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Editorial Preface*

This special issue of the *Review* marks the centenary of the birth of Roy Geary — Ireland's greatest statistician — who was born in Drumcondra, Dublin on 11 April, 1896 and died on 8 February, 1983. It is the third occasion upon which the *Review* has acknowledged the life and work of Geary. In the April issue of 1976, the *Review* celebrated Geary's 80th birthday with an article by John Spencer on Geary's scientific work. That publication also included an invaluable list of Geary's published work up to 1976. Shortly after Geary's death, in the April 1983 issue, the *Review* published a warm appreciation by John Spencer and updated his published output from 1977 to 1983. It is a remarkable testimony to Geary's zest for work that in the last seven years of his long and productive life he published 16 papers. Many a researcher would like to publish as many in a lifetime! In 1993, on the 10th anniversary of Geary's death, the *Review* published a highly informative account of Geary's life and personality by John Spencer. In the same issue, Kieran Kennedy wrote eloquently of Geary's time at the ESRI.

It is not our intention here to go into any great depth on biographical detail as this is already done in the references cited above and fuller information can be found in Spencer (1983b, 1983c and 1990) and in Stone (1987). In what follows we draw liberally on these sources.

Geary was a student at UCD from 1913 to 1917 obtaining a first-class honours B.Sc., in Maths and Mathematical Physics and a M.Sc., in Maths. He continued his post-graduate studies at the Sorbonne from 1919-1921 acquiring a fluency in the French language and a love of the French people in the process. He was awarded a D.Sc. by NUI in 1937, based on his published work.

His first employment was at the University of Southampton in 1922 as lecturer in Mathematics and Mathematical Physics. In 1923, he took up employment in the Statistics Branch of the Department of Industry and Commerce and remained there until 1949 but he did spend the academic year 1946-47 in Cambridge in the Department of Applied Economics under the headship of Richard Stone.

*I would like to thank the many individuals who encouraged and assisted me in preparing this special issue. Special mention must be made of John Spencer and Denis Conniffe. Mary McElhone and Deirdre Whitaker and Wendy Commins did trojan work, especially with the reproduction of the Geary article. — Editor

In 1949 he was appointed first Director of the Central Statistics Office. There is an interesting family connection here in that Roy's father was associated with the Census of Population in 1901, 1911 and 1926. R.C. retired from the Civil Service in 1957 to become Chief of the National Accounts Branch of the UN Statistical Office in New York. While there, he was also Visiting Professor of Econometrics at the New School of Graduate Social Studies, New York. In 1960, he returned to Ireland to become first Director of The Economic Research Institute. He retired from this position in 1966 but remained on as consultant until his death on 8 February, 1983.

Roy received many honours during his long career. He was an Honorary Fellow of the Royal Statistical Society and the American Statistical Association. He was elected to a Fellowship of the Econometric Society and served as a Council member from 1962-1964. He was Past President of the Statistical and Social Inquiry Society of Ireland and of the International Statistical Institute and Past Chairman of the Council of the International Association for Research in Income and Wealth. He was a member of the Committee of Experts on the European Social Charter (Council of Europe) and in 1981 was awarded the prestigious Boyle Medal of the Royal Dublin Society. He was also, of course, honoured by the establishment in 1966 of the annual Geary Lecture by The Economic and Social Research Institute.

Roy Geary produced 112 published papers in his lifetime — more than half of these after he was 65. The range of his publications is extensive. His major contribution was undoubtedly in the field of mathematical statistics. But he was always concerned with practical applications and he made a lasting contribution to applied statistics. His work in the Central Statistics Office and at the UN Statistical Office led him to produce a number of practical results in the field of applied index number analysis. He also jointly derived the utility function underlying the Linear Expenditure System, the so-called Stone-Geary utility function, which continues to be an important function in applied analyses of consumer demand. From the mid-1960s onwards, he devoted more of his considerable energies to statistical and economic analysis of Irish economic issues.

But Roy was no closeted statistician and did not fit the stereotypical characterisation. He found plenty of time for leisure activities and his extended family. He loved soccer both as a player and spectator. He had a great love of the arts including painting, ballet, music and especially the theatre. In fact, Roy acted on the stages of the Abbey and the Gate and knew O'Casey. He had the charm and generosity of most great men and was especially encouraging to young academics and researchers.

