

Dr. Laing's investigations also point to the significance of aeration conditions in the soil and manurial treatment in determining whether fungus and root system shall enter into the characteristic mycorrhizal relation. The conditions favouring mycorrhizal infection of the roots also favour vigorous growth of the young tree, so that it remains difficult to assess the significance of the fungus partner in the development of the tree.

A progress report upon investigations into the same problem was presented to Section K (Botany) of the British Association at the York meeting by a committee, of which Dr. M. C. Rayner acted as secretary and Mr. F. T. Brooks as chairman. The work initiated under this committee is now being continued with the aid of a grant from the Forestry Commission, and the results of this work will doubtless be published more fully by Dr. Rayner in due course.

In the report it is stated that soil inoculation experiments have now provided convincing evidence of a direct relation between mycorrhiza formation and satisfactory seedling growth in the case of three species of pines, Scots pine, Corsican pine and maritime pine. From the practical side, the work of the committee has been devoted largely to an examination of the effect of the addition of humus to the nursery beds of tree seedlings, with the view of improving root development and mycorrhizal infection.

### University and Educational Intelligence

CAMBRIDGE.—The Sir William Dunn readership in biochemistry has become vacant by the resignation of Prof. J. B. S. Haldane. Candidates for the readership, the stipend of which is £600 a year, are requested to communicate with the Vice-Chancellor on or before February 18.

EDINBURGH.—The Cameron prize for advance in knowledge in practical therapeutics for 1933 has been awarded to Dr. George F. Dick and Dr. Gladys H. Dick, of the John M'Cormick Institute for Infectious Diseases, Chicago, jointly, in recognition of their work on the etiology and treatment of scarlatina.

LONDON.—Prof. L. N. G. Filon, Goldsmid professor of applied mathematics and mechanics in the University (University College), has been elected Vice-Chancellor for the remainder of the year 1932-33 in succession to the late Mr. J. L. S. Hatton.

The title of reader in experimental physiology in the University has been conferred on Mr. H. P. Gilding, in respect of the post held by him at University College.

Mr. Frank Arnold Greene has been appointed a fellow of King's College. Mr. Greene was a student in the faculty of engineering from 1891 until 1894; he is treasurer of the Institution of Chemical Engineers, and a member of the College Chemical Engineering Committee.

In the eighth annual report to the Court of Governors of the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, various changes in the personnel of the Court and of the Board of Management are recorded. Sir Austen Chamberlain becomes chairman of the Court in succession to Sir Holburt Waring, who becomes honorary treasurer

to the Board of Management. The minimum annual expenditure to which the School is committed is £60,000, towards which there is a reasonably assured income of £50,000, leaving a deficit of £10,000 to be met by subscriptions and donations. A grant of 25,000 dollars for 1932 was received from the Rockefeller Trustees. In the report by the Dean, Prof. W. W. Jameson, on the year's work of the School, the teaching and research activities are surveyed, examination results are recorded, and a list of papers published by members of the staff is appended. It is announced that the Prudential Assurance Company has endowed for a term of seven years the chair of public health, which will henceforth be known as the "Prudential Chair of Public Health". A syllabus containing full particulars of the post-graduate instruction in preventive medicine given at the School is issued and may be obtained on application to the Dean.

### Calendar of Nature Topics

#### The First 'Buchan Cold-Spell'

February 7-14.—In 1869 the late Dr. A. Buchan, from an analysis of observations of temperature in Scotland, concluded that "there are certain periods more or less well-defined, when the temperature, instead of rising, remains stationary or retrogrades; instead of falling, stops in its downward course, or even rises; and at other times falls or rises respectively for a few days at a more accelerated speed than usual". Buchan attributed these variations to the alternations of cold and warm air currents, but several other more or less fanciful explanations have been put forward by different authors, all of whom took the reality of the 'spells' for granted. A recent investigation has shown, however, that in London since 1870 there has been no definite tendency for temperature to be abnormally low on the dates of Buchan's cold spells, the period February 7-14, for example, having been warm as often as it was cold.

#### Fish Culture

"Feb. 9th, 1863.—Eggs of first lot of Rhine salmon hatched out in my bath." (Buckland, Diary.) The middle of last century saw a great revival in European countries of the ancient art of pisciculture. The work of Coste and the establishment by the French Government in 1848 of a hatchery at Huingue near the Rhine and Rhône Canal led to a widespread interest in salmon and trout rearing. In 1853, Dr. Garlick of Ohio first bred fish artificially in the United States, and in the same year the well-known Stormontfield establishment on the Tay came into being. In England, Buckland, later H.M. Inspector of Fisheries, took up the idea with great enthusiasm. During the past eighty years, fish culture has developed commercially on a very large scale especially in America.

