# SCIENTISTS IN THE PUBLIC SERVICE

## PROMOTION OF INDIVIDUAL RESEARCH WORKERS

EACH year a special committee reviews the work of scientists carrying out research work in Government establishments and in similar establishments of other public bodies and recommends, under the provisions of the White Paper on the Scientific Civil Service (Cmd. 6679 of 1945), the promotion of individual research workers of exceptional merit. The promotions were effective from July 1 and include the following:

### Deputy Chief Scientific Officers

MR. G. K. ADAMS joined the then Armament Research Establishment in 1942 after graduating at the University of Bristol with first-class honours in chemistry. He moved to the Explosives Research and Development Establishment, now a part of the Ministry of Aviation, in 1946 and worked on the mechanism of combustion of liquid propellents. In 1955 he was awarded a special merit promotion to senior principal scientific officer and since then has had responsibility for combustion and sensitiveness research, ballistic assessment, and theoretical investigation of propellent burning and initiation of detonation of shock waves. Mr. Adams's best-known contribution is probably that to the theory of laminar flame propagation, where he has analysed the mechanism of the hydrazine decomposition flame and calculated the flame properties from isothermal kinetic data, a system more complex than any previously subjected to theoretical treatment. His calculations of the spatial distribution of radicals and the resulting hydrazine decomposition-rate as a function of flame temperature and pressure confirmed his theory of a chain reaction scheme. They led to the experimentally observed coefficient of flame speed and revealed a possible explanation of the anomalous pressure coefficient. An assessment of the explosive hazards of some of the higher energy propellent systems led Mr. Adams to study, in collaboration with Prof. D. C. Pack, the problem of the development of the shock waves in accelerating combustion and the initiation of detonation by shock waves.

DR. O. SIMPSON first joined the scientific civil service in 1944 and served in the Admiralty Research Laboratory until 1946, when he returned as a research scholar to Trinity College, Cambridge. He was elected a Fellow of that College in 1949 and for the next three years he was assistant professor of physics in the University of Michigan. In 1953 he joined the Services Electronics Research Laboratory and gained a special merit promotion to senior principal scientific officer in 1957. Dr. Simpson initiated a new branch of solid-state physics by making the first comprehensive study of the fluorescence and conductivity of the crystalline aromatic hydrocarbons. In addition to his own research work, Dr. Simpson has since 1956 been head of the solid-state physics group at the Services Electronics Research Laboratory, which has acquired an international reputation for its contributions to research on super-conductivity in metals, compound semi-conductors and organic semi-conductors, and has pioneered in new applications of these solids. Dr. Simpson is active on various inter-service committees covering a wide range of electronic subjects.

MR. J. H. WILKINSON joined the Scientific Civil Service in 1940 and was transferred from the Ministry of Supply to the National Physical Laboratory in 1946, where he worked in the Mathematics Division on the *ACE* electronic computer project under Dr. A. M. Turing. In 1948, when Dr. Turing left, he assumed charge of the *ACE* project. Mr. Wilkinson specializes in numerical methods and the exploitation of high-speed computers. The field that he has made particularly his own is that of linear algebra, a subject the importance of which has been enormously increased by the advent of the high-speed electronic computer. For some years he devoted himself to the development of new algorithms for the solution of matrix problems, and the testing and improvement of existing ones, with the view of developing as powerful and practical methods as possible. For many years, work had been seriously hampered by an inability to assess the accuracy of solutions of large-scale matrix problems, but in 1955 Mr. Wilkinson developed a new method of error analysis which proved to be applicable to a wide range of algebraic problems including the more difficult eigen-value problems; this also applied equally well to both fixed-point and floating-point calculations. His successful application of this method in the succeeding years led to a real understanding of the factors that govern the accuracy of solutions obtained by numerical methods. It has also led to the possibility of obtaining, for the error of the solutions, theoretical bounds that are close to those actually obtained in practice. Mr. Wilkinson, who was awarded a special merit promotion to senior principal scientific officer in 1954, is continuing to work in this field and hopes to extend his studies to cover non-linear problems.

### Senior Principal Scientific Officers

MR. R. L. BICKERDIKE, of the Royal Aircraft Establishment, is at present working on the development of new methods of preparing shaped pieces of graphite by impregnating loose or lightly bonded aggregates of particles with carbon deposited from the gas phase.

DR. H. A. GEBBIE, of the Basics Physics Division, National Physical Laboratory, has made outstanding

contributions to the study of infra-red spectroscopy and has pioneered the use of interferometers in the far infra-red region and their application both in the laboratory and in astro-physics. He has led the team of the National Physical Laboratory which has been studying the transformation of non-metals under the highest obtainable pressures to the metallic state.

