

## Obituary

### Geoffrey Howson (9 May 1931- 1 November 2022)

TONY GARDINER

Geoffrey lived his life largely away from the public view. Yet he was widely respected and consulted internationally. He occupied significant positions, and he interacted with many of the central figures in mathematics education and mathematics from the second half of the twentieth century. A full review of his life would provide a survey of the recent history of mathematics, society and curricula in the mid-late 20th century.

Geoffrey's professional appointments included Honorary Secretary of The Mathematical Association 1969-76, President in 1988 and an Honorary Member from 2002. He was a Trustee of the School Mathematics Project 1967-96 and Chairman 1984-96. He was Secretary-General of the International Commission on Mathematical Instruction 1983-90. He chaired the LMS-IMA-RSS committee that produced the influential 1995 report *Tackling the Mathematics Problem*. But he was perhaps more widely appreciated internationally than within the UK – holding visiting positions in Europe and in the Far East, and awards from Columbia University, Japan, China and elsewhere.

Albert Geoffrey Howson was born on 9 May 1931, son of Arthur and Hannah (née Silverwood). Both his parents married first when young. Each had three children by their first marriages; and both were widowed at age 32. Each then struggled on for eight years bringing up their children. They married each other aged 40. Geoffrey appeared the next year, and grew up very much as the baby of seven (with four half-brothers and two half-sisters, ranging from 11 to 18 years older than him): in a three-bedroomed house with no inside toilet, no electricity, and no hot water – the five boys all sleeping in one room with two beds.

The family came from the small mining-cum-agricultural village of Kippax, four miles north of Castleford. Arthur's father had come and gone before Arthur was born! Arthur was bright – completing school by age 12, and then starting work down the mine (like most of his forbears). He later became Director of Training for the local mines. He also served as Superintendent of the Wesleyan Sunday School, while Hannah ran the "Women's Bright Hour".

This was no cosy middle class home; but it had a genuine warmth – mostly thanks to Geoffrey's siblings and to Hannah. Like his six siblings, Geoffrey attended the local elementary school in Kippax. Unlike them, he later went on to secondary school in Castleford. At that time, primary schools were structured in terms of "standards" – each "standard" representing the locally determined curriculum-plus-assessment for an expected "School Year". Once one "standard", or level, had been achieved satisfactorily, a pupil could be bumped up to the next level in the middle of

an academic year. Within this context, IQ scores (from tests sat across an entire Local Authority) provided evidence of exceptional ability to back up a teacher's judgement. Approaching age 10, Geoffrey had completed the available standards, and his Headmaster pressed his parents to pay to send him to Castleford Grammar School a year early – with a view to sitting for a scholarship at the required age of 11. This he duly did.

In 1949, at age 18, Geoffrey went to study Mathematics at Manchester University, thanks in part to a teacher who introduced the possibility of studying pure and applied mathematics as separate Higher School Certificate subjects. He got a state scholarship, and an additional scholarship to Dalton Hall – a Quaker Hall of Residence for 90 students, attached to the University. There he had the good fortune to be tutored by the two resident mathematics tutors Walter Ledermann and Charles Illingworth – both distinguished mathematicians, and committed teachers. For a young lad from mining stock, the first from his family to complete secondary school, and the first from his school to study mathematics, the opportunity of such high-quality, face-to-face guidance was a formative experience – and not just in his chosen subject of mathematics. Ledermann had studied under Issai Schur in Berlin, moved to St Andrews in 1933, and completed a PhD under Turnbull in 1936. But he had also been an avid opera-goer ever since his youth, and was more than happy to digress:

“Having Walter to myself in my own room was marvellous. He was a lovely man and a great teacher. After the tutorial he would stay to discuss the Hallé concert or the visiting Covent Garden Opera Company with me, and tell me of his student days in Germany.”

From 1945 the Manchester mathematics department had been led by Max Newman (MA President 1958). Max had nurtured Turing in Cambridge in the 1930s, and had led the early development of computing at Bletchley Park in the 1940s. As Head of Department in Manchester after the war, he attracted a veritable galaxy of young research talent. He also insisted on good teaching. Geoffrey's list of undergraduate lecturers included: Ledermann, J. W. S. [Ian] Cassels, Bernhard Neumann, Graham Higman, Newman, Kurt Mahler, Arthur Stone, James Lighthill (MA President 1970), M. B. Glauert, Charles Illingworth and Bernard Lovell. He was clearly an outstanding student, and Newman made sure that he stayed on as a postgraduate. In Geoffrey's first postgraduate year 1952-53, Newman was to be in Canada visiting Bill Tutte; so as a temporary stop-gap, Geoffrey was allocated to Graham Higman – then a rising star. The two of them got on so well that the arrangement became permanent. In Geoffrey's thesis he proved that the intersection of two finitely generated subgroups of a free group was itself finitely generated. He published two significant papers on free groups while still a research student, including results that are still of interest [1]. He continued this line of research, but he published nothing more on free groups, and focused increasingly on applied mathematics.

