

BRITISH AGRICULTURAL HISTORY SOCIETY

THE British Agricultural History Society held its annual winter conference, in co-operation with the Association of Agriculture, at the Institute of Education, University of London, on December 5, under the chairmanship of its newly elected president, Sir Keith Murray, who was welcomed with acclaim. Sir James Scott Watson retired this year after having been president of the Society since its inception in 1953.

Unfortunately, sudden illness prevented Mr. W. B. Mercer from attending to give his proposed lecture on the "Development of Agricultural Education and Advisory Services". This hiatus in the programme was ably filled by Mr. T. W. Fletcher, of the Department of Agricultural Economics, University of Manchester, with a paper on "Lancashire Livestock Farming in the Great Depression".

Mr. Fletcher, whose views on the farming history, especially of Lancashire, in the past three decades of the nineteenth century are somewhat revolutionary, showed that the livestock farmers of Lancashire did not, in fact, suffer in the depression. On the contrary, their standards of output, purchase of imported concentrates and other feeding stuffs, as well as their incomes, improved. The reasons for this were not far to seek. The local demand, both number of urban mouths and size of urban incomes, was growing. Consequently, the livestock farmers had a market, so to speak, on their doorstep for all the milk, butter, cheese, beef, mutton and pork that they could produce. On the east side of the county, too, there was a large demand from the West Riding industrial district. In such circumstances, it is not surprising to learn that rents were well paid and stable, and that relations between landowners and tenants were amicable.

The afternoon session was opened by Mr. O. R. McGregor, reader in social institutions, University of London, with a paper, "Free Trade in Land in

the Victorian Period". Mr. McGregor argued, in a way that would certainly have pleased Maitland and Vinogradoff, that in any event for the nineteenth century the study of the social institutions surrounding farming was more important than the study of the development of technical changes. With wide reference to contemporary dialectic he emphasized the conflict between the rising class of urban industrialists and of the small number of great landowners (not more than about a thousand) who were striving by all means to retain their dominance of the political scene, and the prestige and patronage, for example, in Army and Church, that derived from it. He emphasized that the landowners, who used every possible device to prevent the break-up of estates—primogeniture, entail and settlements—regarded the land not so much as a rent- or food-producing commodity, but as a possession of social value. This outlook coloured their relation with their tenants, whom they wished to keep in mercy as tenants-at-will, and their attitude towards the increasingly wealthy and pugnacious middle classes who demanded 'free trade in land'. It was significant that so many members of the House of Commons before 1870 were landowners and land agents, not to speak of the House of Lords. This lecture certainly provided a new approach to the problems of farming history in the nineteenth century.

Finally, Miss Edith Whetham, Gilbey lecturer in the history and economics of agriculture, University of Cambridge, discussed "Cambridgeshire Tithe Maps, 1836-1890". She said that the county was backward in 1836 and that the tithe maps therefore gave a fine illustration of the change from open to enclosed fields in many parishes. She did not develop the subject at length, preferring to allow the documents exhibited, and the photostats passed around, to confirm it for her.

G. E. FUSSELL

NATIONAL RESEARCH COUNCIL OF CANADA

STRESS has been laid on a recent report on the support given to postgraduate research in the universities of Canada, for which some 34 million dollars have been provided by the National Research Council of Canada since 1917*. In the current year, 5.9 million dollars were provided for this purpose by way of 681 grants and 435 scholarships, fellowships and associateships, and expenditure is expected to reach 8.2 million dollars in 1959-60. The Council itself employs a scientific research staff of 613 (including 149 postdoctorate Fellows), 883 technicians and 887 general service and administrative staff. Much of the work of the Division of Applied Biology is in the applied field, and its statistical studies of short-term protein variability in cargoes of Northern wheat exported from Vancouver were expanded (in

co-operation with the Grain Research Laboratory Board of Grain Commissioners) to permit accounting for this variability as the resultant of random differences between successive car loads from the same shipping point, of weekly variations in the geographical pattern of car-loads, and of mixing incidental to terminal limeing, handling and loading. A study of the effect of exposure on new-born caribou indicated that caribou calves are quite sensitive to cold and wind, to which they respond by a marked increase in metabolism. Investigations are also in progress on the fundamental properties of the hemicelluloses of common pulping woods, designed to assist pulp-makers in the production and use of semi-chemical pulp, but the report emphasizes that the biological sciences occupy an unfavourable position in the overall Canadian scientific effort.

