

re-seeding had not been successful, a result which they thought was "entirely due to the prevalence of dry seasons, the germinating plants being killed before they could get hold of the soil." A more successful result is reported by Middleton, who on a poor pasture on clay soil in Essex sowed, in the spring of 1903, 12 lb. per acre of wild white clover seed, with and without basic slag, kainit, and lime, this treatment being unaccompanied by harrowing. There were no Leguminosæ naturally present in the field. Helped by abundant rain in the summer of 1903, the seed germinated well, and "in 1904 the results were very marked." It was, however, only when the seeding had been accompanied by basic slag that "there was the luxuriant growth which one expects in pastures where Leguminosæ are present." I also have reported on an experiment where renovating a thin, poor pasture with 6 lb. per acre of wild white clover seed was entirely successful, and here, too, the beneficial effects were only secured in the presence of basic slag.

When a responsive pasture is treated for the first time with, say, half a ton of basic slag per acre, the effects reach their maximum usually in the third season. From then onwards there is a steady diminution in the yield, though even after nine years from the time of the initial dressing the improvement is far from being exhausted. At Cockle Park, for instance, the plot dressed once with half a ton of slag was, at the end of nine years, producing three times as much mutton as the continuously unmanured ground, while at Sevington and Cransley the yield at the end of nine and eight years respectively was 70 per cent. to 80 per cent. greater. None of the other stations was carried on for so long a period, but up to the end of the sixth year most of them show residual fertility which is as great as the original rental value of the land. That is a very important result, but in the interests of the country it is still more important to endeavour to secure that the level reached at the period of maximum productivity shall be maintained.

From this rapid survey of grass-land experiments the following conclusions may legitimately be drawn:—

(1) That the quality of a pasture is not primarily dependent on its botanical composition, though, as a rule, the presence of white clover and other Leguminosæ is indicative of high feeding value.

(2) That poor pastures, especially on clay soil, can be rapidly and profitably improved by the use of phosphates, especially basic slag.

(3) That, as a rule, phosphates alone are necessary to effect and maintain the improvement, and that, of supplementary substances, potash and lime are occasionally worthy of attention.

(4) That the improvement of poor pasture is very dependent on the presence of Leguminosæ, and especially of white clover.

(5) That renovating with the seed of wild white clover may, in the absence of natural Leguminosæ, be a necessary preliminary or concurrent operation.

(6) That cake can rarely be used at a profit, and that, as an agent in improving poor pasture, it occupies an unsatisfactory position.

(7) That nitrogen, whether in the form of artificial manure or as cake residues, when added to phosphates for pasture, is always unnecessary and frequently detrimental.

(8) That in the case of hay on permanent grass-land, equal weights of produce may have very different feeding values.

(9) That few forms of agricultural expenditure are more certain in their results than the judicious use of manures on grass-land, and that the meat and milk-

producing capacity of the country can be largely and rapidly increased, with great pecuniary gain to the farmer, and still greater economic advantage to the nation.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

**BIRMINGHAM.**—Mr. C. Grant Robertson, tutor in modern history since 1905 to Magdalen College, Oxford, and a stimulating lecturer upon national development, has been appointed to succeed Sir Oliver Lodge as Principal of the University.

**CAMBRIDGE.**—Mr. K. J. J. Mackenzie has been re-appointed reader in agriculture. Other appointments are:—Mr. W. J. Harrison, University lecturer in mathematics; Mr. A. Wood, University lecturer in experimental physics; Mr. A. G. Tansley, University lecturer in botany; and Mr. F. Balfour Browne, University lecturer in zoology.

**DURHAM.**—Members of the University are invited to help in compiling the definitive edition of the Roll of Service and Roll of Honour. The latest date for receiving forms framed to include all details of military service is December 31. The address of the University offices is 38 North Bailey, Durham.

**EDINBURGH.**—The University Court has made the following appointments to three newly instituted chairs:—Dr. G. M. Robertson to the professorship of psychiatry, Dr. J. H. Ashworth to the professorship of zoology, and Mr. T. P. Laird to the professorship of accounting and business method.

The following appointments have also been made:—Dr. F. E. Jardine as lecturer on applied anatomy, and Dr. David Lees as lecturer on venereal diseases.

The Right Hon. Lord Lyell of Kinnordy has presented to the geology department forty-six volumes which had formed part of Sir Charles Lyell's library when he was preparing his "Principles of Geology."

The late Mr. Samuel Elliott, of New York, has bequeathed to the University Court the sum of 1500*l.* to be held in trust by it for the purpose of applying the income in providing scholarships or prizes in connection with the classes of the professors of rhetoric and English literature and of ancient history and palæography, the scholarships or prizes to be known as the James Elliott scholarships or prizes, in memory of the testator's brother, James Elliott, who was a student and graduate of the University.

At the last meeting of the Munitions Committee, South-East of Scotland Area, a sum of 500*l.* was set aside to be expended in providing additional equipment for the engineering laboratory.

**LIVERPOOL.**—Mr. T. E. Peet has been appointed to the Brunner chair of Egyptology, and Dr. J. Share Jones to the chair of veterinary anatomy.

**LONDON.**—Dr. Sydney Russell Wells has been elected Vice-Chancellor in succession to Sir Cooper Perry, who has been appointed to the post of Principal Officer.

Sir Richard Glazebrook has been appointed to the Zaharoff chair of aviation tenable at the Imperial College of Science and Technology, founded by Sir Basil Zaharoff, who gave to the University the sum of 25,000*l.* for this purpose.

Dr. A. P. Newton has been appointed, as from September 1, 1920, the first occupant of the newly established Rhodes chair of Imperial history tenable at King's College.