Richard Ruggles of Yale University, in a communication with the Editor, provides a delightful pen picture of Geary the "man":

> His imposing stature and white hair made him stand out. Geary was very articulate — when he rose to speak the audience listened with great attentiveness. He had a presence and a melodious voice that were derived, no doubt, from his interest in the theatre. But more than that he exuded good humour and goodwill that brought people together and gave them a sense of belonging to a community of scholars. His presentations were always witty; he sprinkled them with stories that were always to the point. Despite his ability in abstract mathematical statistics, his clear logic and common sense were very convincing to audiences of diverse backgrounds. He was an unusual man who illuminated the period in which he lived.

The editorial approach to this centenary tribute has been to celebrate Geary's scientific contribution through the publication of original articles by distinguished contributors which cover a broad expanse of Geary's work and interests.

Geary described himself as a "follower of Fisher" and he was usually in full agreement with the estimation methods and criteria that were advocated by that famous statistician. However, this was not always the case. In his work on the "taxi" problem he preferred an estimator that is best in terms of "Pitman closeness" to what would have resulted from Fisher's maximum likelihood procedure. Largey and Spencer have re-examined his estimator in three separate situations — where the distribution is continuous and where it is discrete, sampling with and without replacement. Using mean square error as the criterion, they compare the Geary estimator with leading alternatives and show that it has strong properties in a number of different situations.

Conniffe's paper investigates the topic further in the context of general methods for non-regular estimation situations. He shows that Geary's estimator is a special case of one recently proposed approach and suggests an alternative procedure.

Spatial statistics is now a thriving area of research and application. It was not always so and Geary was one of the first to make a lasting contribution through his introduction of the Contiguity Ratio, c. Like other aspects of his work his paper on c is applied as well as theoretical and uses Irish economic data. Antony Unwin's paper discusses c and related developments in spatial statistics. In particular he highlights the new research in interactive spatial graphics and discusses the relationship between this work and Geary's ratio.

Comparing GNP per head across countries is misleading because prices of goods and services differ significantly between countries. However, it is not obvious how to construct a common set of prices in terms of which consistent comparisons can be made. Geary proposed an ingenious method of doing this,

which calculates "world" prices for all goods and "true" exchange rates which measure the real purchasing power of different currencies. Geary's method has many practical advantages, which have made it by far the most widely used today. However, it has often been criticised for a lack of theoretical foundations. In his contribution to this issue, Peter Neary reviews the debate on international comparisons and suggests how the Geary method may be reconciled with the standard theory of consumer behaviour. He proposes an "ideal" method of making international comparisons and argues that, of all the methods currently available, the Geary method is likely to come closest to the ideal in practice.

Geary often argued that if you cannot show a result with a simple method, one would have to be sceptical of the "proof" implied by a more sophisticated method. Honohan's note develops a simple test for the presence of unit root which surely meets this criterion. In 1970, Geary proposed the count-of-sign-change test as a simple alternative to the Durbin-Watson statistic in testing for autocorrelation. But, as Patrick Honohan points out, this test could have a new lease of life as a visual check for the existence of a unit root. As Honohan notes, there is the added convenience that the critical value for 95 per cent confidence is just twice the square root of the sample size. So, unlike the situation with other unit root tests, the user of Geary's test in this application needs neither computer nor tables.

We have also taken the opportunity, with the kind permission of The Econometrics Society, to re-publish one of Geary's classic and enduringly influential papers on instrumental variables which was originally published in *Econometrica* in 1949. The "discovery" of the instrumental variables technique is sometimes credited to Reiersøl on the strength of his 1950 paper and earlier work. But Aldrich (1993), who published in the *Review*, has analysed the relationship between Geary's 1949 paper, his earlier related papers and Reiersøl's work. He has shown how relative contributions have become clouded, partly because the contents of earlier work were misleadingly rationalised in the later papers, and partly because Geary chose not to highlight some of his own relevant work. In reprinting the 1949 paper here, we believe we are, in part, redressing the view that some historians of econometrics have taken.

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