

devoted his whole life to science and "qui restera dans la mémoire comme un des représentants les plus admirables de ce que peut donner, dans notre race, l'association d'un génie scientifique de premier ordre, avec un de ces caractères incorruptibles qui sont l'honneur de l'humanité". W. CAMPBELL SMITH

Dr. E. P. Harrison

DR. E. P. HARRISON, for many years professor of physics at Presidency College, Calcutta, and head of the Observatory, and later chief scientist to the Mine Design Department in H.M.S. *Vernon*, died suddenly at Chigwell Row, Essex, on May 6.

Born in London in 1877, he was the eldest son of Robert William Harrison. His school career was much interrupted by illness, but he entered University College, London, where he won the Clothworkers' Exhibition, and an 1851 Exhibition Research Scholarship in physics. From London he went to the University of Zurich, where he took a Ph.D. in science. In 1904 he went up to King's College, Cambridge, as an 'advanced student', and worked at the Cavendish Laboratory for two years. He lectured at King's College, London, and the Royal College of Science, Dublin, and was then appointed professor of physics at the Mahomedan College of Aligarh in India. Afterwards he was appointed to the Indian Educational Service, and became professor of physics at the Presidency College, Calcutta, and later, in addition, meteorologist to the Government of Bengal.

In 1923, he became chief scientist to the Mine Design Department, H.M.S. *Vernon*, a post which he held until his retirement under the age limit in 1937. His work during this period naturally received no publicity; but under his direction the application of scientific research to the problems of naval mining, begun in the First World War, under the inspiration of, among others, W. L. Bragg, F. E. Smith and G. W. Walker, was continued and extended, and the results he achieved bore good fruit when another war came. He was happiest when working in a

laboratory, and never allowed the responsibilities of administration to keep him from active research.

Among Dr. Harrison's personal contributions to naval problems were pioneering work in the application of magnetostriction to the generation of high-frequency sound in water, and the investigation of various properties of the high-permeability alloys of the 'permalloy' group. Perhaps the most interesting of these are the very large changes of impedance which occur in a wire carrying audio-frequency A.C. when small longitudinal magnetic fields are applied to it. An account of fundamental work on this effect was published by Dr. Harrison and members of his staff in 1936, and a practical application was a novel form of magnetometer which was used before the War, in anticipation of the use by the enemy of magnetic mines and torpedoes, to explore the possibilities of controlling the magnetic fields of warships by current-carrying cables. This was probably the earliest practical essay in 'degaussing'. During the War the magnetometer was developed on behalf of the Admiralty by the Electrical Research Association, and became a standard measuring instrument on degaussing ranges.

On leaving the Admiralty, Dr. Harrison joined the staff of Messrs. Hughes and Sons, of Barkingside, and arranged to continue the work he had begun earlier on magnetostriction in H.M.S. *Vernon*. The original oscillators made by him were developed by the firm, and a large number of experiments were made with listening devices off Gourock pier, which led to increased sensitivity.

The outbreak of war attracted his attention to the detection of mines, either floating or submerged, by supersonics, and very valuable data were collected. Later he did much work, both in the laboratory and in trials at sea, on non-contact firing devices for torpedoes.

Dr. Harrison was a physicist in the classical tradition, and had a very keen brain which he applied with great zest to new technical arts of war and peace. He had a large circle of friends, and will be greatly missed for his constant kindness and help to young scientific workers.

NEWS and VIEWS

The King's Birthday Honours List

THE following names of men of science and others associated with scientific work are included in the King's Birthday honours list:

Baron: Sir Alfred Webb-Johnson, president of the Royal College of Surgeons.

K.B.E.: Sir Hector Hetherington, principal and vice-chancellor of the University of Glasgow; Acting Air Commdre. Frank Whittle.

Knights Bachelor: A. Leigh B. Ashton, director of the Victoria and Albert Museum; Dr. A. H. Gardiner, the well-known Egyptologist; Dr. C. R. Harington, director of the National Institute for Medical Research; Prof. C. N. Hinshelwood, Dr. Lee's professor of chemistry, University of Oxford; J. D. G. Medley, vice-chancellor of the University of Melbourne.

C.B.: H. M. Garner, principal director, scientific research (air), Ministry of Supply; N. H. Kinnear, director of the British Museum (Natural History); O. Thornycroft, director of aeronautical and engineering research, Admiralty.

C.M.G.: W. N. Allan, recently director of irrigation, Sudan Government; Dr. P. Stocks, chief statistician (med.), General Register Office; Dr. H. H. Storey, secretary of the Colonial Agricultural Research Committee.

C.B.E.: Prof. W. E. Agar, lately professor of zoology, University of Melbourne; H. H. B. Allan, director of the Division of Botany, Plant Research Bureau, New Zealand; Prof. J. H. Biggart, professor of pathology and dean of the Faculty of Medicine, Queen's University, Belfast; Dr. H. W. Cremer, president of the Institution of Chemical Engineers; Mrs. Maud E. Cunningham, for services to archaeology; Prof. A. Findlay, emeritus professor of chemistry, University of Aberdeen, for services to chemistry; B. E. Fraying, Colonial Mines Service, lately chief inspector of mines, Nigeria; Lieut.-Colonel W. French, superintendent of the Technological Department, City and Guilds of London Institute; Dr. A. A. Griffiths, research engineer, Rolls-Royce, Ltd.; W. F. Higgins, superintendent of the Physics Division, National Physical Laboratory; Prof. W. R. Jones,

emeritus professor of mining geology, University of London (Imperial College of Science and Technology), for services to the Board of Trade; C. Kershaw, director of British Optical and Precision Engineers, Ltd., for services to the production of optical instruments; Dr. A. King, chief scientific liaison officer, Office of the Lord President of the Council; Prof. H. A. D. Neville, lately professor of agricultural chemistry, University of Reading; Miss Margery Perham, reader in Colonial administration, University of Oxford; Prof. J. Ritchie, professor of natural history, University of Edinburgh; Dr. H. V. Taylor, lately senior education and advisory officer, Ministry of Agriculture; S. G. Taylor, director of irrigation, Ceylon.

