

University of Toronto Archives



Edward Joseph Barbeau fonds

B2006-0003

Compiled by
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Biographical note

Edward Barbeau was born in Toronto in 1938 and received his Bachelor of Arts (1960) and Master of Arts (1961) from the University of Toronto. While taking his masters' degree, he was a lecturer in the Department of Mathematics. In 1961 he left for the University of Newcastle-upon-Tyne in England where he studied under F.F. Bonsall. He held a position as temporary lecturer there in 1963-1964 and received his PhD in the latter year. His thesis topic was on functional analysis. From 1964-1966 he was assistant professor at the University of Western Ontario, and then a NATO research fellow at Yale for one year. In 1967 he accepted an appointment as assistant professor in the Department of Mathematics at the University of Toronto. He was promoted to associate professor in 1969 and full professor in 1988. In 2003 he was appointed professor emeritus.

Professor Barbeau's principal research areas are functional analysis, optimization under constraint, history of analysis, and number theory. His teaching at the undergraduate level, has included courses in the history of mathematical analysis, a general interest course in mathematics for students in other disciplines, a course on chaos and dynamical systems, a course on Pell's equation, and a course in mathematics for intending elementary teachers. Graduate courses have included functional analysis, Fourier series, and a shared course on problem solving for a Masters of Science in Teaching program.

He has been especially active in mathematics education and "has published a number of books directed to students of mathematics and their teachers, including *Polynomials...*, *Power Play...*, *Fallacies, flaws and flimflam...* and *After Math...*, has frequently given talks and workshops at professional meetings and in schools, has worked with high school students preparing for Olympiad competitions and has on five occasions accompanied the Canadian team to the International Mathematical Olympiad."¹ In addition to his books, Professor Barbeau has written about fifty papers on mathematics research and mathematics education.

Professor Barbeau holds life membership in the Mathematical Association of America, American Mathematical Society, and the Canadian Mathematical Society (where he chaired its education committee, served on its Olympiads committee, and chaired the Canadian Mathematical Olympiad). He is also a member of the Canadian Society for History and Philosophy of Mathematics (president 1983-1985), and the International Commission of Mathematics Instruction (co-chair of ICMI Study 16 and its conference in Trondheim, 2006). He has also made presentations at many colloquia and meetings of these organizations and the International Congress on Mathematics Education. He is

¹ Quote taken from Barbeau's curriculum vitae, 2006; copy in box 001(01).

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Biographical note (continued)

currently (2006) associate editor of the 'Fallacies, flaws and flimflam column in the *College Mathematics Journal* and education editor for *Notes of the Canadian Mathematical Society*.

Other professional activities have included being a member of the People-to-People Mathematics Education delegation of North Americans to China (1983), and of the council of the Royal Canadian Institute, where he delivered a three-part radio talk in 1982; and chairing the external review panel for the Department of Mathematics at Wilfrid Laurier University (1999). He has also co-chaired the committee to review the constitution and by-laws of the University of Toronto Faculty Association (2002), and sat on the panel for the Postsecondary Education Quality Assessment Board to examine the proposal for a BSc degree at the new University of Ontario Institute of Technology (2002). Since 2004 he has been a member of the executive committee of Retired Academics and Librarians at the University of Toronto (RALUT). From 1988 to 1990 he appeared frequently on Quirks and Quarks, the CBC radio program, and since 2001 has authored a regular mathematics problem in the *CAUT Bulletin*.

Professor Barbeau's honours include fellow of the Ontario Institute for Studies in Education (OISE), 1989; David Hilbert Award for contributions to mathematics education, from the World Foundation of National Mathematics Competitions (1991), and the Adrien Pouliot Award from the Canadian Mathematical Society (1995).

He continues to reside and work in Toronto.

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Scope and content

Textual, graphic, sound recordings, publications, 1955-2006 [bulk, 1955-2003], 2.10 metres

Records documenting the education and career of Edward Barbeau as a mathematician, primarily at the University of Toronto. Included are files on his education; administrative and teaching files; professional organizations, especially the Gelfand Club of Ontario; manuscripts and publications, in particular his column, "Aftermath", and his book, *Polynomials*; addresses, photographs, and audiotapes. There are numerous files on his outreach work to high school students and professionals, especially engineers.

