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OBITUARY

HARRY DOWSON
(1939–2008)

Henry Richard Dowson – known to everyone as Harry – was born in Newcastle upon Tyne in England on 2 March 1939. His father Matthew Ridley Dowson came from near Penrith, Cumbria, England and was a park gardener who rose to be head gardener of Newcastle's hospitals. His mother Frances Walker Dowson (whose maiden name was McQuet, pronounced mac-yew-it) came from Bo'ness, near Linlithgow in Scotland and was trained as a lady's maid. They met when they were in the service of the same landowner.

Harry benefited from an education system that was working well. His primary school, where he developed his distinctively elegant handwriting, quickly recognised his exceptional ability and enabled him to obtain a scholarship to the Royal Grammar School in Newcastle. The grammar school developed his mathematics and also gave him a rounded education, instilling in him a love of history and literature. From school he went to what is now the University of Newcastle but was then King's College of the University of Durham. He obtained a first class honours BSc in mathematics in 1960 and embarked on a PhD at Newcastle in functional analysis. However, after a year, his supervisor John Ringrose moved to Cambridge. Harry moved with him and spent two years at St John's College, graduating with a Cambridge PhD in 1964. He greatly loved his time at St John's, just as he had loved his time at the Royal Grammar School, and kept in touch with both institutions, regularly attending reunion dinners.

His first appointment was in 1963 as an Assistant Lecturer at University College of Swansea (now Swansea University and which was then still recovering from the cruel satirization of it by Kingsley Amis in his novel *Lucky Jim*). After two years there, he spent a year lecturing at Newcastle, followed by two years at the University of Illinois, a spell in America being considered a very good way of developing your own mathematics research. He then moved to a lectureship at the University of Glasgow. On his arrival in Glasgow in 1968 he made the first of many shrewd financial moves: instead of moving his money from America straight to Britain he kept it offshore for a year, thereby avoiding a large amount of tax.

Glasgow University was to be his base for the rest of his life. He was promoted to Senior Lecturer in 1973 and to Reader in 1975. A high point of his career came in 1978 with his election as a Fellow of the Royal Society of Edinburgh and the publication of his book *Spectral Theory of Linear Operators*. His one disappointment was that the University never promoted him to a professorship. It was frustrating that, in his retirement, the University introduced new promotion rules that surely would have made him a professor if he had still been in post. He took very early retirement at age 51, tiring of teaching and examining large numbers of students, but he remained a member of the Mathematics Department, active in his own personal research, encouraging and supporting other researchers and editing the *Glasgow Mathematical Journal*. The University recognised his continuing contribution to the Department in 1998 by making him an Honorary Senior Research Fellow.

You could easily make a big mistake about Harry. If you simply saw him wandering down the street you could conclude he was nobody special. It took time to appreciate his intelligence, integrity and quietly understated kindliness. Everyone had a soft spot for Harry, even colleagues who could not agree about anything else. Everyone talked to him. Everyone shared confidences with him. As a result he had an encyclopaedic knowledge of what was going on around him. I lost count of the number of times colleagues phoned me to say in frustration: "How is it that Harry always knows what's going on before we do?"

He lived very modestly. His few indulgences in life were his collections of books, stamps and coins, a good malt whisky — and looking after his money. He took an active part in the social life of his local church and was particularly generous in welcoming and sharing his knowledge with newly arrived students from overseas. His many friends miss him.

Harry loved mysteries and conspiracy theories. He had read extensively about Jack the Ripper, the assassination of President Kennedy, the imprisonment of Rudolf Hess, the death of Robert Maxwell and the death of Diana, Princess of Wales. So it is only fitting that he should have left us with a bit of a mystery. His death certificate stated that the cause of death was unknown. In spite of all the physical evidence I am still not entirely sure that he has left us. I still have the feeling that at any moment there will be a knock on my office door and he will wander in to tell me how many pages he has just edited for the next issue of the *Glasgow Mathematical Journal*.

