JOHN MICHAEL TEDDER
BA, MA, ScD(Cantab), PhD, DSc(Birm)

John Michael Tedder, second Baron Tedder of Glenguin, Purdie Professor of Chemistry, University of St Andrews (1969-89; Emeritus 1989-94), was born in London on 4 July 1926. He was the second son of Marshal of the RAF Arthur William Tedder, the first Baron (created 1946) and Rosalinde (née Maclardy) and the grandson of Sir Arthur John Tedder who, as Commissioner of the Board of Customs had been the chief architect of the Old Age Pension Scheme. Daunting footsteps indeed to follow, but - after attempting to join the Air Force while still under age, and rejected because of his poor hearing and eyesight - John wisely chose the very different field of science.

His father's overseas postings resulted in a somewhat fragmented early education (Frensham Heights, Surrey, 1934-36; Highland School, Sumatra, 1936-38, Dauntsey School, Wiltshire, 1938-44). The traumatic effect of losing his elder brother (shot down over France, 1940) and his mother (killed in an air accident in Egypt, 1943) probably marred his performance at Cambridge (Magdalene College, BA 1947, MA 1951, ScD 1965). Despite rather poor results, the strong personal recommendation of Professor Solly (later Lord) Zuckermann led Professor Maurice Stacey to accept him as a research student at Birmingham. Professor Stacey wrote me 'It was some months before he began to revive, but when near the end of the year a top scholarship became available, John was placed by the staff top of the list to receive it....His total progress was now dramatic. He shone in seminars, debates, etc. . .'. John had joined Professor Stacey's 'F-team' who, under the more immediate supervision of J C Tatlow, were continuing studies of organofluorine chemistry initiated during the war. The work for his PhD (awarded 1951) and a year as postdoctoral fellow constituted the first full study of the properties of trifluoroacetic acid and anhydride and led directly to the now common use of these reagents. It was also the source of John's abiding interest in fluorine chemistry, in fluorination, and hence more generally halogenation. He continued the same line of work during a postdoctoral year with A L Henne at Ohio State University (1952-53) and during his tenure of an ICI Fellowship in Sir Edmund Hirst's department at Edinburgh University (1953-55). While still at Birmingham, John had married Peggy Eileen Growcott.

His first permanent post was a lectureship at Sheffield University (1955). It was there that we met and rapidly became firm friends. It was a good time to be at Sheffield as the Chemistry Department, let by R D Haworth, was growing rapidly in both size and renown. John's appointment coincided with that of George (later Lord) Porter as the first Professor of Physical Chemistry and both did much to broaden the interests of the Department. John contributed both by his own researches and his ability and eagerness to join in constructive discussion of an extremely wide range of chemical problems. He taught us the use of the still new gas-liquid chromatography. Building his own equipment, he applied this technique most elegantly to study the precise product distribution obtained by the halogenation of simple alkanes and alkenes and later of many functional derivatives. Such careful analysis provided much new insight into the steric and electronic factors which influence these free radical reactions. The results rapidly established John as a leading figure in Free Radical Chemistry and undoubtedly constitute his best-known work. At the same time he broke new ground in a totally unrelated area by demonstrating the value and undertaking a study of the scope and mechanism of the previously neglected direct diazotisation reaction; by this, many of the more reactive aromatic (including heterocyclic) systems can be efficiently converted to diazonium salts in a single operation using one of several nitrosating agents.

Recognition of John's work came by the award of a DSc degree of Birmingham (1961), his promotion to readership at Sheffield (1962), and his appointment (1964) to the Roscoe Chair of Chemistry at Dundee. His last move followed in 1969 when Principal Steven Watson, aware of his success at Dundee and having lost John Cadogan to Edinburgh, decided to look no further and requested John to move across the Tay to the Purdie Chair at St Andrews. Here he rejoined an old Sheffield colleague, Peter Wyatt, who had been appointed to the Chair of Physical Chemistry, and with whom he fully shared the administration of the department. John Walton, who came with him as a lecturer, was to continue to support all the free radical work, while John Tedder himself started another major new line: building a two-stage ion-beam mass spectrometer to undertake some of the earliest studies of ion-molecule reactions. This was to be just the first step in what later led him to build a five-stage ('quinqua quadrupole') instrument and also to invent charge exchange mass spectrometry 'whereby the appearance potential of a gas and its positive ion fragments are determined from the absolute charge-exchange cross sections of the gas with (a number of) primary ions of known ionisation potential and low kinetic energy.'.

