In Memoriam

Tillman Merritt Brown, 1913–73

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Merritt Brown, a delightful man, a dedicated scholar and teacher, and one of the pioneers of econometrics in this country, died in London, Ontario, on 23 August 1973, at the age of 59.

Born in Windsor, Ontario, Professor Brown obtained his BA in Mathematics and Physics from The University of Western Ontario in 1934. A year later he received his High School Teacher’s Certificate from the Ontario College of Education. Although employed briefly as a substitute teacher, he was unable to find full-time work in the teaching profession because of the widespread unemployment among teachers at the time. This direct personal experience of the effects on the individual of widespread unemployment left an indelible impression on this deeply sensitive man, which greatly affected his professional attitudes in later years.

After serving in the RCAF from 1941 to 1945 as an instructor in navigation, Professor Brown attended the University of Toronto where he obtained his MA in economics in 1947. Upon graduation he was appointed Head of Economics and Development Research in the Economics Branch of the Department of Trade and Commerce, where he remained until 1959. During these years he attended the Australian National University, while on leave from the Department, to complete the requirements for a doctorate, which he received in 1958. From 1959–62 he was a Professor at the Royal Military College in Kingston. In 1962 he joined the Faculty at Queen’s University and in 1967 he moved to Western, where he remained until his death. During 1962–4 he served part-time on the staff of the Royal Commission on Health Services.

The twenty-six years of Professor Brown’s professional career, encompassing twelve years as a civil servant and fourteen as a professor, were all devoted to the application of mathematical and quantitative methods to the

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development of economics as a useful tool for policy analysis. He became an economist at a later age than most students because of his personal experience of unemployment during the thirties and a deep-seated conviction that economics is important and can help in improving the lot of mankind. In his own words, 'It is the potential uses of the empirical models that make all of this research worthwhile.' (16) He embarked on economics as a trained mathematician already fully conversant with many of the mysteries of calculus, matrix algebra, statistics, and so forth, that baffled most of his teachers and fellow students at the time. And he remained one of the few people in this country up to the early sixties who was able not only to follow but also to contribute to the substantial econometric advances in economics during this period. International recognition of these contributions came in 1972, when he was elected a Fellow of the Econometric Society, the only resident Canadian economist ever to have been so honoured.

Professor Brown's scholarly publications and papers may conveniently be grouped into two broad categories. The first group (1 to 9) is concerned with the development of econometric theory. A common characteristic is the attempt to clarify the properties of various estimation procedures and to devise methods that increase their practical applicability. Three of these papers are especially notable. In (2) Professor Brown restated the full information maximum likelihood estimator, which has optimal large sample properties, so that it could be evaluated in an operational way. This was important because the original statement by T. Koopmans et al. had been so complex as to inhibit its application to large systems of equations. The paper on simultaneous least squares (3) provided an imaginative application of the principle of least squares, or minimum distance, to estimate jointly all the coefficients of a simultaneous equation model. This was only the second estimator to do this and pre-dated three-stage least squares by several years. The third paper (4) applied the principles developed in the simultaneous least squares paper to non-linear simultaneous systems. At the end of his life Professor Brown was deeply engaged, with nine collaborators, on a large study using Monte Carlo procedures to examine the small sample properties of various econometric estimators. This study will be completed under the co-ordination of Robin Carter, a former student and close associate at Western.

The second category of research (10–18) concerned mainly the application of econometric techniques for purposes of policy analysis. These include his pioneering and perhaps most widely known paper on ‘Habit Persistence and Lags in Consumer Behaviour’ and his major book on the Specification and Uses of Econometric Models. The former was the first formal exploration of what has since become widely known as the permanent-income hypothesis, elaborated by M. Friedman and others some five years later. As L.R. Klein stated and M. Friedman acknowledged, ‘Brown’s work on lags
in consumer behavior is truly a complete anticipation' of Friedman. 1 His book was a bold attempt to construct a general purpose macro-economic system in a general equilibrium framework, showing how it could be used to throw light on policy questions. It abstracted from questions of estimating techniques and data and focused on specifying one large model embracing five major sectors. Heroic in conception, the book came in for criticism on the ground that it did not consider sufficiently the merits of alternative specifications and that depth had necessarily been sacrificed in the interest of extensive coverage of the economy.

