

## SCIENTISTS IN THE PUBLIC SERVICE IN BRITAIN

## SPECIAL PROMOTIONS

**F**URTHER special posts have been created in the Civil Service under provisions included in the White Paper on the Scientific Civil Service (Cmd. 6679; 1945) to provide for the promotion of individual research workers of exceptional merit. The promotions, which are effective from July 1, include the following:

## Chief Scientific Officer

DR. N. P. ALLEN has been superintendent of the Metallurgy Division at the National Physical Laboratory, Teddington (Department of Scientific and Industrial Research) since 1944. He was a lecturer in the University of Birmingham, where he obtained the degree of D.Sc. in 1934. As a research metallurgist with the Mond Nickel Co., Ltd., he made important contributions to the study of alloy steels and to the development of creep-resistant alloys for gas turbines. At the National Physical Laboratory he has been responsible for work on the metallography of uranium, the brittle fracture of exceptionally pure iron and the influence of additions on it, the development of improved materials for steam power plant and the processes taking place during the fatigue and creep of metals. He has been interested in the metallography of the newer metals such as titanium and niobium, and in the application of radioactive tracers, electron microscopy and soft X-ray spectroscopy to metallurgical problems. He was elected Fellow of the Royal Society in 1956.

## Deputy Chief Scientific Officers

DR. I. J. GOOD joined the Government Communications Headquarters in 1941, leaving in 1945 to lecture in mathematics in the University of Manchester. He returned to the Government Communications Headquarters in 1948, and has made notable original contributions to statistical theory and the development of advanced methods of application to Service problems.

MR. H. L. GREEN joined the Physics Section of the Chemical Defence Experimental Establishment in 1922. In January 1949 he was given special promotion on individual merit to the grade of senior principal scientific officer. He has been engaged, and is a recognized authority, on problems related to particulate clouds and filtration, developing many novel devices and techniques for sampling and assessing aerosols and conducting research which has led directly to widely used filter systems including those in respirators. Of late years, he has also been working on problems of radiological defence, including the physics of nuclear fall-out. He has served on Committees of the Department of Scientific and Industrial Research, the Home Office and Medical Research Council and (with W. R. Lane) is author of a recent book, "Particulate Clouds: Dust, Smokes, and Mists".

MR. A. R. HOWELL joined the Royal Aircraft Establishment in 1938. He was a research engineer

with Power Jets (Research and Development), Ltd., during 1944-46. On the conversion of the firm he joined the National Gas Turbine Establishment, and since 1949 has been, as a senior principal scientific officer, head of the Aerodynamics Department. Mr. Howell's career has been devoted mainly to the aerodynamics and performance of gas turbines and he is well known for the analysis on which the design rules for the modern axial compressor are based. He has made original contributions on ejectors, theory of aerofoils in cascades, flutter of compressor blades and engine-assisted lift. He is a Fellow of the Royal Aeronautical Society.

DR. J. G. NAGELSCHMIDT, who joined the Safety in Mines Research Establishment in 1949, is a mineralogist of international reputation and is now engaged on research on the mineralogical aspects of pneumoconiosis. He has made important contributions to the study of the toxicity of dusts, as well as in the metallurgical and chemical fields, where he is both an expert and an authority. He has been a pioneer in the application of X-ray diffraction techniques to the study of clay materials, in the application of new mineralogical techniques to the study of dusts responsible for lung disease, and in the application of the electron microscope to the study of clay minerals and dusts. He has developed new techniques for the quantitative mineralogical analysis of small dust samples and for the identification of mineral particles too small for identification with the optical microscope. He is secretary of the Medical Research Council's Sub-Committee on Dust which co-ordinates pneumoconiosis research in Britain; he is a member of the Council's Industrial Pulmonary Diseases Committee, and of its working party on atmospheric pollution. He is also a member of the committee of the Clay Minerals Group of the Mineralogical Society.

MR. J. S. SAWYER, assistant director (dynamical research), joined the Meteorological Office in 1937. He joined the new Forecasting Research Division at Dunstable in 1948, becoming assistant director in 1953. In the past ten years he has made major contributions to the study of rainfall, depressions, the tropopause and the dynamics of fronts, as well as to the revolutionary subject of dynamical forecasting by the numerical integration, using electronic computing aids, of sets of differential equations derived from basic fluid dynamics and thermodynamics. Developments in this promising field are likely to be the main concern of his group for some years to come.

