

AN anonymous donor has given 500*l.* to the South-Eastern Agricultural College, Wye, for the extension of the research department, and the Development Commission is recommending a grant of 6000*l.* for the completion of the new college buildings. The governors have decided upon the erection of the buildings at the Fruit Research Station at Malling, the land for which (twenty-two acres) has been purchased by the Kent County Council.

THE following benefactions, among others, we learn from *The Times*, have been left to the British Academy by the late Miss Henriette Hertz:—2000*l.* for an annual lecture, investigation, or paper on a philosophical problem, or some problem in the philosophy of Western or Eastern civilisation in ancient and modern times bearing on the phenomena of life in relation to eternity; 1000*l.* for an annual public lecture on some master mind, considered individually with reference to his life and work, specially in order to appraise the essential elements of his genius, the subjects to be chosen from the great philosophers, artists, poets, musicians; and 1000*l.*, the income of which is to be used to promote the publication of some philosophical work or to reward some meritorious publication in the department of philosophy. Miss Hertz also left the sum of 1500*l.* to Girton College, the income to be used for the endowment of archaeological research.

THE Board of Agriculture and Fisheries has awarded research scholarships in agricultural science of the annual value of 150*l.*, tenable for three years, to the following candidates, viz.:—E. W. Barton (Wales), economics of agriculture; W. Brown (Edinburgh), plant pathology; Miss E. C. V. Cornish (Bristol), dairying; F. L. Engledow (London), genetics; E. J. Holmyard (Cambridge), plant nutrition and soil problems; R. C. Knight (London and Bristol), plant physiology; F. J. Meggitt (Birmingham), agricultural zoology; H. Raistrick (Leeds), animal nutrition; G. O. Sherrard (Dublin), genetics; T. Trought (Cambridge), genetics; G. Williams (Wales), animal nutrition; S. P. Wiltshire (Bristol), plant pathology. The Board has also awarded Miss T. Redman (London), a scholarship in dairying, tenable for two and a half years, to fill a vacancy caused by the resignation of a former scholar. The scholarships have been established in connection with the scheme for the promotion of scientific research in agriculture, for the purposes of which the Treasury has sanctioned a grant to the Board from the Development Fund; they are designed to provide for the training of promising students under suitable supervision with a view to enable them to contribute to the development of agricultural science.

THE May issue for this year of the *Johns Hopkins University Circular* takes the form of the University Register for 1912-13. The volume contains an interesting historical introduction, which points out that the Johns Hopkins University was founded by a merchant of Baltimore, Johns Hopkins, who bequeathed the greater part of his estate for the establishment of a university and a hospital. The University was incorporated on August 24, 1867. Instruction began in 1876, in which year President D. C. Gilman, from the University of California, was appointed first president, and remained in office for twenty-five years, being succeeded in 1901 by President Remsen, who resigned last year. The original endowment of the University amounted to somewhat more than 600,000*l.* This has been supplemented by several gifts, including the Endowment Fund of 1902 (200,000*l.*), the John W. McCoy Fund (100,000*l.*), and the Garrett Fund of 60,000*l.*, in addition to many

other large sums. The income-bearing funds have a book value of more than 1,000,000*l.*, and the real estate and buildings, books, scientific apparatus, and general equipment are valued at more than 450,000*l.* The assets of the University have thus a total value of a million and a half sterling. By Act of the Legislature of Maryland, at its session of 1912, the sum of 120,000*l.* was granted for the purpose of constructing and equipping buildings for a school of technology as a department of the University, with an annual appropriation of 10,000*l.* for maintenance.