Part III of the book is of particular interest because of the account given of the development within the Department of Trade and Commerce of the first major econometric models of the Canadian economy. For many Canadians Professor Brown is likely to be remembered particularly for his pioneering work on these short-run forecasting models. Initiated by O.J. Firestone, this activity was briefly under the direction of L.R. Klein during the summer of 1947. With the help of a few clerks working with desk calculators, the doughty band of Klein, Grayson, Daly, and Brown specified and estimated Model I in the record time of three months! Shortly thereafter Professor Brown found himself working alone on the model, with the help of one clerk, until he was joined by S. May in 1949. Together they formed the team that developed the impressive series of models that followed during the next decade. More recently, of course, many new and more sophisticated models have appeared reflecting the growing number of econometricians, the improved quantity and quality of data, the increased availability of funds, and, most important perhaps, the development of the electronic computer. To have been some two decades ahead of one's time is a rare achievement which few can claim.

This pioneering spirit was again reflected in Professor Brown's work for the Health Commission during 1962–4 when he estimated, once more with a bare minimum of assistance and facilities, a long-term model of the Canadian economy focusing on the determinants and prospects of long-run economic growth. While this work too has now been superseded by CANDIDE and possibly other models, it again showed Professor Brown at work on the frontier, well ahead of most of his colleagues.

Less well known but equally impressive was Professor Brown's attempt during his stay in Ghana in 1969–70 and after his return to Canada to develop an econometric model of the Ghanaian economy. It was 1947 all over again: inadequate statistics, little research assistance, desk calculators. Plunging in single-handedly, with all the optimistic enthusiasm that characterizes pioneers, he developed a comprehensive set of macro-economic data for the period 1956 to 1969, which is unique and represents a considerable

achievement. Initially he himself intended to estimate a model based on these data. Waning health and a growing concentration on his Monte Carlo study led him to transfer his work on Ghana to younger colleagues at Legon and at Western.

Apart from his dedication, his pioneering contributions to scholarship, and his care and patience as a teacher, Professor Brown lives on in the memory of all who knew him as a charming, courteous man, of elegant bearing and gallant manner. Modest, gentle, witty, humane and understanding, uncomplaining whatever the task – all this and more. Whether recounting the amusing tale of his highly unsuccessful attempts to grow tomatoes in Ghana or patiently explaining some fine point of econometrics or assisting boys from disadvantaged homes (on whom he spent considerable time), he inspired in all he met a warm affection and the deepest respect.

No more fitting words can be found perhaps to suggest Professor Brown's attitudes and approach than those found in the Preface to his book:

It is probably no exaggeration to suggest that ... the future of the world hinges on the combined international and domestic solution of welfare problems. While some of them are social, psychological and political, many of the problems are basically economic. Also economic wealth is needed to help solve the non-economic problems ... In this sense a sane and humane economics is fundamental to the creation of a sane and humane society ...

This book is optimistic that such a world can be reached.

As an expression of the esteem in which he was held, an award has been established at Western by his colleagues to honour the memory of this beloved man and one of Canada's outstanding economists.