DR. W. S. STILES's original work at the National Physical Laboratory was concerned with problems of vision arising in illuminating engineering, and he did valuable work on glare from car headlights and on street lighting. From these applied problems, he was led to a series of basic studies of the threshold sensitivity of vision under a wide range of stimulus conditions. One outstanding result was the resolution of several mechanisms concerned in colour vision, by

methods independent of the traditional colour-matching approach. Dr. Stiles is probably best known as the discoverer, with his colleague, Dr. B. H. Crawford, of the directional sensitivity of the retina—the Stiles-Crawford effect. Dr. Stiles's investigations during the Second World War of such Service problems as visibility and visual scanning methods was recognized by his appointment in 1946 as O.B.E. Since then he has resumed his investigations of vision, and his latest contribution to the subject is a large-scale determination of average colour-matching properties. In 1957 he was elected Fellow of the Royal Society for his work on vision.

MR. C. K. THORNHILL, joining the Government service in 1939, worked successively at the Projectile Development Establishment, the Ordnance Board and the Armament Research and Development Establishment. In 1952 he was given special promotion on individual merit to senior principal scientific officer. Mr. Thornhill is a versatile applied mathematician. His early research was on the development and lethality of rockets, external and internal ballistics, gun-heating and gun-erosion, and led to the award of the U.S. Medal of Freedom for meritorious service in the Second World War. More recently, he has contributed to several fields of weapons research and has become a recognized authority on steady and unsteady gas dynamics and on explosion phenomena, working particularly of late on the effects of atomic explosions. Mr. Thornhill served on the Compressible Flow Tables Panel of the Aeronautical Research Council, and contributed portions of its well-known published collection of tables and graphs.

MR. R. A. WELLS is in charge of the Radio-chemistry Group at the National Chemical Laboratory of the Department of Scientific and Industrial Research. He has played a large part in the foundation of analytical techniques based on chromatography and applied to inorganic materials, now used in Australia, South Africa, Rhodesia, Portugal and Canada. These researches constitute an outstanding achievement in analytical procedures during the past decade. He also devised field techniques for the determination of various metals in river waters. In hydrometallurgical research he has developed new methods for the concentration and extraction of metals, for example thorium, by the use of modified celluloses such as the phosphorylated product; and a series of selective ion-exchange resins whereby gold can be recovered from cyanide liquors. He has on occasions acted as a consultant to the Atomic Energy Authority on flow-sheets and costing in connexion with full-scale industrial uranium-extraction plants.

#### Senior Principal Scientific Officers

MR. P. J. E. FORSYTH, of the Metallurgy Department, Royal Aircraft Establishment, is a skilled experimenter who has done outstanding work on fundamental aspects of the fatigue of metals and alloys.

DR. L. GRUNBERG is engaged in the Lubrication Division at the Mechanical Engineering Research Laboratory of the Department of Scientific and Industrial Research on the chemical and physico-chemical aspects of lubrication in relation to the wear of the rubbing surfaces of machine components. He

is distinguished for his work on the study of the emission of charged particles occurring on freshly deformed metal surfaces.

DR. F. E. JONES is a member of the Chemistry Division at the Building Research Station of the Department of Scientific and Industrial Research, where he has worked on the chemistry of cement and concrete, and in particular on the products formed on hydration; and on the corrosion of metals under the particular conditions that arise in buildings.

DR. D. MCK. KERSLAKE, of the R.A.F. Institute of Aviation Medicine, is in charge of the Climatic Research Laboratory. His work in recent years has been mainly directed towards the protection of aircrews against extremes of cabin temperature, and in this particular field he has become well known throughout Britain.

DR. T. S. MOSS, of the Radio Department, Royal Aircraft Establishment, has carried out much original experimental and theoretical work on the properties of semi-conductors and is a leading authority on photo-conductivity and infra-red detection.

DR. C. A. PARKER is head of the general chemistry division at the Admiralty Materials Laboratory, which includes in its programme radiochemistry, X-ray techniques and ferrite chemistry. He is now specializing in photo-chemistry.

MR. H. H. B. M. THOMAS, of the Aerodynamics Department, Royal Aircraft Establishment, is well known as an authority on the stability and control problems of aircraft.

MR. P. R. WALLIS, working at the Admiralty Signal and Research Establishment, has been responsible for much of the development of radar techniques for guided weapon systems.

DR. JOHANNA WEBER, of the Aerodynamics Department, Royal Aircraft Establishment, has worked on a variety of problems in classical theoretical aerodynamics, including the theory of lifting surfaces in supersonic flow and the minimization of wave drag.

DR. J. G. WHITMAN, of the Mechanical Engineering Experimental Establishment, has a wide background of engineering research, especially in problems of welding and of the fatigue and failure of metals and metal structures.

Similar promotions have been made by the Agricultural Research Council, as follows:

#### Deputy Chief Scientific Officer

DR. ROBERT BROWN, after graduating with first-class honours at the Imperial College of Science and Technology, London, in 1936, held various teaching appointments. He was a senior lecturer in botany at the University of Leeds during 1946–49, when he became reader in plant physiology. He joined the staff of the Agricultural Research Council in 1953 on his appointment to the directorship of their Unit of Plant Cell Physiology at Oxford. Dr. Brown's researches are principally directed to the cellular phenomena involved in plant growth and differentiation. He has given particular attention to the meristems, analysing development in terms of cell division and cell expansion. In October 1958 Dr. Brown will become head of the Cell Biology Department of the John Innes Horticultural



Institution. Dr. Brown was elected Fellow of the Royal Society in 1956.