THE Government's education policy was outlined by Mr. J. A. Pease, President of the Board of Education, in introducing in the House of Commons on Tuesday a "Bill to amend the law in respect to grants in aid of building, enlarging, improving, or fitting up elementary schools." In the course of his remarks, Mr. Pease said that the defects of our so-called national system of education are two—it is not national and it is not a system. The age at which compulsory attendance at school ceases under the existing law is too early; and to allow children to leave school at the age of from twelve to fourteen years, and leave them to forget what they have learned, is to neglect national responsibility. One main purpose of the Government is to organise intermediate education—that is, all classes of education from the elementary school and the university—by extending the powers and duties and adding to the resources of local education authorities. Further duties of these authorities must be accompanied by further and substantial assistance from the State. Out of 29,834,000*l.* spent on education in 1911-12, 14,186,000*l.* was obtained from the rates and 13,648,000*l.* from Exchequer grants. The increase in expenditure since 1905-6 has been 3,500,000*l.* drawn from the rates and 1,000,000*l.* from grants, or out of every additional 9*l.* required in the last six years 7*l.* had been found by the ratepayers and 2*l.* by the taxpayer. The demand which the ratepayer has for further relief for the taxpayer must, therefore, be admitted. As regards higher education, there will be no interference with the independence of the universities or with the government of training and technical colleges. The principles of the proposed legislation will be the arbitrary provision of intermediate education for all who desire it, placing it within the reach of all classes, and the coordination of such provision between authorities to prevent overlapping. Local authorities will have the duty imposed upon them of affording children during the latter years of elementary-school life opportunities of obtaining such instruction of a more advanced character than that given in the ordinary public elementary schools as may be thought suitable to the circumstances of the children. For this purpose the limit imposed by the Act of 1902 on the amount that might be raised by way of rates for the purposes of higher education will be removed. To give effect to the proposals of the Government, will require a large and substantial addition to the sum at its disposal, which will rise progressively from the first, second, third, and subsequent years. The forecast, of which no details can yet be given, includes provision for the universities, provision for the reconstitution of London University, and provision for the maintenance of increased secondary and technical schools.

SOCIETIES AND ACADEMIES.

DUBLIN.

Royal Irish Academy, June 23.—Dr. F. A. Tarleton in the chair.—H. Ryan and Rev. J. M. Dunlea: Unsaturated diketones. I. By the condensation of

cinnamic ester with acetone, acetophenone, methyl-ethyl-ketone, and isopropyl-methyl-ketone, the unsaturated β -diketones, cinnamoyl-acetyl-methane, cinnamoyl-benzoyl-methane, cinnamoyl-propionyl-methane, and cinnamoyl-isobutyryl-methane were synthesised, and their structural properties examined.—**H. Ryan and J. Algar**: Unsaturated diketones. II. Although benzylidene-acetone does not condense to a β -diketone with benzoic ester in the presence of sodium it reacts readily with dimethyl oxalate. Similarly anisylidene-acetone condenses to a β -diketone with dimethyl oxalate. The diketones formed isoxazols with hydroxylamine hydrochloride, and behaved as weak mordant dyes.—**G. H. Carpenter**: Aptera, in connection with the Clare Island Survey. Eighteen species of Collembola and two of Thysanura are recorded from Clare Island, and the apterygotan fauna is found to present, on the whole, an Arctic and American facies. One of the commonest insects on the island and neighbouring mainland is *Petrobium maritimus*, Leach. Some details of the external anatomy of this species are given, and it is shown that the Dutch shore-haunting bristle-tail described by Oudemans, and called *Machilis maritima*, is entirely distinct from the British and Irish insect named by Leach.—**W. M. Tattersall**: Amphipoda, in connection with the Clare Island Survey. The number of species recorded in this paper from the Clare Island marine area is ninety-five. No new species are described, but nineteen species are added to the Irish list for the first time, and fifty-four species are new to the area under review. The Amphipoda of Clare Island include thirty-three Arctic species and sixty-two non-Arctic. Of the former, fourteen extend to the Mediterranean and twelve to the coasts of America. Of the non-Arctic forms, twenty-five are found in the Mediterranean, a further twenty-one are confined to the Atlantic coasts of Europe from Norway to France. Six species are common to the British area and the Mediterranean, but do not extend to Norway. A further ten species are confined to the waters of the British area and neighbourhood, and are unknown from both Norway and the Mediterranean.—**R. Southern**: Nemertinea, in connection with the Clare Island Survey. The total number of species found in the Clare Island area was thirty-one. Of these, two species, *Lineus acutifrons* and *Prostoma beaumonti*, were described as new. *Tubulanus banyulensis*, Joubin, was added to the British fauna, and seven other species were obtained which had not previously been recorded from Ireland. The Nemertean fauna as a whole closely resembles that found in the south-west of England.

