

AGRICULTURE AT THE BRITISH ASSOCIATION.

AS might have been expected, the papers read before the Agricultural Section at the Bournemouth meeting had special reference to the abnormal conditions brought about by the war. Most of the members had been engaged either directly or indirectly in food production work, and there was a very marked reduction, as compared with normal years, in the amount of research work reported to the meeting.

[The presidential address appeared in NATURE of December 23, 1919, and need not, therefore, be further considered now.]

Two important papers dealing with the work of "Food Production" were read by Sir Thomas Middleton, formerly of the Food Production Department of the Board of Agriculture and Fisheries, and by Mr. J. M. Caie, an Assistant Secretary of the Board of Agriculture for Scotland, dealing with the methods and results of the food production schemes in England and Scotland respectively.

Sir Thomas Middleton revised the estimates, which he had brought forward at the Manchester meeting, of the number of persons who could be supported on the meat produced on 100 acres of average land under various conditions.

As compared with twelve to fourteen persons who could be supported on the meat produced on 100 acres of average grass land he estimated that:—

	Persons for a year
100 acres average wheat, milled as it was before the war, would support ...	200
100 acres milled (80 per cent.) would support ...	230
100 acres average barley (60 per cent.) would support ...	180
100 acres average oats (54 per cent.) would support ...	160
100 acres average potatoes would support ...	400
100 acres average mangolds would support ...	40
100 acres average meadow hay would support ...	14

Before the war the ploughed land in the United Kingdom was feeding about 84 persons per 100 acres, while the grass land was feeding about 20. Altogether we grew food for about 17,500,000 out of 46,000,000 people, or, in other words, we supplied the week-end requirements of the entire population throughout the year. The Food Production Department was set up in December, 1916, and by April, 1917, plans had been developed for bringing 2,700,000 acres of extra arable land into cultivation in 1918 over the 1916 area; and the agricultural returns for 1918 showed that, as compared with 1916, 1,842,000 additional acres in England and Wales were growing other crops than grass—roughly, two-thirds of the total additional area aimed at. Sir Thomas Middleton paid a high tribute to the assistance given by the scientific staffs of the agricultural departments of the universities and research stations.

As regards Scotland, Mr. J. M. Caie referred to the essential differences in the agricultural conditions of the two countries as exemplified by the following figures relating to 1917:—

Country	Percentage of total cultivated area under	
	Permanent grass Per cent.	Rotation grass Per cent.
Scotland ...	30	31
England ...	58	9

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The increased cropping was therefore to be secured much less by ploughing up old grass land and more by a shortening of the rotations on arable farms than was the case in England.

The increased area aimed at in 1918 was 350,000 acres, and of this 241,000 acres were obtained, or approximately 75 per cent. of the extension aimed at. It is a notable fact that the increased cropping was obtained without any appreciable reduction in the number of horses, cattle, and sheep.

It is believed that a noteworthy feature of the schemes for increased food production for Scotland will be their relatively low cost to the State. No special Food Production Department of the Board was set up; the number of officials attached to the Committees was kept down to a minimum, usually one, or at most two, to each Committee, many of them being officers of the agricultural colleges.

Dr. E. J. Russell read a paper of much interest on "War-time and Post-war Problems of Food Production," in which the author referred to the necessity for devoting renewed attention to drainage and liming in particular, and for providing an adequate amount of organic matter in the soil. He referred to the enormous waste in the preservation of farmyard manure, and to the difficulties of conserving the manure from dairies. The ploughing in of green crops was advocated and an increase in the clover crop, as a means not only of providing more keep, but also of increasing the amount of organic matter in the soil. With reference to manures, Dr. Russell stated that the production of ammonium sulphate had risen to 269,000 tons in 1919. Similarly, the production of superphosphate had risen from 560,000 tons in 1916 to 750,000 tons in 1919, and the amount of basic slag from 321,000 tons in 1916 to 540,000 tons in 1919. The British farmers are probably now using more artificial fertilisers than any other farmers in the world. The change in the composition of basic slag due to the alteration in the methods of manufacture was also dealt with, and the necessity for a complete revision of experimental field work with basic slag was insisted upon.

The possibility of the increased recovery of nitrogen from sewage by means of the "activated" process was also considered.

Amongst the other papers communicated were:—"The Value of Lupins in the Cultivation of Light Land," A. W. Oldershaw; "The Past Neglect and Future Improvement of Livestock in British Husbandry," K. J. J. Mackenzie; "The Electrical Treatment of Seeds," Dr. A. E. Blackburn; "The Composition of Linseed Recovered from Flax Crops," T. W. Fagan; and "The Classification of Cattle Foods," J. Alan Murray.

In the last-named paper Mr. Murray pointed out that the object of the classification should be to bring together in natural groups those foods that are of similar character and quality, irrespective of the concentration and the nutrients in them, and he suggested that the amount of available energy per pound of dry matter should be made the basis of classification. If the foods were arranged in this order the distinction between fresh and dry foods would vanish. No sharp line of demarcation between coarse and fine could be drawn, but the foods could be arranged in groups according to quality, and then might be subdivided according to the amount of digestible protein.

The more important foods in the main natural groups are as follows:—

- (1) Cereal and pulse straws.
- (2) Inferior hays.
- (3) Grasses and clovers in flower, good hays, undecorticated cotton-cake.

(4) Mangels, pasture grass, wheat-bran, brewers' grains.

(5) Swedes, molasses, cabbages, oats, pollards, rape-cake.

(6) Potatoes, barley, sharps, peas, beans, decorticated cotton-cake.

(7) Locust beans, rye, wheat, middlings, cotton-seed, maize-germ cake, palm-nut cake, linseed cake.

