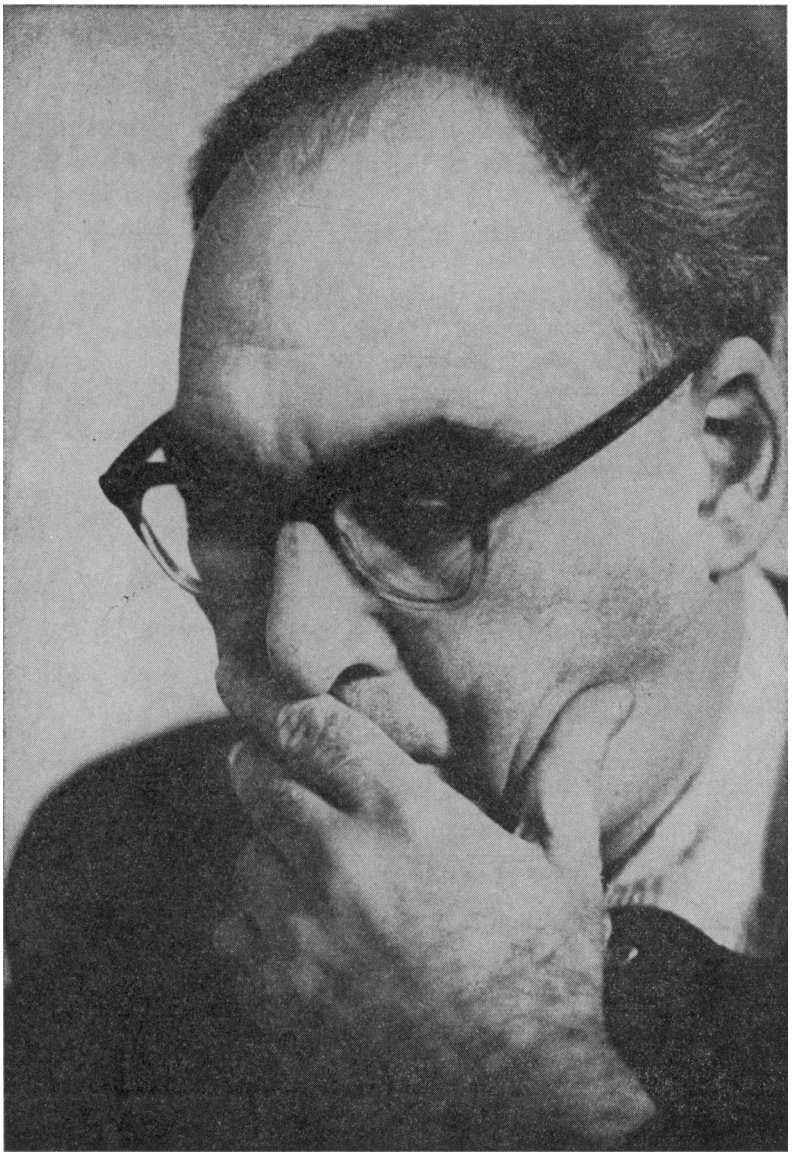

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ALFRÉD RÉNYI

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Obituary: ALFRÉD RÉNYI

The news of the death of Alfréd Rényi on 1st February, 1970, at the age of 48 years, brought an acute sense of loss and bewilderment to his many friends in all parts of the world, and especially so in Cambridge where, as an Overseas Fellow of Churchill College and a frequent and irregularly regular visitor to the Statistical Laboratory he had made himself so securely at home that we had come to think of him as a member of our permanent staff, normally on sabbatical leave in Hungary or elsewhere. His association with Cambridge, dating approximately from my own arrival there, was a constant source of strength and encouragement to me, for I saw in his Mathematical Institute in Budapest a model of what such a unit should be and could do in the world of today. Himself a pure mathematician of massive achievements and towering stature in the classical fields of number theory and analysis, Rényi possessed also an inquisitive and dogged interest in all the phenomena of the world about him, and in all the scholarly activities of his colleagues, whether scientific or humane, and this unique combination of powers and interests enabled him to build up a research institute in which the criterion for acceptability of a subject for investigation was 'does there exist at least one mathematician with a genuine interest in this topic'? Once accepted as appropriate, however, the topic would be pursued in a thoroughly professional way; the argument would be followed wherever it led, and buttressed by whatever mathematical means seemed appropriate, however exotic or sophisticated. Finally, an outcome capable of practical interpretation was required, and usually obtained.

The contrast with some other approaches — those in which problem, method, and solution all have to be formulated exclusively in terms of probability triples, or categories; those in which statistics is so narrowly defined as to exclude everything but the interests of a minority sect; those in which mathematics is only pure enough if God can be thanked for its uselessness; and those in which all currently developing mathematical structures and their attendent techniques are dismissed as 'soft trash' — this contrast was so marked as to make every meeting with Rényi as full of refreshment as the moment when one first sets foot on a mountain peak and so suddenly sees all the topography of the surrounding country vividly presented in its just scale and proportion.

