

## Sir David Cecil Smith FRS (1930–2018)

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David Smith, undoubtedly one of the most eminent of British lichenologists, died on 29 June 2018. For 67 years, as researcher, teacher and administrator, he was deeply involved in university activities. His reputation and achievements in all aspects of academic life were widely recognized and his contribution to our knowledge of symbiosis has been unequalled.

David Smith was born in Port Talbot, Wales, on 21 May 1930, but was educated in Bristol and subsequently London where, at St Paul's School, he came under the

influence of an inspirational sixth-form biology teacher whose approach to the subject through fieldwork and the identification of organisms was instrumental in changing his career. When he entered the sixth-form he had every intention of becoming a doctor, but instead, he became 'hooked on plants', gaining the Browne Scholarship to Queen's College, Oxford, where he read botany, graduating with first class honours in 1951. An award of the Christopher Welch Scholarship from Oxford University enabled him to undertake postgraduate research, first at

Uppsala University for one year, with additional support from the Swedish Institute. Afterwards, he returned to Queen's College, Oxford, where, under the supervision of Dr (later Professor) Jack Harley, an expert on mycorrhizae of beech trees, he completed his postgraduate research on lichen physiology, for which he was awarded a doctorate in 1954.

After a two-year stint of military service, he returned once again to Queen's to continue his work on lichens. In 1959, he received the Harkness Fellowship, enabling him to further his research at the University of California, Berkeley after which he returned to Oxford. After an initial joint paper with his supervisor in *Annals of Botany*, his research was published in the *New Phytologist* from 1960 onwards as 'Studies in the physiology of lichens', a series of 15 papers via which he and a series of graduate students continued to report research progress in this area over the next 16 years. During this time, he built up an international reputation through his pioneering work. Initially his studies were on the uptake and use of nitrogen containing compounds and water relations of *Peltigera polydactyla* (= *P. hymenina*), but with postgraduate students he extended this research to include several lichen genera which revealed, for the first time, that not only glucose but a variety of sugar alcohols such as ribitol and erythritol were transferred from alga to fungus depending on the genus of algal symbiont. The research demonstrated that lichen algae could release large amounts of carbohydrates, formed as a result of photosynthesis, to the fungal partner which then stored them as the sugar alcohols arabitol and mannitol. In addition to research papers dealing with the physiology of lichens and mechanisms involved in this symbiosis, David wrote a series of seminal reviews that were widely read and stimulated research elsewhere (see below), and inspired countless students with his booklet *The Lichen Symbiosis* (1973) published in the Oxford Biology Readers' series.

In 1966, he extended his studies to examine other symbiotic relationships, choosing to study coral-reef systems, since most of their

corals, anemones, flatworms, molluscs and coelenterates host symbiotic algae. For several years, including a sabbatical year in California and Jamaica, he was primarily a marine biologist, often forsaking the Oxford laboratory to work in exotic tropical environments.

David remained at Oxford until 1974 as a member of the Department of Agricultural Science, and also initially as a Senior Member of Linacre College, then as a Royal Society Senior Research Fellow, and subsequently as Tutorial Fellow in Biological Sciences at Wadham College. In 1974 he was appointed Melville Wills Professor of Botany at Bristol University, and three years later as Director of Biological Sciences. In 1980, his appointment as Sibthorpe Professor of Rural Economy and Head of the Department of Agricultural and Forest Sciences, Oxford, enabled him to return once again to his alma mater, during which time he was a Fellow of St John's College.

In 1975, David was elected a Fellow of The Royal Society for his distinguished work on the physiology of symbiotic systems. He played an active role in that Society, firstly as a Council Member, then as its Biological Secretary, a position he held from 1983 to 1987.

In 1987 he was appointed Principal and Vice-Chancellor of Edinburgh University. Questioned about the taxing nature of his new appointment, he responded: "I've had a great deal of pleasure out of working in a university...I think that, after a time, one has to plough something back into the business... it's about time I took on the role and tried to create the best environment I can for other people...I'm dedicated to all aspects of academic life". This was not an easy time for universities, but with his typical modesty and diplomacy, he and Edinburgh University came through relatively unscathed.

Despite his strong commitment to a broad spectrum of university duties, and a very active research career, David still found time to pursue a significant role on research councils, national committees and learned societies, including NERC, ARC, SERC and the Biological Sciences Subcommittee of the UGC. He recognized the over-dominant influence that research had come to play in

universities and also the problems involved in the assessment of quality, and he championed the value of taxonomy and systematics in biology teaching at all levels.

David had a long and close association with the British Lichen Society, and indeed was a founder member in 1958, and its President from 1972 to 1974. For his major contribution to lichenology he was awarded the Acharius Medal in 2003. He was also President of the British Mycological Society in 1980 and of the Society for Experimental Botany from 1983 to 1985. In 1988 he was elected a Fellow of the Royal Society of Edinburgh, and in 1989 he was awarded the Linnean Society's Medal for Botany. He was also the President of the Scottish Association for Marine Science and a Trustee of the World Wide Fund for Nature UK. He also supported the formation of the International Symbiosis Society and gave the keynote address in 1991 at its first Congress in Jerusalem, continuing to follow the Society's development and writing an introduction to the Congress Proceedings published in 2012.

David had an extensive publication record. In addition to early seminal reviews on lichens and other symbioses published in, for example, *Biological Reviews* (1962 & 1969), *Symposia of the Society for General Microbiology* (1963), *Symposia of the Society for Experimental Biology* (1974 & 1975), *Perspectives in Experimental Biology* (1976) and *Symbiosis* (1992), he co-authored *The Biology of Symbiosis* (1987) with Angela Douglas. He also co-edited four books, *The Cell as a Habitat* (1979), *Nutrition in the Lower Metazoa* (1980), *Cell to Cell Signals in Plant, Animal and Microbial Symbiosis* (1988) and *The Idea of a University* (1999), and was the senior editor of two of Britain's premier journals, *The New Phytologist* and *Proceedings of the Royal Society*, for 18 and 4 years respectively.

In 1994, David returned yet again to Oxford, taking up the Presidency of Wolfson College. After two terms of office, he retired in 2000, moving back to his beloved Scotland. However, this was in no way to be a real retirement, since, for example, he accepted the position as President of the Linnean Society from 2000 to 2003.

David had a warm and generous nature, on occasion inviting visiting scientists to his home in Oxford or Edinburgh where his wife, Lesley, made them most welcome. He was an excellent supervisor of graduate students, providing wise advice but letting them make their own way forward and then encouraging and helping to see their research published. Many of his students have subsequently had distinguished careers. Highly respected throughout the academic world, David's outstanding ability to present material in a novel, interesting and delightfully humorous way made him much in demand as a speaker. His keynote address at the Mycological Congress in Tampa in 1977 entitled *What can lichens tell us about 'real fungi'* (a recording of which is now in the BLS Archives) is still remembered by many to this day. He was never afraid to admit that a published conclusion had been proved wrong and to revise a hypothesis with respect to an interaction mechanism in a particular symbiosis. The revised ideas would then appear in his next review or lecture and helped to move the field of symbiosis research forward. His innovative work and tireless efforts on behalf of British science were recognized by the conferment of a richly deserved knighthood in 1986, and of honorary degrees from numerous British and North American Universities.

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