Neil Dickson

Harry and the Glasgow Mathematical Journal

No account of Harry's life would be complete without a discussion of his extensive work for the *Glasgow Mathematical Journal*. When Harry joined the University of Glasgow Mathematics Department in 1968, Robert Rankin held the Chair of Mathematics and was Head of Department. He ran the GMJ, acting as its editor-in-chief (ie chairing the Editorial Board and taking the final decisions on whether to accept papers) and also its business manager (ie negotiating with the University, publisher and printer). Other members of the Department acted as subject editors, and one as production editor (ie responsible for taking accepted papers and seeing them through to publication). Harry's involvement with the GMJ began in 1970 when he became a subject editor in analysis. In 1975 the production editor was seriously ill. Harry took over that role and, with Robert Rankin approaching retirement, Harry slowly acquired all the functions of editor-in-chief and business manager as well, so that by the early 1980s he really was the GMJ. In the mid 1980s the informal agreement between the GMJ and the University came under strain. From the GMJ's viewpoint it was unclear who was entitled to take decisions about the future direction of the GMJ. From the University's viewpoint, it was unclear why it was subsidising a non-core activity over which it did not seem to have control. The situation came to a head when the University decided to withdraw the subsidy. Fortunately Harry and others were determined to ensure the GMJ's future. A chance conversation that I had with Peter Neumann of the University of Oxford led to me conceiving the idea of creating a new independent charitable trust to take over the GMJ. I led the negotiations that resulted in the Glasgow Mathematical Journal Trust being formed in 1987, with Harry as one of the five trustees. In the subsequent reorganisation of the running of the GMJ, Harry decided to focus on being production editor (the role that he enjoyed the most) and continued to be a subject editor, while others took over the editor-in-chief and business manager roles. That was the arrangement that continued for the next 21 years until it was interrupted by Harry's death.

Harry had presided over an era of great changes. The GMJ more than quadrupled in size between 1968 and 2007. Technology advanced from authors preparing papers using mechanical typewriters, and printers typesetting in hot metal, right through to online submission of papers in LaTeX. When Harry started working for the GMJ, it was quite common for an academic to be production editor of a journal. Over the years, pressures on academics to maximise their research output, and changes in technology and the economics of publishing, caused production work to be moved from academics to specialist editors employed by publishers. To some extent the GMJ was shielded from such pressures because Harry had retired from his academic post (though the colleagues who assisted him had not). However during 2007 the editors felt that the existing arrangements were becoming untenable, and arranged that much of the production work would move to the publisher in 2008. So, when Harry suddenly died on 28 January 2008, the production editor post died with him.

Neil Dickson

Harry's Research

Harry's research interests were in the spectral theory of bounded linear operators. He published twenty-six papers, the majority of which concerned operators on Banach spaces, though there were occasional diversions into the theory on Hilbert space. He also wrote a substantial monograph [21]; this has been an important reference in the area since its appearance. His most prolific period was during the years from his PhD in the mid 1960's to the early 1980's, though he returned to the problems that had attracted him then in the last few years of his life.

To appreciate Harry's contributions, it is necessary to review something of the background to his work. In finite dimensions, the highlights of operator (i.e. matrix) theory are the Jordan decomposition and the diagonalisation of a hermitian or, more generally, normal matrix. The extension of the latter to infinite dimensional Hilbert spaces was successfully accomplished in the early decades of the twentieth century with the development of the spectral theory of self-adjoint and normal operators. These rely crucially on the notion of the adjoint of an operator on Hilbert space. However, there is no such notion in the context of a Banach space (the underlying geometry is just too general).

In the 1950's, N. Dunford and his co-workers attempted to address this issue by introducing the class of *spectral operators* on a Banach space, which captured both the ideas behind the Jordan decomposition of matrices and the spectral theorem for normal operators. The notion of a *spectral measure* on a Banach space X was defined. This is a projection-valued function $E(\cdot)$ with some natural properties akin to the projections onto the eigenspaces of a normal matrix, but now associated with Borel subsets of the complex plane. An operator T was deemed to be *spectral* if its spectrum $\sigma(T)$, the natural extension in infinite dimensions of the eigenvalues of a matrix, could be localised to subsets of the complex plane via a spectral measure. It was then possible to write T as

