

clearly how the lamentable waste of nitrogen involved in present practice may be most effectively reduced. Passing reference may also be made to his further discovery that under certain conditions an actual gain of nitrogen may be secured. The communication by Dr. T. Goodey of an experimental verification of the view advanced by Messrs. Russell and Hutchinson as to the rôle of protozoa in controlling the activities of soil bacteria is also worthy of note, and must have given special satisfaction to the president.

The subject of "Economy in Meat Production" was introduced by Messrs. T. B. Wood and K. J. J. Mackenzie by the contribution of interesting and valuable data as to the food requirements of animals under various conditions of feeding. The differences in the economy of utilisation of fodder for the supply of the different forms of animal produce used for human consumption prove to be most striking. Whereas the good milch cow will yield, in the form of milk, energy equivalent to one calorie for every $5\frac{1}{2}$ calories consumed in the form of fodder, the production of mutton requires practically double, and the production of steer beef nearly three and a half times, the expenditure of energy.

The subject was further discussed from quite different aspects by Prof. D. A. Gilchrist. Experience in the familiar experiments at Cockle Park led him to urge the possibility of securing considerable economies in meat production by reforms in manuring and cropping. On many farms the cost of production of meat and milk could be sensibly lowered by an increased use of basic slag or other phosphates and a reduced expenditure on oil-cakes.

Brief reference only can be made to the further interesting contribution by Mr. Mackenzie on "The Inheritance of Mutton Points," in which a summary of interesting investigations at Cambridge was given.

Much of the land of Great Britain is naturally incapable of yielding high returns to agriculture, and for such the respective claims of agriculture and sylviculture must be duly weighed. In an interesting survey of the past and future of British forestry Prof. Somerville directed attention to the fact that nearly twenty million acres of land in the United Kingdom are used as rough mountain grazing or as deer forests, some $15\frac{1}{2}$ millions being less than 1500 ft. above sea-level. This land, which produces no more than $15\frac{1}{2}$ lb. of meat (chiefly mutton) per acre per annum, would, if rationally afforested, produce a crop of one ton of timber, besides providing employment for ten times the population occupied with pastoral farming. Our forest practice in the past has been seriously defective in many respects. Our woods have been much understocked; there has been little appreciation of specific individual requirements in respect of crowding, and ground game has taken a heavy toll of young trees, or has in other ways been a serious charge on profits. Government action in the past has led to some improvement in education, management, statistics, etc., but has not prevented a marked shrinkage in our wooded area. If a large extension is to be secured, State action will be necessary, and, in the opinion of those who have given most thought to the subject, such extension on a scale commensurate with the nation's requirements can only be attained by purchase.

A further feature of interest in forest economy was dealt with by Mr. S. H. Collins. For some time Mr. Collins, in association with Mr. J. F. Annand, has been examining the possibility of economic utilisation of branch wood and other forest waste by distillation in a portable plant, whereby charcoal, tar, and acetate of lime are obtained as saleable products. Under their guidance members of the Association had an opportunity of seeing the experimental plant in operation in the Crown Woods of Chopwell. Shortage of labour

has hampered the experiment in its preliminary stages, but the results so far obtained promise well for future success. The inspection of the woods under the guidance of Mr. Annand added further to the interest of the excursion.

It is gratifying to note that despite the exceptional difficulties of the times an excellent attendance was obtained throughout the sectional meetings, and adequate discussion thereby secured.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

WITH the desire to encourage the study of Russian, in view of the commercial intercourse between Russia and Hull, Capt. H. Samman has expressed to the Hull Chamber of Commerce his willingness to start an endowment fund for the purpose with a sum of 10,000l.

THE annual meeting of the Mathematical Association will be held on Friday, January 5, 1917, at the London Day Training College, Southampton Row, London, W.C., under the presidency of Prof. A. N. Whitehead. The subjects of papers are:—The school syllabus in geometry, T. P. Nunn; Some of the work of the Teaching Committee, Mr. A. W. Siddons; Technical education and its relation to literature and science, Prof. A. N. Whitehead; An accuracy test set in some public schools, Mr. A. W. Siddons; The place of mathematics in educational reconstruction, Mr. P. Abbott. A joint meeting of the Mathematical and the Geographical Associations will be held on Saturday, January 6, at 10.30 a.m., when Prof. T. P. Nunn will read a paper on "Map Projections." Mr. H. J. Mackinder, M.P., will take the chair.

IN October last an invitation was extended by the Universities of Leeds and Sheffield to the Circle of Scientific, Technical, and Trade Journalists to form a party of journalists to visit these two cities. A similar visit to the Universities of Liverpool and Manchester took place on December 10-13. In the absence, through indisposition, of the Vice-Chancellor of Liverpool University, the party was received by Prof. Gonner, the deputy-chairman of Senate, and Mr. Carey, the registrar. Prof. Herdman gave an address, in which he referred specially to the departments of modern languages and geography, the School of Tropical Medicine, and the researches being undertaken in connection with sea-fishery. These departments, together with those devoted to chemistry, engineering, etc., were visited by the party in the course of the day. The University of Manchester and the Manchester Municipal School of Technology were visited on Tuesday. Sir Henry Miers, Vice-Chancellor of the University, addressed the party, and in the course of the inspection of the laboratories short lectures were delivered by Prof. Harold Dixon on "Explosives" and Sir Ernest Rutherford on "Radium Emanations." At the Municipal School of Technology the work was of a very varied and comprehensive character, including special departments for cotton spinning, printing and paper manufacture, organic chemistry and dyeing, engineering and electrometallurgy. The visitors were entertained by the Lord Mayor of Manchester to luncheon, when an address on the work of the Municipal School of Technology was delivered by Principal Garnett. At a dinner and reception in the evening speeches were made by Sir Henry Miers, several of the professors, and some of the visitors, the hope being expressed that such visits would lead to closer relations between the scientific and technical Press and the universities, and to a more general appreciation among manufacturers of the benefits of scientific research. The proceedings were concluded by a visit to the works of the British Westinghouse Electric and Manufacturing Co., Ltd.