical world, were frequently endowed with human qualities; and he contemplated the beauty, magic and mystery of their behaviour in the best traditions of the natural philosopher and poet. He had the innate feeling for the right turn of phrase. On listening to him, or reading his work, one was impressed by the freshness of his metaphors, which were invariably newly minted. And he obviously relished the act of regulating the rhythm of his sentences. His physical chemistry was described with the right words in the right order. Some of the gems that constitute part of his legacy trip off the tongue: 'Energy among molecules is like money among men; the rich are few, the poor numerous.' 'Belief in the essential simplicity of things is one of the chemist's articles of faith.' And consider his discussion of the self-evident fact that the liquid state of matter is intermediate between the solid and gaseous states. 'Like a central party in politics or a moderate denomination in religion, the liquid state is less rigorously defined and more difficult to understand than either of the extremes that flank it.'

His introduction to the Everyman Edition of *The Sceptical Chemist* (1963) is a model of succinct historical exposition. In asking when the discovery of the inverse relationship between pressure and volume was made and who was Robert Boyle, he wrote: 'He flourished in the seventeenth century, that turbulent time of pestilence and fire so amply described by Evelyn and Pepys, when Bunyan wrote in Bedford jail and Penn left England's shores, when Milton sang his *Paradise Lost* and Wren built London's churches, when Britain's monarch was overthrown and Cromwell made Protector.' His book-reviews were also delightfully composed.

Moelwyn-Hughes was greatly admired by many. He was appreciated as a significant figure in twentieth century

physical chemistry. His coruscating, if sometimes caustic, wit was much enjoyed (and occasionally feared) as was his superb storytelling gift; and very many including those Welshmen who got to know him at the University of Cambridge Welsh Society (Cymdeithas y Mabinogi), valued his warm-hearted friendship.

His illness was prolonged: for many years he was struck with immobility and incapacity. During that time he uttered not a syllable of complaint; and throughout it all he was nursed with profound affection and care by his devoted wife Mair who, along with his twin sons Edmwnd and Rolant, survive him.

J. M. Thomas

F. C. Fraser

DR FRANCIS CHARLES FRASER, CBE, FRS, Polar Medal 1942, a cetologist of international distinction and Keeper of the Department of Zoology at the British Museum (Natural History) from 1957 to 1964, died on 21 October 1978 at the age of 75. A graduate of Glasgow University, where his interests had been in both zoology and geology, his love of the sea and an appropriate opportunity sent him to the Antarctic and South Georgia from 1925-1933. His early work with the 'Discovery Investigations' was on the development and distribution of the young stages of *Euphausia* (*Discovery Rep.* 1936, 14, 1).

From the time of his appointment to the museum in 1933 as an Assistant Keeper, Fraser devoted his research to various aspects of cetology. He took over the *Reports on Cetacea, stranded on the British Coasts* which had been initiated in 1913 by Sir Sidney Harmer. This involved the development of communications between coastguards and other authorities and the museum, and then recovery, identification, measurement, and preparation of specimens to ensure the fullest scientific use of each stranded cetacean. Successive *Reports* were published in 1934, 1946, 1953 and 1974. Each contained analyses of strandings by species, site and distribution, number per month, estimated age, time of birth and summaries of many other findings useful in building up facts about the life histories of cetaceans. Altogether (from 1913-1966) 1,550 cetaceans were identified by Harmer and Fraser. These reports have been so valuable that other countries have begun to publish similar records.

During the Second World War, Fraser worked at the Admiralty. Afterwards he joined the 'Atlantide' expedition (1945-1946) and studied cetaceans off the coasts of West Africa. He soon confirmed his reputation as a leading