Access: Open

Accession: B2006-0003

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Series 1: Education

Textual, 1955-1960, 0.19 m.

Except for a single file on English composition at Parkdale Collegiate in Toronto, this series documents Barbeau's academic work in the Mathematics and Physics honours program in the Faculty of Arts at the University of Toronto (BA, 1960). The files contain some of his course notes and laboratory books that are arranged alphabetically by course name within each year. (There is no material relating to his MA degree.) The series ends with a file of notes taken from F. F. Bonsall, his doctoral supervisor at the University of Newcastle-upon-Tyne.

/Box	(file)	Description	Dates
/001		English composition, Parkdale Collegiate University of Toronto. Honours M&P, I and II	1955-1956 1956-1958
/002	(01) – (08)	University of Toronto. Honours M&P, II – IV University of Newcastle-upon-Tyne. PhD program. Notes	1957-1960 1966

Series 2: Administrative and teaching files

Textual, 1902-2006 [bulk, 1959-2003], 1.02 m.

This series begins with a file containing Professor Barbeau's curriculum vitae. It is followed by a single file on courses he taught at the University of Western Ontario (1964-1966). The remaining files document his activities in the Department of Mathematics at the University of Toronto. There are a few general files, followed by a report of the Committee on the Structure of the Governance of the Department (1973), and files on selected staff, the Fields Institute and the Fields Medal. This section concludes with two boxes of index cards listing students registered in the Mathematics and Physics program between 1903 and 1966, along with cards on interested Commerce and Finance students, physics students, and students who received the Samuel Beatty Fund Scholarship between 1953 and 1959. One use made of these cards was to compile statistics on the number of students registered in the Mathematics and Physics (M&P) program.

Series 2: Administrative and teaching files (continued)

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The main part of the series contains material relating to courses Professor Barbeau taught at the University of Toronto, beginning in 1969. It ends with files on a number of publications and organizations at the University of Toronto.

For most courses of the courses in this series, Professor Barbeau inserted a memo providing the background and context of each. The material for each course ranges from memoranda, notes and reports, reading lists, and supplementary notes to problem sets, analysis, tests and examinations. Included is the occasional term paper. Until the 1980s, Professor Barbeau developed detailed mimeographed material for his courses; he then switched to typewriters and eventually to computers. Some files, such as those for courses 129, 133Y, and 1030F, contain manuals, drafts of papers, and supplementary notes. Course 439 has drafts of chapters for a work by Barbeau on 'functional analysis,' the topic of his doctoral thesis.

Professor Barbeau taught both at the undergraduate and graduate level at the University of Toronto, and also did a lot of outreach work with high school students and working professionals. He taught his first course at the University of Toronto in 1960-1961, while taking his Master's degree: calculus to pre-medical students. Later he taught the history of mathematical analysis, a course on chaos and dynamical systems, and a research course of Pell's equation (the last not represented in this series). He also developed a general course in mathematics for students in other disciplines, particularly engineering students (see, for example, MEC 362F and MAT 2432/335) and a course in mathematics for intending elementary students. At the graduate level, besides courses in functional analysis and Fourier series, he helped develop a course on problem solving for a Master of Science in Teaching program.

Professor Barbeau's interest in introducing high school students to mathematics is well documented in this series. Beginning in 1970 and for a quarter century thereafter, he ran a number of courses for high school students. The first, in the summer of 1970 and 1971, was the John Honour Special Seminar in mathematics, while the longest running program, from 1985-1995, was a correspondence course in polynomials, initially for high school students in Metropolitan Toronto. It was soon extended across Canada. In the 1980s he also ran a quantum mechanics seminar (1986), a recreational mathematics and combinatorics course (1987-1988), and he also encouraged high school students to compete in the American High School Mathematics Examination competition.

