

mental Husbandry Farms at Terrington St. Clement and at Trawscoed, and the National Institute for Research in Dairying at Shinfield.

Two types of diet were used: one with white-fish meal and vegetable protein was typical of the diets mainly used for fattening pigs in Britain; in the other the protein was of vegetable origin only. Both diets were tested in two systems of feeding, the usual all-meal system and the Lehmann system in which a constant daily quantity of a meal mixture is supplemented with a gradually increasing amount of home-grown bulky foods. The antibiotics tested were penicillin given as procaine penicillin, and aureomycin included as 'Aurofac 2A', the proprietary mixture containing also some vitamin B₁₂ made by Lederle Laboratories, Ltd. In most trials vitamin B₁₂ was also added to the penicillin supplements and the antibiotics were tested side by side. The antibiotic content of the diets varied with centres and experiments; with procaine penicillin it was usually at 15 or 43 gm./ton (equivalent to 9 or 27 gm. penicillin) and with aureomycin at 14 and 28 gm./ton.

In all but one centre the pigs were fed according to scales for fattening pigs. The experiments began within a few weeks of weaning and continued to bacon-weight, when the pigs were slaughtered and most of the carcasses were graded by an expert. The diversity of treatments and conditions make it impossible to discuss and consider them in detail; but a clear view of the findings can be obtained from a study of the general conclusions of the report based on experiments with some five hundred pigs.

On the unsupplemented rations with animal protein, the mean daily live-weight gain was 1.17 lb. (standard error \pm 0.013); with penicillin it was 1.29 lb. (S.E. \pm 0.013) and with aureomycin 1.28 lb. (S.E. \pm 0.015). On all-vegetable diets the figures were 1.05 lb. (\pm 0.020), 1.18 lb. (\pm 0.020) and 1.22 lb. (\pm 0.022). Both antibiotics, therefore, improved the growth of fattening pigs by some 10 per cent with the better diet and by 12–16 per cent with the diet containing only vegetable protein.

The antibiotics also improved food conversion; thus 3.72 lb. (\pm 0.038) of the unsupplemented diet was needed to produce 1 lb. of live-weight gain, whereas the same gain required only 3.45 lb. (\pm 0.038) food in the presence of penicillin and 3.49 lb. (\pm 0.041) in the presence of aureomycin.

Trials under the Lehmann system are included in these averages. On their own they also indicated benefit from antibiotics.

In the grading, carcasses of pigs given the antibiotics were indistinguishable from the others, and treatment up to bacon-weight had therefore no effect on carcass quality.

For the trials with suckling pigs, more litters were needed than were available at the research stations. Farmers were therefore invited to co-operate, and thirteen of them, mainly breeders of pedigree pigs in south-west counties of England with a standard of management above the average, took part in the experiment. They either added the antibiotic supplement to their own creep meal, or used proprietary meals with the supplement in them. Two levels of aureomycin and two levels of procaine penicillin were tested. The piglets were weighed at birth and again at weaning. With 208 litters, the following weaning weights corrected to 63 days were obtained: aureomycin, 29 gm./ton, 43.7 lb., 43 gm./ton, 40.5 lb.; procaine penicillin, 7.5 gm./ton, 40.1 lb., 15 gm./ton, 39.3 lb.; control, no antibiotic,

37.7 lb. The results were very variable, probably owing to the wide difference of conditions on the farms. In consequence, the overall differences between treatments were not statistically significant and comparisons between individual treatments are not valid. The figures nevertheless suggest that some improvement in weight at weaning may have been produced by the antibiotics. The smaller dose of aureomycin gave the biggest apparent effect.

Taken as a whole, the results of tests carried out under the aegis of the Agricultural Research Council showed the usefulness of antibiotics in British pig-farming practice. They made it clear, however, that the extent of the benefit is influenced by a variety of factors, including method of feeding, management and health conditions on the farm. Thus the value of antibiotics can only be judged by their average performance in the country as a whole or on many farms, and not by individual effect or lack of effect in any separate trial.

The report emphasizes that many practical important aspects of the use of antibiotics in pig feeding with which the trials could not deal still require investigation. Thus the experiments were not designed to study the effects of adding vitamin B₁₂ with the antibiotic, and the alleged synergistic action of these substances will need to be studied. Nor did the trials extend over successive generations, and the benefit or harm of antibiotics to breeding stock should be given consideration in the future. Further work with suckling pigs is clearly needed, and the distinct possibility of beneficial use of antibiotics with runts must be explored.

Be that as it may, the trials showed that antibiotics have a place in British pig farming, and the findings of the report no doubt influenced the recent official decision about their use.

¹ Stokstad, E. L. R., and Jukes, T. H., *Proc. Soc. Exp. Biol. Med.*, 73, 523 (1950). *Poult. Sci.*, 29, 611 (1950). Jukes, T. H., Stokstad, E. L. R., Taylor, R. R., Cunha, T. J., Edwards, H. M., and Meadows, G. B., *Arch. Biochem.*, 23, 324 (1950).

² cf. Braude, R., Kon, S. K., and Porter, J. W. G., *Nutr. Abstr. Rev.*, 23, 473 (1953).

³ Agricultural Research Council, A.R.C. Report Series No. 13, "Antibiotics in Pig Food". (H.M.S.O., London, 1953.)

