



John Mereu - Instructor of Actuarial Science  
at The University of Western Ontario  
from 1957 to 2009

ACTUARIAL SCIENCE  
AT  
THE UNIVERSITY OF WESTERN  
ONTARIO

Presented to John Mereu  
on the occasion of his retirement  
after 52 years of teaching Actuarial Sciences  
at  
The University of Western Ontario

by  
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ACTUARIAL SCIENCES  
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**T**he study of actuarial science at The University of Western Ontario was the brainchild of Professor Harold Kingston (1886 – 1963), former Head of the Department of Mathematics, and Dean of Arts and Science.

Kingston obtained his Ph.D. in mathematics from the University of Chicago in 1914 with a thesis entitled, “Metric properties of nets of plane curves”, a topic far removed from actuarial science. Upon graduation from Chicago, he took an academic position at the University of Manitoba. There he joined Lloyd Warren, who had graduated in 1913 from Chicago, also with a Ph.D. in mathematics. Both were from small towns in Ontario (Kingston from Picton, Warren from Balderson) and both were interested in astronomy (Warren’s thesis is entitled, “A class of asymptotic orbits in the problem of three bodies”). In 1921 Warren started the actuarial program at the University of Manitoba. It was a good marriage between business and academia. Winnipeg was a growing financial centre in Western Canada. The university was located just south and west of the downtown core, and the thirty-year-old Great-West Life was located nearby in the financial district northeast of the downtown core. That same year 1921 saw Kingston’s appointment as Professor and Head of the

Department of Mathematics at The University of Western Ontario. The year after taking up his new position in London, Kingston started an actuarial program at The University of Western Ontario. Like Warren's decision, it was a sound one. London was also a growing financial centre. At that time the University was located nearer the downtown core than its present location and London Life was nearby in downtown London. About two years after Kingston's arrival, the University moved to its present location.

In the year prior to Kingston's arrival there was only one mathematics professor in the Department of Mathematics. At least one course was taught by someone outside the department. A junior course (Mathematics 15) called "Business Arithmetic" was taught by Mr. Westervelt, presumably connected to the present day Westervelt College. Another course "Introduction to Statistics" (Mathematics 25), whose teacher is unknown, was also offered. These courses remained on the books for several years. Westervelt taught "Business Arithmetic" for another year or two. After Kingston arrived, there were a total of three mathematics professors in the department. Western's calendar for 1922/23 shows Kingston teaching "Introduction to Statistics" and three new courses in actuarial science.

Mathematics 107b - "The Mathematical Theory of Investment" which covered interest, annuities, amortization of debts, bonds, sinking funds, and depreciation with textbook *The Mathematical Theory of Investment* by

Ernest Skinner. The text was first published in 1913. Mathematics 407a – “Finite Differences” which included interpolation formulae, finite integration, and statistical applications with textbook *The Elements of Finite Differences* by Joseph Burn and Edwin Brown. The book contains solutions to questions from sittings of the first exam offered by the Institute of Actuaries.

Mathematics 407b – “Theory of Probability in Life Insurance” which covered mortality tables, probabilities of life, laws of mortality, and survivorship probabilities with texts *The Mathematical Theory of Probabilities and Its Application to Frequency Curves and Statistical Methods* by Arne Fisher first published in 1915 and the *Institute of Actuaries Text Book, Part II* by Ralph Todhunter.

In addition, there was a graduate course “Advanced Actuarial Science” in the mathematics M.A. program listed in the 1922 calendar. It was one of ten graduate courses that were “offered from time to time to suit the qualifications of candidates”.

By the 1930s the Department of Mathematics added a senior statistics course to its offerings. Typically three senior courses in actuarial science were offered every year. The courses were given by one of the three or four faculty members in the Department, usually Kingston. Topics covered in the actuarial courses were essentially the same as those in 1922. Textbooks were updated to cover the latest actuarial examination syllabus. The statistics course was

also geared to the actuarial syllabus. In the early 1940s, for example, the textbooks for the probability and statistics course were the classic *Higher Algebra* by Hall and Knight, *Mathematics for Actuarial Students* by Harry Freeman first published in 1939 and *An Introduction to Statistical Analysis* by Clarence Richardson first published in 1934.

