

Symposium: The Evolution of Data Needs for Policy/Research in Ireland **[Marking the Donation of Roy Geary's Papers to the UCD Geary Institute]**

Introductory Remarks on Roy Geary

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Abstract: The life and professional achievements of Roy C. Geary are summarised.

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My task today is to describe briefly some of Roy Geary's professional skills and achievements. This is not the place for a comprehensive account, such as is provided in John Spencer's centenary lecture (Spencer 1997 – on which some of what follows relies), but we must be satisfied with a taster, to be complemented by the other presentations at this meeting.

Geary was born in Dublin in 1896 and grew up in Drumcondra. Like James Joyce a few years earlier, he went to O'Connell Schools (run by the Irish Christian Brothers), before proceeding to take a BSc. in Mathematics and Mathematical Physics at University College Dublin (UCD) in 1916 and a MSc. the following year. The traveling studentship he was awarded then took him to the Sorbonne in Paris where he studied under great mathematical names such as Borel, Goursat and Lebesgue.

He was an academic *manqué*. He accepted a lectureship at the University of Southampton in 1923 but never took it up, veering to a civil service job in Dublin in the Statistics Branch of the Department of Industry and Commerce. Ultimately, this unit evolved into an independent Central Statistics Office, of which he became the first Director in 1949 (after a kind of sabbatical year in Cambridge 1946/47). When he reached the age of 60 in 1957, he was ready to take early retirement from the CSO. UCD offered him a Chair when he reached 60, but apparently it was not accompanied by a sufficient salary. Instead, he went to the United Nations Statistical Office as Chief of the National Accounts Branch. He returned to Ireland to become the first Director of the Economic Research Institute (ERI—now the Economic and Social Research Institute). We may recall that it was the Statistical and Social Inquiry Society that wrote to the Ford Foundation seeking funding for the establishment of the ERI, and it is understood that the availability of Geary as Director was an influential factor in securing the Foundation's support. He was ERI Director from 1960 to 1966, and then continued there as a consultant until his death in 1983.

To an extent, Roy was a chip off the old block. His father was a civil servant whose job at the General Registrar's Office involved him in the 1901, 1911 and 1926 censuses. Geary *père* was elected to membership of this Society in 1923. Geary *fils* was elected the following year, and quickly became Honorary Secretary from 1926-1946 and President from 1946-51. Roy Geary was thus in the engine room of our Society for a quarter century.

And he was a prolific member, publishing no fewer than eleven papers in the Society's journal (JSSISI)—a score matched in the past century only by his boss in the Department of Industry & Commerce, Stanley Lyon, and by J.C.M. Eason, managing director of the family-owned bookshop and publishing company. He was also an active, not to say voluble, contributor to the post-paper discussion. Take, for example, his discussion of a 1936 paper by the agricultural economist Frank Hussey (who was incidentally my godfather). The paper doesn't seem too

complicated now, but apparently was not understood by many in the audience. Geary began his commentary trenchantly but facetiously as follows:

“In most statistical societies it is traditional that there should be one paper in each session completely incomprehensible to the great majority of members; and it was right that our Society, as one of the oldest in the world, should be true to this tradition... This is precisely the kind of paper which the Society requires.”

All the same, he did acknowledge that members could at least “appreciate the very practical importance of the problem and the significance of the results.”

Already in the early years, Geary was inventing fundamental statistical methods that he would apply to Ireland. For example, his paper on the distribution of the quotient of normal variates (Geary 1930) has the following application: Tuberculosis (TB) mortality grew by 5% in one particular location (Castletown Superintendent Registrar’s District, Co. Cork) between 1905 and 1924, whereas it fell by 40% on average across the country. Given the standard deviations in both years, what is the probability that such an outlier would be found? (He proposes to use rate of change over time, and not just current levels since there was great persistence in locality-specific death rates, attributable to stable but hard to measure local factors)? He worked out the formula for that probability, thereafter applicable to any ratio of normal variates, and applied it to the Irish data.

Other speakers today have more to say about his role in official statistics. I will just mention two examples of how imaginative he was in these matters. One is his suggestion of attaching a quality rating to published statistical series ranging from A to D depending on how reliable the CSO felt that statistic was. The other example is a comment I was struck by in Spencer (1997) who quotes Geary as saying that one of the principal functions of official statistics was in the “steadying of public opinion”.

His period at the UN is memorable in particular for the brilliant Geary-Khamis method he devised for producing measures of real income comparable across countries with widely differing relative price structures, a method which was long used in the major Penn World Tables data set.

His period as a well-liked Director of the ERI was marked by success in establishing that pioneering Institute on a solid basis. His modesty in offering his resignation because of what he saw as underperformance in hiring suitable senior staff was characteristic; though the Institute’s Council immediately dismissed the idea. Although he retired from the Directorship at the age of 70 he continued to come into the Institute on a daily basis thereafter to continue working.

Curiously, Geary had a poor opinion of economic theory, or at least “of the unrealistic abstractions of advanced mathematical economics.” It was not the advanced mathematics that bothered him, but the underlying naïve or “elementary logic that was assumed”. He criticized econometrics for its “almost slavish deference... to economic ideas”: preferring instead to plunge into a problem by measuring “obvious” concepts; as Peter Neary put it: he favoured more the inductive than the deductive. He was inclined to make dismissive remarks about economics, and did so even when chairing Nobel Laureate James Mirrlees’ Presidential Address at the Econometric Society’s European Meeting in Dublin in 1982.

Mention must be made here of his mathematical papers. Clearly, he made significant contributions, especially in the 1930s and 1940s to fundamental but practical statistical questions. As an example of the fundamental, there’s the famous Geary Theorem (Geary 1936). This states that, if repeated random samples are taken from a distribution and the mean and variance are independent, then the distribution must be Normal (Gaussian).

As an example of practicality, take, for example, his paper “Testing for Normality” (Geary 1947). This generalizes Fisher’s z-test for seeing if two samples have the same variance (thus enabling you to tell whether they come from the same population) to the case of non-normal distribution. Importantly, he shows that the correct significance boundaries can be much wider if the kurtosis is different to 3 (if kurtosis is 6, the conventional 95% confidence bound is actually only at about 80% confidence).

It is clear that he was very quick with mathematical manipulations. Complicated calculations of, for example, Charlier expansions used to derive approximate distributions seemed to pose no challenges. And, as another type of example, he quickly saw that the Klein-Rubin Linear Expenditure System (LES) was derivable from Stone-Geary utility function. (A rare example of economic theory being interesting to him.)

Some of his papers are quite hard to read today, partly because of notational choices and some old-fashioned terminology, but mainly because each one of them dips into the middle of a complex mathematical debate. His interventions, seeking to generalize or improve on authors such as T.W. Anderson, Gerhard Tintner, Harold Hotelling, almost seem to assume that the reader is part of the debate. His style was to make short, pointed, but important interventions in a methodological debate but then move on—inevitable I suppose if he was to hold down the day job.

Because his focus was on fundamental questions, others were often working in parallel and he didn't always get full credit – though he is well acknowledged in the literature (as witness the eight references in my prized graduate school copy of Kendall and Stuart 1967), and in the many honours he received, among which I will mention his Fellowship of the Econometric Society (despite his comments about Economic Theory) and Honorary Doctorates from the National University of Ireland and Queens University Belfast.

Roy Geary's importance, both as a long-time pillar of this Society and as one of the architects of the data and research infrastructure of the Irish State, can hardly be overstated.

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