But where should he go after Manchester? He had invitations to spend time in Illinois (from Reinhold Baer), and in Chicago (from Saunders

Maclane). And his early work would probably have secured a job in a UK university mathematics department. But matters were complicated by his having to complete National Service at some stage. So the invitations were put on ice during a National Service Commission from 1955-57. He spent this time at the RAF Technical College in Henlow, where he taught engineering officer cadets about guided missiles (replacing David Wishart, who had in turn replaced Brian Wilson with whom Geoffrey would later edit the second ICMI Study).

In 1957 he was appointed as Lecturer (later Senior Lecturer) at the Royal Naval College in Greenwich, where he served until 1962, with his interests shifting from Group Theory to Control Theory. The mix of mathematics, naval protocol, sport, and the London musical scene suited him well, and he enjoyed teaching many of those who were to feature as stars in the first generation of the modern highly technical navy – especially the early nuclear submarine commanders. Despite his modest background, Geoffrey had very broad interests. He was deeply immersed in sport (including fives, squash and tennis, rugby and cricket – once playing a two-day match for the Royal Navy). He also had a profound love of music – especially opera – which persisted throughout his life: he remained a Friend of the Royal Opera House; he served on the committee that ran the Turner Sims Concert Hall in Southampton; and he attended postgraduate lectures in music long after he had retired.

As the 1960s dawned, the world was changing. Though Geoffrey had enjoyed his time in Greenwich, he began to consider his future. This was the era of ‘modern maths’ and of imminent university expansion in response to the *Robbins Report* [2]; so all sorts of opportunities were beginning to open up.

The *School Mathematics Project* (SMP) had been formally launched at the Southampton Conference in 1961 (whose proceedings are recorded in [3]). Geoffrey was at that time unaware of these developments. But in late 1961 or early 1962 he read – purely by chance – an advertisement for a position as a Lecturer in Southampton, linked to the newly-formed SMP. (Geoffrey's version was that he was doing the *Observer* crossword, and by chance noticed the advertisement in an adjacent column!) He had always enjoyed teaching. He had observed masterly teachers like Ledermann in action; Newman had entrusted him as a postgraduate with delivering undergraduate lecture courses; and he had been effective in teaching engineering cadets in the RAF and naval trainees in Greenwich. So he applied and was appointed in 1962.

The work with SMP was funded for seven years, after which Geoffrey was to become an ordinary member of the department. The early goals of SMP emerged from meetings held with the initial authors: Douglas Quadling (MA President 1980), Martyn Cundy, Tom Jones, Bryan Thwaites and T. D. (David) Morris. This was a truly remarkable group of mathematics teachers. They were all from private schools and the SMP approach was initially designed for students like theirs. But SMP was always more down-to-earth

and less abstract, than continental and North American “new math” projects. And as things progressed in the 1970s and 80s, the group of authors, the range of schools and the educational goals broadened.

Geoffrey's initial task was to manage the editing of the textbooks being written and trialled by the initial group of school teachers (especially the original SMP Books T and T4, and the SMP Books 1, 2, 3 – together with the associated *Teachers' Guides*; and the ensuing *Additional Mathematics Part 1* and *Advanced Mathematics Book 1*). However, the practical demands of guiding this new venture were far more extensive: managing the planning, production and trialling of drafts; getting the projected versions typed up; printing and distributing these to schools (often driving round the country to deliver copies to schools in his own minivan); managing the feedback and revisions; negotiating and liaising syllabuses with exam boards; and producing and editing final versions of each year's texts for the printers (so that available texts kept pace with demand, as the “guinea pig” classes moved through their secondary years).

In 1965 Geoffrey married Jennifer Lound; and the next year his daughter Katharine was born. He was promoted in 1966 to Senior Lecturer; in 1979 to Reader in Mathematical Curriculum Studies; and in 1984 to Professor in Mathematical Curriculum Studies. From 1990-92 he served as Head of the Department of Mathematics and Dean of the Faculty of Mathematical Studies, and contributed to something of a revival of the department (partly through implementing a plan in which he himself retired early in order to release funds for new appointments).

In 1967 he was seconded from Southampton for three years as one of the Assistant Directors for CREDO (the Council for Curriculum Renewal and Educational Development Overseas) – a joint project with the Ministry for Overseas Development, with offices in the BMA building in Tavistock Square in London. The work involved hosting visitors wishing to sample recent developments in UK schools, and making official visits to other countries (including Ghana, Sierra Leone, Nigeria, Swaziland various West Indian nations, India, Sri Lanka, Malaysia, Singapore, Thailand, Bangladesh, Pakistan, Egypt, Mauritius, Tanzania, Kenya, Uganda, Mexico, Iran, USA and various European countries). Geoffrey's work with CREDO also led to the publication of reports showcasing contemporary projects. He got involved rather early in the educational aspects of computing – not just in the UK; and in 1968 he joined the Council of NCET (the National Council for Educational Technology).

In 1969, having already been involved in various MA committees (thanks to the initiative of T. A. Broadbent (MA President 1953), who had been his boss in Greenwich), he became MA Honorary Secretary. Among other contributions, he was then part of the drive (with Peter Reynolds, MA President 1989, and Douglas Quadling) to introduce the journal *Mathematics in Schools* in 1971.

