



Reverend Dr. Lindon Eaves: A Career Remembrance

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The Reverend Dr. Lindon John Eaves was an eminent professor in behavior genetics, with an international reputation as an exceptional scientist. His achievements spanned over 40 years of distinguished scholarship, leadership, teaching and service to the scientific community.

Lindon started his academic career at the University of Birmingham England, obtaining his B.Sc. (1966) in Genetics; then trained for ministry in the Church of England at Cuddesdon College near Oxford, being awarded a GOE in Theology (1968); and then returned to the University of Birmingham, completing his Ph.D in Genetics (1970) within 2 years. He continued there at the internationally recognized Center of Excellence in Genetics, as MRC Research Fellow and then SRC Advanced Fellow in Genetics. In 1978, he was an A.D. Williams Distinguished Scholar and Visiting Professor in the Department of Human Genetics at the Medical

College of Virginia at Virginia Commonwealth University (VCU). Exceptionally, in 1979 he received appointment at Oxford University as University Lecturer in Psychology and Fellow of Lady Margaret Hall, despite having no formal education in Psychology. In 1980, he was awarded a D.Sc. in Genetics from the University of Birmingham based on recognition of the continuing high caliber of his scientific publications, 10 years post-PhD being the earliest possible date of eligibility. In 1981, he received appointment as Distinguished Professor in the Department of Human Genetics at Virginia Commonwealth University. He subsequently played a key role in the recruitment of Dr. Kenneth Kendler and others to VCU, received a joint appointment in Psychiatry, and later appointment as Distinguished Professor in Psychiatry (1999).

From its inception in 1996, Dr. Eaves was the Co-Director of the Virginia Institute for Psychiatric and Behavioral Genetics (VIPBG), which he co-led until his retirement in 2016. There he oversaw the development of the Mid-Atlantic Twin Registry, which is the largest registry of its kind in the United States. In 2000, Professor Eaves received a *Doctor Honoris Causa* from the Free University of Amsterdam, the Netherlands. After assuming emeritus status at VCU, he was the Benjamin Meaker Visiting Professor in Social Medicine, at Bristol University, UK.

Dr. Eaves served as President of both the Behavior Genetics Association and the International Society for Twin Studies. He was the recipient of numerous honors and awards, including First class honors in Genetics at the University

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of Birmingham, the James Shields Award for contributions to Twin Research, the Paul Hoch Award of the American Psychopathological Association, the Lifetime Achievement Dobzhansky Award of the Behavior Genetics Association, the VCU School of Medicine Outstanding Research Achievement and Departmental Teacher awards, the VCU Distinguished Scholarship award, and the Fulker Award for the best paper published in Behavior Genetics. Professor Eaves has been an invited lecturer at many renowned universities, including Oberlin College (Mead-Swing Lecturer), the University of North Carolina at Chapel Hill (McNair Lecturer), Washington & Lee University (Root Lecturer), the Harvard Divinity School, and the Gustavus Adolphus College (Nobel Lecturer).

Research prowess and influence is often measured in terms of publications, citations and grants. All three indicators demonstrate Lindon's extensive productivity and influence. He published over 500 papers on the application of statistical genetic methods to data on twins and their families in highly prestigious journals such as *Heredity*, *Nature*, *American Journal of Human Genetics*, *Archives of General Psychiatry*, *Journal of the American Medical Association*, *Journal of Child Psychology and Psychiatry*. Some of his most influential papers were published in *Behavior Genetics* and *Twin Research and Human Genetics*, journals of the scientific societies he cared most about. He also authored a widely-cited book titled *Genes, Culture and Personality: An Empirical Approach*. According to the citation databases from the Web of Science, his publications have been cited over 28,000 times. In 1999, he was ranked 15th in the world in citations of high impact papers in psychiatry. His contributions include major advances in statistical genetic methods as well as substantive contributions to child and adult psychiatry.

During his tenure at VCU, Professor Eaves held an unbroken record of grant support from federal and private sources. Federal grants were obtained from the National Institute on General Medical Sciences, the National Institute of Child, Health and Development, the National Heart, Lung and Blood Institute, the National Institute of Aging, the National Institute of Alcohol Abuse and Alcoholism, the National Institute of Mental Health and the National Institute on Drug Abuse. In addition, he had a strong track record of private sources of funding including the Robert Wood Johnson, John Templeton and Keck Foundations.

Lindon wrote some of the first programs for model-fitting to twin and family data and conducted some of the first computer-aided design explorations of the power and design of behavior genetic studies. His research embraced the genetics of cognitive function, personality, social attitudes, political behavior and juvenile and adult psychopathology. His particular focus was on the structural modeling of effects of genes and the home environment on behavior and its

development. He built upon some of his earlier pioneering research on modeling developmental change in the effects of genes and environment, which was instrumental in the funding of the longitudinal Virginia Twin Study of Adolescent Behavioral Development. His work on the modeling of biological and cultural inheritance with extended kinships of twins provided the conceptual and analytical framework for many research proposals. He played a key role in the application of Markov Chain Monte Carlo methods to extend the repertoire and flexibility of genetic models for growth and gene-by-environment interaction for twin data. With colleagues in Britain, he explored the use of genomic data in the resolution of causality in human kinship data. He was the principal or co-investigator of many projects, including the VCU component on the NIDA "Genes, Environment, Development Initiative" project, the Puerto Rican Infant Twin Study and the Virginia Children of Twins study.

