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# Probability and Mathematical Genetics

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## Preface

John Frank Charles Kingman was born on 28<sup>th</sup> August 1939, a few days before the outbreak of World War II. This Festschrift is in honour of his seventieth birthday.

John Kingman was born in Beckenham, Kent, the son of the scientist Dr F. E. T. Kingman FRSC and the grandson of a coalminer. He was brought up in north London, where he attended Christ's College, Finchley. He was an undergraduate at Cambridge, where at age 19 at the end of his second year he took a First in Part II of the Mathematical Tripos, following it with a Distinction in the graduate-level Part III a year later, for his degree. He began postgraduate work as a research student under Peter Whittle, but transferred to David Kendall in Oxford when Peter left for Manchester in 1961, returning to Cambridge when Kendall became the first Professor of Mathematical Statistics there in 1962.

John's early work was on *queueing theory*, a subject he had worked on with Whittle, but was also an interest of Kendall's. His lifelong interest in *mathematical genetics* also dates back to this time (1961). His next major interest was in Markov chains, and in a related matter—what happens to Feller's theory of recurrent events in continuous time. His first work here dates from 1962, and led to his landmark 1964 paper on regenerative phenomena, where we meet (Kingman) p-functions. This line of work led on to his celebrated characterisation of those p-functions that are diagonal Markov transition probabilities (1971), and to his book, *Regenerative Phenomena* (1972). Meanwhile, he had produced his work on queues in *heavy traffic* (1965). His work on subadditivity began in 1968, and led to the *Kingman subadditive ergodic theorem* of 1973. His genetic interests led to his book *Mathematics of Genetic Diversity* of 1980, and his famous paper on the (Kingman) coalescent of 1982. Later work includes his book *Poisson Processes* of 1993. Other interests include

Spitzer's identity and its connection with queues, the subject of his *The Algebra of Queues* of 1966.

John began his academic career in Cambridge, as Assistant Lecturer (1962–64) and Lecturer (1964–65), with a fellowship at his undergraduate college, Pembroke (1961–65). He left for a Readership at the University of Sussex, where he was promoted to Professor at the very early age of 26 in 1966, the year in which he published his first book, *Introduction to Measure and Probability*, with S. James Taylor. He left Sussex to be Professor at Oxford from 1969–85. He was elected a Fellow of the Royal Society in 1971 at age 31. He was made a Foreign Associate of the US National Academy of Sciences in 2007.

We all know very good mathematicians who could not run a corner sweetshop, let alone a mathematics department, still less a university. On the other hand, mathematicians who are not very bad at administration are often very good at it. John Kingman is a shining example of the latter category. This led to his secondment, while at Oxford, to chair the Science Board of the Science Research Council (1979–81), and later to serve as Chairman of the Science and Engineering Research Council (1981–85), for which he was knighted in 1985. It led also to John's career change in 1985, when he became Vice-Chancellor of the University of Bristol, serving a remarkable sixteen years until 2001. He then served for 5 years as Director of the Isaac Newton Institute for Mathematical Sciences in Cambridge. In 2000 he became the first chairman of the Statistics Commission, overseeing the Office of National Statistics.

John Kingman is the only person who has been President of both the Royal Statistical Society (1987–89) and the London Mathematical Society (1990–92). He has also served as President of the European Mathematical Society (2003–06). He received the LMS Berwick Prize in 1967, the RSS Guy Medal in silver in 1981, and the RS Royal Medal in 1983 (for his work on queueing theory, regenerative phenomena and mathematical genetics). He holds a number of honorary doctorates. He does not hold a PhD, being Mr Kingman until he was made Professor Kingman at Sussex, later taking a Cambridge ScD.

John Kingman's mathematical work is remarkable for both its breadth and its depth. But what shines out from everything he does, whether his written papers and books or his lectures and seminars, is *lucidity*. Kingman is always clear, and lucid. This even extends to his handwriting—small, neat and beautifully legible. The Wiley typesetters who set his 1972 book worked from his handwritten manuscript, which they said was easier to work from than most authors' typescripts. During his Oxford

years, the secretaries there revered him: they were not used to Chairmen of the Mathematical Institute whose desks were tidy, who handled paperwork promptly, and who would give a decision in real time, rather than procrastinate.

John Kingman has been blessed since his marriage in 1964 in the love and support of his distinguished wife Valerie Cromwell; they have a son and a daughter, who are now acquiring distinction themselves. They now live in retirement in Bristol and London.

While probabilists may regret the loss to probability theory of John's years in administration rather than mathematics, this is offset by the continuing impact of his most important work, whether in queueing theory and heavy traffic, Markov chains and regenerative phenomena (the subject of some of his most recent papers, where he has successfully solved some problems that had remained open since his own work of thirty years ago), subadditive ergodic theory or mathematical genetics and the coalescent. Indeed, the intense concentration of effort on the genetics side associated with the Human Genome Project has thrown in to ever higher relief the fundamental importance of Kingman's work in this area. The editors and contributors to this volume take pleasure in dedicating this book to him, on the occasion of his seventieth birthday.

N. H. Bingham and C. M. Goldie, December 2009.

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