

changes induced by irradiation are then considered in detail. During his second lecture, special attention was paid to ratcheting and irradiation creep.

Mr. J. Harper, head of laboratories, Springfields, described the Springfields manufacturing process from ore to machined bars for Calder and Central Electricity Generating Board fuel elements. The emphasis was placed on the metallurgical stages in the process. He pointed out that the efficiency of slag/metal separation in uranium billet production is a major factor in the quality of a fuel rod. Each fuel rod has its case-history recorded on a punched card.

Mr. D. O. Pickman, deputy head of laboratories, Springfields, described the design and manufacture of Calder-type fuel elements, assembly and testing procedure, and out-of-pile proving tests. In the course of his second lecture he reviewed performance experience in Calder and irradiation proving of Central Electricity Generating Board fuel elements. Out of the 90,000 fuel elements loaded up to mid-July 1959, only twenty-seven failures have been observed.

Mr. L. M. Wyatt, late deputy head of laboratories, Culcheth, and now with the Central Electricity Generating Board, described fuel elements for the advanced gas-cooled reactor and fast reactors. He considered the design and expected performance of these uranium dioxide fuels with stainless steel, beryllium and other casing materials. The design of similar fuels for light water and/or heavy water-cooled and moderated reactors was also briefly

referred to. In his second lecture, Mr. Wyatt described fast reactor fuels and cans and expected operating conditions. He concluded by briefly comparing British, American and Russian fuel elements. Design drawings of the advanced gas-cooled reactor fuel elements aroused great interest.

Mr. H. Lloyd, leader of the Fuel Element Fabrication Group at Harwell, discussed the fabrication of *Dido*-type fuel elements including the Mark III version, and considered their application to power reactors. Possible variations and improvements in fuel materials and design were mentioned and comparison was made with similar American fuels. Although various power reactors employing plate-type fuel elements have been built in the United States, only design studies have so far been made in Great Britain. Mr. Lloyd displayed samples illustrating various stages in the fabrication of the *Dido* fuel element, and these aroused much interest.

The course was well attended and it was particularly pleasing to see about forty representatives from industry. Each of the lectures provoked a stimulating discussion. Although the lecturers would have liked to answer the questions put to them fully, they were occasionally prevented from doing so by commercial security regulations. This applied mainly to questions concerning throughput and costs.

In view of the interest the lectures aroused, it is hoped to hold a similar series early in 1961.

S. HARTLAND

THE LEVERHULME TRUST

REPORT FOR 1956-58

THE third report of the Leverhulme Trust*, which covers the period 1956-58, in which commitments of £593,000 were undertaken, is the first of a series of triennial reports. Of this sum, 33 per cent was devoted to universities and centres of higher education, 8 per cent to learned societies, 30 per cent to medical research and 12.5 per cent to grants to individual scholars. Of those to British universities, the largest grant, £30,000, was to Liverpool for fellowships in general research, mathematics, physics and town planning. The University of Manchester received £14,900 for research fellowships and studentships at Jodrell Bank Experimental Station, Nuffield College, Oxford, £14,100 for a study of industrial relations with particular reference to the history and problems of the trade union movement, collective bargaining, the appointment and responsibilities of shop stewards and so forth, and St. Antony's College, Oxford, £12,500 for the study directed by Lord Ismay's committee on the changes in the international status of the United Kingdom since the Second World War and of its position as a Colonial power. £6,000 went to Birkbeck College, London, for research by Dr. N. Pevsner on the buildings of England, and £16,950 to the London School of Economics for miscellaneous scholarships and research awards. The University of Leeds received £7,500 for a research fellowship, scholarship and lectureship in the history

and philosophy of science; the Institute of Commonwealth Studies, London, £6,000 for research fellowships in economic development in the Colonies; and the University College of Rhodesia and Nyasaland £28,000 to finance inter-collegiate conferences.

Of the grants to learned societies, research institutions, etc., those of £4,500 to the British Association for the Advancement of Science for an inquiry, under Sir Patrick Linstead's direction, into the broadening of the education of those intending to become scientists and technologists, and of £8,400 to Political and Economic Planning for a study of the effects of economic planning on governments and administration may be mentioned; in medical research, the Royal College of Surgeons received £42,000 for research fellowships and scholarships in dental surgery; the Middlesex Hospital Medical School, £35,000 for scholarships at the Institute of Clinical Research; the London School of Hygiene and Tropical Medicine, £14,000 for research in industrial medicine over four years; the London College of Osteopathy, £12,500 for scholarships; the Institute of Laryngology and Otology, £9,100 for research fellowships; King's College Hospital Medical School, University of Durham, £8,700 for a research fellowship and the Department of Education of the Deaf, University of Manchester, £2,000 for research in connexion with the design of hearing aids. St. Mary's Hospital Medical School received £9,500 for biochemical research.

* The Leverhulme Trust. The Third Report of the Leverhulme Trustees. Pp. 55. (London: The Leverhulme Trust, 1959.)