IVOR MALCOLM HADDON ETHERINGTON
BA(Oxon), PhD, DSc(Edin)

Ivor Etherington was born in Lewisham on 8 February 1908, the son of Bruce and Annie Margaret Etherington, Baptist missionaries working in Ceylon. His father had been born in India and his mother in Ceylon; both came from talented families which had made significant contributions in a variety of walks of life. His paternal grandfather, also a Baptist missionary, had written a standard text on Hindi grammar, whilst his maternal grandfather had been a prominent figure in the political and agricultural life of Ceylon. A great uncle on his father's side, John Haddon, edited the first Baptist hymnary, for which he invented the typesetting of music.

Bruce Etherington died in Colombo in the October prior to Ivor's birth and his mother returned to England with her other two children before Ivor was born. She remarried in 1913, her second husband Edwin Duncombe de Rusett also being a Baptist minister. He was a widower with three children and the second marriage produced another two sons. Ivor was thus part of a large family of eight children, of which he was the sixth. Later the family increased by one when an orphaned cousin came to live with them.

These early years were happy ones and Ivor recalled them with great warmth. Life in a large family of lively intelligent people formed the grounding of Ivor's education. Before joining the ministry, his stepfather had been a naval engineer and he maintained his interest in matters practical after joining the Church. Their house was full of gadgets which stimulated infectious curiosity. When he was seven, Ivor invented a meccano-based contraption for sending the cruets round the dining table. Unfortunately it was not allowed to be used until after lunch on Sundays! He showed early signs of his lifelong interest in mathematics when he entertained himself during his stepfather's sermons by factorising the hymn numbers.

After several years in London, the family moved to Thorpe Bay on the Essex coast in 1921, where his stepfather started Thorpe Hall School for Boys, primarily for the education of his two youngest boys and their friends. It was something of a family affair; Ivor recalls being roped in on one occasion to deputise for an ill master. Now much expanded, the school still flourishes.

In 1922, soon after the family's move to Thorpe Bay, Ivor was sent to Mill Hill School in North London. Here he came under the influence of the Senior Mathematics Master, Herbert Coates, an inspiring teacher who gave him the encouragement needed to pursue the subject. At Mill Hill he also met John Ffoulkes Edwards, a fellow pupil who was to remain a lifelong friend. Unbeknown to either at the time, Edwards was later to play an important part in Ivor's mathematical career. After leaving Mill Hill School, Ivor went up to Hertford College, Oxford in 1927 to read mathematics. Although he found the mathematical life in Oxford stimulating, the time at Oxford was not as enjoyable or profitable as it might have been. With his religious background, Ivor was persuaded to become Secretary of the Hertford College branch of the Student Christian Movement, a job which encroached badly on his time for study and other social activities. This was all the more galling in that his religious beliefs were waning to the point of atheism, yet his sense of duty forced him to continue in the position. He obtained First Class Honours in Mods at the end of his first year and Second Class Honours in Finals.

Undoubtedly Ivor sacrificed a First in Finals through his loyalty to the SCM. He assumed that he had no hope of an academic career but fortunately his tutor at Hertford, W L Ferrar, knew otherwise. Ferrar had recently arrived at Oxford from a lectureship at the University of Edinburgh and was able to arrange for Ivor to go to Edinburgh as a research student, working on the General Theory of Relativity under E T Whittaker. Apart from a very brief appointment in London, Edinburgh was to remain his home until his retiral in 1974.

Ivor was interested in the geometrical rather than the physical aspects of relativity. Having learnt almost no physics at Mill Hill or Oxford, he confessed to finding many of Whittaker's research lectures incomprehensible. By good fortune, Whittaker was at that time working on the notion of 'spatial distance' and this captured Ivor's interest. By even more good fortune (at least from the perspective of a research student) he happened on an error in Whittaker's treatment and this led to his PhD thesis 'On Relativistic Cosmology, and the Definition of Distance in General Relativity'. The degree was awarded in 1932.

After finishing his PhD, Ivor spent a year teaching at Chelsea Polytechnic (and sharing a flat with his old schoolfriend Ffoulkes Edwards) but returned to the University of Edinburgh in 1933 to a Lectureship in the Mathematics Department. He was elected a Fellow of the Royal Society of Edinburgh in the following year.

Soon after arriving back in Edinburgh, he entered into a long correspondence on blood group inheritance with Ffoulkes Edwards, who was then studying medicine at University College Hospital, London. This led to three notes published in *Nature* in 1935 and 1938 and marked the start of what was to be Ivor's main mathematical work, the development of a mathematical framework in which to study genetical inheritance. He realised that the computations used by geneticists to calculate the distribution within a population of particular genetically inherited characteristics could be formulated abstractly. This led to the theory of 'genetic algebras'. The key difference between this type of algebraic structure and that more commonly studied was the failure of the associative law, this failure being a natural consequence of the genetic laws which the abstract mathematics was modelling. Of particular note was his observation that the theory of indices and logarithms have interesting and wide-ranging generalizations in the context of non-associative algebras. This led him to introduce the notion of the logarithmetic of a non-associative algebra. He was awarded a DSc by Edinburgh University for a thesis on 'Researches in non-associative algebra' in 1941 and the Keith Prize of the Royal Society of Edinburgh in 1958.

