building developments in nuclear physics stem directly from Chadwick's influence, though he returned to Cambridge in 1948 to become master of Gonville and Caius College.

It would be invidious to mention by name those who still serve the University. Many of them will leave an indelible mark on the history of science and a few will light lamps which will shine as brightly as any which illuminated the first half-century of the University's history. The territory now being covered is extensive. It includes the chemistry of natural products such as insecticides, fish poisons, and antibiotics; the synthesis of anthocyanins and new oxygen-heterocyclic compounds such as the chromonopyrones; studies on vitamin A, detoxication, and carotenoids, and the use of radioactive tracers in biogenesis; contributions to the theory of the solid state, metals and dielectrics; to differential geometry, relativity and cosmology; the phenomena of wakes and the compilation of mathematical tables; nuclear physics; endocrinology; and experimental zoology. Restricted space forbids reference to the related fields—engineering, medical, dental, veterinary and the social sciences—in which this University has made and continues to make a contribution of first-rate importance.

In this brief sketch of the outstanding scientific events in the history of science in the University of Liverpool during the past fifty years, it has been possible to mention only a tithe of the foremost figures and achievements. Also, these jottings have been "written by Time on the memory" of one man. Others may justifiably have painted a picture in different colours, light and perspective. Moreover, the solid contribution of many hundreds of a singularly able and loyal junior staff to the shape and stability of the University has had to remain unrecorded. If there be grave omissions or misplaced emphasis, I will hope with Pliny the Younger that "history however it is written will always please".

LONG ASHTON RESEARCH STATION

JUBILEE CELEBRATIONS*

LONG ASHTON, the second oldest agricultural research station in Britain, began in 1903 as a private foundation—the National Fruit and Cider Institute. The Institute evolved from the pioneer experiments in cider-making carried on at Butleigh Court, Somerset, by Mr. Robert Neville Grenville. His enthusiasm stimulated the Bath and West and Southern Counties Society, in collaboration with the County Councils of Devon, Gloucester, Hereford, Somerset and Monmouth, to establish at Long Ashton an Institute for research and instruction in cider-making and fruit-growing. Thanks mainly to Mr. A. E. Brooke-Hunt, superintending inspector of the Board of Agriculture, the Institute, from its inception, was aided by a small government grant.

The Institute continued independently, under the management of governors nominated by the contributing bodies, until 1912, when it became formally associated with the University of Bristol as one of the research institutes set up at that time by the Board of Agriculture and the Development Com-

missioners. Under this scheme, the subjects of research at Long Ashton were widened to include all aspects of fruit culture and the control of pests and diseases of fruit crops, and the enlarged Institute was given the name of the Long Ashton Research Station. Its administration became the responsibility of the Agricultural Committee of the University, on which the National Fruit and Cider Institute was given agreed representation. This Committee now includes representatives of the following bodies: Council and Senate of the University, the Governors of the National Fruit and Cider Institute, the Ministry of Agriculture, the contributing counties, and the national associations concerned with the manufacture of cider and fruit juices. Since 1931 the Station has been one of the national research institutes the work of which is co-ordinated by the Agricultural Research Council. The Station's income is now largely derived from grants made to the University by the Ministry of Agriculture and the Agricultural Research Council. The scientific staff at Long Ashton numbers thirty-eight, with forty assistant-scientific and office staff; the Station property covers more than 250 acres.

Research at Long Ashton on cider-making and cider orcharding, started in 1903, has received world-wide recognition and maintains its prominence in the Station's programme. The extension of this work since 1931 to include non-alcoholic fruit juices and syrups has provided the basis for a flourishing new British industry. In fruit culture, the work in growth-regulating substances has been specially noteworthy. Fruit-breeding investigations have produced pear, plum and black-currant varieties of high merit. In pest and disease control the special attention given to spray methods and machinery has made Long Ashton a centre for consultation on spraying problems arising both at home and overseas.

The Station has maintained research and advisory work in willow-growing since 1922 and in domestic food preservation since 1930. The work of this Section has recently been extended to include the preservation of meat and poultry, in addition to that of fruit and vegetables.

The plant-nutrition work at Long Ashton enjoys a world-wide reputation. The discovery in 1924 that a major cause of fruit-tree failures was potash deficiency revolutionized fruit production in England. Since 1939 studies of the nutrition of farm and market-garden crops have been included in this work, and, arising from these, the visual symptoms of mineral deficiencies and excesses on a wide range of crop plants have been defined and published in a colour atlas. In 1952 the group of research workers engaged in these investigations was constituted a special Agricultural Research Council Unit for the study of problems of plant nutrition, with particular reference to the micronutrient elements.

The celebrations of the Station's Jubilee, which were jointly planned by the University of Bristol and the National Fruit and Cider Institute, took place during July 22–23. On July 22, the Jubilee Lecture, entitled "Agricultural Research, 1953", at which the vice-chancellor of the University, Sir Philip Morris, presided, was given in the reception room of the University by Lord Rothschild, chairman of the Agricultural Research Council. In a survey of problems of the organization of agricultural research in Britain, Lord Rothschild pleaded for closer contact between the agricultural research institutes and the industries they serve. Without prejudice to the

* See also p. 264 of this issue.

policy of recruiting outstanding scientists and leaving them to develop their own approach to the long-range problems of agriculture, he advocated the listing of the short-term problems in order of economic importance, with the aim of allotting agricultural research facilities in accordance with national needs. He suggested that a reduction in the number of committees dealing with research and administration would be advantageous.