In the early 1940s the Department of Mathematics made a new hire. This was Randal Cole who had obtained his Ph.D. in 1940 from the University of Wisconsin Madison with a thesis on differential equations. Arriving at Western upon finishing his doctorate, Cole took over the statistics courses offered by the Department. In the 1949/50 academic year, he offered a graduate course with the title, "Advanced Statistics". Cole had some research interests in statistics, publishing an article on biometry in the *American Mathematical Monthly* in 1944 and an article on order statistics in the *Annals of Mathematical Statistics* in 1951. The latter article involved discussions with the prominent statistician H.O. Hartley, then at University College London. Under Cole's influence the statistics course, although geared mainly to the actuarial program, fell more in line with mathematical statistics as it was developing in North America. In the late 1940s, the textbook used for the course was Paul Hoel's *Introduction to Mathematical Statistics* first published in 1947. It became one of the standard mathematical statistics textbooks in North America. In the early 1950s the textbook for the course changed to Alexander Mood's *Introduction to the*

*Theory of Statistics* published in 1950, again another classic statistics textbook.

Although there was no actuary in the Department, the actuarial syllabus moved with the times even as the headship of the Department changed from Harold Kingston to Gordon Magee in 1950. C.W. Jordan's classic *Life Contingencies*, first published in 1952, was developed for the students preparing for the Society of Actuaries examinations. It was the textbook for Western's life contingencies courses almost as soon as it was published. Throughout the 1950s the actuarial syllabus at Western remained standard with courses in financial mathematics, finite differences, probability and statistics, and life contingencies. The number of full-time faculty members in the Department was usually three or four. Between them all, they covered a wide range of courses. A later hire in the Mathematics Department, John Moore often taught the actuarial courses. Moore wrote several introductory mathematics textbooks.

John Mereu was a student in Western's actuarial program in the late 1940s. He received his B.A. in Mathematics and Physics in 1949. Upon graduation he joined London Life beginning as a clerk working on special calculations. He became an Associate of the Society of Actuaries in 1950 and received his Fellowship in 1955. Working through various actuarial positions in the company, he was promoted to Senior Actuarial Assistant for Valuations after qualifying as a Fellow. Other promotions followed – Assistant Actuary in 1958 and Associate Actuary in 1963.



In 1957 Mereu received a call from Gordon Magee at his alma mater asking him to teach an actuarial course for the Department of Mathematics for the coming academic year. Mereu took on the course, life contingencies, and taught the course year by year as it changed with the times. The course was the backbone of the actuarial program. It was only in December 2009 that he decided to lay down his chalk. Following on his experiences at London Life and in the classroom, Mereu published papers related to actuarial reserves, various approximations used in actuarial work and annuity valuations. Three papers appeared in *Transactions of the Society of Actuaries* over the years 1961 – 1963 and are referenced in the second edition of C.W. Jordan's *Life Contingencies*, the textbook used in Mereu's course. When the Society of Actuaries textbook changed in the 1980s to *Actuarial Mathematics*, a change that adopted a new approach to the treatment of life contingencies, Mereu's published work remained relevant. Two of the early papers are referenced in *Actuarial Mathematics*. Some 1972 work on the computation of expected losses in excess of a stated limit under group life contracts that was published in the *Transactions of the Society of Actuaries* is also referenced in this book. The latter work was motivated by ongoing work at London Life.

And then came the 1960s. Enrolments exploded. A building boom occurred on campus. Faculty numbers increased. When Gordon Magee retired as Head of Mathematics and David Borwein became the new department

head in 1967, there were nineteen full-time faculty members in the Department of Mathematics. There were also two part-time faculty members, both actuaries: John Mereu and Geoffrey Horrocks. Part-time instructors from “downtown” became a standard way of dealing with some of the actuarial instruction. John Mereu could always be relied upon. From time to time other “downtown” instructors were hired, including Horrocks. Beginning in the 1970s, Wayne Berney taught an actuarial course for several years until taking a position in Chicago as Education Actuary with the Society of Actuaries in the 1980s.

In one sense, the actuarial program remained the same. Course offerings in actuarial science remained stable at three: mathematics of finance including interest, annuities, life annuities, and standard forms of life insurance (Mathematics 253), finite differences (Mathematics 353), and life contingencies (Mathematics 463). Mereu taught Mathematics 463. One significant change did occur. In 1964, Bertha Mabel Richter decided to donate money to The University of Western Ontario in order to establish a professorship in honour of her late father, John George Richter. Her father, a Fellow of the Actuarial Society of America from 1890, had carried out actuarial work at London Life, served as the company’s manager, and then as president for many years until his death in 1932.

The first holder of the Richter Memorial Professorship of Actuarial Mathematics, Leland Ritcey was appointed to the Department of Mathematics in 1966.