Although motivated by ideas from genetics, he viewed his work primarily as belonging to the world of Pure Mathematics. In the introduction to his DSc thesis, he wrote 'I wish that this thesis may not be judged as a finished achievement in biological investigations but may be judged primarily as a contribution to algebra, suggested by biological problems, and perhaps having possibilities of applications beyond the simple ones so far demonstrated'. At the timing of writing these words, he did not realise that, some 30 years later, four of his papers would be reprinted in a volume *Genetics and Social Structure*, the editor commenting that they 'have only recently begun to receive the attention they deserve' and that 'a surprisingly large literature has arisen directly from Etherington's materials'.

Ivor played a full part in the life of the University of Edinburgh, being successively promoted to Senior Lecturer, Reader and finally given a Personal Chair in 1972 in recognition of his contributions to algebra. When he retired in 1974, the University conferred on him the title Professor Emeritus. His dedication to teaching and his gentle disposition always ensured that even the most difficult students were dealt with sympathetically. He was the Director of Studies for Mathematics students in the University from 1946 to 1952. It was at that time that he took on substantial administrative duties within the Department. He described his position as 'Secretary'; in practice, this meant shouldering most of the administrative burden of the running of the Department. He continued in this unofficial position for the next twenty years or so, serving in succession Professors Whittaker, Aitken and Erdélyi, until the expansion of the mid-1960s meant that administrative duties could be spread amongst a larger number of colleagues. With his great

mastery of detail, Ivor undertook these duties with considerable efficiency. This was before the days of word processors and other elaborate gadgets of information technology. Ivor relied on his legendary batch of index cards which he kept in his jacket pocket and which contained all the information needed to run the department. Whatever the problem, be it where class A was next to meet or how student B had fared in a particular resit examination, Ivor would dig into his pocket and retrieve the answer. He was acting Head of Department during the years of Professor Aitken's declining health and it is a testament to his efforts that the Department weathered this difficult period as well as it did.

It is remarkable that he was able to combine these administrative activities with his research in abstract algebra. Happily, when Arthur Erdélyi succeeded Aitken in 1966, he encouraged Ivor to take a sabbatical year (his first since his appointment over 30 years earlier). He spent this at the University of California at Santa Barbara, visiting his former research student Henryk Minc, and also lecturing in Wisconsin. He completed the year by driving across the States to the East Coast, visiting relatives en route, before sailing back to Britain.

He also played an active part in the wider mathematical community of Scotland, serving twice as Secretary of the Edinburgh Mathematical Society, from 1933 to 1938 and again from 1939 to 1944. He was the President of the Society during the session 1947-48 and also edited the *Edinburgh Mathematical Notes*.

But to describe Ivor in terms of his professional achievements is only to tell part of the story. He had a wide range of interests in all manner of things, a sharp intellect and an impish sense of humour. He had a reading knowledge of seven foreign languages, not to mention Esperanto, and harboured ambitions to read (though not to speak) Chinese. He obtained some books on Chinese and a Chinese mathematical dictionary, confessing in typically modest fashion to making just a little progress with the language. In some autobiographical notes he left, he wrote 'If I live, as planned, to age 100, I may just manage it with a year or two to spare. Anyhow I guess you can sell these books and get more than I paid for them'. He also had a lifelong love of music and particularly enjoyed playing the piano, especially Beethoven sonatas. He had learnt the rudiments of piano-playing from his friend John Ffoulkes Edwards and started to teach himself, but later received more formal instruction on the insistence of his step-grandmother.

Ivor was a man of great kindness and humanity, qualities which he shared with his wife, Elizabeth Goulding, whom he married in 1934. They were a contrasting couple, Ivor rather shy and unworldly and Betty vivacious and outgoing. They had two daughters, Donia and Judy. Betty had strong left-wing political convictions and after coming to Edinburgh she and Ivor were very active in the anti-fascist movement. As the situation in Europe deteriorated, their home became a sanctuary to a large number of refugees seeking to start new lives beyond the reach of Nazi persecution. The Etheringtons, with the help of anyone else they could involve, managed to effect the escape of some 32 people from Germany. Betty even undertook a journey to Germany herself just before the outbreak of war to smuggle back the belongings of escaping refugees.

As life returned to normality after the war, their house continued to be a place of warmth, hospitality, artistry and excitement for their wide circle of friends. Once the girls were older, Betty resumed her earlier career as a teacher. She and Ivor continued to live their lives to the full, enjoying visits from family and friends alike and maintaining a lively interest in public affairs, as well as in a wide range of cultural activities. They also became very proud and affectionate grandparents.

For many years the Etheringtons maintained a holiday cottage at Easdale on the Argyllshire coast, where they spent long happy summers as their family grew up. After Ivor retired in 1974, they left Edinburgh and moved there permanently. They played their part in the life of the community, with Ivor a special favourite of the local children, whom he would entertain with games and puzzles. Sadly Betty died in 1982 and Donia, who had lived in the district since 1970, moved to the family house to care for her father. Although slowing down, he continued to maintain an active interest in his mathematical research, corresponding with mathematicians in various corners of the world. He even examined a doctoral thesis for the University of Montpellier - no mean achievement for a man in his eighties - and, in 1993, wrote what was to be his last mathematical note. He died on New Year's Day, 1994.

Ivor Etherington was a gentle man of strong humanitarian conviction and a fine scholar who gave long years of service to the University of Edinburgh. He will be remembered with great affection by all whom his life touched.

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T A GILLESPIE