

to a change in approach to organic chemistry, which now is manifest both in the terminology and teaching of the subject, and at the forefront of progress in the field.

His first investigations at University College, London, were in the field of nucleophilic displacement and elimination reactions. The simple concept that several limiting mechanisms for such reactions could be identified and characterized kinetically led quickly to the recognition of fundamental patterns of behaviour which until then had been obscured by apparently conflicting observations. Perhaps the major triumph of this period was the elucidation of the main factors determining whether racemization, retention or inversion accompanies nucleophilic displacement at a saturated carbon atom—the problem of the 'Walden inversion'. His brilliant reviews in the *Discussions of the Faraday Society* in 1937 and 1941 still provide the fundamental basis of any mechanistic account of these reactions. They anticipate also many of the later developments in this field; stereochemical, structural and environmental factors, determining the course of these reactions and the rearrangements which can accompany them, are all discussed in these early summaries, though the elaboration of details required many years of later investigation, to which he and his associates no less than other workers in the field have since contributed.

From 1939 he was one of a very small staff maintaining the Department of Chemistry of University College, London, through its evacuation to Aberystwyth and Bangor. In 1943 he was appointed to the chair of chemistry in the University College of North Wales at Bangor where he had first studied. There he spent five years, and was responsible for the rapid post-war rebuilding and expansion of his Department. At the same time he gathered around him a group of enthusiasts in the application of isotopes to the study of reaction mechanisms. Their pioneering work on the large-scale separation of the heavy isotope of oxygen now has fruitful offshoots in several departments and countries.

Through this period, Hughes maintained his interest and participation in the work in progress in the Chemistry Department of University College, London. His direct and critical approach led during these years towards simplification of the interpretation of the kinetic forms observed for aromatic substitution, and to the general acceptance of the view that the nitronium ion is the most important entity involved in aromatic nitration.

In 1948 he was appointed professor of chemistry at University College, London. Here he remained until his death. His scientific distinction was marked in 1949 by his election to fellowship of the Royal Society. In 1961 he became head of the Department of Chemistry at University College, London. His contributions to the elucidation of reaction mechanism ranged in these years over a wide field. He initiated important and imaginative studies of structural and stereochemical effects in nucleophilic and aliphatic replacement reactions; of Wagner-Meerwein and related rearrangements; of anionotropic rearrangements; of electrophilic aromatic and aliphatic substitution; of aromatic rearrangements; and of prototropic shifts. Alongside these developments he maintained a policy of encouraging and fostering independence in his younger colleagues, who owe a great debt to his generosity and to his faith in their ability and promise.

In 1961 he undertook editorship of a series of monographs to be published by Elsevier on special topics in physical organic chemistry; the first of these was at the proof stage at the time of his death.

His services to academic life, which were marked by his election to fellowship of the University of Wales and of University College, London, were by no means solely in the field of research. A valued teacher and colleague both at Bangor and at University College, London, where he was dean of the Faculty of Science from 1958 until 1961, he contributed also in a most valuable and important

way as an appointed teacher of the University of London, particularly through his chairmanship (1955–60) of the University Board of Studies in Chemistry. Here his wise and efficient guidance gained him many friends, and he will be much missed from the academic councils of the University during the times of change ahead. He was greatly in demand as external examiner for first degrees and for higher degrees of universities throughout Britain. He performed an extremely important task as honorary secretary (1949–61) and then as chairman of the Advisory Council of the Ramsay Memorial Fellowship Trust; and on committees of selection for Imperial Chemical Industries, Ltd., and other senior research fellowships, where his judgment, common-sense and powers of assessment were regarded highly.