Ritcey was an Associate of the Society of Actuaries. Like the origin of the actuarial program, Ritcey was an import from Winnipeg. After obtaining an M.A. in mathematics from Harvard, Ritcey took a position in mathematics at Wesley College (later United College, now the University of Winnipeg). He was an excellent teacher and, in terms of his mathematics, was described as a “quiet, efficient and thorough theorist”. In 1945 Ritcey obtained his doctorate in mathematics from the University of Chicago with a dissertation on the calculus of variations. Two years later he moved to the Department of Actuarial Mathematics at the University of Manitoba. It is impossible to say what motivated Ritcey to move to Western. However, in the mid-1960s departments at Manitoba were being formed, reformed, and reorganized. Ritcey’s department had become the Department of Actuarial Mathematics and Statistics. In 1967, it was split into two separate departments along discipline lines and the Department of Actuarial Mathematics was housed in the School of Commerce.

Prior to Ritcey’s arrival, the Department of Mathematics had acquired another faculty member with actuarial experience. This was Mir Maswood Ali, who was hired in 1961. Although he possessed a Master’s degree in actuarial science from the University of Michigan and had worked for two different insurance companies, Ali’s interests following his Ph.D. were in the area of statistics. He devoted himself to statistical research and to developing the newly emerging statistics program within the Department

of Mathematics. Years later, there were others who followed a similar pattern. David Bellhouse and John Braun have undergraduate degrees in actuarial science; Serge Provost is an Associate of the Society of Actuaries. Although they have all taught some actuarial courses at Western, the vast majority of their work, teaching and research, has been in statistics.

Leland Ritcey retired in 1973 and died the following year. Bertha Richter died in 1976 and left an additional sum of money to the University for the Richter Professorship. Attempts were made to fill the position. Records show that a Professor Spurgeon was approached for the position, but apparently to no avail. The Richter Professorship was not filled for several years. Hiring a qualified academic actuary in a tenured position (a new process that came in during the late 1960s) was a difficult feat to accomplish. Academic actuaries were a rare breed and competition for them was very keen.

In the late 1970s, Harry Panjer, an alumnus of Western's undergraduate actuarial program in the Department of Mathematics and also holding a Ph.D. from Western, was hired into a tenure-track position as an Assistant Professor. Panjer, a bundle of energy, ideas and enthusiasm, took charge of the actuarial program. A highly regarded teacher, he was the first Fellow of the Society of Actuaries with a Ph.D. hired at Western. While at Western, he collaborated with both Bellhouse and Mereu on research publications in actuarial science. He took a faculty

position at the University of Waterloo in 1980.

During the late 1970s there was considerable unrest in the Department of Mathematics among the statisticians. Statistics had grown substantially as a discipline, but had been split over two departments, Mathematics and Applied Mathematics. In 1977, the statisticians were brought under one roof within the Department of Mathematics and given semi-autonomy. There was growing frustration with attempted curriculum changes that were not approved by the Department of Mathematics as a whole. Consequently, the statisticians along with the one actuary, Panjer, decided to split off from the Department of Mathematics. The Department of Statistical and Actuarial Sciences was formed on July 1, 1980, the day that Harry Panjer took up his new position at Waterloo. Ian MacNeill, who had put substantial effort into the formation of the new department, was made the first Chair. Two initiatives immediately took place under MacNeill's leadership: one was to carry out a substantial curriculum reform and the other was to hire an academic actuary into a tenure-track position to replace Harry Panjer. Under MacNeill's supervision, curriculum reform was guided by Bellhouse, then Chair of the Undergraduate Curriculum Committee; MacNeill took charge of recruitment. Through it all, John Mereu remained the bedrock for the actuarial program.

With regard to the new actuarial curriculum, the courses were semesterized. One-semester courses in demography, mortality table construction, and risk theory

were added. The treatment of life contingencies was spread over three semesters instead of the two semesters that had previously been offered. The operations research course that had previously been offered was reworked into a course applicable to actuarial science and renamed “Quantitative Methods in Management Science”. The undergraduate syllabus now covered all topics necessary to become an Associate of the Society of Actuaries. Courses superfluous to the undergraduate actuarial program were taken out. These were a two-semester course in the second year and a two-semester course in the third year, both covering topics in mathematical analysis. A course in introductory probability and statistics was added to the second year, allowing proper preparation for the probability and statistics examination from the Society of Actuaries. Previously, the first course in statistics was in the third year. The textbook used was *Introduction to Mathematical Statistics* by Hogg and Craig. From the mid-1960s, this was the standard text for a course in mathematical statistics usually given once a student had been introduced to the subject at a more elementary level. Within two years of making the curriculum changes the Department’s enrolments tripled. Based in part on his efforts at curriculum reform, Bellhouse was awarded the UWO Gold Medal for Excellence in Teaching (now called the Pleva Award) in 1985.