Another area of outreach was working professionals who needed to upgrade their knowledge. There are two examples in this series, a mathematics seminar for secondary school teachers (1964, 1965) and "Operation alert for engineers". Each fall between 1972 and 1975, the Faculty of Applied Science and Engineering offered an engineering

Series 2: Administrative and teaching files (continued)

update program in seven three-hour sessions, initially for about 40 working engineers from General Electric and later engineers from General Motors in Oshawa. Professor

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Barbeau taught one of the sessions in each semester, on linear algebra and linear analysis.

This series ends with files on a number of publications and organizations at the University of Toronto. “Mathematical Mayhem” was a mathematical journal for gifted high school students and undergraduate students created by students at the University of Toronto. In 1979, Professor Barbeau conceived of the idea of an essay contest in mathematics open to high school students, named in honour of Samuel Beatty, former Dean of Arts and head of the Department of Mathematics, which ran until 1982. The quality of the submissions was sufficiently high that the trustees of the Samuel Beatty Fund published two volumes of the best essays.

For a listing of the contents of this series, see Appendix 1.

/Box (file)	Description	Dates
/002 (09) – (21)	Curriculum vitae	2006
	University of Western Ontario. Department of Mathematics	1964-1966
	University of Toronto. Department of Mathematics (general and staff)	1902-1998
/003 – 004	Index cards	
/005 – 009	Undergraduate and graduate courses, University of Toronto; special courses for high school students, secondary school teachers, and engineers	1960-2000
	<i>Mathematical Mayhem</i> . Correspondence [copies of journal in Print Room]	1989-1990
/010 (01) – (05)	Samuel Beatty essay contest – Faculty Reform Caucus	1968-1997

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Series 3: Professional organizations

Textual, graphic, 1945-2006, 0.12 m. [bulk, 1969-1993]

This small series encompasses three professional organizations with which Professor Barbeau was involved. There is a slim folder of correspondence from when he was editor of the *Canadian Mathematical Bulletin*, and extensive files on the Gelfand Club of Ontario, a correspondence program founded in 1969 by Professor Israel Halperin of the University of Toronto “to provide resource material for able secondary school students interested in mathematics and to encourage them to correspond with mathematicians.” Professor Barbeau took over the program in January 1970 and ran it until October, 1978. The files contain notes, problem sets, and answers.

There are also three slim files on his involvement with the Mathematical Association of America, including its joint meeting in Toronto in 1976 and short courses Professor Barbeau offered for it in 1991 and 1993.

The arrangement is alphabetical.

/010	(06) – (12)	Editor, <i>Canadian Mathematical Bulletin</i> ; Gelfand Club of Ontario	1973-1980 1969-1980
/011	(01) – (03)	Mathematical Association of America	1976-1993
/001P	(01)	Canadian Mathematical Congress	1945?

Series 4: Manuscripts and publications

Textual, 1983-2006, 0.61 m.

In the summer of 1983 Professor Barbeau was invited to write an article on mathematical problems for the alumni magazine, *University of Toronto Graduate*. Thirty-eight columns appeared between September 1984 and the summer of 1993. Associated with it was the newsletter, *After Aftermath*, also compiled by Barbeau. Each column contained a cryptic crossword and posed a mathematical problem and, over the years, it drew responses from several hundred readers, including about two dozen “regulars”. The columns were assembled in book format and published as *After Math: puzzles and brainteasers* in 1995. This column, the resulting correspondence, and the newsletter form the bulk of this series.

Series 4: Manuscripts and publications (continued)

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Other publications in this series are, in chronological order, *The Mathematical Oak*, a newsletter of the Department of Mathematics edited by Professor Barbeau between 1986 and 1992; *Polynomials* (1989), a course book “designed to stand between the high school and university curricula”²; *Power Play* (1997), the focus of which is power of numbers; a paper co-authored with P. C. Stangeby, “Some foundations of analysis for engineering science (MAT194F)” (2002); reviews of *Pell’s Equations* (2003); and a copy of a manuscript by Don Patterson, “University of Toronto – Honours Mathematics and Physics and Chemistry, 1927-1931; some memories as of December 1993.”