Outside the University he played many important parts. He was a governor of the Northern Polytechnic (1950–60). He was a Fellow (1938) and member of the Council (1961–63) of the Royal Institute of Chemistry, and acted for the Institute as assessor in organic chemistry for Higher National Certificates and Diplomas, and as a special examiner; he was honoured by the Society as a Meldola Medallist in 1936. Perhaps his greatest contribution, however, was to the Chemical Society, to the publications of which he personally contributed so much. He served on almost every sub-committee of this great Society, being chairman of the Library Committee from 1959 onwards, an honorary secretary from 1950 until 1956, and a vice-president (1956–59). He was honorary secretary of the Chemical Council (1953–55).

Hughes's scientific lifetime has seen an enormous change in organic chemistry. All its many aspects have been affected by the realization that the complicated patterns of yield and reactivity can be interpreted and already in part predicted in terms of the accessibility of the various transition states leading from starting-materials to products. Few have contributed to the acceptance of this approach, bitterly contested as it has been, more than Hughes. His work has always been characterized by steadfast belief in the importance of mechanistic investigations, an insistence on experimental verification of each point as it has come under scrutiny, and an intuitive recognition of the quality of crucial experimental observations.

He was a man of outstanding humanity. His actions and his advice led directly to the heart of any problem through clear recognition of general principles. His friends will remember him for his deep sense of loyalty; for his unshirking sense of responsibility; and for his devotion to the Department where so much of his work was done.

In 1934 he married Ray Fortune Christine, daughter of the Rev. Ll. Davies, of Brecon. She survives him with their daughter.

P. B. D. DE LA MARE

### Dr. Annie Porter

PARASITOLOGISTS the world over will mourn the loss of Annie Porter, who died in London at the advanced age of eighty-three on May 9, after a protracted and debilitating illness.

Born at Shoreham-on-Sea, Sussex, on February 20, 1880, Annie was the elder daughter of Samuel Porter. The family early moved to Brighton where she received her school education, whence she proceeded to University College, London. There her first love was mycology—a subject in which she retained an interest throughout her life—although animal parasitology, and especially protozoology, demanded most of her professional time in later years.

From University College she proceeded in 1914 for a time to the Quick Laboratory in Cambridge, where she met and worked with H. B. Fantham (and whom she married in 1915). At Cambridge Dr. Porter held a Boit Memorial research fellowship for two years and taught as an assistant helminthologist.

In 1917 she accompanied her husband to Johannesburg and became head of the department of parasitology in the South African Institute for Medical Research, serving also as senior lecturer in parasitology in the University of the Witwatersrand and as examiner in zoology and animal parasitology at both institutions. She remained in South Africa until 1933 when she accompanied her husband to Canada, where she remained until 1938 as research associate in zoology at McGill University, Montreal. On the death of her husband (during October 1937) she was invited by the secretary of the Zoological Society of London (Dr. (now Sir) Julian Huxley) to become honorary parasitologist at Regent's Park, a post she filled with great success until a few months prior to her death.

The furtherance of zoology and especially animal parasitology was almost the sole interest in Annie Porter's long life. Always ready to help anyone interested in animals, she will long be remembered by her many pupils and friends who are now widely scattered over the globe. Her dedication to zoological science transcended all other interests and amounted to a passion when stimulating her

co-workers in the several team projects with which she was associated.

Her early interest in mycology found expression during the lean periods of the Second World War when she combed the areas around her home for edible fungi, samples of which she generously bestowed on her friends. She spent long hours propagating the edible species by spreading their spores in suitable localities in Regent's Park.

Apart from her scientific work Dr. Porter devoted her time to social welfare and particularly to the education of spastic children, for whom once a year she borrowed live animals from the Zoo for demonstration.

Out of her large estate in Great Britain, Dr. Porter willed £10,000 to Christ's College, Cambridge, to endow a research scholarship in animal parasitology and protozoology, £5,000 each to University College and to the Zoological Society of London for similar research scholarships, besides £5,000 to the University of the Witwatersrand for a research scholarship "to be held in any University in the British Empire" and £1,000 to McGill University for a research scholarship.