#### Partridge Disease

The partridge season which has just closed will be memorable for the prevalence and the investigation of partridge disease. Beginning noticeably in the autumn of 1930 the disease spread widely and caused heavy mortality. Examples of its incidence in 1931 on various estates are—in Hampshire of a

stock of young and old birds numbering 3,000, 2,000 perished, in Norfolk 4,200 perished out of 5,000, in Suffolk 2,600 out of 3,467, in Derbyshire 2,200 out of 2,500, in Nottinghamshire 10,100 out of 12,000. *Country Life* appointed a committee under the chairmanship of Major M. R. Portal to investigate the disease and the findings have recently been published under the editorship of Major Portal and Dr. W. E. Collinge. While partridges have several internal parasites, the cause of the widespread disease is a nematode worm, *Trichostrongylus tenuis*, a near relative of the agent of grouse disease, *T. pergracilis*. Like the latter, the partridge strongyle lives in the caeca, causing blockage and the production of septic conditions. Exceptionally, as many as 12,226 and 10,500 individuals have been found in single birds, but a count of 1,000 to 2,000 marks a more usual infestation. In the caeca the worms pair and after the eggs are laid they pass out with the faeces and develop into larvæ which make their way up the damp stems of grasses, clovers and such like. With vegetable matter they are swallowed by the partridges and the cycle begins again in the bird's intestine. The Committee has reached the conclusion that predisposing causes of the spread of the disease were interbreeding, the carrying of large winter stocks, an insufficiency of food, and peculiarly unfavourable meteorological conditions.

#### Fluctuations of Partridge Numbers

It is notorious that the numbers of partridges on an estate may show great changes from year to year, and periods of great plenty and of great scarcity seem to follow each other in cycles. In the game book of one of the great landowners in Britain, ignoring the years before partridge driving began (about 1845), there are enormous swings of the partridge pendulum: in 1864, 634 birds were shot, the numbers rose to a peak in 1870 with 3,741, but by 1879 they had fallen, gradually, to 359; another steady rise, and in 1887, 5,360 were shot and in 1896, 5,478. Such totals have not since been reached on these estates and later figures suggest a tendency for the annual bag to become smaller. The complicated factors of weather, food, natural enemies and disease, which influence the numbers from year to year, have not yet been resolved, but there can be little doubt that the modern trends of agriculture and transport are likely to make permanent inroads upon the partridge population. The partridge is a bird of cultivated land, and the intensive cultivation which ploughs a field to its very borders and replaces hedgerows by fences, has destroyed the rough herbage which was a favoured nesting site. Extensive turning of crop land into pasture has removed a source of food, as well as protective cover for the nests and young, and grass conceals the fine grit essential for the grinding of food, which the plough laid bare. New forms of road surface have done away with another source of grit, and have banished favourite dust baths, also reduced by the grass lands. The cleaning up of the roadsides and the removal of hedges have removed former nesting places, and the fast traffic of the roads is directly responsible for a certain amount of mortality. In face of such adverse factors, it would be surprising if the stock of partridges were not to decline, unless steps are taken to minimise their influence. This is a very simple illustration of the way in which the native fauna of the country may be undergoing modification.

## Societies and Academies

### LONDON

Royal Society, Jan. 26. J. Z. YOUNG: Comparative studies on the physiology of the iris. (1) Sclerotics (second paper)—*Uranoscopus* and *Lophius*. The sphincter iridis muscle of *Scyllium*, *Mustelus* and *Trygon* contracts in direct response to illumination and is not under nervous control. The iris of *Lophius piscatorius* and also that of *Uranoscopus* is capable of rapid movements under nervous control, the oculomotor dilating and the sympathetic constricting the pupil. S. G. PAINE, F. L. LINGOOD, FRED SCHIMMER and T. C. THRUPP: The relationship of micro-organisms to the decay of stone. Three groups of bacteria have been distinguished. In the first group are included common organisms of air, soil, and water. These organisms are capable of living on a variety of food materials, and in their metabolism acid substances are formed as waste products; these acids, even when the food supply is merely the small amount of organic matter present in rain water, can dislodge carbon dioxide from its combination with calcium in the stone. In the second group some confirmation is to be found of the view of Marsh that nitrifying bacteria can be responsible for stone decay. In the third group are the sulphur-oxidising organisms which have been found closely associated with white incrustations of sodium and calcium sulphate on the surface of decaying stones. W. J. ELFORD: The principles of ultra-filtration as applied to biological problems. The several factors concerned in the general process of filtration have been investigated, using typical disperse systems—colloidal dyes, metal sols, protein solutions and suspensions of bacteria and viruses. The relationship between the size of retained particles and the estimated pore sizes of membranes is also discussed. The fact that, for colloidal dispersed systems, the pore-size of the limiting membrane is definitely greater than the size of the retained particle, even under optimum filtration conditions, is in accordance with theoretical expectations. The particle sizes of suspensions, estimated from filtration experiments with carefully graded collodion membranes, agree well with the values obtained by other methods. The method of analysis adopted has proved of great value in virus studies.

### PARIS

Academy of Sciences, Dec. 19 (195, 1185-1335). MARCEL BRILLOUIN: Multipolar spherical non-antipodal functions. Recurrences. L. CAYEUX: The existence of a phosphate containing spicules of Calcsponges in the Ordovician of Wales. MARIN MOLLIARD: Experiments permitting an explanation of the attenuation of the chlorophyll shown by parasitic green plants. Results of experiments comparing the growth of the radish in a medium of carrot decoction and in Knop's fluid containing saccharose. About ten times as much chlorophyll appeared in the leaves of the plants grown in the latter medium as in leaves from plants grown in the carrot decoction. L. BLARINGHEM: A case of atavism which appeared in a strain of the opium poppy. One example, in 5,000 strictly isolated individuals, of reversion to a type known three centuries ago, showed a change to white petals bordered with red. CHARLES ACHARD and AUGUSTUS BOUTARIC: Some physico-chemical researches on suspensions prepared starting with