Dennis McEldowney; Snow through a spectrum darkly

Dennis McEldowney who died on 23 September was for many years in charge of Auckland University Press. I became acquainted with him when, in 1971, Auckland University Press published a Festschrift for H. G. Forder, former Professor of Mathematics at this University. Dennis proposed the name *A Spectrum of Mathematics* for this collection of mathematical papers and, although I had some misgivings about this title, I couldn't think of anything better and I agreed with it. Perhaps my instinct against such a poetic title, without a clear-cut meaning that I could understand, was a small example of the difficulty of communication between what C.P. Snow called "The Two Cultures". Certainly Dennis McEldowney came from the Arts side of this great divide and I came from the Science side.

I suspect that *A Spectrum of Mathematics* was never thought of as a predominantly commercial venture, but more as a tribute to one of the University of Auckland's distinguished Emeriti. In those days Universities had no money but they did have a culture of graciousness. Eventually the book was taken out of stock, and only the intercession of Garry Tee stopped the remaining copies from being pulped. Garry has kept these surplus copies and gives them out to people whom he feels might be interested.

My contact with Dennis McEldowney left me in awe of the man. He had incredibly fine judgement about editorial and literary matters and also an ability to get things done. By this I mean he knew how to cajole contributors to the Festschrift to deliver their work more or less on time and how to carry out the proof-reading of their individual contributions with high standards of literary style. Many of the authors were experienced and distinguished mathematicians and required no urging, but this was not true in every case; indeed some of the contributors were a little sloppy. I remember the many hours that Dennis and I sat side by side working through the proofs to impose our own standards on the work.

But Dennis McEldowney was more than an efficient and accomplished editor. He has been described as the New Zealand Samuel Pepys and he knew everything that was going on, especially in the University. He was a distinguished writer and literary critic in his own right, and his autobiographical writings are particularly prized. Not only was he great at writing about his own life, but he had a remarkable life to write about. He was born with "a hole in the heart" and thus had a very limited life expectancy. At the age of 8 he overheard his doctor telling his mother that she shouldn't worry because he would not live past 12. This gave him quite a challenge and he lived to 24 before Sir Douglas Robb performed the, at that time revolutionary, surgery on him to repair his heart abnormality. He married Zoë Greenhough, also a hole in the heart survivor, and they had many years together until her death in 1990. Now Dennis himself has passed on at the age of 77 and left his own outstanding literary legacy.

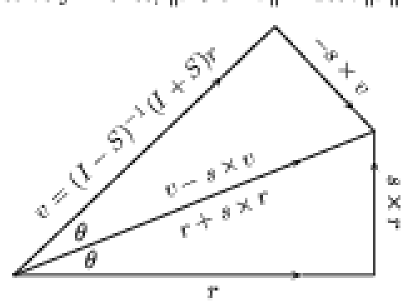
For me, a significant part of this legacy is *A Spectrum of Mathematics* which could not have existed as the beautiful tribute to Professor Forder that it is, without his support and assistance.

Amongst the list of 23 authors appears the name of Frederick Chong. Professor Chong was H. G. Forder's successor as Professor of Mathematics and, in a way, I am F. Chong's successor, in that I once held the chair that he inherited. The Chong paper is little more than one page long and I want to acknowledge this elegant contribution by giving my own presentation of his work 32 years later. He aimed to prove a standard result in linear algebra but in a manner that would have been dear to the heart of the Geometer that Forder was.

Let S denote a 3×3 skew-symmetric matrix, related to a vector $s \in \mathbb{R}^3$ by

$$S = \begin{bmatrix} 0 & -s_3 & s_2 \\ s_3 & 0 & -s_1 \\ -s_2 & s_1 & 0 \end{bmatrix}.$$

Then the Cayley transformation of S is $A = (I-S)^{-1}(I+S)$. The aim is to prove that this transformed matrix is orthogonal and proper. Let $\tan\theta = \|s\|$. If $r \in \mathbb{R}^3$ is orthogonal to s, then $(I+S)r = r + s \times r$. The two terms in this expression are orthogonal and their norms are $\|r\|$ and $\|r\| \tan\theta$ respectively. Hence, $\|r + s \times r\| = \sec\theta \|r\|$. This means that multiplication of a vector in the plane orthogonal to s by $I + S$, is equivalent to a rotation about a vector in the direction of s through an angle θ and multiplication by a factor $\sec\theta$. Since multiplication by $I - S$ is a similar magnification combined with a rotation by an angle $-\theta$, multiplication by $(I - S)^{-1}$ corresponds to rotation through θ combined with scalar multiplication by $\cos\theta$. Thus multiplication by A is equivalent to rotation by 2θ and scalar multiplication by $\cos\theta \sec\theta = 1$. Since an arbitrary vector $x \in \mathbb{R}^3$ can be written in the form $\alpha s + r$ where r is in the plane orthogonal to s, the result generalizes to $\|Ax\| = \|x\|$, because Ax is a rotation of x about s of 2θ. In the diagram, $Ar = (I - S)^{-1}(I + S)r$ is denoted by v.



To find out more about Dennis McEldowney, do a Google search. To find a review of *A Spectrum of Mathematics* consult MathSciNet. To obtain a copy, see if Garry Tee still has one for you.

John Butcher, `butcher@math.auckland.ac.nz`