Other contributions included in his 200 original publications relate to the reactivity of orthoquinones (with W M Horspool at Dundee) and his invention and demonstration of homosolvolysis whereby weak bonds are broken in free-radical solvents. Whatever the topic, John always pursued his objectives with relentless determination. He particularly enjoyed devising new techniques and conducting his own experiments, even when this involved operating the hazardous fluorine generator.

John Tedder's teaching was as innovative as his research. He was convinced that organic reaction mechanisms should not only be used to point out some common features, but should form the main basis of teaching, replacing the traditional text-book organisation of organic chemistry by functional groups. He first demonstrated the success of this approach in his teaching at Dundee where his lecture notes soon began to be translated into his five-volume treatise (with A Nechvatal and others) *Basic Organic Chemistry*. Part 1 of this was the most successful, being adopted by the Open University and reissued in revised editions as well as being translated into several foreign languages. Part 4 (Natural Products) pioneered the wholly biogenetic approach and part 5 (Industrial Products) filled a gap in the information readily available to students. He had already at Sheffield conceived and co-authored with John Murrell and Sid Kettle the very timely *Valence Theory* (1965) later rewritten as *The Chemical Bond* (1976). John Walton and Derek Nonhebel joined him in writing *Radicals* (1979), the definitive text in the field at the time, and Tony Nechvatal was again the co-author of his last book, the highly original *Pictorial Orbital Theory* (1985).

John travelled widely, accepting numerous invitations to lecture at conferences and universities all over the world. He served on the editorial boards of two journals and was Vice-President of the Perkin Division of the Royal Society of Chemistry. He was a member of the Court of St Andrews University (1971-76) and was elected to the Fellowship of the Royal Society of Edinburgh in 1968, and served on its Council (1983-86). Although opposed to the hereditary principle and hence at first reluctant to accept the peerage on his father's death (1967), he ultimately agreed with the viewpoint of many colleagues that, while the system lasted, there was a need for more scientists in Parliament. Accordingly he attended and frequently contributed to debates in the House of Lords if and only if matters relevant to science and education were under discussion. He also served as a member of the Select Committee on Hazardous Waste. John also maintained an interest in Air Force matters and particularly in the administration of the RAF's Malcolm Clubs (for 'other ranks' and their families) which he visited whenever opportunity permitted.

John was very widely read; in particular he collected works about Oliver Cromwell and at one time hoped to add to their number. Despite the poor hearing, which plagued him throughout his adult life, he gained much pleasure from classical music and was an

accomplished amateur pianist, albeit unwilling to play for any but his own and his immediate family's enjoyment. He also loved hillwalking - a pastime we shared on joint family holidays in Scotland, Wales and the Alps.

All these activities had to be curtailed when some ten years ago, and to the great distress of his family and his many friends, he began to show symptoms of Parkinson's disease. Later on, also Alzheimer's disease struck, thus forcing his early retirement (1989). Peggy lovingly and courageously supported and nursed him at home only agreeing to his hospitalisation when the relentless deterioration of his condition made this unavoidable. He died in hospital on 18 February 1994.

John will always be remembered by his friends, colleagues and students for his warmth and generosity, his acuity and directness, his unfailing fair-mindedness and courtesy, his enthusiasm and the encouragement he gave to others, and for his and Peggy's hospitality. Our warmest sympathy goes to his widow, his three children and four grandchildren who have lost a loving and devoted husband, father and grandfather.

PETER L PAUSON