**Scholarly Publications and Papers**

2. 'Simplified Full Maximum Likelihood and Comparative Structural Estimates.' *Econometrica* 27 (October, 1959) 638–53
7. 'Estimation of Structure for Single Nonlinear Equations.' Read before Econometric Society meetings in Toronto, August, 1967, and the
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9 'Conversion of Simultaneous Least Squares to a Malinvaud Minimum Distance Estimator.' Read before the Econometrics Workshop, The University of Western Ontario, January, 1973.
10 'Habit Persistence and Lags in Consumer Behavior.' Econometrica 20 (July, 1952) 355–71
11 'Some Recent Econometric Developments.' The Canadian Journal of Economics and Political Science 25 (February, 1959) 23–33
12 'Unemployment or inflation -- Economic Dilemma of the West.' Queen's Quarterly 68 (Summer, 1961) 226–36
14 Canadian Economic Growth Royal Commission on Health Services (Ottawa, 1965)
18 'Economic Models and Their Uses.' In John F. Chant (ed.) Canadian Perspectives in Economics (Don Mills, Ontario, 1973)
Monte Carlo Research
Dr. Merritt Brown, Mr. Robin Carter and Mrs. Joan Johnson of the Computing Centre discuss how the computer works out one of their Monte Carlo equations on the blackboard behind them.

UWO version of Monte Carlo

Four economists in the UWO Economics Department and the Canada Council are betting $30,406.50 on Western's version of Monte Carlo.

The Canada Council gave Dr. Merritt Brown the grant last year to study how to improve methods of economic forecasting. The study is technically called Monte Carlo because it involves the use of randomized sets of numbers produced by an electronic roulette on a roulette wheel.

Dr. Robin Carter, who works with Dr. Brown, believes the significance of their work: "We are trying to build better tools for methods of economic forecasting in order to make predictions more effective. In the recent federal election there was a big push to allow University of Western Ontario's insurance factors. The Liberal government emphasized how much the scheme was to cost. It was proven to work but we would have to accurately forecast the future." If Dr. Carter and the team of economists at UWO-PAAD/Centre for the next 10 years, the province would take over making up Canada's economy's more stable.

Foundation: Dr. Brown, Dr. Carter, Dr. Peter Ramsin and one statistician - Dr. Tom Wortham from the Statistical Institute, including Dr. A.L. Nager, one of the world's leading economic theorists.

The book will cover the basic theory being tested and will outline the results of the Monte Carlo test.

Dr. Brown says: "We have been doing a lot of our work in the field but since there has never been a complete review of everything, we are seeing some gaps.

"We will be considering other perspectives considered before and we will be generating more accurate forecasts of economic activity than we have been able to do in the past."

The Monte Carlo researcher builds models or artificial worlds which he studies. When he draws his conclusion based on the processes he observed in his artificial world, he hopes they will hold in the real world.

"The problem with economic forecasting," says Dr. Carter, "is that there are some variables which we can't take accounts of because we can't measure them and because we don't really understand how they influence economic behavior."

Dr. Brown explains: "Most economists prefer to deal with the real world, just like meteorologists prefer to fix a real case. The mechanical likes to have his tools ready to use for him, and that is why we are trying to sort out and indicate the best tools for the practicing economist to use. The problem is that the economist faces more difficult problems, since the vast economy is not exactly seen, understood and grasped as a real." The two major problems involved in economic forecasting are random shocks or disturbances and finding the influences of price, dollar and labor variables in the equation which explains such economic behavior as consumer spending. Basically, the team is trying to discover the best estimators or methods of estimating these influences.

"We've got the best damn set of random numbers we've ever had," says Dr. Carter.

"If there were only one estimator, then there would be no problem. We are trying to pick out which estimator is best and just as we can say to the economist with the Department of Finance, 'Under these conditions this method works best.'"

In working with artificial models random shocks or disturbances must be added because there are random disturbances included in real world economic relationships. Random shocks are necessary for several reasons: first, in analyzing real world economic behavior the economist may not come across all the variables or may have ignored them incorrectly; secondly, it may be the case that there is a fundamental pattern of economic behavior.

Dr. Carter and Dr. Brown are looking for the best method of injecting randomness into a model. Dr. Carter thinks they have succeeded.