Royal Dublin Society, June 24.—**Prof. H. H. Dixon**, F.R.S., in the chair.—**Miss M. C. Knowles**: Maritime and marine lichens of Howth (Dublin Bay). Altogether 180 species are recorded from the Howth coasts in this paper, of which three are now described for the first time, and twenty-three are new to Ireland. An attempt has been made to give an account of the lichen vegetation from an ecological as well as from a systematic point of view, and the various species are described as growing in the following succession of belts from the top of the cliffs to low-water mark:—(1) The Ramalina belt; (2) the belt of orange lichens; (3) the Lichina vegetation; (4) the *Verrucaria maura* belt; (5) the belt of marine Verrucarias. The composition of each belt is given in detail.—**Prof. G. H. Carpenter**: Injurious insects and other animals observed in Ireland during the year 1912. The very hot, dry summer of 1911 led to an excessive abundance of insects in the spring of 1912, from the depredations of which orchards and fruit-trees suffered heavily. "Greenfly" on apple-

trees were especially abundant, and two distinct kinds of Aphis occurred in many parts of Ireland. Referring to the "woolly aphid," or "American blight," attention was directed to a new mode of wintering for the insects—inside the cores of apples, several of which, imported from America and sold in Dublin, were found to be infected in this way. Introduction of the pest into fresh localities might thus be brought about.—**W. R. G. Atkins**: Oxydases and their inhibitors in plant tissues. The distribution of oxydases seems to point to their being concerned in the production of cork and sclerenchyma. The guard cells of stomata and the cells abutting on them are particularly rich in "epidermal" oxydase, while the abutting cells may also contain the bundle oxydase of Keeble and Armstrong. The leaf-saps of *Iris germanica* and *Aspidium Filix-mas* contain powerful reducing substances which inhibit oxydase reactions. Precipitation of the enzymes by alcohol or removal of the reducing substance by dialysis permits of the detection of oxydase. The colours of the perianth of *Iris* are due to the presence of a yellow plastid pigment or of a purple anthocyan chromogen which arises by the action of the epidermal peroxydase on a chromogen. The reducing substance may inhibit colour production.—**Dr. W. E. Adency**: The "streaming" of dissolved atmospheric gases in water. Part i. In this communication there are given the results of an experimental investigation of the rates at which atmospheric nitrogen and oxygen are dissolved by the exposed surfaces of quiescent columns of de-aerated fresh- and sea-water, and the rates at which the dissolved gases are transmitted downwards through the columns under the conditions: (1) when evaporation can freely take place from the exposed surfaces of the columns, and (2) when it cannot, the columns of water being maintained at a uniform temperature. The determinations have been made for temperatures varying between 8° and 20° C. Descriptions of special apparatus for the rapid extraction of the dissolved gases from water, and for their analysis, are also given.

EDINBURGH.

Royal Society, June 2.—**Sir William Turner**, K.C.B., president, in the chair.—**Sir William Turner**: Contributions to the craniology of the people of the Empire of India. Part iv. The author described and compared a number of skulls from the Bhils, frontier tribes of Burma and Pakkoku, South Shan tribes, and Tibetans.—**Dr. J. H. Harvey Pirie**: Scottish National Antarctic Expedition, glaciation of the South Orkneys. This was a full account of a careful survey made by Dr. Pirie when wintering at the South Orkneys. These glaciers are either of the "ice-foot" or of the "Spitsbergen" type, according to Nordenskjöld's classification. Their movement and erosive powers are very slight, and they are at present much less extensive than at former times.

