

The 184-in. cyclotron was designed and constructed with the view of generating mesons artificially; but until recently it was thought that the fast particles it produces were not sufficiently energetic for this purpose. From the point of view of meson production, an α -particle of energy 400 MeV. was considered to be approximately equivalent to four nucleons, each of energy 100 MeV.; and such a nucleon has not sufficient energy to lead to the creation of a particle of rest-mass $300 m_e$. In contradiction with this view, the observations show that the generation of mesons occurs when the kinetic energy per nucleon is about 75 MeV., and indicate that the production process must be considered in relation to the α -particle as a whole.

It is pointed out by Gardner and Lattes¹ that it is possible to reconcile the observed production of mesons with the view that they are created in interactions between individual pairs of nucleons, if, following a suggestion of McMillan and Teller², account is taken of the internal motion of the nucleons in the colliding nuclei. Suppose the internal kinetic energy of the nucleons, in an α -particle or in a carbon nucleus, to be 25 MeV. For the production of mesons, it may be assumed that the most favourable collisions will be those in which the relative velocity of pairs of nucleons has the greatest possible value. The maximum kinetic energy available in the centre-

of-mass co-ordinate system of a pair of nucleons in such a collision will then be equal to $\frac{1}{2}(\sqrt{100} + \sqrt{25} + \sqrt{25})^2 = 200$ MeV.; a value more than sufficient for the creation of a particle of mass $320 m_e$. The same approach suggests that the threshold for the production of mesons by α -particles should occur at an energy of ~ 300 MeV. The observations are thus consistent with the simple assumption that the mesons arise as a result of an interaction between single pairs of nucleons.

These experiments establish the possibility of investigating the properties of mesons in laboratory conditions, with localized sources of particles of high intensity. It is reasonable to suppose that they will lead to a period of rapid advance in nuclear physics, especially in the development of our knowledge of the internal motion of the nucleons, and of the forces between them which give stability to the nuclei. They represent a technical advance of decisive importance, and the progress of the investigations will be followed with great interest.

¹ Gardner and Lattes, *Science* (March 12, 1948).

² Lattes, Muirhead, Occhialini and Powell, *Nature*, **159**, 694 (1947).

³ Lattes, Occhialini and Powell, *Nature*, **160**, 453 and 486 (1947).

⁴ Goldschmidt, King, Muirhead and Ritson (in the press).

⁵ Lattes, Occhialini and Powell (in the press).

⁶ McMillan and Teller, *Phys. Rev.*, **72**, 1 (1947). See also Horning and Weinstein, *Phys. Rev.*, **72**, 251 (1947).

⁷ Marshak and Bethe, *Phys. Rev.*, **72**, 506 (1947).

NEWS and VIEWS

Holweck Prize: Prof. Y. Rocard

THE Holweck Prize and Medal were founded in 1945 as a memorial to Fernand Holweck, director of the Curie Laboratory of the Radium Institute in Paris, and to other French physicists who met their death during the occupation of France in 1940-44. The award, made jointly by the Physical Society and the Société Française de Physique, is conferred alternately upon a French and an English physicist. This year the Prize and Medal are awarded to Prof. Yves Rocard, professor at the Sorbonne, and director of the Physics Laboratory of the École Normale Supérieure, University of Paris. During 1925-39 M. Rocard published many papers on the equation of state of gases, hydrodynamics, diffusion of light by liquids, the optics of the atmosphere, mechanics, acoustics, and the propagation of electromagnetic waves. He introduced molecular hypotheses into the equations of hydrodynamics; he rediscovered the classical equations, determined the state of the liquid in the capillary layer which separates it from the vapour, and developed the theory of surface tension. These detailed studies of the structure of liquids enabled Rocard to determine the mechanism of the diffusion of light by an exact calculation of the intermolecular field, and to give the classical theory of the Raman effect. In connexion with these investigations, he carried out a series of theoretical and experimental studies of the transparency of the atmosphere, the range of projectiles and the visibility of signals.

