A Nobel Prize for Dr. Irving Langmuir

THE influence of the contributions to modern chemical thought of Dr. Irving Langmuir, who has been awarded the Nobel Prize for chemistry for 1932, is probably more widespread and generally appreciated than those of many of his predecessors. It was as if a new chapter had been commenced in the book of knowledge of the state and behaviour of molecules at interfaces, which forms the very bases of the science of colloids and is of fundamental importance in such diverse ramifications of the physical sciences as heterogeneous catalysis and thermionic emission, when Langmuir published his well-known papers in 1917. As occasionally happens, mathematical treatment may obscure the reality of physical and chemical processes, and that useful tool may prove an obstruction rather than an aid to further advance. It is no exaggeration to say that a new flood of light was thrown on the whole subject of the adsorption of, and reactions of, gases at solid surfaces, as well as the mechanism involved in changes in the surface tension of liquids. There are no better examples of the effects of welding our essentially chemical point of view, in which molecules are regarded as perfectly defined objects of definite form, with a physical appreciation of the general applicability of the Boltzmann distribution law and of the action of local fields of force extending over relatively short distances. This same breadth of treatment is also noted in the more recent and what some may regard as more physical aspects of his work. Thanks to Langmuir, thermionics is now an important branch of physical chemistry.

IT is only natural that investigations of such a fundamental character should have economic consequences, and Langmuir's work has led to many important industrial results, of which the gas-filled lamp is probably most widely appreciated. What was once "Dr. Whitney's experiment" in the General Electric Company has now become the life blood of all important industries, and it is a pity to note that apparently one large European firm is no longer encouraging fundamental research; probably the right men are not available. No small part of Langmuir's contributions to chemistry lies in his enthusiasm and the clarity of his presentation. The Lewis atom became as it were a household word when the concepts were developed, applied and expounded by Langmuir, and one almost had a vision of molecules of fatty acid floating across a water surface when listening to him. Those that know Langmuir as a friend are always impressed both by his kindness and his great breadth of interests. Whether it is ice-skating in winter, observing the formation of ripples and surface currents in summer on Lake George, or noting the brilliance of spiders' eyes when illuminated by a flash-lamp, there is always something of interest, something arresting and something which would convince many a classical scholar of the great advantages of science as an educational medium.

Retirement of Prof. E. B. Poulton, F.R.S.

WHEN, now forty years ago, Prof. E. B. Poulton succeeded Prof. Westwood, its first holder, in the Hope professorship of zoology at Oxford, great anticipations were entertained of the results to follow from the appointment of one who had already distinguished himself as an able investigator and experimenter in the field of evolutionary study. These expectations have been abundantly fulfilled; and it is not too much to say that under Prof. Poulton's untiring exertions, the Hope Department in the University of Oxford has become known throughout the scientific world as a chief centre for the maintenance and development of those views of organic evolution which owe their origin to the epoch-making work of Charles Darwin and Alfred Russel Wallace. Under his energetic administration, the great entomological collection, bequeathed by Mr. Hope and tended in its early days by the first Hope professor, has been immensely increased, and has been made available in an unexampled manner for the illustration of problems of first-rate biological importance. By his influence in stimulating and directing the efforts of observers and collectors in many parts of the world, Prof. Poulton has been able to accumulate a vast amount of material of the highest value for scientific workers at home, to whom he has never failed to afford the utmost help and encouragement. His own labours in the field of bionomics have been far-reaching and fruitful, and have caused him to be known everywhere as the most prominent living upholder of the doctrine of natural selection as propounded by Darwin in the "Origin of Species". His approaching retirement is felt, not only by entomologists, but also by the whole University of Oxford, as a serious loss; and it is much to be hoped that a successor may be found who will recognise and make it his business to carry on the great traditions of the Hope Department. It is a matter of congratulation that Prof. Poulton, when he relinquishes the engrossing task of administration, will be free to continue, on an even larger scale, those researches and expositions which have had so remarkable an influence on the progress of scientific entomology.

Dr. R. A. Millikan

IT is stated by Science Service, of Washington, D.C., that a Roosevelt Medal for achievement in science has been presented to Dr. Robert Andrews Millikan, director of the Norman Bridge Laboratory of Physics and chairman of the executive council of the California Institute of Technology. The presentation was made by James R. Garfield, Secretary of the Interior in the Roosevelt Cabinet. The medal is one of a series of awards established in 1923 by the Roosevelt Memorial Association. Usually three are given each year in three out of twelve fields of activity associated with Col. Roosevelt's career, but only one award has been made in 1932. Dr. Millikan has become widely known because of his achievements in physical research and was awarded the Nobel Prize for physics in 1923. Outstanding among his accomplishments are the measuring of the charge on the electron and the study of cosmic radiation. Former recipients of the Roosevelt medal for work of a scientific nature include: Prof. Henry Fairfield Osborn, president of the American Museum of Natural History; Dr. Frank M. Chapman, curator of ornithology for the Museum; Dr. Herbert Putnam, librarian of Congress; and Richard E. Byrd, explorer.

