

## Ken Pearson: 1943 – 2015

Ken Pearson was born on August 21, 1943. He graduated in mathematics with first class honours at the University of Adelaide in 1963. He was awarded a Ph.D. in pure mathematics at the same university in 1966 for his thesis on Topological Semirings.

Forty years later in 2006 Ken was elected as a Fellow of the Academy of Social Sciences in Australia. The nomination citation stated:

**“Ken Pearson is one of only a handful of Australian academics who have made a significant difference to the world of economics.”**

What this difference was, and how Ken’s career transitioned from high-end theoretical mathematics to intensely practical economics is a story of intellectual curiosity, insight, courage and perseverance.

Ken’s early career followed a conventional path for a brilliant young pure mathematician: promotion through the ranks (lecturer in mathematics at Adelaide; assistant Professor at Penn State; Senior lecturer and later Reader at La Trobe) and a string of publications in prestigious pure mathematics journals.

By the early 1980s, Ken was Chairman of the Pure Mathematics Department at La Trobe. It was in this role that his interests began to shift. Ken was looking for applications of mathematics with which to interest students. Traditionally mathematicians had looked to the physical and life sciences for illustrative applications: ball bearings running down slopes, striking each other and rebounding; stocks of predators and prey interacting; etc. Ken wanted to equip his students with a broader perspective. He was curious about the emerging use of mathematics in economics. On enquiry he discovered that the Economics Department at La Trobe had an active group of researchers, headed by Peter Dixon, in the field of Computable General Equilibrium (CGE) modelling. The La Trobe group was working on the Federal Government’s IMPACT Project, headed by Alan Powell at the University of Melbourne.

CGE modelling is all about links between different parts of the economy. The IMPACT Project was particularly concerned with links between tariff-protected, import-competing industries (e.g. textiles, clothing & footwear and motor vehicles) and export-oriented industries (e.g. agriculture and mining). The IMPACT Project’s CGE model, ORANI, quantified the path from cuts in tariffs, to increased imports, to a lower exchange rate, to increased exports. This was important for reassuring politicians that tariff cuts would not have a disastrous effect on aggregate employment: it demonstrated that jobs lost in import-competing industries would be replaced by jobs in export-oriented industries.

The ORANI model was a rich source for mathematical illustrations of the type that Ken was looking for: algebraic formulations; matrix manipulations; constrained optimization; and calculus. But for Ken the story didn’t end there. Ken sensed that what was going on at IMPACT was important. ORANI was gaining political traction and was used effectively in-house and at the Industries Assistance Commission. Ken knew that IMPACT was keen to facilitate wider use but this was inhibited by computational complexity. His insight was to see that dissemination could be achieved via computationally efficient, easily transportable, user-friendly software.

Enthusiastically backed by Alan Powell, Ken set himself the assignment of creating the right software platform. Large-scale, policy-relevant CGE models contain many thousands of variables and non-linear equations. Making them computationally efficient and widely accessible must have seemed a monumental task. Embarking on it was an intellectually courageous decision. For Ken, it required a break from his familiar world of pure

mathematics at considerable risk to his burgeoning career. But he succeeded. The outcome was the GEMPACK software.

The first version of GEMPACK was unveiled at a training course on the ORANI model for public servants and academics held in 1984. Over the next 30 years, Ken continuously developed and improved GEMPACK, working with several collaborators, most notably Mark Horridge.

GEMPACK is now used in 600 sites including the World Bank, the International Monetary Fund, the Asian Development Bank, the Global Trade Analysis Project (GTAP), and numerous government departments and universities in more than 90 countries. In a recent computational comparison with the other major CGE software platform (GAMS, developed at the World Bank), GEMPACK was the overwhelming winner.

Through GEMPACK, Ken has democratized CGE modelling. Using GEMPACK, economists without specialist computational expertise can build and apply sophisticated models. GEMPACK-generated results can be readily analysed and constructively challenged in policy debates ranging across trade, public finances, industry assistance, microeconomic reforms, greenhouse and other environmental policies, immigration, labour markets, macro stimulus, natural disasters and security. GEMPACK has linked the world-wide CGE community by facilitating easy transfer of models and results.

What were the factors behind GEMPACK's spectacular international success? First, there was Ken's superb technical prowess and his ability to draw on his mathematical knowledge (e.g. understanding of sparse-matrix techniques) in solving practical computing problems. Second, there was Ken's perseverance, focus and hard work over more than three decades.

