

then a known weight of the food to be tested is added, and the increase in weight again observed. The data thus obtained indicate that so many pounds of starch produce as much increase in live-weight as so many pounds of the food under experiment, from which it is easy to calculate how many pounds of starch are actually required to produce as much increase in live-weight as 100 lb. of the food under experiment. The starch equivalent thus found expresses an experimentally determined fact which is of immediate practical value in arranging a dietary, its value, however, depending on the accuracy with which it has been determined. Kellner and his colleagues have thus determined the starch equivalents of all the commonly used foods. Their values for concentrated foods, and other foods commonly used in Germany, have been determined with considerable accuracy, and with the method which has also been devised for defining the relation between the experimentally determined equivalent and the equivalent calculated from the analysis by means of a formula, they form by far the most reliable basis for arranging a feeding ration including such kinds of foods.

But roots, which form the staple of the diet of fattening animals in Great Britain, are not used on the same scale in Germany, and Kellner's starch equivalents for roots have not been determined with sufficient accuracy or under suitable conditions to warrant their use for arranging diets under our conditions.

This, and the fact that the term starch equivalent is so widely misunderstood, is no doubt the reason why the Kellner equivalent has not been more generally accepted in Great Britain. An advance will be made in the practise of feeding as soon as the starch equivalent of roots has been accurately determined under our conditions,

when the Kellner equivalents will no doubt come into general use.

I have now reached the end of my survey. I recognize that it is very incomplete, and that I have been compelled to neglect whole subjects in which important work has been done. I venture to hope, however, that my words have not been altogether unprofitable. It is somewhat difficult to summarize what is in itself really nothing but a summary. Perhaps, however, I may be allowed to point out once more what appears to me to be the moral of the last twenty years of work in agricultural science.

The many practical field and feeding tests carried out all over the country have demonstrated several very striking results; but, if they are to be continued with profit, more trouble must be taken to insure accuracy. Farmers are ready to listen. It behooves us more than ever to found what we tell them on accurate results.

Besides such practical trials, however, much has been done in the way of individual scientific work. The results thus obtained, as, for instance, Russell and Hutchinson's partial sterilization of soils. Biffen's new wheats, and Beaven's pure Archer barley, are of practical value to the farmer as immediate as the most practical field trial, and of far wider application.

T. B. Wood

THE ROYAL GEOGRAPHICAL SOCIETY

ANNOUNCEMENT has been made of the plans for the new session of the Royal Geographical Society. The first of the ordinary meetings will be held, as usual, in the Theater, Burlington-gardens, on November 10, when Mr. Raymond E. Priestley will give an account of the work and adventures of the northern party of Captain Scott's Antarctic expedition, for the conduct of which, under the most trying circumstances, it will be remembered Lieutenant Victor Campbell was awarded a gold watch by the society. At the next meeting, on Novem-

ber 24, Mrs. Bullock Workman and Dr. Hunter Workman will give an account of their most recent explorations in the eastern Karakoram. An interesting and perplexing subject will be dealt with at the meeting of December 8 by Professor J. W. Gregory, who will endeavor to answer the question, "Is the Earth Drying Up?" At the first meeting in January, 1914, on the 12th, it is probable that Mr. Griffith Taylor will give a paper on the Federal district and capital, Canberra, of the Commonwealth of Australia. Mr. Griffith Taylor was one of the geologists on Captain Scott's expedition, and made a special survey of the Federal district on behalf of the Australian government. It is also expected that either at one of the evening meetings or at an afternoon meeting Mr. Taylor will deal with the geographical aspects of two sub-expeditions in the Antarctic. At an early meeting in the New Year it is hoped that Dr. Hamilton Rice will give an account of his interesting journeys in the Upper Amazon basin, about which some information was published in a recent number of *The Times*. Other subjects which may be dealt with at subsequent meetings will be "An Expedition to Dutch New Guinea," by A. F. R. Wollaston; "Famous Maps in the British Museum," by J. A. J. de Villiers; "The Anglo-German Boundary Survey in West Africa," by Captain W. P. Nugent, R.A.; "The Gulf Stream," by Commander Campbell Hepworth, C.B.; "Journey through Arabia," by Captain G. E. Leachman; "The Red Sea and the Jordan," by Sir William Willcocks; "Fresh Discoveries in the Eket District of Southern Nigeria," by Mr. P. A. Talbot; "The Atlantic Ocean," by Professor Edward Hull, F.R.S., and "The Panama Canal," by Dr. Vaughan Cornish. The afternoon meetings are held in the map room of the society at 5 p.m., and are devoted mainly to the discussion of questions of a more scientific character than the subjects which occupy the evening meetings. The first of these will take place on November 20, when it is expected that Captain H. G. Lyons, F.R.S., will deal with the subject of "Relief in Cartography." At subsequent meetings Dr. A. Strahan, F.R.S., will

give his final report on the river investigation, which has been carried on under the society for some years past. Other subjects will be "Recent Geodetic Work," by Captain E. O. Henrici, R.E.; "The Rainfall of the World," by Professor A. J. Herbertson; "Some Central Asian Problems," by Mr. Douglas Carruthers; "Results of a Recent Journey in Turkestan and Siberia," by Dr. Mackintosh Bell; "Researches in the Natron Lake Region, East Africa," by Mr. John Parkinson, and "The Agricultural Geography of New Zealand," by Mr. F. N. Roxby. There will be two Christmas lectures to young people early in January, one on "Glaciers," by Mr. Alan G. Ogilvie, and the other on "Earthquakes and Upheavals," by Mr. Carus-Wilson. The anniversary meeting and dinner will take place on May 25.

SCIENTIFIC NOTES AND NEWS

THE autumn meeting of the National Academy of Sciences will be held at the Johns Hopkins University, Baltimore, on November 18 and 19.

PROFESSOR FELIX KLEIN, of Göttingen, has been presented by his former pupils with a portrait of himself, painted by Max Liebermann. It will be placed in the mathematical institute of the university as soon as the building is completed.

MR. ROOSEVELT is on his way to South America in response to invitations from Argentina, Brazil and Chile, to deliver addresses on subjects of international social interest. After the delivery of the addresses, Mr. Roosevelt will head a scientific expedition into the tropical interior of South America. This expedition is organized by the American Museum of Natural History, and two naturalists of that museum, Mr. George K. Cherry and Mr. Leo Miller, will accompany Mr. Roosevelt, while the Arctic explorer Mr. Anthony Fiala will have charge of the equipment and route.

SIR DAVID BRUCE will leave England on November 1 for the purpose of concluding his sleeping sickness investigations in Central Africa. He will be accompanied by Lady