Increased enrolments did not translate into tenure-track positions. After the great expansion of the 1960s the

University ossified with respect to new positions. The number of tenure-track positions within a faculty was usually fixed. That translated into a fixed number for a department. The only way to obtain a new position was to take one from another department. On the other hand, limited term positions that had no obligation to consider tenure were much easier to obtain. There was one catch. After seven years in a full-time limited term position, the incumbent either had to be considered for tenure or was let go. Part-time appointments without benefits could continue forever. Without a tenure-track opening in a department, a faculty member on a limited term contract had no hope of continued employment. As a result of its enrolment surge, the Department of Statistical and Actuarial Sciences was given several limited term appointments.

There was still the tenure-track position in actuarial science to fill. Over a number of years, several people were hired into this position. Most of the new actuarial faculty members came directly from their doctorates into the position at Western. None remained long enough to establish a record that would give them what had become known as the Richter Chair in Actuarial Science. Tenure-track actuarial faculty members during MacNeill's chairmanship included:

Colin Ramsay – His research interests were, and are, in risk theory. He began his career at UWO after finishing a Ph.D. at the University of Waterloo. He is now in the College of Business Administration at the University of Nebraska, Lincoln.

Beda Chan – His research interests were in risk theory. He left UWO to take a position at the University of Toronto and then went to the University of Hong Kong. He died in a swimming accident in 2009.

James Broffitt – He took a one-year position at UWO while on leave from the University of Iowa. He returned to Iowa where he became Chair of the Department of Statistics and Actuarial Science.

Krzysztof Stroinski – His research interests were initially in casualty actuarial science. He became interested in the emerging insurance industry in Eastern Europe. He currently works for Deloitte as Lead Partner in their Warsaw office of Actuarial & Insurance Solutions for Central Europe. Stroinski's interest in Eastern European insurance was directly tied to the political events of the day. Around the time of the fall of the Berlin Wall in 1989 and the subsequent breakup of the Eastern Bloc, there was a rebirth of market economies in these countries. One growing area was the insurance market. The problem was that there were no trained actuaries. Born in Poland and maintaining his Polish connections while studying and working abroad, Stroinski began organizing a summer school for actuarial science in Warsaw in 1990. The project attracted funding from Foreign Affairs and International Trade Canada, the British Know-How Fund, the Society of Actuaries and Nationwide Corporation in the United States. Over a five-year period the summer school grew substantially and constantly increased in quality. At one point, there were about thirty lecturers at the summer school, coming from



Canada, the United Kingdom, the United States, France and Poland. Included in the Canadian contingent were John Mereu and another lecturer from Western, Steve Kopp.

Kopp was one of those who held a non-tenure-track actuarial teaching position in the Department of Statistical and Actuarial Sciences. He was joined by a few others, most notably Mary Millard. Both had come through Western as undergraduates and both continued on to a Master's degree. Millard initially worked as a statistical consultant in the Department's Statistical Laboratory from 1982 to 1984. From Western she went to London Life where she worked in various actuarial positions, rising to Actuary for Retirement Products. She obtained her Fellowship in the Society of Actuaries in 1991 while at London Life. Kopp began teaching at Western in 1984 after receiving his Master's degree. In 1990 he took a position at London Life but continued to teach a course for the Department on a part-time basis.

The 1990s was a difficult decade financially for the University and, as a result, for the Department of Statistical and Actuarial Sciences. There were budget cuts every year during the decade. The number of tenure-track positions remained static, although money was available for full and part-time limited term positions. At the same time, the University changed its policy on the full-time positions. They could be renewed indefinitely instead of the seven-year maximum.

Through all the expansion, cuts, and turbulence,

and despite suffering heart attacks in 1984 and 1994, John Mereu continued faithfully to teach for the Department. Mereu's contributions to actuarial science were officially recognized at the beginning of the decade. The 1990 Actuarial Research Conference was held at Western in Mereu's honour. In the conference proceedings his research contributions were particularly noted.

“His important research achievements were mentioned and referenced by several speakers at the conference. His research influences many actuaries and, to give a recent example, the problem from his paper on aggregate claims distributions for two correlated benefits given at this conference, has been widely discussed among actuarial research circles and especially at the 22<sup>nd</sup> ASTIN Colloquium in Switzerland.”