Rényi's scientific output — 202 publications in 24 years — is an adequate indication of his apparently inexhaustible energy. It would be impossible in so short a memoir to attempt a critical appraisal of the whole, but for readers of this

Journal, of which he was an enthusiastic founder-editor, perhaps his most interesting contributions were those concerned with order-statistics (based on an elegant use of the exponential distribution), conditional probability spaces, powerful generalisations of classical probabilistic inequalities, generalisations of the information-theoretic concept of entropy, the characterisation of Poisson processes, sums of random numbers of random variables, 'mixing', random space-filling, random graphs, dimensional concepts in information theory, problems of random search, information-theoretic approaches to statistical inference, information-theoretic proofs of classical limit theorems, extreme observations, geometric probability, stable sequences of events, equivalent events, random matrices, traffic problems, mathematical models of biological processes (especially those involving viruses and enzymes), trees (in the mathematical sense), coding theory, and (this sub-title covering an enormous volume of work) 'applications of probability theory to other areas of mathematics'.

This brief list of topics gives a slight idea of the breadth of his interests, and yet much is still excluded. Thus Rényi was passionately interested in the teaching of his subject, and his books are among the most readable and rewarding advanced texts available. Again, he was profoundly interested in the history of mathematics and of probability theory and presented his findings in a novel and highly successful way as a series of imaginary dialogues or exchange of letters between historical characters in such a way as to throw light on modern controversies by seeing them through ancient eyes. Those who have read some of the dialogues will have appreciated the insight of Littlewood's remark to Hardy: "the Greek mathematicians were not clever schoolboys or 'scholarship candidates', but 'Fellows of another college' ". (The past tense is of course now most inappropriate; Rényi, together with the writer, was one of those who attended what the Mayor of Loutraki described as 'the first international mathematical symposium to be held in Greece since classical times'.)

A few years ago Rényi became convinced that Pascal and Fermat could not conceivably have interested themselves in the theory of probability solely to enable the Chevalier de Méré to balance his gambling account, and that there must have existed, might yet exist undiscovered, and could with sufficient care even be reconstructed a correspondence between the two on the philosophical foundations of the subject. This reconstruction he carried out, taking great care to avoid all anachronisms, and the German version *Briefe über die Wahrscheinlichkeit* has recently appeared; an English translation is urgently needed. A portion of the work consists of an imaginary dialogue between Pascal and a 'Bayesian' rival, Damien Miton. A rough English translation of this portion exists; it was prepared for the purpose of a dramatic presentation before the philosophers and mathematicians of Cambridge University, arranged by the Committee for the History and Philosophy of Science. At the last minute the writer had to 'stand in' to read the part of Miton; it was of course a most agreeable experience to be

demolished piece by piece, by Rényi-Pascal, and to have the absurdity made clear to the world of the Bayesian beliefs one did not, in fact, hold.

This Cambridge occasion, the colourful excursions around Loutraki, endless talks and walks at Oberwolfach, coffee in Rényi's Budapest office under its old-magisterial ceiling, excursions from Tbilisi, and a drive (by no means without incident) from Budapest to Belgrade are a few of the many happy memories I shall treasure of this lovable and wholly delightful man. To have lost his beautiful, gracious, and mathematically most accomplished wife, Catherine, and then Alfréd himself within so brief a space of time is a grievous blow whose hurt is lessened only by the knowledge that it is shared by many others who loved them too. One can end only on a note of gratitude for the fellowship we had, and for the last and perhaps most significant of Alfréd Rényi's accomplishments: he made the integral and connected character of European mathematics — Europe in the widest sense, east and west — once more *a reality*, and today, in esteemed friendships with mathematicians in other parts of Europe, we enjoy the substance of what he hoped for. So on this foundation — as well as on other, more technical, foundations laid by him, let us build.

DAVID KENDALL
Statistical Laboratory,
University of Cambridge

Biographical details

Rényi's date of birth (in Budapest) is given as 20th March, 1921, but in the Academy obituary he is described as being 49 years of age on 1st February, 1970. Probably the date of birth is correct, and 'at the age of 49' should be read as 'in his 49th year'. He studied mathematics and physics at the University of Budapest from 1939 to 1944, and obtained the degree of Ph.D. at the University of Szeged in 1945. He then held a post-doctoral fellowship at the University of Leningrad in 1946–7. A series of posts at Budapest and Debrecen led to his appointment as Director of the Mathematical Institute of the Hungarian Academy of Sciences in 1950, and as head of the chair of probability theory in the University of Budapest in 1952. He was a member of the Hungarian Academy of Sciences (twice holder of the Kossuth Prize), a member of the Praesidium of the János Bolyai Mathematical Society, and a Vice-President of the International Statistical Institute. He played a prominent role in the founding and early days of the International Association for Statistics in the Physical Sciences, and would surely shortly have served with distinction as its President, but for his untimely death.

He was Editor of *Studia Scientiarum Mathematicarum Hungarica*, and a member of the editorial boards of *Acta Mathematica*, *Annales Sci. Math.*, *Publicationes Math.*, *Matematikai Lapok*, *Zeitschrift für Wahrscheinlichkeitstheorie*, *Journal of Applied Probability*, *Journal of Combinatorial Analysis*, and *Information and Control*.

He was honoured in many ways by other countries; in the United States of America he was at various times Visiting Professor at the Universities of Michigan, North Carolina, and Stanford, and he was a Fellow of the Institute of Mathematical Statistics. In the Federal German Republic he was a Visiting Professor at Erlangen University, and in the United Kingdom his Fellowship of Churchill College has already been mentioned.

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