Just as important as these factors was Ken's personality: gregarious; intellectually honest; inquiring; always up for a challenge; and completely free of pretension. These characteristics enabled Ken to work productively alongside economic modellers at the IMPACT Project and its successor, the Centre of Policy Studies (CoPS, now located at Victoria University in Melbourne). Starting in the 1990s, Ken also became a key member of a huge international network centred on GTAP. Because of his ability to communicate with economists and operate outside his comfort zone, Ken was able to develop GEMPACK in parallel with the evolving needs of economic modellers.

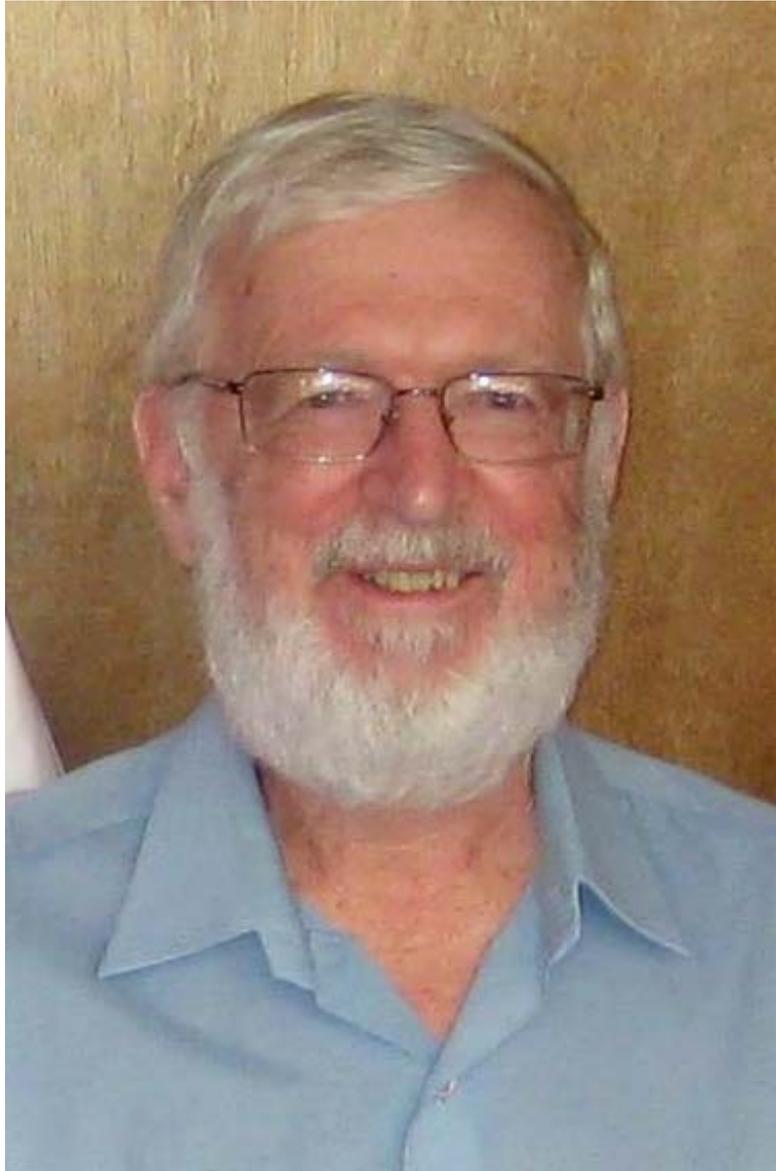
In recognition of his contributions, Ken was appointed professor in CoPS in 1999 (then located at Monash University). From 2000 to 2004 he was the much respected Deputy Director of CoPS. In addition to his fellowship in the Academy of the Social Sciences in Australia, Ken received a major international recognition in economics: in 2007 he was in the first group of inductees to the GTAP Hall of Fame.

Ken had many friends and admirers in every part of the world. He was a great participant in life. He was an adventurous tourist. He loved playing golf, tennis and bridge. He was a chorister with the Royal Melbourne Philharmonic. He had a close-knit family and is survived by Helen, his wife of 50 years, 4 daughters and 9 grandchildren.

Ken retired in 2014, leaving GEMPACK in the safe hands of Mark Horridge and Michael Jerie.

He died of cancer on May 12, 2015. Throughout his illness he was stoic, always cheerful and grateful for a good life. Typical of his lifetime attitude, his main concern towards the end was to make things as easy as possible for his family, friends and colleagues.

*Peter Dixon and Maureen Rimmer, May 12, 2015*



*2011 in Washington*