react through thiol groups, whereby mixed polymers are formed. The epoxide resin constituent acts as a reinforcing agent and confers improved solvent resistance and increased tear-strengths.

Applications

Mr. H. G. Manfield gave a comprehensive account of the use of epoxide resins in the potting and encapsulation of electronic equipment. The resins have special value in that they have good sealing properties. Manfield considers that their greatest future outlet lies in transformers, but pointed out various difficulties in this field. Supported by Dr. A. J. Warner, he made a plea for closer liaison between users and resin manufacturers, particularly from the point of view of electrical properties over a range of frequencies and temperatures.

The possible use of epoxide resins as stabilizers for polyvinyl chloride (P.V.C.) was discussed by Dr. E. C. A. Horner. When used with other compounds, not necessarily good stabilizers themselves, a synergistic effect is observed, whereby the resulting stabilization is better than that expected from either component separately.

Special Aspects

A paper by Dr. L. B. Bourne, a medical officer attached to a large organization, raised much interest since it dealt with handling precautions. Dr. Bourne stressed the toxic nature of many of the curing agents employed, and the necessity for extreme care in large-scale use. He considered, however, that the use of good barrier creams to reduce skin contact, efficient ventilation and the reduction to a minimum of quantities handled at any one time, combined with good training of personnel and the use of cautionary notices, could be adequate. He gave details of desirable treatments in case of need.

The important role of glass fibres as reinforcing agents was covered by Mr. K. J. Brookfield, who outlined the methods of production of fibres and described the special treatments now provided to improve adhesion of resins. These treatments include the use of methacrylato chromic chloride, vinyl trichlorosilane and a new compound based on the interaction of allyl trichlorosilane with resorcinol.

The fundamentals of adhesion, with special reference to epoxide resins, were most lucidly presented by Dr. N. A. de Bruyne. Experiments on monomolecular films, determination of dipole moments and influence of chemical structure all lead to the conclusion that hydroxyl groups are largely, but not entirely, responsible for the good adhesive properties. Measurements of differential strains in aluminium joints similarly suggest that the rise in breaking stress with hydroxyl content is associated with a fall in the residual stress.

The place of epoxide resins in industry was discussed by Mr. E. S. Paice in the final paper. Basing his conclusions on estimates in the United States, he thought that, by 1960–62, the market in Great Britain should be between 7,000 and 10,000 tons a year. Of this amount, 55 per cent would be absorbed in surface coatings, and the remainder would go to 'potting' of electrical equipment, press tools, structural laminates, adhesives and miscellaneous uses. Although increase in production would naturally lead to a reduction in price, he considered that epoxide resins would remain inherently more expensive than existing resins; nevertheless, he believed their special properties would ensure them a prominent place in industry.

N. J. L. MEGSON

OBITUARY

Mme. Irène Joliot-Curie

ALTHOUGH the health of Madame Irène Joliot-Curie had given cause for anxiety for several years, her death on March 17 came as an unexpected shock to those outside her immediate circle, not only to those who had known her personally but also to all who have worked or studied in the field of radioactivity. She was born in the stirring days of radioactivity when her parents were making their great discoveries, she grew up with radioactivity, and all her working life was devoted to its study. She bore an honoured name, to which she added lustre by many contributions of great importance in radioactivity and in the development of nuclear physics.

Irène Curie was born on September 12, 1897, the first child of Pierre and Marie Curie, *née* Sklodowska, a few months before the publication of the papers announcing the discovery of polonium and of radium. Her early training was interrupted by the First World War, during part of which she served as a radiographer, and afterwards she became 'préparateur' to her mother at the Laboratoire Curie of the Institut du Radium in Paris. Here she received a thorough grounding in all aspects of radioactivity, both physical and chemical, which gave a secure basis for her future work. Her first important paper was on the α-rays of polonium, presented for her doctor's thesis in 1925. In 1926 she married Frédéric Joliot, who had joined the Institut du Radium a year or two earlier as special assistant to Mme. Curie, and there began a collaboration of husband and wife in scientific work rivalling in productive genius even that of her parents. Equal in the partnership, each was a fitting complement to the other, and together they published some remarkable work. The most outstanding of their joint papers were published in the years 1932–34. In the first of these, on the radiation excited in beryllium by α-particles, they reported a very strange effect which provided the clue to the discovery of the neutron. Then, after studying the conditions of excitation of neutrons by the impact of α-particles on various elements, they turned for a time to the 'materialization' of positive electrons through the action of γ-rays of high energy. This was followed by a systematic study of the radiations emitted from the lighter chemical elements under the impact of α-particles, which through the light of intuition—and good technique—led them, in early 1934, to their beautiful discovery of artificial radioactivity. An interesting feature of this discovery is that it was so long in coming; for the phenomenon of artificial radioactivity had been expected, and sought for, since the earliest days of radioactivity. For this discovery the Joliot-Curies were awarded the Nobel Prize for Chemistry in 1935.