June 16.—**Dr. B. N. Peach**, vice-president, in the chair.—**Dr. J. G. Gray**: New models of gyrostats. When large rotational speeds are employed, the fly-wheels must be perfectly balanced. Some of those exhibited could be run up to 30,000 revolutions per minute. The largest size, when spun at 15,000 revolutions per minute, continued to revolve for forty-five minutes. Among the many curious devices shown was the model of a motor-car running on two wheels placed in tandem. The car was stable, both when at rest or when in motion. When in motion the car derived its stability from the propelling system. The gyrostat detected any tendency to tilt over and immediately applied to, and obtained from, the propelling system just the forces required to correct the tendency. This force disappeared precisely when its existence

was no longer needed, so that the contrivance was entirely free from gyrostatic oscillations. The model was shown moving slowly about the room under the direction of an electromagnetic driver seated on the car and controlled by a switch on the lecture table. The driver could also be operated by wireless transmission.

July 7.—Dr. J. Horne, vice-president, in the chair.—S. D. **Carothers**: Plane strain in a wedge with application to masonry dams. The equations of equilibrium for plane strain were applied to a sector of an infinite right cylinder bounded by two planes through the axis, when the plane faces were subject to various conditions of pressure, which was either constant or varying as the distance from the axis. The several appropriate solutions were combined with the solution appropriate to the case in which the body forces were considered so as to obtain a solution applicable to the case of a masonry dam. The displacements were worked out for one case.—Prof. J. Stanley **Gardiner**: The corals of the Scottish National Antarctic Expedition. Five species were described, of which one, referred to genus *Madracis*, was new. It was dredged off the Abrolhos Bank.—Dr. W. M. **Tattersall**: The Schizopoda, Stomatopoda, and non-Antarctic Isopoda of the Scottish National Antarctic Expedition. Of Schizopoda twenty-four species were recorded, including one new species of *Boreomysis*. The Stomatopoda were represented by one species of *Squilla* and three larval forms of *Lysiosquilla*; and of the eighteen species of Isopoda recorded, three were new, two of *Exosphæroma*, and one of *Antarcturus*.—Dr. J. H. **Ashworth**: Some pseudo-hermaphrodite examples of *Daphnia pulex*. The specimens were undoubtedly females, but in each the antennule of one side resembled that of a male, and in one case also one of the valves of the carapace had a configuration similar to that of a male. In all other features, both external and internal, the specimens exhibited female characters. The offspring of two of the specimens were available for examination, and proved to be entirely normal—that is, the structural peculiarities of the antennule were not transmitted.

PARIS.

Academy of Sciences, July 15.—M. F. Guyon in the chair.—J. **Boussinesq**: The theory of Savart's retractile liquid sheets.—Armand **Gautier** and P. **Clausmann**: Fluorine in the animal organism, brain, glands, muscles, blood, milk, excretions. Fluorine exists in all animal organs and tissues, but in very varying proportions. Excluding organs not completely formed in very young animals, and the excretions, there is a relation between the amounts of fluorine and phosphorus present; the two increase together without being proportional. The dental enamel has the highest proportion of fluorine, 180 to 118 milligrams in 100 grams of dry material; muscle has the smallest amount, 0.6 to 0.15 milligram in 100 grams of dry material. In man about 1 milligram of fluorine is excreted per day, and as the fluorine taken with the food is considerably greater than this figure, the difference represents epithelial desquamation, hair and nails, &c.—H. **Block**: The energy of nebulae and Carnot's principle. A discussion of the theory of Arrhenius and an extension of some recent calculations on this subject by Schwarzschild.—Kr. **Birkeland**: The general magnetism of the sun.—M. **Robinson**: Systems of partial differential equations.—Th. **Anghelutza**: A generalisation of Riemann's summation.—M. **Ariès**: Remarks on a form of the velocity of propagation of sound in a homogeneous fluid.—Thadée **Peczalski**: New forms of the characteristic equations