"We've got the best damn set of random numbers we've ever had," says Dr. Carter. Their system is capable of doing more than 250,000 different random numbers of six digits each. The numbers are generated mathematically on a computer. The large scale of numbers available is important because if the likelihood of repeating numbers is high, then the randomness is limited and along with it the usefulness of the data work. It is also extremely unlikely that they don't repeat numbers in such a way that they form a predictable pattern. Finally, there would be no problem. We are trying to pick out which estimator is best and just as we can say to the economist with the Department of Finance, 'Under these conditions this method works best.'" Dr. Carter says.

Graduate aid unchanged

Ontario Minister of Colleges and Universities Jack McKeen has announced that the Ontario Graduate Assistance Program will be continued for the 1973-74 academic year at the same $3 million level as last year.

During the 1972-73 academic year there were 190 awards to Western students totalling $1,600,000. In a letter to university presidents, Mr. McKeen said that a new graduate scholarship program recommended by the Council on University Affairs has yet to be established.

The purpose of the present Program is "to encourage students to enrol in graduate programs in our universities and to be better able to contribute to the Ontario scientific and economic growth by research." The Fellowships are intended for students who are residents of Ontario and will be awarded to both Western and other Ontario universities.

For fellowships tenable in the 1973-74 academic year, the deadline for submitting applications for on-campus graduate programs is Friday, January 15, 1973, and March 15, 1973, for application forms and Killam regulations. For fellowships tenable in the 1974-75 academic year, the deadline for submitting applications to universities is 30th March, 1974, and March 15, 1975, for prospective Killam regulations.

Ph. D. Lectures and Orals

A Chemistry Ph.D. Public Lecture will be presented by Mr. Roy Keen on Fri., Dec. 12, at 8:00 p.m. in the Chemistry Physics building. Dr. John C. Ralph has announced that the Department of Chemistry will conduct the event.

The title of the thesis is "Kinetics of Trans(-S)-4-Acetoxy 3,4-Epoxy 2-Cyclohexene-1-Carboxylic Acid and Some Aqueous Systems (III) Complexes.

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Distinguished econometrician dies

T. Merritt Brown, Professor of Economics at Western, and one of Canada’s most distinguished econometricians, died on Thursday, August 23. He was 59.

Professor Brown’s career as an econometrician spanned the development of the field from its infancy to its modern state. In 1972 he was elected a Fellow of the Econometric Society, the first Canadian to receive this honor.

Born in Windsor, Prof. Brown began his pioneering work as an econometrician after World War II, doing an M.A. at the University of Toronto. He then went to Ottawa to head the Econometrics Research group in the Department of Trade and Commerce where the first of the models of the Canadian economy were developed. During his stay in Ottawa he took time out to obtain his Ph.D. from Australian National University.

In 1969 he became Professor of Economics at Royal Military College, moving to Queen’s University in 1962. Then, in 1967 he returned to The University of Western Ontario where he had obtained his B.A. some 33 years earlier.

Prof. Brown’s work as an econometrician included both the theoretical and applied aspects. He wrote several major articles in theoretical econometrics. His books on Canadian Economic Growth (for the Royal Commission on Canada’s Health Services, 1955) and on Specification and Uses of Econometric Models (McGilllan, 1970) stand as classic contributions to the field.

He had also just completed directing a major collaborative study of the properties of various econometric estimators. During his career as a Professor, he also supervised numerous graduate theses.

Prof. Brown participated in the U.W.O.-University of Ghana twinning agreement, spending the 1969-70 academic year at the University of Ghana, where he developed the first complete comprehensive set of Macroeconomic Data of Ghana.

At the time of his death, Prof. Brown was on sabbatical leave, with the early stages of a book dealing with Macroeconomic Theory and Policy. Dr. Brown is survived by his wife Elizabeth, and sons Garry, Ronald and David.

NRC publishes research directory

The National Research Council of Canada recently announced the publication of a Directory established within the National Science Library early in 1971. Following a comprehensive industrial research activities in

Many types of information are