News and Views

Nobel Prize for Physics: Prof. J. Chadwick

THE award of the Nobel prize for Physics for 1935 to Prof. James Chadwick and that of Chemistry for 1935 to M. and Mme. Joliot-Curie are associated with two of the most important discoveries of recent years, that of the neutron and of artificial radioactivity. Prof. Chadwick worked in Lord Rutherford's laboratory, and M. and Mme. Joliot-Curie in that of Mme. Curie, and it will be felt by all how fitting it is that these two latest awards should be connected in this way with the two great founders of nuclear physics. In 1919, Prof. Chadwick went with Lord Rutherford to Cambridge from Manchester, where he had taken his degree and worked before the War. His first research in the Cavendish Laboratory, on the scattering of α-particles, still remains one of the most important direct determinations of the nuclear charge of the elements. Then for many years he worked in collaboration with Lord Rutherford on the artificial disintegration of the elements by α-particles. These fundamental researches really laid the foundations on which modern nuclear physics is built. The scintillation method of counting the particles was the only certain method available at that time, and further advance was checked by its limitations. Prof. Chadwick was intimately connected with the development of electrical methods of counting, and applied them to a detailed study of the disintegration of some of the light elements. These investigations were of the highest importance since they yielded precise information about the nuclear energy levels.

WHEN M. and Mme. Joliot-Curie reported the anomalous behaviour of certain radiations emitted in the transformation of beryllium by α-particles, Prof. Chadwick was able in a very short time to carry out a brilliant investigation which showed, beyond doubt, that the neutron had at last been detected. The possibility of such a particle had often been discussed, and as early as 1922 experiments were made in the Cavendish Laboratory in the hope of finding something of this nature. In his first communication, Prof. Chadwick gave quite an accurate estimate of the mass of the neutron, and with various collaborators began a thorough investigation of its properties, particularly that of its power to disintegrate other elements. Recently, by investigating the disintegration of the deuteron by γ-rays, he has obtained what is generally accepted as the most dependable value for the mass of the neutron. The importance of the discovery of the neutron may best be realised when it is remembered that it has changed completely and simplified our ideas of the structure of nuclei.

Nobel Prize for Chemistry: M. and Mme. Joliot-Curie

M. AND MME. JOLIOT-CURIE have long been distinguished for their work in various branches of radioactivity. After the discovery of the positive electron, they made several investigations of its mode of production, and quite early concluded that it could be formed in some manner other than by the action of γ-rays. In particular they observed positive electrons to accompany neutrons in the disintegration of certain light elements by α-rays. Further investigation of this led them to the striking discovery that while the neutrons were emitted simultaneously with the bombardment by the α-particles, the emission of positrons was an entirely separate process occurring after the source of α-particles had been removed. By a variety of experiments, they were able to show that they had formed new radioactive bodies, and in many cases they were able to verify the chemical nature of the substances by using their radioactive properties as an indicator. This is a discovery of fundamental importance, and has provided a new and powerful method of investigating the transmutations of bodies. In the last year this work has been much extended by the proof that the neutron is very effective in forming new radioactive bodies, and both these and all other investigations have only tended to increase the importance of this new phenomenon, which in addition to furnishing many new isotopic species, promises to throw great light on the true nature of radioactivity.

Medal Awards of the Royal Society

HIS MAJESTY THE KING has approved of the awards this year by the president and council of the Royal Society in respect of the two Royal Medals to Prof. C. G. Darwin, Tait professor of natural philosophy in the University of Edinburgh, for his researches in mathematical physics, especially in the quantum mechanics of the electron and in optics, and to Dr. A. Harker, emeritus reader in petrology in the University of Cambridge, in recognition of his distinguished work and influence as a petrologist. The following awards of medals have also been made by the president and council: Copley Medal to Prof. C. T. R. Wilson, emeritus professor of natural philosophy in the University of Cambridge, for his work on the use of clouds in advancing our knowledge of atoms and their properties; Davy Medal to Prof. A. Harden, formerly head of the Department of Biochemistry of the Lister Institute, for his distinguished work in biochemistry and especially for his fundamental discoveries in the chemistry of alcoholic fermentation; Hughes Medal to Dr. C. J. Davisson, of the Bell Telephone Laboratories, New York, for research resulting in the discovery of the physical existence of electron waves through long-continued investigations on the reflection of electrons from the crystal planes of nickel and other metals.

New Officers of the Royal Society

THE following is a list of those recommended by the president and council for election to the Council of the Royal Society at the anniversary meeting on