The files may contain correspondence, notes, drafts of manuscripts, page proofs, printed columns and newsletters.

/Box	(file)	Description	Dates
/011	(04) – (19)	“Aftermath”. Correspondents, A – John Flatman	1983-2003
/012		“Aftermath”. Correspondents, Warren Forrester – Alfred Nathan	1983-1996
/013		“Aftermath”. Correspondents, O – Z Columns for “Aftermath	1983-1993
/014		<i>After Math: puzzles and brainteasers</i> “After Aftermath”, #1-66 <i>The Mathematical Oak</i> <i>Polynomials</i> , 1989	1995 1985-1994 1986-1992 1985-1988
/015	(01) – (13)	<i>Polynomials</i> , 1989 <i>Power Play</i> , 1997 “Some foundations of analysis for engineering science (MAT194F)” <i>Pell’s Equations</i> , 2003 Patterson, Don. “University of Toronto – Honours Mathematics and Physics and Chemistry, 1907-1931: some memories as of December 1993”	1988-1994 1996-1997 2002 2003 1993

Series 5: Addresses

Textual, 1979-2004, 0.10 m.

² From draft of the “foreward”.

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Most of this series is comprised of files on the radio broadcast, 'Proof and truth in mathematics', that Professor Barbeau presented on the CBC "Ideas" program on 11, 18, and 25 May, 1982. Included is covering correspondence, drafts of the scripts and transcripts of the tapes, and interviews with H.S.M. Coxeter, Chandler Davis, Stillman Drake, Charles V. Jones, Morris Kline, Frank Tall, Gregory Moore and Israel Weinzweig. The remainder of the series consists of a number of other addresses by Professor Barbeau and one by Serge Lang. The arrangement is chronological.

/Box	(file)	Description	Dates
/015	(14) – (18)	Addresses; 'Proof and truth in mathematics', CBC 'Ideas', 1982	1979-1983
/016		'Proof and truth in mathematics', CBC 'Ideas', 1982; addresses	1982-2004

Series 6: Sound Recordings

Reel to reel tapes	1964
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These sound tapes were given to Professor Barbeau by Professor Warwick Sawyer at the time of his retirement in the 1970s. Includes two 1964 lectures by professor Edward F. Assmus, Jr. (1931–1998) on Algebraic Coding Theory as well as a talk by Harvard Mathematics Professor Garrett Birkhoff (1911-1996) on the history of computing math. All three lectures were possibly for the same event in February 1964 "lecture to AYI".

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Appendix 1: Series 2: Administrative and teaching files

/Box	(file)	Description	Date(s)
/002	(09)	University of Western Ontario. Department of Mathematics. Courses 34 and 356	1964-1966
	(10)	University of Toronto. Department of Mathematics. General correspondence	1976-1988
	(11)	University of Toronto. Department of Mathematics. Committee on the structure and governance of the Department of Mathematics. <i>Report</i>	1973
	(12)	University of Toronto. Department of Mathematics. <i>First year mathematics: a course guide and student notebook</i>	1975
	(13)	University of Toronto. Department of Mathematics. Staff and students (general). Press coverage	1976-2003
	(14)	University of Toronto. Department of Mathematics. Samuel Beatty	1902, 1970
	(15) – (16)	University of Toronto. Department of Mathematics. H.S.M. Coxeter	1981-2003
	(17)	University of Toronto. Department of Mathematics. George F.D. Duff. “Upside Down Under”(sabbatical)	1982
	(18)	James C. Ham	1972
	(19)	Vanstone, J. Ray. Death, 1991	1991-1995
	(20)	Fields Institute	1995-1997
	(21)	Fields Medal	1936-1998
/003		Index cards: students in Mathematics & Physics [M&P] (alphabetical), A-Z, 1903-1966	
/004		Index cards: ex-M&P students; interested C&F; (commerce and finance) students, physics students; Samuel Beatty Fund Scholarships (1953-1959); students in Maths & Physics (chronological) 1903-1966	
/005	(01)	M& P students – numerical compilations from cards (see boxes 003 and 004)	
	(02)	Courses. First year calculus and probability for pre-medical students	1960-1961

