ALISON GRANT HARCOURT

Alison Harcourt (nee Doig) is an 86-year-old resident of Kew, Victoria. She was born in Colac, Victoria, on 24 November 1929 and was educated at Colac West State School, Colac High School, Fintona Girls School and the University of Melbourne.

During her career as an academic, she has made major contributions to the development of statistics, both in Australia and internationally.

Academic work

Alison completed a B.A. (Hons.) at the University of Melbourne in 1948 majoring in Mathematics, and a B.Sc. in 1950, majoring in Physics. However, her interest in Statistics led to her undertaking a Master of Arts in that subject. In this study, she developed a new technique known as "integer linear programming". On the basis of this work, she took up a position at the London School of Economics in the late 1950s and, with co-author Ailsa Land, published a landmark paper[i] on the technique in 1960. This method, now known as "branch and bound", allowed industry to increase the efficiency of logistics and resource use, and remains a fundamental mathematical tool today.

Alison returned to Melbourne in 1963 to take up a position as Senior Lecturer in the Department of Statistics. During the mid-1960s, Alison worked in a team headed by sociologist Professor Ronald Henderson AO on the first systemic attempt to estimate the extent of poverty in Australia. Their report[ii] was published in 1970. The Royal Commission of Inquiry into Poverty used it later to produce the first authoritative national estimates of poverty.

Updated estimates of the Henderson Poverty Line (HPL) which emerged from their work in the 1960s have been published regularly since 1979 by the Institute of Applied Economic and Social Research at the University of Melbourne (now known as the Melbourne Institute of Applied Economic and Social Research) and reported by welfare organisations such as the Australian Council of Social Service (ACOSS).

Updates of the HPL have also been used to estimate poverty as more recent Australian Bureau of Statistics household income data have become available, and also as a benchmark against which to assess the adequacy of government benefits. While more recent poverty line estimates have been subject to extensive criticism, no viable alternative has been proposed to date and the HPL continues to be used widely to measure poverty.

While on study leave in Sweden in 1970, Alison was co-author with her husband Richard of two papers[iii] in his field of Theoretical Chemistry.

In 1983, Alison appeared before the Commonwealth Joint Select Committee on Electoral Reform, to demonstrate that the system used to allocate the positions of political parties on ballot papers was inadequate, and hence liable to produce results

that failed to meet the criterion of sufficient randomisation. Her evidence led to an amendment to the Commonwealth Electoral Act in 1984 to introduce the "double randomisation" method, which has been used at every subsequent election for both Houses of Federal Parliament. Together with Malcolm Clark, Alison published a paper[iv] on this issue in 1991.

Alison was the foundation secretary of the Victorian branch of the Statistical Society of Australia (1963-67). She has a number of other publications, including *An Introduction to the Theory of Graphs* (Methuen, London, 1962), a translation from the French of the book by Claude Berge, and *Bibliography of Statistical Literature*, Volumes I-III (Oliver & Boyd, Edinburgh, 1963-1967), co-edited with M.G.Kendall.

She stopped working full time in 1972, but returned to part-time work in 1979. Since formal retirement from the University of Melbourne in 1994, Alison has continued to work there as a sessional tutor in Mathematics and Statistics.

Community activities

For over 30 years Alison has been a volunteer deliverer for the Kew (and later Boroondara) Meals-on-Wheels service, an activity that she continues today. She has also played an active role in many other community organisations, including the Melbourne Film Festival (which later became the Melbourne International Film Festival) (secretary, 1955 – 56; the Kew Primary School Parents' Association (secretary, 1980 - 84); a Council of Adult Education book group (secretary, 1998 - 2015); and a study group at the Leo Baeck Centre for Progressive Judaism (co-ordinator, 1999 - 2014).

She is also a long-term member of the Australian Conservation Foundation, and Amnesty International. From time to time, she helped the Friends of Merri Creek plant trees in a local catchment area and she volunteered with the Victorian Rogaining Association, but these activities are now limited by increasing age. She still participates occasionally in rogaining (which is similar to orienteering), where she is one of the oldest competitors. Alison was a regular blood donor, having given blood more than 60 times.

Alison is married to Richard Harcourt and is a mother of two, and a proud grandmother. She enjoys Scottish country dancing, reading and rogaining.

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[i] A. H. Land and A. G. Doig, 'An Automatic Method for Solving Discrete Programming Problems' *Econometrica*, Vol.28 (1960), pp. 497-520.

[ii] Henderson, R. F., Harcourt, A. and Harper, R. J. A. (1970), *People in Poverty: A Melbourne Survey*, Cheshire, for the Institute of Applied Economic and Social Research, Melbourne.

[iii] Harcourt, R.D. and Harcourt, A. 'A simple demonstration of Hund's Rule for the helium 2S and 2P States.' *Chem. Phys*. , 1 : pp. 238 – 243 (1973).

Harcourt. R.D. and Harcourt, A. 'Wavefunctions for 4-electron 3-centre bonding', *J.C.S. Faraday* II, 70 : pp. 743 – 757 (1974).

[iv] Harcourt A.G. and Clark R. M. 'Randomisation and the l975 Senate Ballot Draw', *Australian Journal of Statistics* Vol. 33 (1991).