This period of Rocard's scientific life was followed, from 1930 until the War, by ten years of work on acoustics, the mechanics of oscillating systems, and the mechanics of fluids; he studied the stability of motion of locomotives, the possibility of self-sustained oscillations in a centrifugal pump, and the damping of vibrations in the wings of aircraft. At the beginning of the War, Rocard put his knowledge at the service

of his country, especially his work on critical frequencies of self-oscillation in aircraft, and the increase of sensitivity of sound detection apparatus. During the occupation of France, he occupied his enforced leisure in compiling a book on the general dynamics of vibrations; this has been translated into English and published in the United States. At the beginning of 1943 Rocard escaped from France and joined the Free French Forces in England. He adapted British and American radar to French ships, and took part in the liberation of Corsica and the capture of Toulon.

Engineering at the National Physical Laboratory: Mr. D. G. Sopwith

MR. D. G. SOPWITH has been appointed superintendent of the Engineering Division of the National Physical Laboratory in succession to Dr. G. A. Hankins, who recently became director of mechanical engineering research in the Department of Scientific and Industrial Research. Mr. Sopwith has been on the staff of the Engineering Division of the National Physical Laboratory for about twenty years, and his main interest has been in research on engineering materials and in the application of the basic principles of elasticity to engineering design problems. Until 1938 he worked in collaboration with Dr. H. J. Gough on fatigue and corrosion fatigue of metals, and on the design of lifting gear such as crane hooks. The former work showed the effect of the atmosphere on the fatigue resistance of various metals, while the latter resulted in improved practical designs. During the War, Mr. Sopwith carried out important work on the design of gun springs, gun barrels and shells; but his most valuable contribution was on the penetration of shot into armour plate, and his work both analytically and by controlled experiment in a laboratory armour-penetration range has done much

to place that hitherto empirical subject on a sounder scientific basis. Mr. Sopwith brings to his new task, not only research experience, but also a marked ability to appreciate and then simplify analytical methods so that they can be readily applied to practical problems of engineering design.

Economics at the University of Sheffield : Dr. G. P. Jones

DR. G. P. JONES, reader in economic history in the University of Sheffield, has been appointed professor of economics in the University, in succession to Prof. D. Knoop, who retires in September. Dr. Jones is no stranger to Sheffield or Sheffield people, for he has been a member of the University staff since 1926 when he was appointed lecturer in economic history, and in recognition of the distinction of his scholarship and research the University conferred upon him in 1946 the title of reader. He has been especially interested in the organisation of the building industry from medieval to early modern times, to which field he has made distinguished contributions. In addition, ever since he has been in Sheffield, Dr. Jones has been closely connected with adult education, and throughout the whole period April 1940–July 1946 he did great service to the cause of education in H.M. Forces as secretary to the Sheffield Regional Committee, under the auspices of which more than twelve thousand lectures and classes were held for members of the Army, the R.A.F. and Women's Auxiliary Forces.

Royal Geographical Society : Awards for 1948

H.M. THE KING has approved the award of the Royal Medals for 1948 of the Royal Geographical Society as follow : *Founder's Medal*, to Mr. Wilfred Thesiger, for his contributions to the geography of southern Arabia and for his recent crossings of the Southern Arabian desert, the Rub al Khali ; *Patron's Medal*, to Mr. Thomas H. Manning, of the Geodetic Survey of Canada, for his explorations and survey work in the Canadian Arctic, including the mapping of Southampton Island and the Foxe Basin shores of Baffin Island, and for his successful adaptation of Eskimo methods of travel. The Council of the Society has made the following awards : *Victoria Medal*, to Prof. Frank Debenham, professor of geography in the University of Cambridge, for his work in geographical education and for his contributions to polar geography and exploration in the Antarctic and as first director of the Scott Polar Research Institute at Cambridge. *Murchison Grant*, to Mr. Robert W. Steel, lecturer in Colonial geography at the University of Oxford, for geographical work on the West African Ashanti Social Survey, 1945–46. *Back Grant*, to Mr. Alan J. Marshall, for exploratory and scientific work as leader of the Oxford University Exploration Club Expedition to Jan Mayen Island, 1947. *Cuthbert Peek Grant*, to Dr. Donald F. Thomson, for his explorations and anthropological studies in Arnhem Land, Northern Territory, Australia. *Gill Memorial*, to Mr. William W. Williams, lecturer in geography at the University of Cambridge, for original research during the War on the determination of underwater beach gradients.