Dr. C. Hilsum, of the Services Electronics Research Laboratory, has been engaged since 1950 on various researches, some of which have eventually been developed for commercial use, among them being a new infra-red detector, the photo-electromagnetic cell and the Hall effect susceptibility meter. He is at present responsible for an intensive research programme on a compound semi-conductor, gallium arsenide, and is already well known for his work on this increasingly important material.

Dr. A. E. Johnson, of the National Engineering Laboratory, East Kilbride, is internationally known for his work on the creep properties of metallic alloys subjected to complex stress systems at elevated temperatures and the application of his results to the analysis of the stress/strain relations in engineering structures operating under such conditions.

Mr. N. B. Marshall, an ichthyologist at the British Museum (Natural History), has special interests in the taxonomy of fishes, the environmental effects of depths on the structure of the fish skeleton, and comparative and functional anatomy of the swim bladders in fishes.

Dr. R. J. Murgatroyd has for the past ten years been in charge of the Meteorological Research Flight of the Meteorological Office. He specializes in high-altitude meteorology, and has been relieved of administrative duties in order to undertake further research work.

Dr. R. A. Pattle, of the Microbiological Research Establishment, is in charge of a team carrying out research in the Munitions Research Division.

Dr. P. H. Thomas, of the Fire Research Station, is engaged in the study of the behaviour of fires in buildings, in particular the characteristics of fires in single compartments. He has also developed small-scale techniques which fully evaluate the venting of fires by openings in the roof and has produced a theoretical background to this work. His recent publications include new dimensionless correlations of the height of flames from natural fires and an extension of the theory of thermal explosion.

Similar promotions have been made by:

### (1) United Kingdom Atomic Energy Authority: Senior Principal Scientific Officer

Mr. A. E. Glennie joined the Atomic Energy Authority in 1949 and worked with the Atomic Weapons Research Establishment, first at Fort Halstead and then at Aldermaston. Since 1957 he has been leader of an analysis group engaged in numerical solution of physical problems. This group was responsible for the systems programming for '*IBM* 704' and subsequent computers; it is at present concerned with the preparations for the installation of the new fast computer *STRETCH* to be installed at Aldermaston. Mr. Glennie is also interested in research work leading to the more effective use of fast computers, including an automatic programming language which could be used on large computers.

### (2) Agricultural Research Council: Deputy Chief Scientific Officer

Dr. H. L. Penman joined the staff of Rothamsted Experimental Station in 1937 and became head of the Physics Department in 1954. He has worked on a wide range of agricultural and botanical problems and has made outstanding contributions to the knowledge of soil aeration, the availability to plants of water in soil, the role of stomata in controlling transpiration and the dependence of total transpiration on current weather. His investigations of the use of water by crops are the basis for modern irrigation practice. He has shown that routine weather records could be used to assess the likelihood that irrigation would increase yield, when crops needed irrigating, and how much water should be given. Dr. Penman has shown that irrigation often unexpectedly produces substantial increases in yield and has provided farmers with information that defines need for water objectively, so taking irrigation out of the realms of 'guess-work'. He has also studied the effects of microclimate on pests and diseases. Dr. Penman recently became an officer of the Order of the British Empire and is president of the Royal Meteorological Society. Earlier this year he was elected a Fellow of the Royal Society.

### Senior Principal Scientific Officers

Dr. J. J. Bullen is the head of the Pathology Department, Rowett Research Institute, Bucksburn, Aberdeen. His research programme has been particularly concerned with host–parasite relationships in bacterial infections and he has made a number of notable contributions in this field.

Dr. A. T. Cowie, of the Physiology Department, National Institute for Research in Dairying, Reading, carries out all the major surgical procedures required by the Institute. He has made great contributions to endocrinological studies and has a special interest in the field of hormonal regulation of mammary growth and lactation.

Dr. G. A. Garton is a member of the Protein and Lipid Chemistry Section of the Rowett Research Institute and has done much original work on various aspects of lipid metabolism in animals, with particular reference to the pig, ox and sheep, in the course of which he has developed a number of new methods of isolating and analysing lipids.

Dr. J. S. Kennedy is a member of the Agricultural Research Council's Unit of Insect Physiology at Cambridge. His research work has had a great influence on present-day ideas about the behaviour of mosquitoes, the behaviour and nutrition of aphids and the behaviour and polymorphism of locusts.

### (3) Development Commission: Senior Principal Scientific Officer

Dr. Mary Parke, senior algologist at the Plymouth Laboratory of the Marine Biological Association of the United Kingdom, is distinguished for her research work on the systematics and life-histories of marine unicellular algae.