At the Atlantic Regional Laboratory, Halifax, a chelating chemical as a dip before frying was found to

* Forty-Second Annual Report of the National Research Council of Canada, 1958-59, including the Annual Report of Canadian Patents and Development Limited. Pp. 26. (Ottawa: Queen's Printer, 1959.)

prevent 'greying' in the production of partly pre-cooked French fried potatoes, due to an abnormally high content of iron in the environment, while at the Prairie Regional Laboratory, Saskatoon, gas-liquid chromatography has been used for the quantitative determination of fatty acids in oils and fats, and a new type of foam breaker developed which operates on the principle of rapid acceleration of the foam through a nozzle, using only pressure from air charged into the fomentor. The work of the Division of Applied Chemistry has gradually changed in recent years in an effort to obtain broader information in specific fields so that *ad hoc* problems have received less attention. Much of its work is related to petroleum and corrosion chemistry. In the Division of Pure Chemistry, which is organized in thirteen sections, outstanding achievements of the year were the determination of the total structure of aconitine, the establishment of characteristic zone patterns for each type of functional group, following the determination of the infra-red spectra of many steroids, and the development of the new technique, known as nuclear magnetic resonance, in which the nucleus within a molecule is used as a 'probe' to investigate details of molecular structure.

The Division of Applied Physics has produced a new kind of plotting instrument for making maps from air photographs, and the Division is also investigating the suitability of using for the measurement of time an invariable frequency of vibration emitted by some atom or molecule, and observations over six months have shown promising agreement of the caesium 'clock' with the one at the National Physical Laboratory, Teddington. Much cosmic-ray work was carried out for the International Geophysical Year by the Division of Pure Physics, and

micro-wave technique was used to determine precisely the distances between the atoms in molecules of acetone, propiolic aldehyde, vinyl cyanide, nitric acid, methyl difluorosilane and formamide, while a detailed theory has been developed which appears to be in excellent agreement with experimental data on the multiple scattering of charged particles. The thermoelectric powers of copper and silver, among others, at temperatures much below 1° absolute have been found to be extraordinarily high, higher by orders of magnitude than present-day theory predicted.

In October 1958 the new Fire Research Building was officially opened as the final part of the Building Research Centre, and in its work of keeping the National Building Code of Canada up to date the Division of Building Research has undertaken studies of the actual loads on structures due to floor loadings, wind and snow. In the Division of Mechanical Engineering, emphasis on projects relating to improvements in transport in Canada continued, including harbour improvements, winter navigation by water, rail transport and various aspects of the evolution of new aircraft capable of vertical take-off and landing.

About half the programme of the Radio and Electrical Engineering Division was concerned with defence. Techniques were developed for producing and measuring extremely low pressures in gases, and the Division co-operated with the National Aeronautical Establishment in developing a small radio transmitting beacon which is flung clear from the tail of the aircraft in the event of disaster. In co-operation with the Marine Services Branch of the Department of Transport, electric circuits are being applied to marine navigational devices, often for isolated locations.

DYNAMIC AND STATIC DEFORMATION OF ARMCO IRON

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A RECENT article on the above subject¹ showed that the mechanical properties of Armco iron were slightly lower after a previous amount of dynamic prestrain than after the same amount of static deformation. This finding confirmed the results of Campbell and Duby² but was contrary to those of Harris and White³. The object of the present article is to give further results concerning the effects of variables such as amount of prestrain and temperature of deformation.

The same method of dropping a weight on a specimen 0.75 in. diameter and 1.5 in. long placed on a large solid anvil was used. By varying the height of drop, the velocity of impact and thus the amount of deformation were changed. Other specimens were then deformed statically by the same amounts obtained during dynamic impact. After deformation, the specimens were cut in two longitudinally, with one half hardness tested before ageing and the other after ageing. The results are shown in Fig. 1. The hardness was found to increase with amount of deformation for both static and dynamic deformation and the rate of increase in hardness was about the same for the two methods of prestraining. The

increase in hardness, however, is less for the dynamically than for the statically deformed specimens, for the whole range of deformation used, and this difference is approximately constant for that range of deformations.

After ageing the difference in hardness is again approximately constant for both statically and dynamically deformed specimens. If, on the other hand, one considers the difference in hardness between the aged and unaged condition for both static and dynamic prestrain, it will be seen that this difference increases with higher amounts of deformation. This observation confirms established beliefs that the tensile strength of iron after strain-ageing increases with the amount of static prestrain. It is seen here that the same phenomenon is observed with dynamic prestrain if we assume that tensile strength is proportional to hardness. Hundy⁴ has suggested that this effect could be ascribed to the formation of discrete submicroscopic carbide or nitride precipitates at dislocation junctures.

The fact that hardness and other mechanical properties are lower after dynamic than after static prestrain was corroborated by compression and