Royal Asiatic Society of Bengal : Medal Awards

THE following medal awards of the Royal Asiatic Society of Bengal were announced at the annual meeting held on February 16 : *Barclay Memorial Medal*, a biennial award for contributions to medical

or biological science with reference to India, to Rai Bahadur K. C. Mehta, principal of Agra College, for his contributions to the study of "Cereal Rusts in India" ; *Joy Gobind Law Memorial Medal*, a triennial award for contributions to the study of zoology in Asia, to Dr. Lieven Ferdinand de Beaufort, professor of zoology in the University of Amsterdam and director of the Zoological Museum at Amsterdam, for his contributions to the study of "Fishes of the Indo-Australian Archipelago" ; *Paul Johannes Bruhl Memorial Medal*, a triennial award for contributions to the study of Asiatic botany, to Prof. S. R. Bose, professor of botany, Carmichael Medical College, Calcutta, for his original research on polyporin from fungi ; *Dr. Bimala Churn Law Gold Medal*, an annual award for contributions to Indological studies, to Dr. B. M. Barua, professor of Pali in the University of Calcutta, for his contributions to the study of Buddhism in India ; *Sir Jadunath Sarkar Gold Medal*, a newly instituted biennial award for contributions to Indological researches from the thirteenth century A.D. up to A.D. 1802, to Sir Panduranga S. S. Pissurlencar, for his contributions to the study of the history of the Marathas and the Deccani Muslim Powers down to the time of Tipu Sultan.

Council for 1948

THE members of Council of the Society for 1948 are as follows : *President*, Dr. W. D. West ; *Vice-Presidents*, Dr. B. C. Law, Maharajadhiraja Bahadur Sir U. C. Mahtab, Dr. M. N. Saha, Sir B. L. Mitter ; *General Secretary*, Dr. K. N. Bagchi ; *Treasurer*, K. P. Khaitan ; *Philological Secretary*, Dr. S. K. Chatterji ; *Joint Philological Secretary*, Dr. M. Ishaque ; *Natural History Secretaries*, Dr. K. Biswas (biology) and Dr. S. K. Mitra (physical sciences) ; *Anthropological Secretary*, Dr. Verrier Elwin ; *Historical and Archaeological Secretary*, H. Waddington ; *Medical Secretary*, Lieut.-Colonel C. L. Pasricha ; *Library Secretary*, Dr. B. S. Guha ; *Other Members of Council*, C. C. Blagden, H. F. Bensly, Dr. A. H. M. Mohiyuddin, Sir A. H. Ghuznavi and Ramaprasad Mookerjee.

The following were elected fellows of the Society : Rao Bahadur K. V. Rangaswami Aiyangar, director of public instruction, Travancore ; Dr. B. M. Barua, professor of Pali, University of Calcutta ; Dr. F. G. Percival, of the Tata Iron and Steel Co. Prof. D. R. Bhandarkar, formerly of the University of Calcutta, was elected an honorary fellow.

Corrosion Research in Canada

THE National Research Council, Canada, has established a committee to assemble information on all aspects of corrosion and promote its dissemination. In the first instance, a survey is being made of existing Canadian facilities for the study of corrosion and means of combating its effects. It is proposed to assist Canadian universities in making studies of the fundamental chemical and electrochemical reactions that cause deterioration of metals in service, and in the training of students in the techniques of corrosion research and prevention. In the development of a programme of research in this field the committee is seeking the co-operation of all organisations and industries that are concerned in dealing with corrosion problems, and to obtain information a questionnaire has been prepared and given wide distribution.

The chairman of the new committee is Dr. R. R. Rogers, Department of Mines and Resources, and the secretary is D. Wolochow, Division of Building