$$T = \int_{\sigma(T)} \lambda E(d\lambda) + N.$$

The integral here is to be thought of as a 'diagonal' operator whilst $\sigma(N) = \{0\}$, the infinite dimensional generalisation for N of nilpotency. This gave, on the one hand, an infinite dimensional analogue of the Jordan decomposition of a matrix and, when $N = 0$, something that had a vestige of a normal operator on Hilbert space. Of course, as with Hilbert space, conditions on T that allow such a Jordan decomposition are severely restrictive and there was no expectation then that any complete extension of the Jordan decomposition for a matrix to infinite dimensions would be possible; this remains the case, even on Hilbert space. Nevertheless, the ideas that Dunford introduced had a significant impact on how Banach space operator theory would develop over the next twenty years and Harry made some notable contributions to this development.

Harry's PhD thesis (*Restrictions of spectral operators*, Cambridge University, 1964) considered the question of when the restriction of a spectral operator T to an invariant subspace would itself be spectral. There had been some earlier work on this but Harry's important contribution was to explore what topological conditions on $\sigma(T)$ would ensure that this was the case. The techniques here used ideas of uniform approximation of functions on the complex plane, an area in itself that was very much in vogue at the time. In turn, these restriction results gave conditions relating the structure of the quotient of T on the quotient space associated with the invariant subspace. The results of his PhD thesis and the methods used therein were reported in his earliest papers [1,2,3], though he returned to these ideas in [7,22] following later developments.

One of the shortcomings of the Dunford theory was that the adjoint of a spectral operator is not necessarily spectral, in contrast with the Hilbert space setting of normal operators. However, such an adjoint does belong to the wider class of *prespectral operators* and still has a form of Jordan decomposition. The difference between spectral and prespectral operators lies in the countable additivity associated with a localising spectral measure $E(\cdot)$. For a spectral operator one requires the countable additivity of the scalar measures $\langle E(\cdot)x, \varphi\rangle$ for $x \in X$ and $\varphi \in X^*$ whilst, in the prespectral case, φ need only belong to a total subset Γ of the dual space X^*; the terminology here is to refer to $E(\cdot)$ in the latter case as a *resolution of the identity of class* Γ. The distinction between these two types of countable additivity is technical but of central importance in the development of the theory. In particular, Dunford had shown that, for a spectral operator, the localising spectral measure and Jordan decomposition are unique, but it was known that a prespectral operator could have distinct resolutions of the identity of different classes. The central outstanding problem in the theory, as it stood in the 1960's, was to determine what the correct uniqueness results were in the prespectral case. After some initial work on this problem [6,10], Harry finally solved it in complete generality in [13]. He showed that a prespectral operator does have a unique Jordan decomposition and, for a given total set Γ of functionals, a unique resolution of the identity of class Γ.

There are other themes in his publications. In particular, a series of papers, some written with colleagues or former students, study algebras of spectral or prespectral operators and the structure of Boolean algebras of projections on Banach spaces [4,5,12,23,25,27], whilst [9] gives an interesting description of the spectral structure of the discrete Hilbert transform on the reflexive ℓ^p spaces. Although it was not realised at the time, this latter paper anticipated the role that the Hilbert transform would play in future developments of spectral theory.

If [13] was Harry's most significant single paper, his monograph [21] is just as important. In this, he brought together much of the work that had been undertaken in Banach space spectral theory during the previous thirty years. As well as giving the first comprehensive account of the theory of spectral and prespectral operators, it covered results (recent at the time) concerning compact operators and the closely-related Riesz operators, as well as the basic theory of well-bounded operators, a class of Banach space operators that captures aspects of self-adjointness in Hilbert space. Harry's meticulous attention to detail, coupled with his extensive knowledge of the area, resulted in a book which was timely when it was published and has served as an invaluable reference in the intervening years.

Alastair Gillespie

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The Glasgow Mathematical Journal would like to thank Dr Simon Wassermann for giving his permission to use the above photograph.