#### Senior Principal Scientific Officers

DR. H. F. BARNES is deputy head of the Entomology Department at Rothamsted Experimental Station. He is a world authority on gall midges and he has published widely on these and other insect pests.

DR. K. L. BLAXTER, head of the Nutrition Department of the Hannah Dairy Research Institute, has been particularly concerned with research on problems related to the energy exchange of large farm animals.

DR. G. A. LEVY is head of the Enzymology Department of the Rowett Research Institute. He is working in the field of the biochemistry of the glycosidases of their inhibition by aldolactones.

One similar promotion to senior principal scientific officer has been made by the Atomic Energy Authority. DR. P. E. CAVANAGH, who is head of the beta-ray spectrometer group at Harwell, doing mainly basic research but also responsible for some technical developments, including that of the recording of nuclear-pulse data on magnetic tape. Achievements in basic research include the original observation of the double Compton effect—a higher order process in quantum electrodynamics—and the first accurate measurements of electron polarization violating parity.

The Development Commission has similarly promoted DR. H. BARNES to senior principal scientific officer. Dr. Barnes has been a research chemist on the staff of the Marine Station, Millport, since 1946, and is well known for his work on physical and chemical oceanography. In addition, he has developed underwater television apparatus and is an authority on the biology of barnacles.

## OCCUPATIONAL PSYCHOLOGY

AMONG the best-attended meetings in Section J (Psychology) of the British Association this year were those held during the occupational psychology session on September 1. Four papers were given in the course of the morning on which the session was held. Anyone looking for continuity or what the papers had in common might have remarked that the first dealt with competitive entry into industry in youth—trade apprentice selection—while the last dealt with retirement—largely compulsory retirement—from industry because of age. From another point of view there was also a certain similarity between the first three papers. All were, in a sense, directly concerned with problems of inspection; the first, 'inspection' of suitability for trade-apprenticeships in shipbuilding; the second, routine inspection of industrial products; and the third, systems of fault-finding in electronic equipment.

In the first paper, by Mr. J. G. McComisky (University of Hull) and Dr. P. P. Daws (University of Edinburgh), the introduction and development of an apprentice selection scheme in a Glasgow shipyard were described. In 1956, when the firm approached the Applied Psychology Unit of the University of Edinburgh for assistance, only about half the boys put on the firm's pre-apprentice trade courses were reaching the necessary standards to become indentured. In round figures, to obtain its quota of about 80 trade apprentices each year, the firm was obliged to put about twice this number through its pre-apprentice courses. All boys entered on courses were regarded as being likely to succeed. Following a review of the position when the firm asked for assistance, the following programme was decided on: (1) That immediate steps be taken to check the effectiveness of the firm's own system of initial selection. This consisted of an arithmetic test and an interview by the firm's apprentice supervisor. The arithmetic test was checked and found to be faulty. It was discarded and a new arithmetic test introduced. (2) That a selection scheme involving psychological testing be run for an experimental period of one year,

and if the results warranted it, that this should replace the firm's existing system of selection. (3) That the selection scheme be developed in a way which would enable the firm's apprentice supervisor to run it with the need for no more than occasional advice and guidance from a psychologist.

Before experimental selection began, all second-year trade apprentices in the firm were given the battery of psychological tests which it was proposed to use during the experimental phase of the scheme, the object being to see what relation there was between scores on the various tests and foremen's assessments of the second-year apprentices. A meeting was also arranged with the instructors on the pre-apprentice courses, the object being to enlist the co-operation of these in the projected scheme right from the beginning, and also to obtain information on the kinds of difficulties met by both instructors and boys on the pre-apprentice courses.

With the information and insights obtained from these sources experimental selection began. This, in practice, entailed giving all the boys on the firm's courses the battery of tests decided on, interviewing each for about 15 minutes, and then predicting whether or not the particular boy was likely to pass the course. An attempt was also made to spot particularly bright boys, as the firm was anxious to put these in line as early as possible for technical advancement in the firm. The degree of success in predicting failures and bright boys in the experimental year was encouraging enough to justify the procedure being put into effect as the official apprentice selection scheme of the firm.

In the first year of actual selection wastage on the courses dropped considerably: on the shipbuilding side—one of the two main divisions of the firm's apprenticeship system—it dropped from 42 to 22 per cent with a reduction of 33 per cent in the number of boys entered on courses. On the marine engineering side, the smaller division of the firm's apprenticeship system, the results were not as good, but the failure-rate in the first year of real selection dropped to