Conference participants also recognized that his contributions to actuarial science were wide-ranging, covering the areas of actuarial research, education, and practice.

In 1992 Millard returned to teaching in the Department on a part-time basis with one course. The next year she took a position split between London Life and Western and then devoted her efforts solely to Western in 1997. Kopp returned to teach full-time at Western in 1994; he obtained his Fellowship in the Society of Actuaries the next year. Both are stellar teachers: Millard was given the UWO Award for Excellence in Teaching by Part -Time Faculty in 2002 and Kopp was given the Faculty of Science Award of Excellence in Undergraduate Teaching in 2007. It was in the mid 1990s that David Stanford, who arrived in the

Department in 1988 working in the area of operations research, began to take a research interest in actuarial science, particularly risk theory. This interest has continued to the present day.

After Bellhouse became Chair of the Department of Statistical and Actuarial Sciences in 1992, Bruce Jones decided to move from Iowa to the London area. Jones, the first Fellow of the Society of Actuaries holding a Ph.D. since Harry Panjer, was hired in 1996 as an Assistant Professor. The following year he was promoted to Associate Professor and designated the Richter Chair of Actuarial Science, the first to hold the chair since Leland Ritcey. Jones's initial research interests on arrival at UWO were in the actuarial aspects of continuing care for higher age groups.

As the new millennium dawned, university finances took a turn for the better. Money became available with the retirement of faculty members hired in the 1960s and with new funding from the Canada Research Chairs program. The University also went to a new funding formula; annual cuts remained in place, but departments could recoup their cuts and obtain new money through a competitive process. Under Ian McLeod's chairmanship the Department was highly successful in retaining and obtaining new money. New tenure-track positions and funding for them were obtained. Ricardas Zitikis, a probabilist, was hired in 2001. Soon after his arrival at Western, Zitikis turned his research attentions to actuarial risk

theory. Jiandong Ren, who has research interests in risk theory, was hired in 2003. Kristina Sendova, whose research interests are also in risk theory, was hired the next year. She spent a year in a postdoctoral fellowship before arriving in the Department in 2005. In the same year, she received a University Faculty Award from the Natural Sciences and Engineering Research Council of Canada.

The year 2003 saw John Mereu honoured for his contributions to teaching. In his capacity as President of the Society of Actuaries, Harry Panjer decided to devote the President's Awards that year to six outstanding teachers within the Society. One of them was John Mereu. Panjer's comments on Mereu at the time were:

“John is a really special person to me. He's remarkable. He has never been a full-time academic. John joined the University of Western Ontario's actuarial program in 1957, a position he still holds. He has taught continuously at Western Ontario since that time and is still teaching. He is now in his 47<sup>th</sup> year of continuous teaching of actuarial students. Every student in the actuarial program there since 1957 has taken a class with John. I was one of those 35 years ago. Although he has not made a full-time career of actuarial teaching, his career is certainly equivalent to a full-time career.”

Changing the number of years teaching to 52 and allowing for his recent retirement, the sentiment remains the same.

In 2004 Bruce Jones was appointed to the chairmanship of the Department. He was able to bring another faculty member into a tenure-track position in actuarial

science. Xiaoming Liu joined the Department in 2006. She works in the modelling of mortality. Under Jones's leadership the graduate program in actuarial science, both at the Master's and doctoral levels, has expanded; further, an actuarial research group has been formed for the purpose of discussing and pursuing current research topics.

The Department has also undergone a complete curriculum review for all its courses – probability and statistics, actuarial science, and finance. For several years Kopp and Millard have kept the undergraduate program current with the Society of Actuaries syllabus based on their professional and academic experiences. Kopp also brings an insider's point of view to the table. Since 2004 he has been the chair of the Society of Actuaries Exam C/4 on the construction and evaluation of actuarial models. The outcome of the Department's curriculum review for actuarial science is the ability to build on current strengths. Students now have a better breadth of learning and are better prepared to write the professional examinations in a timely fashion. The Department is also now well-positioned should the professional actuarial organizations go to an accreditation system.

Currently, the Department has on staff three Fellows of the Society of Actuaries (Jones, Kopp and Millard), three additional faculty members whose research is devoted totally to actuarial science (Liu, Ren and Sendova) and two whose research programs are, in part, devoted to actuarial problems (Stanford and Zitikis). The department offers

strong and successful actuarial programs at both the undergraduate and graduate levels.

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