As examples of achievements of agricultural research in Britain, Lord Rothschild cited the work of the National Institute for Research in Dairying on bacteriophage control in cheese, the success of the Moredun Institute in developing treatments for diseases of farm stock, and the combined operations by Rothamsted, Aberystwyth, the Grassland Research Institute, Jealott's Hill and the Hannah Research Institute in pasture improvement, grass conservation and grass utilization. In referring to the phenoxy-acetic acid weed-killers, he gave the estimate that they have, in ten years, already increased British cereal yields by 5 per cent. Dealing with the biological importance of trace elements, he stressed the increases in yield made possible by Prof. T. Wallace's work at Long Ashton. In conclusion, Lord Rothschild described the Long Ashton staff as a happy and productive family.

At a commemorative dinner given by the University in the Great Hall on July 22, the principal speakers were Sir Robert Sinclair (pro-chancellor), Sir Reginald Verdon Smith (chairman of Council), Sir Philip Morris (vice-chancellor), Sir William Slater (secretary of the Agricultural Research Council), Earl Waldegrave (trustee of the Bath and West Society) and the Lord Mayor of Bristol.

The celebrations were continued at the Long Ashton Research Station on July 23, when approximately nine hundred guests of the National Fruit and Cider Institute attended, under the presidency of Captain D. M. Wills, chairman of the National Fruit and Cider Institute and of the Agricultural Committee of the University. After a morning programme including exhibits, demonstrations and plantation tours illustrating the history and present-day activities of the Station, two ceremonies recalled the events of 1903. Near the cider orchard that had been set out under his direction fifty years ago, Prof. B. T. P. Barker, emeritus professor of agricultural biology in the University of Bristol, completed the planting of a tree of Ashton Brown Jersey, a variety that had been found on the Station farm in 1903. In the Station Library, Lord Bledisloe, senior vice-president of the Bath and West Society, unveiled a plaque presented by the Society to commemorate its part in the founding of the Institute and recording the close collaboration between the Society and the Station throughout the fifty-year period.

These ceremonies were followed by addresses by the Right Hon. Sir Thomas Dugdale, Minister of Agriculture, Mr. C. P. Norbury, vice-chairman of the National Fruit and Cider Institute, and Prof. T. Wallace, director of the Station.

Sir Thomas Dugdale cited Long Ashton as an excellent example of the way in which the British agricultural research service has arisen and developed to meet specific needs and problems: the service was not a set plan imposed from above. The success and strength of the Station are the result of the co-operation of all the parties concerned. The Minister emphasized the Government interest in horticulture no less than in agriculture and referred to the friendly

relations between Long Ashton and the National Agricultural Advisory Service. He paid tribute to the founders of the Station and to its directors, Profs. Barker and Wallace. He announced that Prof. Wallace, who has given much help to the Agricultural Improvement Council, has now accepted his invitation to become a member of that body.

Finally, the Minister referred to the future policy and needs of the Station. While disclaiming the role of a *deus ex machina* (the Minister had arrived in a nearby field by helicopter) he said that he hoped that Long Ashton will see work in hand next year on its much-needed new glasshouses.

Mr. Christopher Norbury, a leader of the British fruit-growing industry, described Long Ashton as one of the foundation stones on which the industry was built. Its work has made possible increased production per acre and per man, through greater regularity of cropping, the better control of pests and diseases and the solution of problems of fruit tree nutrition. Long Ashton also studies fruit products that are providing new outlets for apples and black currants.

Mr. Norbury paid tribute to the University of Bristol for its part in developing not only Long Ashton but also the Chipping Campden Research Station, the work of which on canning has been so valuable to fruit growers. He welcomed the increased Government support for the agricultural research and advisory services, both of which are of vital importance to our survival as a nation.

Prof. T. Wallace thanked, in particular, the Minister for his presence and gracious speech and the Bath and West Society for the presentation of the plaque, referring specially to two distinguished representatives of the Society—Lord Bledisloe and Sir Charles Miles. He welcomed also Sir John and Lady Russell, Sir Donald and Lady Vandepier, Sir Alan Hitchman, Sir James Scott Watson, Sir Reginald Franklin, Sir William Slater, Dr. T. Loveday and Dr. H. V. Taylor. Among the representatives of organizations concerned with agriculture and horticulture, Prof. Wallace greeted delegates from the Royal Agricultural Society, the Central Horticultural Committee of the National Farmers' Union, the Royal Horticultural Society and the Farmers' Club.

Commonwealth and other Governments whose representatives were welcomed by the Director included Canada, New Zealand, Australia, South Africa, Pakistan and the Netherlands. Prof. Wallace expressed his appreciation to the growers, cider-makers and business firms for their past help and their support of the Jubilee celebrations.

The research stations (East Malling, John Innes, Rothamsted and others), universities and agricultural colleges were warmly thanked for their participation, and Prof. Wallace made a special reference to the presence of Prof. Barker, who was also celebrating his jubilee of service at the Station.

In conclusion he quoted a slightly modified version of a sentence written by Mr. Brooke-Hunt in 1903 describing the establishment of the National Fruit and Cider Institute: "It began, as most things do that really last, in only a small way, and it has developed naturally in accordance with the needs of the times; its spirit remains young and the potentialities are great; and it is hoped that its career may continue to be one of increasing usefulness, not only to this generation, but to others which are to follow".

R. W. MARSH