Sir James Chadwick, F.R.S.

SIR JAMES CHADWICK has been pre-elected Master of Gonville and Caius College, Cambridge, of which he has been a fellow and more lately an honorary fellow. Sir James began his scientific work under Rutherford in Manchester; after studying in the University of Berlin he was interned in Germany during the First World War, and there continued his scientific researches. When Rutherford moved to Manchester, Chadwick joined him and took part in Rutherford's classical researches on the disintegration of elements by α -particles. With Bieler and later with Rutherford he studied the scattering of α -particles by hydrogen and heavier nuclei, and from these experiments determined the law of force around atomic nuclei. He became assistant director of research under Rutherford at Cambridge, and as such was responsible for the training of Rutherford's young research students and for the satisfaction of their modest needs. Many nuclear physicists will remember the attic of the Cavendish equipped with ancient vacuum pumps, gold-leaf electrosopes and the simple apparatus for counting α -particles which was then the main tool of nuclear research. The discovery of the neutron in 1932, followed by the photodisintegration of the deuteron (with Goldhaber) and the creation of electron pairs by γ -rays (with Blackett and Occhialini), marked the peak of Chadwick's experimental work. In 1935 he was appointed Lyon Jones professor of physics in the University of Liverpool, and at once embarked on the construction of a 36-in. cyclotron, completing this just prior to the Second World War.

On the outbreak of war, Chadwick took up the study of nuclear chain reactions based on the fission of uranium, and with Frisch and Peierls informed the Government in the spring of 1940 that an atomic bomb could probably be produced if sufficient U235 were concentrated. Further studies of nuclear constants in Liverpool and Cambridge confirmed this view. At the end of 1943, Chadwick was largely instrumental in restoring the collaboration with the United States in atomic energy which was severed in 1941. He recruited a small but powerful British team to work in Los Alamos and Berkeley, and took a leading part with Dr. Mackenzie in establishing the Canadian Atomic Energy Project at Chalk River. Since the War he has served on the Scientific and Technical Committee of the United Nations Atomic Energy Commission. On his return to Liverpool he initiated the construction of a cyclotron to produce 300 MeV. protons. Chadwick's pupils in nuclear physics are distributed over the whole world. They will regret his severance from active experimental work but will all wish him well in the tasks which lie ahead.

Dr. E. D. Merrill

DR. E. D. Merrill retires from the Arnold professorship of botany, Harvard University, at the end of June. As professor emeritus he is to remain in the house on the margin of the Arnold Arboretum that has been his as director of the Arboretum where, granted good health such as all his many friends wish him, he will enjoy the facilities for botanical study that have been so considerably shaped by him. Under him the inflow of material, living and dried, into the Garden and Herbarium from eastern Asia, Malaysia and the Pacific has been tremendous; and it is well that he should take a large part in elaborating it. Born on October 15, 1876, Elmer Drew Merrill passed in 1899 from College into the United States Department of Agriculture. In the Department he was selected (1902) for the appointment of government botanist in the Philippine Islands and went out to Manila, one of a few men chosen to start a science service towards which at that time there was nothing but a budgetary appropriation. It was soon evident that his methods were direct and effective. Botanical teaching was added (1912) to his work, and in 1918 the administration of the Bureau of Science. In 1923 the University of California sought and secured his service as dean of the College of Agriculture, where it was his duty to draw into order State-wide organisations that were growing up too loosely knit. In 1930 New York induced him to cross the continent to take the post of director-in-chief of the New York Botanic Garden. Institutions in the United States such as it, depend much on private generosity, and in bad times suffer checks to their activities: it is so in New York, and he had the years of the great depression to combat. It need be no secret that his successes in adjustment led to an invitation to move to Boston (1935) into a post made for him with the title of administrator of the Botanical Collections of the Harvard University and director of the Arnold Arboretum. The collections that passed under him had some likeness to the miscellany he set in order in California, at least in diversity. The University has rearranged these responsibilities; and his last, the teaching of advanced students in methods of research, passes elsewhere. He is now free to devote his time to botanical research.

Dr. L. H. Bailey

DR. LIBERTY HYDE BAILEY, eminent administrator, botanist, horticulturist and author, attained his ninetyeth birthday on March 15. On this date he was actually on Arruba Island in the West Indies on one of his annual palm-hunting expeditions to tropical America. He was signally honoured on his return to Ithaca, New York, in May by a complimentary dinner sponsored by Cornell University, with which institution he has been associated for the past sixty years. On this occasion, with approximately two hundred guests in attendance from various parts of the United States, the speakers extolled Dr. Bailey's eminent services to Cornell University, to agricultural instruction, research and extension, to botany, to horticulture, and to the humanities. The outstanding feature of the evening was Dr. Bailey's informal address, which dealt with his early experiences and some of his later achievements. Tall, straight, speaking extemporaneously and without notes, it was indeed an inspiration to all who heard him on this occasion.