

## THE GRASSLAND RESEARCH INSTITUTE

IN the past, grassland has received much less than its due share of attention from the scientist, but some of the extensive work on this subject now being done in Great Britain is summarized in the recently published annual report for 1957-58 of the Grassland Research Institute (Experiments in Progress, No. 11. Pp. 108. Hurley, near Maidenhead: Grassland Research Institute, 1959. 7s. 6d.). Many aspects of the composition, treatment and use of grassland swards are investigated by the nine departments. The Department of Herbage Agronomy is concerned with management, yield and quality of herbage at all seasons of the year, and the emphasis has shifted from comparison of species and varieties to establishment and management of the sward. Continuation of the study of the relationship between white clover and top-dressings of nitrogenous fertilizer has shown that the effect of white clover on gross yield of herbage was equivalent to approximately 9 cwt. per acre of a nitrogenous fertilizer annually on a no-clover sward. The results of experiments with gibberellic acid showed that response to nitrogenous fertilizer at 4 cwt. per acre was greater than response to 2 oz. per acre gibberellic acid. Nitrogen plus gibberellic acid produced an additive effect at first, but in the presence of nitrogen there was a significant depression in yield as a result of gibberellic acid treatment; depression was greatest where the initial response to gibberellic acid was marked.

In the Section of Animal Agronomy, grassland production is measured in terms of the animal. Better live-weight performance per animal was obtained when cocksfoot was grown with lucerne than when lucerne was grown alone. A comparison of two methods of sowing and managing lucerne and cocksfoot indicates that it is possible to extend the grazing season by about four weeks in the autumn by use of nitrogenous fertilizers. The live-weight gain per acre of ewe lambs carried throughout the

year at a stocking rate of 6.1 per acre was, on average, 65 lb. higher on swards containing white clover, although the grass swards received nitrogen to compensate. The comparative influence of leys, variously managed, on the yield of subsequent cereal and kale crops has been investigated by the Department of Ley Agronomy. It is demonstrated that management of ley swards has an appreciable effect on yield of the following crops. This is accounted for largely by the nitrogen status of the soil. The study of the intake and digestibility of herbage is one of the main concerns of the Department of Biochemistry and Animal Nutrition. This involves both feeding experiments and biochemical studies of herbage plants. The former have shown that certain of the major grasses are more digestible than others and the latter that the older methods of fractionation are too arbitrary; modern techniques are likely to give a more reliable assessment of digestibility.

The work of the Department of Plant Physiology is linked with that of Herbage Agronomy in laboratory and field. The detailed growth studies are likely to provide valuable guidance on grazing practice. Experiments in microbiology are connected to soil and herbage studies in other departments, with emphasis on the examination of the processes of decomposition which take place when the ley is ploughed. A small experiment on sterilization of grass by radiation suggests that it may be possible to preserve grass for several months without undue changes in palatability. Extra-mural experiments provide supplementary evidence over a wide variety of environmental conditions. Such experiments are usually done in collaboration with the National Agricultural Advisory Service. The Department of Biometrics provides statistical advice and a computing service for other departments and has commenced its own field-experiments to answer specific questions.

## SCIENTIFIC RESEARCH IN ALBERTA

THE thirty-ninth annual report of the Research Council of Alberta, covering the year 1958, stresses the work on ground water geology and the studies on the Precambrian Shield area of north-east Alberta (Report No. 78. Pp. 66. Edmonton: Research Council of Alberta, 1959). Work was commenced on the delineation of areas with large coal reserves which could be developed by industry as a source of power, and reconnaissance surveys were made of alkali lakes in Alberta and of the mountains west of Nordegg. A laboratory study of till from the Cooking Lake moraine showed that electrical potentials up to 0.5 V. can be generated in soil between individual horizons by natural processes. Soil surveys continued and a study is being made to determine the characteristics of the dominant parent materials of Alberta soils, the composition of the glacial till and the local variations. Further work at Youngstown showed that the productivity of the solonetz soils was limited by the physical condition of the soil, times and timeliness of irrigation being both critical under such soil conditions. The hail reporting net-

work was further extended and valuable results were obtained in spite of an unusually low incidence of hail in the area. The highway research programme was largely concerned with the instrumentation and study of a five-mile portion of the trans-Canada highway west of Calgary, on which test sections of three different types of concrete pavement were laid.

Fundamental studies on coal in the organic chemistry laboratory included an examination of reactions of humic acids, a preliminary survey of the properties of kerogens and other organic substances associated with inorganic sediments, and substantial progress in the separation of the products obtained by oxidizing pyrolysed truxene with nitric acid. The main effort of the physical chemistry laboratory was in studies of the mechanism of thermal decomposition of coal and the control of the decomposition by gaseous and gas-entrained additives; but the effects of ultrasonic irradiation on small molecules were also examined and the viscosity characteristics of solvent extracts from coal and the shape and size