Appendix 1: Series 2: Administrative and teaching files

/Box	(file)	Description	Date(s)
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/005	(03)	Courses: 'Unity of knowledge' course (proposed), University College	1980s
	(04)	Barbeau's notes and handouts for students and teachers	[198-]-1995
	(05)	Courses. CSC 158S, "Computer applications"	1985
	(06)	Courses. MAT 120, "Calculus"	1968-1970
		Courses. MAT 129,	1981
	(08) – (11)	Courses. MAT 133Y, "Calculus and linear algebra for commerce"	1980-1993
	(12) – (14)	Courses. MAT 140Y, "Linear algebra"	1967-1977
	(15)	Courses. MAT 150Y, "Analysis I"	1986-1987
/006	(01)	Courses. MAT 150Y, "Analysis I"	1987-1989
	(02)	Courses. MAT 194F, "Calculus I" (Engineering science)	1972, 1976
	(03) – (09)	Courses. MAT 220Y, "Development of analysis"	1969-1976
	(10)	Courses. MAT 250, "Analysis II"	1970-1972
	(11)	Courses. MAT 300Y, "Modern algebra"	1967-1969
	(12)	Courses. MAT 320, "20 th century mathematics"	1973-1974
	(13)	Courses. MAT 334F, "Complex variables"	1989
	(14)	Courses. MAT 335S, "Chaos, fractals, and dynamics"	1991-1993
	(15)	Courses. MAT 338S, "Introduction to real analysis"	n.d. - 1991
	(16) – (18)	Courses. MAT 350, "Real analysis"	1976-1982
	(19)	Courses. MAT 399Y, "Independent work in mathematics"	1972
	(20) – (23)	Courses. MAT 439F, "Analysis for the Applied Mathematics programme"	1973-1980
	(24)	Courses. MAT 504	n.d.
	(25)	Courses. MEC 3562F, "Engineering analysis I"	1974
	(26)	Courses. IMPC, "Physics I"	1968-1969
	(27)	Courses. SCI 199Y, "Organizational details"	n.d.
	(28)	Courses. UNI 180S, "Mathematics in perspective"	1979
/007	(01) – (03)	Courses. UNI 180S, "Mathematics in perspective"	1980, 1981, 1991-1993
	(04) – (06)	Courses. MAT 1010, "Functional analysis"	1965-1975

Appendix 1: Series 2: Administrative and teaching files

/Box	(file)	Description	Date(s)
/007	(07)	Courses. MAT 1030, "Banach algebras"	1974 -
	(08)	Courses. MAT 1050, "Homological algebra"	1972-1973

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	(09) – (11)	Courses. MAT 2432/335, “Problem course in differential equations”	n.d., 1969-1972
	(12) – (14)	Courses. “Problem solving course: Master of Science in Teaching”	1979-1980
/008	(01) – (03)	Courses. “Problem solving course: Master of Science in Teaching”	1979-1980
	(04)	Courses. AMC12 seminar, University College	2000
	(05)	Courses. American High School Mathematics Examination	1981-1996
	(06) – (07)	Courses. John Honour Special Seminar for high school students	1970, 1971
	(08) – (15)	Courses. Polynomials correspondence course	1985-1990
/009	(01) – (05)	Courses. Polynomials correspondence course	1990-1995
	(06)	Courses. “Quantum Mechanics Seminars” for high school students	1986
	(07)	Courses. Recreational mathematics and combinatorics courses for high school students	1987-1988
	(08)	Courses. Mathematics seminar for secondary school teachers	1964-1965
	(09)	Courses. “U of T Saturday Seminars”	1985
	(10) – (12)	Courses. “Operation Alert for Engineers”	1972-1975
	(13)	<i>Mathematical Mayhem</i>	1989-1990
/010	(01)	Samuel Beatty Fund. Samuel Beatty Essay Content	1979-1982
	(02)	Toronto Mathematics Seminar	1968
	(03) – (05)	University of Toronto Faculty Reform Caucus	1973-1997