

WILLIAM LEONARD EDGE
MA, ScD(Cantab)

William Leonard Edge, geometer, died, aged 92, on 27th September 1997 at Bonnyrigg, near Edinburgh. He was born on 8th November 1904 in Stockport, Cheshire. Both parents were teachers, his father a headmaster. His family called him Leonard. Maintaining Edwardian style he liked to be 'Edge' to colleagues and friends. To those of us of a much younger generation who found addressing him in this style difficult, he was 'WLE.'; and he reciprocated by using our Christian names. Educated at Stockport Grammar School, he entered Trinity College, Cambridge in 1923 with an Entrance Scholarship. And so began a life-long love affair with college and city. He frequently returned to visit Trinity, remained in close contact with its affairs, and loved to quiz and regale visitors with its news and people.

Edge graduated as a Wrangler in 1926. He was elected as a Prize Fellow of Trinity in 1928: his submission, published by Cambridge University Press, used the geometry of five-dimensional projective space to classify all ruled surfaces of orders five and six in three-dimensional space. Becoming an MA in 1930 he was awarded the ScD degree in 1936. He was proud that he had proceeded to the latter 'at the earliest statutory time'. He had been elected a Fellow of the Royal Society of Edinburgh in 1934. Edge never took a PhD, in his day a 'new-fangled' qualification; and he took great pleasure in teasing those who had with the 'two scarlet stripes of shame'! Perhaps that is one reason why he supervised only one research student. Happily that student, James Hirschfeld of Sussex University, is a very successful researcher. Once on the staff, Edge did encourage the ablest mathematical students of the University of Edinburgh to proceed to research at Cambridge, and took considerable interest and pride in their achievements. But I am running ahead of the story.

WLE was a research student at Cambridge of the Lowndean Professor of Astronomy and Geometry, H F Baker, and remained a disciple of Baker throughout his career: Baker's photograph was a treasured possession. In the later 1920s Baker's school was at the peak of its success and influence, and Edge's contemporaries included the notable mathematicians H S M Coxeter, P Du Val, W V D Hodge, T G Room, J G Semple and J A Todd. Baker anticipated the modern practise of seminars by his 'Tea-parties', which both stimulated his students' endeavours and led to lasting friendships. Edge was appointed by E T Whittaker to a lectureship at Edinburgh in 1932, becoming a Reader in 1949 and a Professor in 1969. It is typical of the man that in his Inaugural Lecture WLE praised Whittaker and his successor A C Aitken, acknowledged with gratitude his many formal and informal activities with the undergraduates, and then, as he himself said, "made his audience work" on the geometry of the seven-point plane. In retirement from 1975 he maintained an extensive correspondence with former colleagues and pupils, whose visits were of great delight. He also remained outstandingly research-active. Nearly 30 of his 93 articles appeared after he had turned 70; the last of these, in 1994, obtains explicit equations for 28 real bitangents of a particular plane quartic curve and gives a picture of the configuration, computer-drawn by Darrell Desbrow – the Baker-Cayley-Klein philosophy meeting the modern world. His last years were clouded by increasing immobility, deafness and sight deterioration. But his mental faculties remained acute until almost the end. On my penultimate visit and in his last letter (Summer 1997) he was still discussing ideas for solving some geometric questions. A devout Roman Catholic he spent his final years in the devoted care of the Sisters and Staff of Nazareth House.

All of Edge's publications are elegant essays on particular geometric situations, with full attention to detail and complete proofs. He had an instinct for homing in on special cases of a general configuration where the geometry was especially rich. In his mind's eye all the points lines, curves, surfaces etc. were concrete visual objects even when situated in spaces of dimensions 4,5,6,7... . There is no big 'Edge's Theorem', so it is not easy to describe his achievements in a brief account. The most one can do is to describe the themes of his work and mention some highlights among the many gems.

One can detect three periods in Edge's work. Until 1951 and after 1970 he concentrated on classical algebraic geometry, while between those two dates almost all his output concerned finite geometries and their associated collineation groups.

His first 'classical' period concerned many aspects of nets of quadrics and associated loci. In the articles one meets Cayley's octadic surfaces, Möbius tetrahedra, trisecants of Jacobian curves, the Veronese surface, and Cremona transformations. There was related work on quartic curves and surfaces of special types. The geometrical construction of Maschke's quartic surface is his masterpiece of that period. In his second classical period WLE published on many diverse topics. Most concerned configurations, such as Bring's curve, where the existence of a symmetry group gave beautiful results; many related back to his geometric heroes of the nineteenth century. Edge had considerable geometric talent and insight. But he remained detached from the seminal modern developments of algebraic geometry and topology.

Finite geometries and their groups form an area of much current international research. As well as their own intrinsic worth they have many important applications to such topics as error-correcting codes. It is Edge's papers in this area that are most noticed and quoted. He was a pioneer in the days before the great group theory revival in the 1960s. The aim of his work was to elucidate the geometry of an individual orthogonal, symplectic or unitary group, over a particular field, and to use this to determine and display the structure of the group; its subgroups, its conjugacy classes, its character

table, its isomorphism with another group. To this end he fully investigated the geometry of many of the groups of dimension less than 8 over the fields of orders 2 and 3, with excursions to the fields of orders 4 and 9. A wealth of interesting information resulted.

One contribution gave him particular pleasure. In 1968 John Conway discovered his three celebrated simple groups using the Leech lattice. There occurred a subgroup G that seemed to be particular unitary group U . Edge used their associated geometries to show that G and U share a number of permutation representations of the same degrees, thus providing graphic evidence that the two groups are the same, as was later formally proved by others. He said he had never worked so hard as on that paper.

Finally, what more of the man? By temperament, he was the typical bachelor Cambridge don of his day, translated to Edinburgh. He relished good dining and good conversation, his powerful baritone voice contributing at least its fair share of good stories. He was a fine singer, had a grand piano in his lodgings, and played in a 'mathematical' quartet. Any tinge of loneliness was compensated by pleasure in the natural world; for example, walking in the Scottish hills and Lake District, and observing the stars. Behind the formality and occasional chiding one sensed the encouragement and affection of genuine friendship. Above all, one appreciated the penetrating mind, the wide scholarship, and the constant search for new and beautiful geometric results.

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