of gases.—Marcel **Boll**: The influence of the wavelength on the velocity of a photochemical reaction. A formula is given, based on experimental results, expressing the velocity of a reaction as a function of the thickness of the layer, concentration, coefficient of absorption, power and frequency of the incident radiation. The wave frequency acts in a manner analogous with temperature in ordinary chemical reactions.—M. **Blanchetière**: Oxidation and luminescence. A large number of substances have been examined for the production of luminescence on oxidation. The phenomenon was marked with lophine, amarine, hydrobenzamide, extracts of meat, urine, tea. The question as to the exact nature of the organic complex the oxidation of which results in luminescence was not solved.—S. **Wologdine**: The heats of formation of some silicates of iron and manganese.—Paul **Braesco**: The baking of clays.—Victor **Henri** and René **Wurmser**: The action of ultra-violet rays on solutions of hydrogen peroxide. The velocity of decomposition of hydrogen peroxide in monochromatic light is proportional to the concentration, to the incident energy, and to the energy absorbed. Einstein's law of photochemical equivalence does not apply to this reaction. The energy which is absorbed by the decomposition of a gram-molecule of hydrogen peroxide is sensibly equal to the energy evolved by the decomposition of the same quantity in the dark.—Daniel **Berthelot** and Henry **Gaudechon**: Addition reactions between carbon monoxide and other gases under the influence of the ultra-violet rays. Carbon monoxide, under the action of ultra-violet light, combines with chlorine, oxygen, water, ammonia, but not with bromine, iodine, sulphur, sulphuretted hydrogen, phosphine, arsine.—Léo **Vignon**: The formation of methane by catalysis, starting with carbon monoxide and water vapour. Details of experiments with iron, nickel, copper, and their oxides, silica, alumina, and magnesia, as catalysers at temperatures ranging from 300° C. to 1250° C.—H. **Gault**: The lactonisation of the α -keto esters.—Paul **Lebeau** and Marius **Picon**: The action of sodammonium on the true acetylenic hydrocarbons of the fatty series, and on a mode of formation of ethylenic hydrocarbons. Sodammonium reacts with the acetylenic hydrocarbons of the fatty series, giving the sodium derivative of these hydrocarbons and the corresponding ethylenic hydrocarbon in the proportion of one molecule of the ethylene to two molecules of the sodium derivative. The products of the reaction are very pure, and no secondary reactions were observed.—L. **Bounoure**: The influence of the size of insects on the production of chitin. The mean thickness of the chitin layer is constant, or the quantity of chitin is proportional to the secreting surface.—Edouard **Chatton**: *Orchitosoma parasiticum*, a parasite with three rudimentary leaflets of *Paracalanus parvus*.—E. **Faure-Fremiet**: The action of the ultra-violet rays on the egg of *Ascaris magnalocephala*.—Charles **Nicolle**, A. **Conor**, and E. **Conseil**: Intravenous inoculation of some living typhoid bacilli.—Gabriel **Bertrand** and Robert **Sazerac**: The favourable action exercised by manganese on the acetic fermentation. The power of the organism of transforming alcohol into acetic acid is strongly accelerated by the addition of a certain proportion of manganese; the acceleration increases at first as the amount of manganese increases, then passes a maximum.—R. **Fosse**: The presence of urea in the invertebrates and in their excretion products.—Jules **Ventre**: The influence of the yeasts and the initial constitution of the musts on the acidity of fermented liquids.—André **Mayer** and Georges **Schaeffer**: Researches on the lipocytic constancy. The proportion of lipoids containing phosphorus in the tissues.—M. **Repelin**: The geology of Sainte-Baume.

CALCUTTA.

Asiatic Society of Bengal, July 2.—F. F. Laidlaw: Note on the dragonflies of Syria and the Jordan Valley. The dragonflies of Syria and the Jordan Valley are still imperfectly known, but at least two geographical elements may be distinguished among them—a Mediterranean element, and a tropical one, African in its main features, but also showing certain affinities with the Oriental fauna.—Dr. N. Annandale and S. W. Kemp: The Crustacea Decapoda of the Lake of Tiberias. Three species of Decapoda are known from the Lake of Tiberias and its immediate vicinity, viz. the crab *Potamon potamios*, and the prawns *Atyaephyra desmarestii* and *Typhlocaris galilea*. The last occurs only in one small isolated pool, and is remarkable on account of its degenerate eyes and uniform white coloration, as well as for certain structural characters which separate it from all other Caridea.

