

For a year he was lecturer at Goldsmiths' College, and then (1916-1919) research assistant to Sir William Pope in Cambridge, working on problems of chemical warfare. From there he went to the University of Sydney, where his research lay in the field of arsenic stereochemistry. He came home to a post in Woolwich Arsenal, and in 1923 returned to his old College as a senior lecturer and carried out the experimental work which established the linear axis of the biphenyl molecule.

In 1928 he became head of the Organic Chemistry Department at Bedford College for Women, as a reader in the University of London. He began a fruitful research partnership with Dr. Mary Lesslie, and the encouragement which he had received in his youth was in turn lavished on his many research students. Nearly half his long list of publications contain the names of women as collaborators. He was a racy, stimulating lecturer, with a fund of chemical anecdotes, a phenomenal memory, and a gift of practical insight.

In 1939 he was elected a fellow of the Royal Society; in 1944 the title of professor was conferred upon him, and in 1946 he became head of the Department of Chemistry. At this time he began to write his *Organic Chemistry*.

His research covered a wide field—biphenyls, chemotherapeutic agents, petroleum hydrocarbons, labile optical activity, the stereochemistry of heterocyclic systems and bridged biphenyl systems, to name the most outstanding. He was a pioneer in the development of molecular models.

He served for forty-two years on the Board of Studies in Chemistry in the University of London, was a fellow of Queen Mary College, a Freeman of the City of London and a Liveryman of the Coopers' Company. In 1921 he married Miss Beryl Osborne Wyndham who, with their daughter, survives him. His enthusiasm, his lightning wit and his encyclopaedic fund of chemical knowledge will be sadly missed.

M. M. HARRIS

Dr. R. H. Boyer

DR. ROBERT HAMILTON BOYER, whose work in general relativity theory brought him an international reputation, was one of those shot to death on the University of Texas campus on August 1. His death, at the age of 33, interrupted a career still approaching its height.

Robert Boyer was born on December 11, 1932, in Johnstown, Pennsylvania. He studied mathematics and physics at the Carnegie Institute of Technology, and went in 1953 as a Rhodes Scholar to Oxford, where he worked on quantum field theory under Dr. Handel Davies, receiving the D.Phil. in 1957 for his contributions to the theory of the photoelectric effect. He then returned to Pittsburgh as research mathematician at Westinghouse Research Laboratories, where he solved a variety of problems, mainly in diffusion theory. Here also he began a study of the discrete analogue of Bessel's equation, which has recently attracted renewed interest.

Boyer decided to return to academic life, and after a year at McGill University was appointed to a lectureship in applied mathematics at the University of Liverpool in 1961. While at McGill he had turned his attention to general relativity, which occupied him for the rest of his life. He first developed techniques for studying gravitational fields in terms of a preferred congruence of timelike curves. Later he applied these techniques, which resemble Møller's "frames" and Cattaneo's "method of projections", to the relativistic theory of rigid motion. He clarified the relations between various conditions on the motion of a relativistic rigid body, and gave sufficient conditions for the extension of the classical theorem of Herglotz and Noether to general relativity.

Boyer's major contributions were to the theory of rotating gravitating systems. In a series of papers, he investigated the general properties of rotating fluid masses, and contributed largely to the physical under-

standing of an exact solution of Einstein's field equations, discovered in 1963 by R. P. Kerr, which appeared to represent the exterior gravitational field of a rotating body. On a visit to Texas in 1964-65, as research associate at the Center for Relativity Theory, Boyer collaborated with R. W. Lindquist on a detailed analysis of the Kerr metric, which is outstanding among global studies of particular gravitational fields.

At the time of his death, he was returning to Liverpool from Mexico City, where he had been for some weeks collaborating with G. Plebanski at the National Institute of Technology.

Boyer's able teaching and lecturing were complemented by the writing of a number of valuable expository articles, which, with his discriminating research papers, will leave a clear mark on his subject. His colleagues and students will remember him not only for his work but also for his gentle and unassuming manner. He was a ready listener and an honest and patient critic, always willing to take pains to see another point of view.

He married in 1957 Lindsay Robinson, of Liverpool, who, with two young children, survives him.

F. A. E. PIRANI

J. K. Zbrozek

THE sudden death on September 25 of Jerzy Kazimierz Zbrozek, at the early age of 53 years, came as a great shock to his many friends. He collapsed and died on arrival at Kennedy Airport, New York, at the start of a visit for discussions with specialists in the United States and Canada on atmospheric turbulence in relation to aircraft.

Zbrozek was born in Poland, and studied mechanical and aircraft engineering at the University of Warsaw. He came to Great Britain following the invasion of Poland at the start of the Second World War, and became a fighter pilot in the Royal Air Force. At the end of the War he joined the Royal Aircraft Establishment, Farnborough, as a member of the staff of the Aerodynamics Flight Division, with which he later moved to Bedford. He was concerned with a wide range of aeronautical research, and early on devoted much of his efforts to helicopters. He then took up the study of gust loads on aircraft, and this proved to be the line of work which he developed, to become a leading authority on atmospheric turbulence and its effects on aircraft. He was promoted senior principal scientific officer on an individual merit basis in 1956. Zbrozek always prided himself on a thoroughly practical approach, but the fundamental importance of the research he fostered was well exemplified in the *Proceedings of the Symposium on Atmospheric Turbulence* which he organized at Farnborough in 1961, and in his paper on "Gust Research", for which he was awarded the Busk Prize of the Royal Aeronautical Society in 1965.

While actively pursuing his specialist line of research, Zbrozek continued to maintain a close interest in all aspects of aircraft flight, covering as well as stability and control, aeroelasticity and loading actions, the study of pilots' activities and of environmental influences. In addition to being a member of the Gust Research, Loading Action and Oscillation Committees of the Aeronautical Research Council, he was active on Committees of the Electrical Research Association and of the Motor Industry Research Association.

Zbrozek was a colourful and warm-hearted personality, universally known as "George", who was capable when he chose of being bluntly forthright and provocative in discussion, without ever fear of giving offence. The interest and enthusiasm he brought to his work were a great stimulus to all who worked with him, and particularly to junior staff, to whom he showed the greatest understanding and consideration.

He is survived by his widow and a son and daughter.

F. O'HARA