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About two years later, Mme. Joliot-Curie was appointed by M. Blum as Under-Secretary of State for Scientific Research. This office and her numerous other duties must have absorbed a great deal of her time and attention; moreover, her health was showing signs of having been affected by her exposure to radiation during years of work with strongly radioactive materials. But her scientific work continued without abatement. With P. Savić, she examined in detail the artificial radioelements produced by the irradiation of uranium by slow neutrons, analysing the products and identifying them chemically, and she came within a hair's-breadth of recognizing that the phenomenon involved in the production of these elements was that of fission. Then came the Second World War and the German occupation of France, during the last year or two of which she retired to Switzerland with her two children.

When the French atomic energy project was started in late 1945, she was appointed one of the four scientific commissioners, the others being F. Joliot-Curie, P. Auger and F. Perrin. When Joliot was dismissed in 1950 on account of his Communistic activities, she retained her post and served the full term of five years; but on the reorganization of the Commission early in 1951 she was no longer included. During these years she was the chief link between the Commission and the Institut du Radium and the University of Paris, and she served as the Commission's representative on several committees. She continued at the same time to publish work on various aspects of radioactivity, for her ardour for scientific research was such that neither administrative duties nor failing health could keep her from her laboratory.

Her parents were both persons of strong and independent mind, and Mme. Joliot-Curie inherited much of their character as well as their scientific genius. She had a powerful personality, simple, direct and self-reliant. She knew her mind and spoke it, sometimes perhaps with devastating frankness; but her remarks were informed with such regard for scientific truth and with such conspicuous sincerity that they commanded the greatest respect in all circumstances. In all her work, whether in the laboratory, in discussion, or in committee, she set herself the highest standards and she was most conscientious in the fulfilment of any duties she undertook.

She leaves with her husband two children—a daughter Hélène, married to a grandson of the late Prof. P. Langevin, and a son Pierre.

J. CHADWICK

NEWS and VIEWS

New Foreign Member of the Royal Society: Prof. R. B. Woodward

ROBERT BURNS WOODWARD, professor of organic chemistry in Harvard University and recipient of many honours, has now been elected a foreign member of the Royal Society. In 1937 he was awarded the degree of Ph.D. at the Massachusetts Institute of Technology and shortly afterwards moved to Harvard University. His work there has ranged over almost the whole field of organic chemistry, and has had an outstanding influence upon the development of the subject, particularly during the past decade. His most important contributions have been concerned with the elucidation of the structure of natural products and their total synthesis, and in this his views on biogenesis have been of great value. His synthesis of quinine (1944), followed by his brilliant work culminating in the first total synthesis of the steroids (1951), has created a new era in synthetic organic chemistry. He has regarded the complexity of some natural products as a challenge, and this he has met by applying in masterly sequence the methods now available to the modern organic chemist. His recent total synthesis of strychnine will always be regarded as a classical achievement. His work on the elucidation of the structure of natural products is characterized by the use of physical methods which are suitably complementary to the chemical methods of structural investigation. He was a pioneer in the use of ultra-violet and infra-red spectroscopic techniques in structural work, and the present popularity of these methods is in some measure due to his influence; his rules concerning the ultra-violet spectral properties of various chromophoric systems are of great value. Many natural products have been forced to reveal the secrets of their molecular architecture as a result of Woodward's attentions, and these have included patulin, sempervirine, terramycin, aureomycin, magnamycin, ajmaline and cevine and related veratrum alkaloids.

Astronomy in the Australian National University: Prof. Bart J. Bok

DR. BART J. BOK, who has been appointed to succeed Dr. R. v. d. R. Woolley in the chair of astronomy at the Australian National University, will take to Mount Stromlo a detailed knowledge of the problems of galactic structure and stellar statistics, to which he can apply observations obtained with the new 74-in. reflector of the Commonwealth Observatory. At Harvard, Bok was closely associated with Harlow Shapley, and Bok himself took a particular interest in the problems of the southern hemisphere, visiting the Harvard Observatory at Bloemfontein, South Africa, to secure observations with the 60-in. reflector. As a consequence of the closing down of the Harvard Southern Station, Bok has recently turned his attention to radio astronomy, and his appointment to the chair at Canberra will no doubt strengthen the contact between astronomy at Mount Stromlo and the radio astronomy work of the Radio Physics Laboratory of the Commonwealth Scientific and Industrial Research Organization at Sydney.

Beit Memorial Fellowships for Medical Research

THE following Beit Memorial Fellowships for Medical Research have been awarded for research work at the places indicated. *Fourth-Year Fellowship* (£1,000 a year): Dr. Evelyn E. B. Smith, synthesis of hyaluronic acid and of specific polysaccharides in pneumococci (Departments of Bacteriology and Biochemistry, University of Glasgow).

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