Lindon was an exceptional teacher with a stellar training record. He taught courses across four decades on topics such as biometrical, behavioral, psychiatric, mathematical, statistical and population genetics. In the international arena, Professor Eaves played a leading role in the teaching of undergraduate, graduate, and medical students, as well as post-doctoral fellows, junior and even senior faculty. He was a founding faculty member and served as the Academic Director of the annual International Workshops on Methodology for Genetic Studies of Twins and Families, which originated in Leuven, Belgium in 1987 and evolved into the continuing Boulder series of workshops with NIMH support. He led and participated in many of these workshops, which have produced thousands of graduates, many of whom have since become respected researchers. Dr. Eaves was also highly influential in his supervision of graduate and post-doctoral students at the University of Birmingham, the University of Oxford, and subsequently VCU, of whom many have very distinguished careers of their own. He played a key role in promoting the careers of young investigators and possessed the unparalleled combination of qualities of rigor, expertise, enthusiasm and exceptional clarity of explanation.

Besides these 'objective' measures of scholarship, the Reverend Dr Eaves was extraordinary in his role as scholar and mentor. He was forever on the forefront of the field of statistical genetics and frequently advanced it by developing new methods necessary to answer the questions posed in this rapidly evolving scientific area. All this was accomplished seemingly with no ego. He was the most generous supervisor, always making time to discuss new ideas, analyses, papers and always encouraging trainees and collaborators to take his ideas, make them their own, and develop them further within their individual research interests. In that capacity, he was responsible for developing the careers of many outstanding independent research scientists.

In 2012, a festschrift was held in his honor in Edinburgh, Scotland at the annual meeting of the Behavior Genetics Association, showcasing his many contributions to the field. It is no surprise that this was the best attended annual meeting, bringing together many of his colleagues/friends to celebrate his illustrious career. The presentations were recorded and published in a special issue of Behavior Genetics, and will live on forever.

Professor Eaves was a distinguished professor, scholar, mentor and friend, but foremost a genuine human being. He was caring and supportive to all he met. His words and ideas will live on as will the memory of his spirit, intellect and kindness.

Lindon's most-repeated phrase was of course "Look at the bloody data". We can imagine him arriving at the gates of heaven, and being questioned by Saint Peter about how he had fulfilled his duties as a minister of religion. His response, of course, would be "Look at the bloody data"—his science was both his calling, and through his generosity to trainees and colleagues, his ministry.

Lindon's life as a colleague and friend was very well and movingly captured by Dr. Michael Neale during his remembrance service:

*Lindon was, in all likelihood, the greatest scientist I ever met, and if not, well he taught me a lot about likelihood. He was also the best teacher I've ever had, perhaps more *because* of his effing colorful language, than in spite of it. I think he managed all these feats of genius because he really understood the mathematics and science, sure, but more important, he understood people.*

I am so grateful that I got to work with the scientist I admired the most. As a grad student at King's College London in the 1980s, reading Eaves' and colleagues' articles emerging from the rather strange-sounding Medical College of Virginia, was such a treat, that when Professor Martin suggested that I apply for a postdoctoral position, I knew I had to go. We sold our house, and like others before me, emigrated to the USA as a family of 5 & two cats crammed into a station wagon for the drive from Washington DC. With their typical hospitality, Lindon and Sue had us spend the first night in

their home, where one cat, unfamiliar with US appliances in general, jumped up on the water heater in the corner, skidded over the top and got stuck face-down behind it, to be rescued by animal control a while later without needing to cut a hole in the wall of my new boss's home.

When I first started at VCU, we worked in a wet lab on the 11th floor of Sanger Hall. Hewitt, Heath, Meyer & myself shared the space with Eaves, who had a poster on the wall showing the cartoon cat Garfield holding a college pennant to make the phrase "Here I am at VCU (in Lindon's handwriting) big fat hairy deal." The irony of this irreverence is that, due in large part to his magnetism, his rigor, his clarity of thought, his wit, his ever-lively mind, and his generous spirit, being at VCU has indeed become a big fat hairy deal.

What is that scientists try to do? In essence, we battle the four horsemen of the apocalypse: war, sickness, famine and death. Lindon made real headway, he developed new mathematical instruments for us to model the natural world. Even better, he taught other people to use them and how to make new ones of their own. To better understand how things such as the human brain work, and why sometimes they don't. The horsemen have recently made alarming progress, but fear not: with reason and free inquiry we can and will push them back again.

So, thank you, Lindon for enriching our lives, and those of so many thousands of others, now and in the future. The Reverend Professor Eaves' Genes Culture & Personality will live on 'Dammit!'. My deepest condolences to you all, and especially his family.

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