BOOKS RECEIVED.

Bacon's New Contour Map of the Near and Middle East (The Land of the Five Seas). (London: G. W. Bacon and Co., Ltd.) 7s. 6d.

Der Stoffwechsel der Pflanzen. By O. Stocker. Pp. iii+60. (Leipzig and Berlin: B. G. Teubner.) 2 marks.

Expedition Antarctic Belge. Resultats du Voyage s.y. *Belgica* en 1897-8-9. Rapports Scientifiques. Zoologie. Tuniciers, Caducichordata (ascidiacées et Thaliacées). By E. van Beneden and M. de Selys-Longchamps. Pp. 119+xvii plates. Geologie. Petrographische Untersuchungen der Gesteinsproben. By D. Sistik. II. Teil. Pp. 20+plate. (Anvers: J. E. Buschmann.)

The Journal of the Institute of Metals. Vol. ix. Pp. ix+333. (London: Institute of Metals, Caxton House.) 21s. net.

The Journal of the Municipal School of Technology, Manchester. Vol. vi. Pp. 277. (Manchester: Municipal School of Technology.)

The Princeton Colloquium. Lectures on Mathematics delivered September 15 to 17, 1909 before Members of the American Mathematical Society, in connection with the Summer Meeting held at Princeton University, Princeton, N.J. By G. A. Bliss and E. Kasner. Pp. v+107+ii+117. (New York: American Mathematical Society.)

Library Cataloguing. By J. H. Quinn. Pp. viii+256. (London: Truslove and Hanson, Ltd.)

The Under Dog. Edited by S. Trist. Pp. xv+203+v. (London: *The Animals' Guardian*.) 3s. 6d.

The Proceedings of the Optical Convention, 1912 held at South Kensington, June 19 to 26, 1912. Vol. ii. Pp. vii+359. (London: University of London Press; Hodder and Stoughton.) 10s. net.

Ce que j'ai vu chez les Bêtes. By P. Noël. Pp. 343. (Paris: A. Colin.) 3.50 francs.

An Introduction to the Mathematical Theory of Attraction. By Dr. F. A. Tarleton. Vol. ii. Pp. xi+207. (London: Longmans and Co.) 6s.

Industrial Poisoning from Fumes, Gases, and Poisons of Manufacturing Processes. By Dr. J. Rambousek. Translated and edited by Dr. T. M. Legge. Pp. xiv+360. (London: E. Arnold.) 12s. 6d. net.

The Mineral Kingdom. By Dr. R. Brauns. Translated, with additions, by L. J. Spencer. Parts 23, 24, 25. (Esslingen a.N.: J. F. Schreiber; London: Williams and Norgate.) 2s. net per part.

An Account of the Crustacea of Norway. By G. O.

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Sars. Vol. vi., Copepoda, Cyclopoida. Parts i. and ii. Pp. 32+xvi plates. (Bergen: Bergen Museum.)

A Manual of School Hygiene. By Prof. E. W. Hope, E. A. Browne, and Prof. C. S. Sherrington. New edition. Pp. xii+311. (Cambridge University Press.) 4s. 6d.

Evolution by Co-operation. By H. Reinheimer. Pp. xiii+200 (London: Kegan Paul and Co., Ltd.) 3s. 6d. net.

Hull Museum Publications. No. 94. A List of the Seventeenth-Century Tokens of Yorkshire. By T. Sheppard. Pp. 27-59. (Hull: The Museum.) 1d.

Plant Life. By Prof. J. B. Farmer. Pp. viii+255. (London: Williams and Norgate.) 1s. net.

Toadstools and Mushrooms of the Countryside. By E. Step. Pp. xvi+143+plates. (London: Hutchinson and Co.) 5s. net.

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