W. C. OSMAN HILL

## NEWS and VIEWS

### The U.S. National Science Foundation :

Dr. Alan T. Waterman

On the retirement of Dr. Alan T. Waterman as first director of the National Science Foundation, the three Presidents of the United States under whom he had served paid tribute to his skilled leadership in establishing the Foundation and guiding it through the crucial years of its existence as a Federal agency in support of basic research and education in the sciences. The statements of the three Presidents, as well as tributes from the scientific community, were read at a dinner given for Dr. and Mrs. Waterman by the National Science Board on June 21, 1963. President Kennedy observed: "Through the work of the Foundation in sponsoring basic research, the Nation has embarked on exciting and critical adventures in science that will contribute importantly to human progress. The NSF has helped extend our horizons to the innermost workings of man and his society and the outermost reaches of our planet and the universe". Dr. Waterman, who continues as a consultant to the Foundation, is also president of the American Association for the Advancement of Science, and next year will become chairman of the Board of Directors. Dr. Waterman has deferred for the time being further plans for the future until he avails himself of the holiday which he consistently neglected in order to devote himself to the work of the National Science Foundation.

Dr. Leland J. Haworth

DR. LELAND J. HAWORTH succeeded Dr. Alan T. Waterman as director of the National Science Foundation on July 1. He has been one of the five commissioners of the U.S. Atomic Energy Commission since 1961. Prior to his appointment as commissioner, Dr. Haworth was associated with the Brookhaven National Laboratory, one of the United States' major facilities devoted to high-energy physics. He became director of the Laboratory in 1948, and in 1960 he was, in addition, made president of Associated Universities, Inc., a non-profit corporation of nine eastern universities which operates the Laboratory for the U.S. Atomic Energy Commission and the National Radio Astronomy Observatory for the National Science Foundation. A native of the Middle West, Dr. Haworth was educated at the University of Indiana, where he received his A.M. degree, and at the University of Wis-

consin, where he was awarded his doctorate in physics in 1931. During 1938-47 he was professor of physics in the University of Illinois. During the Second World War he was on leave of absence from Illinois to work on radar development at the Radiation Laboratory of the Massachusetts Institute of Technology. Dr. Haworth's intimate knowledge of Government research and development problems has been further enhanced by membership of a number of advisory committees and panels. His most recent personal research interests include high-energy physics, and high-energy accelerator design. In earlier years he worked on secondary emission of electrons, Joule-Thomson effects at very low temperatures, nuclear physics, and electronics.

### Mathematical Physics at Birmingham:

Prof. T. H. R. Skyrme

MR. T. H. R. SKYRME has been appointed to the chair of mathematical physics at the University of Birmingham as from October 1, 1964. Mr. Skyrme succeeds, as professor and head of the Department of Mathematical Physics, Prof. R. E. Peierls, who has been appointed Wykeham professor of physics in the University of Oxford (see *Nature*, 196, 1038; 1962). Mr. Skyrme's academic career started with scholarships at Eton and at Trinity College, Cambridge, where after taking a double first in mathematics he became a Fellow of his College. During the Second World War he was with Prof. Peierls for two years as a member of a British mission sent to work with American scientists in New York and later in New Mexico; he returned to the United Kingdom with Prof. Peierls as a Research Fellow in the Department of which he is now to be the head. Here he met and married Dr. Dorothy Millest, at that time lecturer in the Department of Physics. Since leaving Birmingham in 1948, Mr. Skyrme and his wife have been on the staff of the Atomic Energy Establishment, Harwell, except for two years when he held fellowships at the Massachusetts Institute of Technology and Princeton, a period when he was a visiting professor at the University of Pennsylvania, and the time since 1962 when they have been teaching at the University of Malaya. Thus Mr. Skyrme, who is aged forty, goes to Birmingham in 1964 with experience of eight universities and research institutes in three continents. He has carried out research in the theory of atomic nuclei and of sub-nuclear particles, especially in field theory.