

## Obituary

### Noel Sydney Hush AO, Dist FRSN, FAA, FRS, FNAS, FRACI

15 December 1924–20 March 2019



Noel Hush with his children, David and Julia, both of whom are Fellows of the Society. The occasion was the presentation of his Fellowship (later Distinguished Fellowship) *testamur* in 2012.

Noel Hush, a Distinguished Fellow of the Society and one of Australia's finest scientists, has died at the age of 94. He was one of the key figures in establishing the field of electron-transfer theory, a phenomenon at the heart of oxidation-reduction processes, a class of chemical reactions that are ubiquitous in nature.

At school, Noel was an outstanding student, achieving near-perfect marks in eight subjects at the Intermediate Certificate. In 1942, at the age of 17, he matriculated and commenced his tertiary studies at the University of Sydney. He was a voracious reader and ultimately decided that chemistry was

where his passion lay. The emerging field of quantum mechanics was his area of particular interest and Noel was keen to investigate the mechanisms that occur between electrons when a chemical reaction takes place.

While at university, Noel was actively engaged in student politics, in particular on the editorial board of the student newspaper, *Honi Soit*. In 1945, when he was approaching the end of his formal studies, *Honi Soit* became embroiled in a public controversy. In July that year, an edition was published that carried articles attacking religious and sexual views. There had been a rowdy symposium on birth control at the Women's Union,

Manning House. A Catholic viewpoint was put by a member of the Newman Society and an Andersonian philosopher presented an opposing position. The *Sydney Morning Herald* published a report on the meeting and the controversial articles and Noel, representing the staff of *Honi Soit*, was quoted as saying, “The objections resolve themselves into the question whether *Honi Soit* is to be permitted to publish material that may arouse controversy — that is, whether it is to give principal attention to the truth or to people’s feelings. We cannot have controversy without paining people who have prejudices. I am sure that the anti-liberal forces will not meet with success.” Noel had a strong belief in the importance of dealing with the social issues of the time, such as birth control and the transmission of sexual diseases with servicemen returning home from World War II. His deep-seated interest in philosophy and important social matters stayed with him his whole life.

In 1949, Noel completed his Master of Science degree and published an important paper in *Nature*. He was offered a lectureship by M. G. Evans at Manchester University in the theoretical chemistry department established by Michael Polanyi, a chemist of great distinction but also well known for his political and philosophical writings. At the time the department was the leading theoretical chemistry research group in Europe and Noel collaborated with H. C. Longuet-Higgins. Here, Evans arranged for Noel to meet the brilliant mathematician, Alan Turing. Noel was interested in the process by which an ion or molecule would diffuse to the surface of an electrode to transfer an electron to the metal. Turing was solving diffusion problems in two dimensions, so the field was rich with collaboration oppor-

tunities. When Turing committed suicide, Noel was appalled at the tragic outcome of the prejudice that Turing had suffered.

Noel moved to the University of Bristol in 1955 and worked with M. H. L. Pryce. Based on his prolific publications and his work with Longuet-Higgins and Pryce, he was awarded a Doctor of Science in 1959 and was promoted to Reader in Inorganic Chemistry. In 1971, he returned to Australia as the founding professor of the Department of Theoretical Chemistry at the University of Sydney.

Under his leadership, the Theoretical Chemistry Department at Sydney became internationally recognised both for teaching and research. Staff members whom Noel appointed (for example, Robert Gilbert, Sture Nordholm and George Bacskay) became internationally renowned leaders in their fields, as did a number of his students. From about 1980, Noel was one of the leaders in developing the field of Molecular Electronics, in which techniques were developed to have molecules act as electronic devices. Noel formally retired in 1989 but as Emeritus Professor, he continued full-time research until recently.

Over the last decade or more, Noel worked closely with Jeffrey Riemers, whose award-winning work has given new and important insights into the electronic and vibrational structure of many complex phenomena, such as catalysis, spectroscopy, single-molecule electronic circuits and photosynthesis. Noel’s work on electron-transfer theory was an important foundation of this work. Throughout this time, Noel was a contributing author of many papers, with the last of these being submitted for publication on the day he died.

Noel received much recognition during his long career, including Fellowship of the Australian Academy of Science, the Royal Society of London, the National Academy of Sciences, USA, and Distinguished Fellowship of the Royal Society of NSW. He was appointed an Officer of the Order of Australia in 1993 and received many other prestigious awards. Noel's outstanding life-long contribution was recognised by the University of Sydney in 2009 when he was awarded an honorary Doctor of Science.

Noel was closely involved in the activities of the Royal Society of NSW and rarely missed a meeting. If I might conclude on a personal note — over the last few years, through our shared interest in the Society, Noel and I became friends. He was a great

supporter of the renaissance of the Society, particularly the broadening of its activities to its original purpose of advancing knowledge in science, art, literature and philosophy. At monthly meetings of the Society and on numerous other occasions, we had stimulating discussions on a wide range of subjects but particularly on philosophy, an area of mutual interest. I shall miss him.

*Acknowledgements:* I would like to thank Thomas Maschmeyer, Max Crossley, Richard Christopherson and Jeffrey Reimers for their contributions to this obituary.

— Donald Hector FRSN

Donald Hector FRSN is a former President of the Royal Society of NSW.