(8) Maize, maize meal, gluten meal, gluten feed.

Mr. J. Mackintosh dealt with the outlook in dairying, especially with regard to the return obtained (a) on the sale of milk, (b) on cheese-making. The effect of the control of prices was discussed, and the possible effect of the high prices now allowed for fresh milk on the use of condensed and dried milk imported from other countries where milk is more cheaply produced. Similarly, in connection with the control of cheese, it was pointed out that if the British cheese-maker cannot produce at a much lower price when control is removed, he will have to meet very severe competition, and the outlook cannot be regarded as satisfactory.

A joint meeting was held with Section K (Botany) to discuss forestry problems. Prof. A. Henry, in a paper on "The Afforestation of Water-catchment Areas," advocated the afforestation of all gathering grounds, not only as a hygienic measure, but also as a means of increasing the timber-reserves of the nation.

The enormous extent of these gathering grounds, more than 928,000 acres in extent, has not hitherto been recognised. Of this area 183,416 acres are owned by local authorities, but only in a few cases, e.g. Leeds, Liverpool, Manchester, and Birmingham, has the work of afforesting these gathering grounds been taken up seriously. Prof. Henry urged that all catchment areas still privately owned should be compulsorily acquired either by the corporation or by the State, and that all ground suitable for planting should be utilised.

Mr. R. L. Robertson, of the Forestry Commission, gave an interesting account of the work of his Department, but had little to say as to its future policy—a question on which the audience would have been glad of some information. Other speakers included Sir Daniel Morris, Prof. Somerville, and Mr. Duchesne. Mr. W. E. Hiley read a paper on "Sources of Infection of Forest Trees by Fungi."

The work of the Section concluded with an excursion to Iwerne Minster, by kind invitation of Mr. Ismay, where the home farm and stock were inspected.

ALEX. LAUDER.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE annual oration in connection with the Medical Society of London will be delivered on Monday, May 10, at 9 o'clock, by Sir D'Arcy Power, who will speak on "The Rev. John Ward and Medicine."

THE Irish Geographical Association, which now enters upon its second year in close connection with the Geographical Association in Great Britain, has elected Prof. Grenville A. J. Cole as president for 1920, and Miss F. M. Berry, 15 Lower Leeson Street, Dublin, as hon. secretary.

THE following are among the forthcoming free courses of public lectures at Gresham College:—Physic, by Sir R. Armstrong-Jones (January 20 to 23); Geometry, by W. H. Waststaff (February 3 to 6); and Astronomy, by A. R. Hinks (February 17 to 20). The lecture-hour will be 6 o'clock.

A MEETING of zoologists was held in the rooms of the Linnean Society on Friday, January 9, to consider, among other matters, the teaching of zoology in

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schools and the salaries and remuneration of zoologists in general. Prof. S. J. Hickson presided, and after discussion the following resolutions were passed unanimously:—(1) That this meeting of British zoologists considers that paragraph 10 of the Report of the Investigators of the Secondary School Examinations Council, appointed to inquire into the methods and standards of award in the seven approved First Examinations held in July, 1918, referring to the subjects of natural history and zoology, is likely to discourage the teaching of zoology in secondary schools, and requests the Zoology Organisation Committee to take such steps as may seem desirable to submit to the Board of Education the views of zoologists on the subject. (2) That this meeting deplors the present difficulty in filling vacancies in the scientific staff of the Natural History Museum, and regards it as mainly due to the poor pay and prospects of the members of the staff. It is of the opinion that this, if not remedied, will react adversely not only on the work of the museum, but also on the advance of zoology in this country. It therefore requests the Zoology Organisation Committee to make such representations in the matter as may seem desirable.

UNDER the title *Discovery*, Mr. John Murray has just published the first number of a monthly periodical intended to promote intelligent interest in all branches of intellectual activity and practical achievement. The journal had its origin in a conference held a short time ago at which representatives of many literary, educational, and scientific associations were present. It has the blessing of these associations, and support in the form of suggestions for contributors and subjects of articles. It is to be maintained under a deed of trust, and the trustees, whose names appear on the cover of the magazine, include the presidents of the Royal Society and the British Academy. There is also a committee of management, which will apparently advise the editor, Dr. A. S. Russell, as to the suitability or otherwise of articles submitted or solicited. With such distinguished patronage and competent opinion, *Discovery* should be able to provide interesting fare month by month for the delectation and profit of many thoughtful minds. Prof. R. S. Conway, who has been largely responsible for the inception of the journal, opens the first number with an instructive article on "The Secret of Philæ," particularly with regard to Gallus the prefect and his relations with the poet Virgil. The other articles are on smoke-screens at sea, Dr. T. Slater Price; the modern study of dreams, Prof. T. H. Pear; discovery and education, the Master of Balliol; the Conference at Paris, J. W. Headlam-Morley; sound-ranging in war-time, Dr. A. S. Russell; and Spitsbergen, Dr. Rudmose Brown.

SOCIETIES AND ACADEMIES.

MANCHESTER.

Literary and Philosophical Society (Chemical Section), December 18, 1919.—Mr. H. N. Morris in the chair.—**H. Moore**: Future supplies of motor fuel. The author dealt with the possibility of meeting the future demand by an increased production of petroleum spirit; benzol as a motor fuel; alcohol as a motor fuel; and the advantages of mixed motor fuels, with particular reference to the compression pressures of engines and to the vapour tension of mixed fuels.

Literary and Philosophical Society, January 6.—Prof. F. E. Weiss, deputy chairman, in the chair.—**R. W. James**: The Antarctic: Shackleton's Expedition of 1914-17. A description of the life and scientific work of the expedition and of the explorations round the