List of Postgraduate Students

1. Philip G. Spain (1968)
2. George Moeti (1970)
3. Robert Kelly (1971)

4. S. Al-Maghames (1972)
5. Lim Boon-Hee (1972)
6. Adnan Jibril (1977)
7. Demetre Koros (1977)
8. Saleh Al-Khezi (1977)
9. Madame Boumerfeg (1986)

List of Publications

1. On some algebras of operators generated by a scalar-type spectral operator, *J. London Math. Soc.* **40** (1965), 589–593.
2. Restrictions of spectral operators, *Proc. London Math. Soc.* (3) **15** (1965), 437–457.
3. Operators induced on quotient spaces by spectral operators, *J. London Math. Soc.* **42** (1967), 666–671.
4. On the commutant of a complete Boolean algebra of projections, *Proc. Amer. Math. Soc.* **19** (1968), 1448–1452.
5. On a Boolean algebra of projections constructed by Dieudonné, *Proc. Edinburgh Math. Soc.* (2) **16** (1968–69), 259–262.
6. (With Earl Berkson) Prespectral operators, *Illinois J. Math.* **13** (1969), 291–315.
7. Restrictions of prespectral operators, *J. London Math. Soc.* (2) **1** (1969), 633–642.
8. (With Earl Berkson) On uniquely decomposable well-bounded operators, *Proc. London Math. Soc.* (3) **22** (1971), 339–358.
9. (With P.G. Spain) An example in the theory of well-bounded operators, *Proc. Amer. Math. Soc.* **32** (1972), 205–208.
10. (With Earl Berkson and G.A. Elliott) On Fuglede's theorem and scalar-type operators, *Bull. London Math. Soc.* **4** (1972), 13–16.
11. On an unstarred operator algebra, *J. London Math. Soc.* (2) **5** (1972), 489–492.
12. On the algebra generated by a Hermitian operator, *Proc. Edinburgh Math. Soc.* (2) **18** (1972-3), 89–91.
13. A commutativity theorem for prespectral operators, *Illinois J. Math.* **17** (1973), 525–532.
14. (With G.L.R. Moeti) Property (P) for normal operators, *Proc. Roy. Irish Acad. Sect. A* **73** (1973), 159–167.
15. (With Earl Berkson) On reflexive scalar-type spectral operators, *J. London Math. Soc.* (2) **8** (1974), 652–656.
16. Some properties of prespectral operators, *Spectral Theory Symposium (Trinity College, Dublin, 1974), Proc. Roy. Irish Acad. Sect. A* **74** (1974), 207–221.
17. Logarithms of prespectral operators, *J. London Math. Soc.* (2) **9** (1974–5), 57–64.
18. *m*-th roots of prespectral operators, *J. London Math. Soc.* (2) **12** (1975–6), 49–52.
19. (With T.A. Gillespie and P.G. Spain) A commutativity theorem for Hermitian operators, *Math. Ann.* **220** (1976), 215–217.
20. On power-bounded prespectral operators, *Proc. Edinburgh Math. Soc.* (2) **20** (1976), 173–175.
21. *Spectral theory of linear operators* (Academic Press, 1978). [A London Mathematical Society Research Monograph of length 422 pages.]

22. Restrictions of scalar-type spectral operators, *Bull. London Math. Soc.* **10** (1978), 305–309.
23. (With T.A. Gillespie) A representation theorem for a complete Boolean algebra of projections, *Proc. Roy. Soc. Edinburgh Sect. A* **83** (1979), 225–237.
24. (With S. Al-Khezi) Quasispectral operators, *Proc. Roy. Irish Acad. Sect. A* **81** (1981), 25–28.
25. Solution to a problem of Lior Tzafriri, *Bull. London Math. Soc.* **23** (1991), 285–292.
26. Rodney Beazer, *Glasgow Math. J.* **41** (1999), 471–473. [An obituary.]
27. (With M.B. Ghaemi and P.G. Spain) Boolean algebras of projections and algebras of spectral operators, *Pacific J. Math.* **209** (2003), 1–16.
28. The spectrum of a reductive normal operator, *Bull. London Math. Soc.* **39** (2007), 305–310.