Prof. W. Bulloch has been appointed, as from January 1, 1920, the first occupant of the newly established Goldsmiths' Company's chair of bac-

teriology tenable at the London Hospital Medical College.

The following doctorates have been conferred:—*D.Sc. in Applied Statistics*: Mr. E. H. Chapman, an internal student, of the Sir John Cass Technical Institute, for a thesis entitled "The Application of Statistical Methods to Meteorological Problems." *D.Sc. in Botany*: Mr. S. C. Harland, an internal student, of King's College, for a thesis entitled "Manurial Experiments with Sea Island Cotton in St. Vincent." *D.Sc. (Engineering)*: Mr. N. A. V. Piercy, an internal student, of East London College, for a thesis entitled "On the Flow in the Rear of Aerofoils."

Dr. Thomas Lewis, of the cardiographic department of University College, has been awarded the William Julius Mickle fellowship, of the value of 200*l.*, in recognition of the important work which he has carried out on the nervous mechanism of the heart.

OXFORD.—Dr. F. W. Keeble, who has been elected to the Sherardian professorship of botany in succession to Prof. S. H. Vines, was formerly professor of botany and dean of the faculty of science at University College, Reading. In 1914 he was appointed Director of the Royal Horticultural Society's gardens at Wisley, and in the following year became concurrently Director of Horticulture in the Food Production Department of the Board of Agriculture. Since last year he has been Assistant Secretary to the Board.

DR. FRITZ PANETH has recently been appointed to a professorship in chemistry at the University of Hamburg, which was founded in the spring of this year. After obtaining his doctorate at the University of Vienna Dr. Paneth proceeded to England, and worked for some time in the laboratories of Prof. Soddy at Glasgow, and of Sir Ernest Rutherford at Manchester. Later he was chemical assistant in the Radium Institute at Vienna, and after the appointment of Prof. Hönlgschmid to a chair of chemistry at the University of Munich in 1917, Dr. Paneth directed the work of the chemistry department of the German Technical High School in Prague.

THE University of Manchester, which before the war was preparing to issue an appeal for funds to enable it to make due provision to meet its expanding needs, has now made, in addition to that of the College of Technology, which requires 150,000*l.* for its much needed extension, an appeal for a sum of 500,000*l.*, towards which 76,000*l.* has been promised, in addition to 10,000*l.* for a chair of colloid chemistry as announced at the public meeting held in the Town Hall on December 9, to meet the urgent demands which, among other claims, the great influx of students in all departments has made upon its resources. There was recently opened a large new building for the faculty of arts (languages, literature, history, and philosophy), which, as a consequence, enables the departments of chemistry, engineering, medicine, and commerce to be accommodated more adequately. But the pressure, especially in respect of students in medicine and chemistry, and the growing need for facilities in economics, sociology, and courses of training for social work, cannot be satisfactorily met in present circumstances. A new system of post-graduate training has been instituted and a new degree therein established, which is certain to retain and attract a large body of well-prepared students to the great advantage of the University and of all concerned. The provision of hostels is an urgent need, together with that of extra-mural teaching in tutorial classes, for which there is a strong demand on the part of working men

and women throughout the area covered by the University. A considerable increase in equipment, and especially in that of the teaching staff, in all departments is a pressing requirement, and altogether, having regard to the supremely and increasingly important place the University takes in the life of the city and district, makes this appeal for a large addition to its financial resources one that should commend itself to the liberal support of the great and wealthy community which it so effectively serves.

A DEPUTATION of members of the governing body of the Imperial College of Science and Technology, introduced by Lord Crewe, and received on December 15 by Mr. Balfour and Mr. Fisher, put forward the request that the college should be empowered to award degrees, either by being constituted a university or by granting its own degrees as a college. At present each of the constituent colleges of the Imperial College grants its own diplomas in the form of associate-ships of the Royal College of Science, the Royal School of Mines, and the City and Guilds' Institute respectively, while the Imperial College itself awards a diploma for a course of advanced work. There is, however, a great difference in the market values of a diploma and a degree, and it is on this account that the movement to make the college a degree-conferring institution has the support of most past and present students. The question of constituting another university in London has already been considered by two Royal Commissions and adversely reported upon, and the demand for the foundation of the new university will need to be strongly supported before it can have the promise of success in the face of these two reports and of the certain opposition of London University. The simplest course, and the one that would arouse least opposition, would be to grant the college the power of conferring degrees. Whichever plan is adopted, it is to be hoped that the position of past students of the constituent colleges will be effectively safeguarded. We assume that, whether the Imperial College grants a degree or a diploma, adequate provision will continue to be made for the study of pure science. It is becoming increasingly difficult to obtain the necessary funds for carrying on scientific research not directly concerned with industry, and the neglect of this part of the work of the college would eventually have a disastrous effect on technical education and industrial progress. A strong case can, no doubt, be made out for several distinct universities in London, and the appeal made on behalf of the Imperial College has been followed by a letter from Profs. W. H. Bragg and E. H. Starling in the *Times* of December 22, in which like claims are made for the freedom of King's College and University College "as regards teaching, research, and the granting of degrees."

## SOCIETIES AND ACADEMIES.

### LONDON.

**Royal Society**, December 11.—Sir J. J. Thomson, president, in the chair.—C. F. U. Meek: A further study of chromosome dimensions. The degree of somatic complexity of an animal cannot be correlated with (a) the lengths of the chromosomes composing its complex; (b) the diameters of the chromosomes composing its complex; (c) the total volume of the chromosomes composing its complex; and (d) the number of the chromosomes composing its complex. There are many different chromosome diameters. The chromosomes composing the spermatogonial complex of an animal are not necessarily identical in