

positive training function through courses at the Education and Training Centre and the Isotope School. In 1966 there was an attendance of approximately 1,500 outside students at seventy-two different courses in addition to students from within the Authority. About one hundred and thirty of these students came from overseas and there were, besides, seventy staff from overseas working at Harwell on a full time basis.

Interaction with industry is equally lively. Apart from contracts for building construction, engineering plant and for purchase of stores, approximately 1,400 extra-mural development contracts (value £14m.) have been placed with industry since 1946. As many of these concerned very advanced equipment, the contracts contributed appreciably to the introduction of the latest technology into industry. This effect was broadened by the movement of trained professional staff from Harwell into posts in industry at the rate of about sixteen a year (average over the period 1959-66), supplemented by many apprentices and skilled industrial workers.

Although the chief purpose of the industrial research and development contracts was to develop equipment needed by the Atomic Energy Authority, much of it, particularly electronic and health physics equipment, in-pile rigs and hot laboratory equipment, found a market outside the Authority. Reference has already been made to applications of radioisotopes and large sources of radiation and the industrial and commercial benefits which they offer; radioisotope devices such as thickness and backscatter gauges developed at Wantage are manufactured by industrial firms and have led to substantial savings when used in production plants. These activities taken together brought considerable benefits to industry, but there were limits on what could be done under the Atomic Energy Act.

By 1965, there were signs that the demand for research and development in atomic energy had passed its peak, and Section 4 of the Science and Technology Act of that year made specific provision for the Authority to undertake scientific research outside the field of atomic energy if requested to do so by the Minister of Technology. Given a steady reduction in the atomic energy programme at Harwell over a number of years, it became possible to consider a whole range of new activities. Collaboration with the universities could be increased, particularly on the scientific exploitation of neutron beams; direct support could be given to industry in areas where there has been a strong effort associated with the nuclear programme, such as the science and technology of materials; and certain national programmes, for example those concerned with the environment, could be strengthened by redeployment at Harwell.

Manpower Drain

The contraction in the total number of staff which has taken place over the past few years has provided a stimulus towards improved efficiency in all sectors of the Establishment. Divisions have been concentrated, as far as possible, in particular areas of the site and outstations are being closed down and the staff moved to Harwell. At the same time, laboratories and equipment have been modernized and new items installed. For example, the new variable energy cyclotron, improvements to the original synchrocyclotron and other changes have strengthened the already unique ion-beam resources of the establishment and a new on-line computing system will ensure optimum control and maximum utilization of data. The problem will be to fit new developments in nuclear technology, such as the study of ion implantation methods for the production of semiconductors, development of isotopic generators and of diode fuel elements for direct generation of electricity in reactors and many other items into a shrinking overall nuclear programme. Non-nuclear commitments are already considerable. In addition to Harwell participation in the Authority pro-

gramme on desalination, the setting up of a Ceramics Centre and a national centre for Non-destructive Testing has recently been approved. The Ceramics Centre will work in collaboration with the British Ceramic Research Association and other bodies, and both of these centres will draw on the experience and use the special facilities which have been built up at Harwell for the nuclear programme.

It has often been said that it would be better from a national point of view if the staff engaged in these sorts of activities were employed directly in industry. There is undoubtedly a great need for more scientists in industry, but movements of individuals from Harwell, where there are only 450 scientific officers altogether, would produce no more than a marginal effect. That the large establishment, taken as an organic whole, offers certain special advantages is shown by the record of scientific and technological productivity of the past 21 years. The periodic changes of programme which have occurred suggest that, within certain limits, great flexibility of purpose is possible. Finally, the much publicized brain drain is minimal from a large, well equipped laboratory, where there is always something exciting happening. Professional staff accepting appointments overseas, averaged over the past seven years, have amounted to about 0.75 per cent of the total professionals of all grades (1,200), and of the number going overseas in 1966 only a quarter went to the United States.

Harwell, now in its twenty-second year, looks forward to a new period in which its collective knowledge and special skills will be more widely applied, supported by the confidence which stems from an established tradition of achievement.

University News:

London

THE title of professor of anaesthesia has been conferred on Dr. B. R. Simpson, in respect of his post at the London Hospital Medical College.

Loughborough University of Technology

DR. R. J. W. REYNOLDS, at present project manager and head of the New Polymers Group at the Petrochemical and Polymer Research Laboratory at Imperial Chemical Industries, has been appointed professor and first director of the university's newly formed Institute of Polymer Technology. Dr. Reynolds will continue as a consultant with I.C.I. after he joins the university in September.

Manchester

A NEW chair, the I.C.T. professorship in computer engineering, has been established by the council of the university with the support of International Computers and Tabulators, Ltd. I.C.T. have endowed the chair with a contribution of £100,000, which will be made over a 10 year period.

Newcastle upon Tyne

DR. A. MILNE, at present a senior principal scientific officer at the A.R.C. Unit of Insect Physiology, has been appointed to a personal professorship in agricultural entomology.

Announcements

DR. BARBARA MCCLINTOCK, a member of the Genetics Research Unit of the Carnegie Institution of Washington, has been awarded the Kimber Genetics Medal of the U.S. National Academy of Sciences, in recognition of her studies on chromosome structure and function.

PROFESSOR JOHN H. REYNOLDS, professor of physics in the University of California, Berkeley, has been awarded the J. Lawrence Smith Medal of the U.S. National Academy of Sciences in recognition of his investigations of meteoric bodies.