BRITISH COUNCIL

ANNUAL REPORT FOR 1952–53

THE nineteenth report of the British Council* covers the year ended March 31, 1953, in which its grant of £2,527,100 from United Kingdom public funds was 8.1 per cent less than during 1951–52. In connexion with the appointment of the Drogheda committee of inquiry into overseas information work, the Government announced that the 1952–53 level of activity would be maintained by the British Council, by the Government information services and by the overseas services of the B.B.C.; thus it is pointless, pending the results of this inquiry, to comment on the withdrawals from Persia and China, on the reduction of activity in Europe, and on the general disposition of the Council's resources as between Europe, the Middle East, Latin America and in the Commonwealth. It is understood that the Drogheda committee has now presented its report, but that the report is not to be published for security reasons. Publication of the findings, however, seems desirable in view of criticism of overseas

* Report on the Work of the British Council for the Year ended 31st March, 1953. Pp. v+105. (London: British Council, 1953.) 2s. 6d.

information work and of Government policy in that field.

In the British Commonwealth, demands made for university interchange again increased: applications increased by 30 per cent, and, of the fifty-five travel grants made by the Council's committee for Commonwealth university interchange, forty-four were for visits to United Kingdom universities and eleven for visits to Commonwealth universities overseas. A new centre was opened in Western Uganda at the request of the Uganda Government, and separate chapters of the report are devoted to the Council's work in Nigeria and in Indonesia. In the former, the centres opened in Lagos, Enugu, Ibadan and Kano are being supplemented very successfully by the inauguration of a score of groups all over Nigeria, and the provision of libraries of British books and periodicals, the training of librarians, and the effort to lay the foundations of a nation-wide library service are important features of the work. In Indonesia, the teaching of English is the main part of the Council's work; but the Council's library is a major asset and the awards of scholarships, bursaries and visitorships are of special value.

A feature of the Council's work during the past four or five years is the success of the 'study box' scheme in providing group leaders and organizations with material for group study. The central feature of the collection of books, pamphlets and teaching aids thus provided is a study booklet, of which fifteen copies are supplied, and more than a thousand such boxes have been supplied to sixty-four different countries. In 1952 the Council undertook and completed a survey of the visits to Britain during 1951 of twelve hundred overseas scientific, engineering and medical graduates for research and advanced study, and of the corresponding visits of British scientists abroad. About 40 per cent of these were concerned with medicine. The Council now has only two scientific officers overseas, in Italy and in Brazil, and the large development of the Council's scientific work in Brazil is attributed partly to the latter officer. Medicine and other sciences accounted for about 29 per cent of visitors to the United Kingdom during 1952-53, for whose programmes the Council had responsibility. Reference is made to the close co-operation between the Council and the Department of Scientific and Industrial Research and other scientific bodies in Britain and to the tribute to the Council's scientific work in Latin America paid in the report of the recent training mission of the Federation of British Industries.

Overseas visitors to Britain for professional study with whose visits the British Council was associated during 1952-53 totalled 3,619, including 417 United Nations Fellows and Scholars and 245 trainees under the Colombo Plan. Of the subjects of study, science accounted for 591, social science 1,097, medicine 481 and education 481. Besides this, the British Council met on arrival 3,097 overseas students, accommodated 548 in its residences, arranged accommodation for 242 in university halls of residence and hostels and for 1,657 in lodgings. Some four thousand students were enrolled as members of British Council centres for social and cultural activities and attended study-visits arranged to factories, museums, etc., while 1,647 attended vacation courses of seven to fifteen days duration. During 1952-53 about one hundred lecture tours overseas were arranged, of which thirty-five were in Europe, eighteen in Dominion countries and twenty in the Colonies;

40 per cent of these tours were concerned with science, engineering, medicine or agriculture.

The report of the British Engineering Mission which visited Latin America for the Federation of British Industries recommended that at least a hundred engineering scholarships a year for the countries of Latin America and a proportionate number for other developing parts of the world, both in the British Commonwealth and elsewhere, should be provided. In a tribute to the work of the British Council in Latin America, the Mission urged that Britain should develop a new and favourable outlook to the training of overseas engineering graduates, accepting increasing numbers for training, planning and co-ordinating proper graduate training courses, and cultivating these carefully selected students socially so that they return to their countries friendly disposed to Britain. In this connexion the British Council's report notes that of 394 British Council scholars and bursars who visited Britain during 1952-53, 193 were concerned with scientific subjects, 77 with medicine and 36 with engineering; of 192 scientific visitors for whom the Council made arrangements, 28 were concerned with engineering, 25 with agriculture and 109 with medicine; of the United Nations Fellows and Colombo Plan trainees, 170 were concerned with medicine, 90 with agriculture and 92 with engineering. Of 161 private students of scientific subjects passing through the Council's hands, 50 were engineers and 83 were concerned with medicine and nursing.

NATIONAL RESEARCH COUNCIL OF CANADA

REPORT FOR 1952-53

THE thirty-sixth annual report of the Canadian National Research Council covers the year ended March 1953* and includes, besides the president's report and the financial statement, the annual report of Canadian Patents and Development, Ltd., for the year ended March 31, 1953. During the year this corporation conducted pilot-plant operations, with promising results, on the Cambren process for ethylene oxide, by catalytic oxidation of ethylene. The corporation continues to handle patent matters arising out of the atomic energy project and also to supervise patents on inventions resulting from development work being carried out by A. V. Roe, Canada, Ltd., on contracts relating to the gas turbine engine and aircraft. It now has agreements for handling patent and licensing matters for five Canadian universities and two Provincial research councils.

The president's report records satisfactory progress during the year in all Divisions of the National Research Council despite slight disruption of work due to rehousing of some laboratories. The post-doctorate fellowship plan, inaugurated in 1948, continues to bring a steady flow of young scientific workers from the universities of the world, and their presence has the stimulating effect of creating a sort of university atmosphere in the Council's laboratories as well as making available a wide diversity of training and experience. More than 275 scholarships and fellowships for research were awarded by the Council in 1952-53; in addition, 75 postdoctorate

* Thirty-sixth Annual Report of the National Research Council of Canada, 1952-53. Pp. 54. (Ottawa: Queen's Printer, 1953.)