

ANDREW RONALD MITCHELL

Andrew Ronald Mitchell was born in Dundee on 21 June 1921, and died in Dundee on 22 November 2007. Ron, as he was known to almost everyone, was an only child; his father was a blacksmith.

Ron went to Morgan Academy in Dundee, and in 1938 he won a scholarship through the school to do a mathematics degree in University College, Dundee (then a college of St Andrews University), where E. T. Copson was Professor of Mathematics. He graduated with First Class Honours in 1942, and was called up and sent to the wartime Ministry of Aircraft Production in London, where he remained until after the end of the war. Ron had shown great promise as a footballer at school, and while in Dundee had played for Dundee North End Junior Football Club; he continued to play during the war, turning out a few times for Chelsea.

In October 1946, Ron was appointed to an Assistant Lectureship at St Andrews University and started a PhD with D. E. Rutherford. In 1950, Ron was awarded his PhD (which was concerned with relaxation methods in compressible flow), and stayed on at St Andrews as a Lecturer. There was some co-operation with Rutherford, and in particular, they discovered an early form of successive overrelaxation (before this appeared in a famous 1954 paper of David Young), although the work was never published. His first PhD student was J. D. Murray, who started in 1953 working on a topic in boundary layer fluid dynamics. Around this time, Ron developed an interest in numerical analysis, initially as a means of tackling fluid dynamics problems using Southwell's relaxation methods.

Since his move to St Andrews, Ron had continued to play football, and signed as a part-time professional with a number of Scottish League clubs. During the period 1946-1955, he played with St Johnstone, East Fife, Brechin City and Berwick Rangers. While with Brechin City, he won a Scottish Qualifying Cup South Runners Up Medal in 1949-50, and Scottish Qualifying Cup South Winners Medal in 1950-51.

In 1959, Ron married Ann, and took up a one year post as Senior Research Fellow in the Mathematics Department at California Institute of Technology. Jack Lambert was appointed as a Lecturer at St Andrews in the same year and he became Ron's third PhD student, working on numerical methods for ODEs. Other PhD students who came to work with Ron about this time were Graeme Fairweather and Sandy Gourlay, and with these students (in particular), important contributions were made to finite difference methods for partial differential equations.

By 1965, there was a thriving numerical analysis group in St Andrews. There was also a group in Edinburgh, headed by Mike Osborne. Ron and Mike Osborne felt there should be more interaction, and they agreed to hold a conference, with St Andrews chosen as the venue, and Ron and Jack Lambert the main organisers. Of course no one knew this at the time, but this was the first in a biennial series of conferences on numerical analysis, which continued in Dundee, and became the longest running series of its kind in the world. The 22nd conference in the series was held in Dundee in June, 2007.

Around 1965-66, Ron went to evening classes in Dundee to learn Russian. During Graeme Fairweather's thesis work, it had been realised that some Russians, in particular Samarskii, Andreyev and D'Yakonov were also working on high order difference methods for partial differential equations. A knowledge of Russian not only allowed Ron to keep up with the Russian literature as soon as it appeared, but was invaluable when he attended the International Congress of Mathematicians in Moscow in 1966. There he met D'Yakonov and, as a result, the latter visited Ron in the late sixties. A by-product was that people in the West became much more aware of the activity in the USSR concerning split operator techniques.

In Moscow Ron played football for The Rest of the World against the USSR in a match which was held in the stadium of Moscow Dynamo. The home team, who had been in training for several weeks, won 5-2.

In 1967, Queen's College Dundee (as University College had become in 1954) separated from St Andrews to become the University of Dundee, and Ron's growing reputation and influence were recognised when he was appointed to a newly established Chair of Numerical Analysis. Over the next few years, Ron's leadership and vision built up numerical analysis in Dundee, attracting some

excellent staff and students. He obtained Research Council money for a numerical analysis year in 1970-71, as a result of which 5 conferences were held, and visits for periods up to a year were arranged for about 34 of the world's leading numerical analysts. Indeed his efforts really put Dundee on the numerical analysis map.

Ron's interests changed in the late 1960s from finite differences to finite elements. This was virgin territory for numerical analysts and Ron did much pioneering work during the next few years with collaborators and students. The next change of direction occurred as a consequence of a lecture given by Oleg Zienkiewicz at a conference at Brunel University in 1975. In this talk Zienkiewicz described instabilities experienced by his group in converting their successful finite element codes for structural problems into codes for solving the Navier–Stokes and related equations in fluid dynamics. On his return to Dundee, Ron and David Griffiths attacked this problem with some gusto over the next few weeks, and the end result was upwind-biased test functions and what is now known as the Petrov–Galerkin finite element method.

There followed several fruitful years working on convection–diffusion problems until, through his interest in diffusion and dispersion effects and his collaboration with Brian Sleeman, he became interested in nonlinear effects in the early 1980s. Some of the problems arose from mathematical biology, but Ron was also interested in solitons, particularly those arising from the Korteweg–de Vries and Schrodinger equations. He was instrumental in bringing the subject of spurious solutions to the fore.

During his research career, Ron always had the uncanny knack of alighting on fundamental issues which, through his many papers and conference talks, drew others to the subject. He has a long and illustrious list of publications, but equally if not more impressive is the list of his 27 PhD students, many of whom have gone on to successful research careers. One of Ron's great strengths was the way he was able to motivate and encourage his students; he had a truly outstanding talent for getting the best out of research students and for instilling self-confidence in them.

Ron's many contributions to numerical analysis, both at a national and international level, through his books, his conference talks, his visits, his supervision of students and of research fellows, his encouragement of young people, is only a part of the story. No attempt to paint a picture of Ron would be complete without mention of his human qualities, the immense personal magnetism, the marvellous sense of humour. He was a wonderful companion, a friendly, warm and entertaining person, who had no airs and graces and who made everyone feel comfortable in his presence. He was able to combine a serious side as far as his work was concerned with the ability to poke fun at people and things, and find humour in just about anything.

His last few years were plagued by ill health. As someone who had been very active, both physically and mentally, it was frustrating for him to experience a diminution of those powers. But he never lost his sense of humour, or his love of football and mathematics. Ron was a major figure in numerical analysis who had a significant impact on the subject. Because of his human qualities, he was also regarded with huge affection by a great many friends and colleagues from all over the world. He will be greatly missed.

Alistair Watson.

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