

David Borwein, 1924-2001

I have been asked to speak at this service as someone who knew David professionally, and it is a pleasure and an honour to do so.

I came to Western in 1984 as an NSERC University Research Fellow, while David was Head of Department. The impetus for creating my position (a special government-funded thing) started with Vic Snaith, but as Head, David would have done the lion's share of the organizational and political work to make it so.

I knew a member of the Borwein family well before coming to Western. Peter Borwein and I were graduate students together at UBC in the late 1970s. I came to know Jon Borwein later, starting in the 1980s, and mostly through Canadian Mathematical Society functions. It is so very sad that both Peter and Jon passed away so early.

My wife Catharine and I got to know both David and Bessie over the years, after we came to Western. They were always very good to us, through good times and some bad. David was very supportive as a boss, and he had a hand in much of my early career success at the University.

From the time of my arrival at Western until he retired, about 5 years, David was Head of the Department of Mathematics, and one of the last Heads of Department at Western. He held this position for 22 years.

The essential differences between a Head and a Chair of Department are length of tenure and level of research prestige. The term of a Chair of Department in the Faculty of Science at Western is usually five years, while Head was a “lifetime” appointment, which at that time meant until retirement.

One looks through Math Reviews (a primary online database of reviews of papers and books in the Mathematical Sciences) to start to understand the breadth and scope of David’s research accomplishments.

By my count, there are 156 publications listed for David in Math Reviews - the first appeared in 1950 and the last in 2020. This is a 70 year record of research publications.

Approximately 60 of these publications appeared in 1990 or later, which is really pretty good for a retired guy.

There is a grand old worldwide tradition of well known, highly successful mathematicians continuing their research until quite late in life, and David’s work fits this description perfectly. His level of productivity post retirement is really something to aspire to.

David Borwein was a classical mathematical analyst, with a specialization in summability. Mathematical analysis is essentially the study of real and complex numbers. Real numbers are what we use to describe positions in the space that we live in, the “real” world, while complex numbers have a little more room for solutions of equations.

Summability is concerned with methods of adding up infinite lists of numbers. These techniques are used in analytic number theory (solving old-timey diophantine equations with analytic techniques), and they have applications to estimation of run times for algorithms in cryptography.

David and Jon were long time collaborators, and produced a series of papers together in various areas during 2000-2020. Jon was a mathematical jack of all trades, while David's analytic methods were always relevant. Seven of David's ten most highly cited papers on Math Reviews were coauthored with Jon. The most highly cited of all is a 1995 paper which computes sums related to the Riemann zeta function - this is analytic number theory, and analysis.

Their last paper together was published in 2020, in a volume of proceedings from a memorial conference for Jon entitled *From analysis to visualization*, which was held in Australia in 2017. Here, "visualization" means computer visualization, which is a big research area in Computer Science, and in artificial intelligence in particular.

I don't know if there are other papers still in press, but I suspect that the 2020 paper was the last publication for both David and Jon.

I have focussed on research, but David was also a prominent member of the mathematical community. He was President of the Canadian Mathematical Society during 1985-87. The Society established the David Borwein Distinguished Career Award in his honour in 2004 to recognize individuals who

have made exceptional contributions to Canadian Mathematics.

David Borwein has given us much to remember.

He was a titan of his research area, of Mathematics at the University of Western Ontario, and of Canadian Mathematics in general.

We mourn David's passing, but we celebrate his life and achievements, his contributions to the University and the community, and his incredibly productive and lengthy research career.