Cambridge Philosophical Society

A BRILLIANT company assembled in the hall of Pembroke College, Cambridge, on Saturday, November 12, to celebrate by a dinner the centenary of the grant of a Royal Charter to the Cambridge Philosophical Society. Dr. A. Hutchinson, the Master of the College and president of the Society, was in the chair, and the occasion was honoured by the presence of H.R.H. Prince George. Among other distinguished people present were Mr. Stanley Baldwin, Chancellor of the University, the presidents of the Royal Society and of the British Association, and presidents or directors of many other leading scientific societies and institutions. The toast of the Society was proposed by Prince George and replied to by Dr. Hutchinson. The Master of Trinity proposed the toast of the guests, and responses were made by Mr. Baldwin and Sir William Bragg.

IN his reply to the toast of the Society, Dr. Hutchinson gave an interesting account of its origin and early work, and he was able to show that throughout its existence members of the Royal Family have honoured it by their favour and patronage. H.R.H. the Duke of Gloucester, a nephew of King George III and Chancellor of the University, accepted the office of patron on November 19, 1819, and made a handsome donation to the funds of the Society. Two years later H.R.H. Augustus Frederick, Duke of Sussex and a younger son of King George IV, became a vice-patron of the Society; afterwards he accepted the office of president of the Royal Society. When the Charter was granted by King William IV in 1832 he specifically confirmed his two kinsmen in their offices. The Prince Consort was patron of the Society when he was Chancellor of the University; and Dr. Hutchinson in the course of his speech said that he had been empowered by the Council of the Society to propose that the office of patron be revived, and that the present Chancellor, Mr. Baldwin, be invited to accept it. In his speech later in the evening, Mr. Baldwin stated that he regarded the office as one of high honour and accepted the invitation with pleasure.

Gaseous Combustion at High Pressure

AT the meeting of the Royal Society on November 10 when the Duke of York was admitted to the fellowship of the Society, Prof. W. A. Bone gave an account of Parts 14, 15 and 16 of his researches on gaseous combustion at high pressure. These record an exploration of the phenomena of explosion of hydrogen-air and carbon monoxide–air mixtures into regions of pressure much higher than those hitherto examined and the apparatus specially designed for the purpose was described. Hydrogen–air mixtures explode quite normally with initial pressures up to 500 atmospheres but at 750 atmospheres detonation occurs with violence sufficient to damage the apparatus. Carbon monoxide–air mixtures have been successfully exploded at initial pressures up to 1,000 atmospheres. As previously observed, the nitrogen is activated, absorbing during the early stages energy which is released during the later stages so as to retard the cooling of the products. This activated nitrogen reacts with excess oxygen, if present at the high temperature of explosion, giving oxides of nitrogen, the formation of which is favoured by increase of pressure. Nitric oxide dissociates readily during the process of cooling, so experiments were made in which the cooling is accelerated by causing the gas to expand suddenly at a predetermined instant after firing. Exploding mixtures of ($2CO + 3O_2 + 2N_2$) at an initial pressure of 70 atmospheres, the yield of nitric oxide is 5·4 per cent, and results at 88 atmospheres indicate a probable maximum of about six per cent. Such yields exceed those previously recorded but are probably insufficient to serve as a basis for the commercial fixation of nitrogen by explosive combustion. Experiments were shown to demonstrate how a rise of pressure increases the luminosity of carbon monoxide–air flames and leads to the formation of oxides of nitrogen.

Heavy Oil Aeroplane Engine

THE Air Ministry has issued some particulars of the first British heavy oil aeroplane engine. The Rolls-Royce 'Condor' compression ignition engine has successfully passed an Air Ministry test of 50 hours, and flight tests are now being undertaken in a Hawker 'Horsley' aeroplane. The engine has been developed from the 'Condor' petrol aeroplane engine, which has been strengthened where necessary to take the increased forces due to the raising of the compression ratio from 6½ to 12½. The maximum explosion pressure within the cylinders is 800 lb. per square inch. At the normal speed of 1,900 revolutions per minute, the engine develops 500 brake horse power. The increase in weight over that of the petrol engine is less than ten per cent, the engine weight being 1,504 lb. or 3 lb. per brake horse power, a weight-power ratio which represents a very large reduction over that of the Beardmore 'Tornado' engines installed in the airship *R 101*. As a petrol engine, the Rolls-Royce 'Condor' has a weight-power ratio of approximately 2 lb. per brake horse power. Assuming that the fuel consumption of the heavy oil engine is twenty-five per cent less than that of the petrol engine, there should be a saving in the total weight of engine and fuel for a lengthy flight such as the present types of aeroplanes are capable of making. In addition, the experimental flight tests are intended to investigate the extent to which the size of the radiator and the weight of cooling water can be reduced as compared with standard petrol engines.