In the mid-1970s Geoffrey turned down an opportunity to move to UNESCO. Instead he expanded his UK-based activities – including as an external examiner in teachers' colleges and polytechnics. He later served on

the Council for National Academic Awards. And he continued the work with SMP, which was to expand dramatically in the ensuing decades.

Geoffrey also began to forge his own academic path in “mathematical curriculum studies”. In this he was fortunate in having colleagues (such as Brian Griffiths) who took a broad view of mathematics. He developed an expository approach to mathematics education, which was quite different from what became typical in the newly emerging “research discipline” of mathematics education. And his distinctive approach attracted considerable international respect. Although he was often working with able colleagues, at the forefront of innovation, Geoffrey was no iconoclast. He valued the pragmatic insights on which SMP was based (a blend of high-quality mathematics and excellent teaching). And he learned to report objectively, keeping his own preferences largely under wraps, without thereby being bland. A neglected example of his style of reporting and analysis was the book *National curricula in mathematics* (MA 1991), which laid out for all to see what other countries did and what they did differently – at a time when our own curriculum was facing annual meltdown. Over the years he wrote dozens of reports and edited numerous collections of papers – with a wide range of international collaborators. His many books include most notably *Mathematics: society and curricula* (CUP 1974, with Brian Griffiths), *Curriculum development in mathematics* (CUP 1981, with Jeremy Kilpatrick and Christine Keitel-Kreidt) and *A history of mathematics education in England* (CUP 1982).

Geoffrey attended the first ICME in Lyons in 1973. He also influenced how subsequent ICMEs evolved. For the second ICME in Exeter in 1976, he worked closely with Hans Freudenthal to devise a more satisfactory programme and edited the proceedings. After the third ICME in Berkeley in 1980, ICMI (the educational arm of the International Mathematical Union) had to be restructured, with Jean-Pierre Kahane as President and Geoffrey as Secretary-General (1983-90). The new team had to plan and negotiate the ensuing ICMEs in Adelaide (1984) and Budapest (1988). The 1988 meeting in Budapest was a particularly bold step. Planning a large international meeting in eastern Europe at that time presented challenges; but it allowed important interactions between large numbers of educators from eastern Europe and their western colleagues.

Geoffrey had a major hand in introducing the series of “ICMI Studies”: each study involved an international group of specialists, meeting and working towards a final book-length report – of which there have been 23 to date. Geoffrey co-edited the first report (on the influence of computers on mathematics education); the second (on school mathematics in the 1990s); the third (on service teaching); and the fifth (on popularisation).

The 1970s and 1980s were increasingly busy. SMP activities were expanding massively (with existing projects still needing to be supported, and with a variety of new projects like SMP 11-16, SMP 7-13 and later SMP 16-19). On the international front, mathematics education was expanding, both as a practical concern and as an academic discipline, and there were numerous

gatherings to explore problems related to school mathematics. Geoffrey was a regular participant – not as a “big cheese”, but because he was respected and by nature non-factional. As a result he worked closely with, and got to know, a dizzying array of major players from both East and West. He also got involved with, and often helped to organise, international ventures: for example, BACOMET (Basic Components of Mathematics Education for Teachers) with Bent Christiansen and Michael Otte; work with IEA/TIMSS on comparisons of international attainment; and meetings that explored mathematics education and computing on both sides of the Iron Curtain.

Geoffrey was never enthusiastic about central control of curricula or examinations – and hence had misgivings about the advent of a National Curriculum in England. In 1988 he was the MA President, and so attended the annual conference in Birmingham, where the Secretary of State, Kenneth Baker, gave the keynote address about the impending English national curriculum for mathematics. The initial curriculum was a botched compromise, and the mathematics part was subject to significant revisions every couple of years. Hence, when the national academic mathematical societies were persuaded in 1992 to look into what might have gone wrong, Geoffrey accepted their invitation to Chair the committee. This led in 1995 to the influential report *Tackling the Mathematics Problem*, which had a significant impact on subsequent trends.

In retirement he enjoyed discovering that his many writings were still much appreciated – if largely in places other than the UK. He had the time to join in once again with the work of BACOMET; he travelled to the Far East; and he gave invited talks at ICME in Seville (1996: *Common sense and mathematics*) and in Copenhagen (2004: *Felix Klein and Hans Freudenthal*). He had always been deeply interested in medieval church architecture and was now able to take his interest more seriously – visiting continental churches and contributing obliquely to a book on Church architecture in early medieval Spain (by Peter Reed – an old contemporary from Manchester). He also immersed himself in embroidery – originally attending classes to keep his wife Jennifer company, but continuing after her sudden death in 2009. In this he was both a student and a practitioner: he had pieces of his work displayed in the most unlikely places, and he explored the possibility of doing a postgraduate degree on Bauhaus textile design (and especially Gunta Stölzl). He also continued to enjoy and to support music-making.

#### References

1. [https://en.wikipedia.org/wiki/Howson\\_property](https://en.wikipedia.org/wiki/Howson_property)
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