

Zoology," by A. Sedgwick, F.R.S., vol. iii., completing the work, illustrated; "Insect Pests of the Farm and Garden," by F. M. Duncan, illustrated; and "School Gardening for Little Children," by L. R. Latter, with an introduction by Prof. Geddes.

The University Tutorial Press, Ltd., announce:—"Geometry, Theoretical and Practical," by W. P. Workman and A. G. Cracknell, part ii., part iii.; "Arithmetic for the Preliminary Certificate Examination," by H. R. Chope; "Model Answers to Arithmetic Questions for the Preliminary Certificate Examination"; "Algebra, Preliminary Certificate Edition, With Section on Graphs," by R. Deakin; "Geometry, Theoretical and Practical, Preliminary Certificate Edition (for Course A)," by W. P. Workman and A. G. Cracknell; "Euclid, Books i.-iii., Preliminary Certificate Edition, with Mensuration and Practical Problems arranged in Accordance with Euclid's Order of Proof," by R. Deakin; "Key to Matriculation Algebra"; "Logarithms and How to Use Them"; "Chemistry, First Stage, Theoretical Organic," by R. A. Lyster; "Chemistry, the Junior," by R. H. Adie; "Experimental Science, the Junior," by W. M. Hooton; "Hygiene, Certificate," by R. A. Lyster; "Technical Electricity," by Prof. H. T. Davidge and R. W. Hutchinson; "Physiology, First Stage," by Dr. G. M. Meachen; "Elementary Science of Common Life (Chemistry), Subject xxvi. of the Board of Education Science Examinations," by W. T. Boone; "Properties of Matter," by C. J. L. Wagstaff; "Elementary Science for the Preliminary Certificate Examination (General Section)," edited by Drs. R. W. Stewart and W. Briggs; "Elementary Science for the Preliminary Certificate Examination (Section A, Chemistry)," by H. W. Bausor; "Elementary Science for the Preliminary Certificate Examination (Section B, Physics)," by J. Satterly; "Intermediate Hydrostatics"; "Principles and Methods of Education," by Dr. S. S. Fletcher and J. Welton; and new editions, of "First Stage Inorganic Chemistry (Theoretical)," by Dr. G. H. Bailey; "Synopsis of Matriculation Chemistry"; "New Matriculation Physics: Heat, Light, and Sound," by Dr. R. W. Stewart; "Light, Text-book of," by Dr. R. W. Stewart; and "Graphs, Graphical Representation of Algebraic Functions," by C. H. French and G. Osborn.

Mr. T. Fisher Unwin promises:—"Haeckel: his Life and Work," by W. Bölsche, translated by J. McCabe, illustrated; and "The Birds of Middlesex," by J. E. Harting, illustrated.

The following are Messrs. Whittaker and Co.'s announcements:—"A Pocket Book of Aëronautics," by H. W. L. Moedebeck, translated from the German by Dr. W. M. Varley; "Electricity in Mines," by P. R. Allen; "Steam Turbine Engineering," by T. Stevens and H. M. Hobart; "Electric Lamps and Electric Lighting," by L. Gaster; "Armature Construction, a Handbook for Electrical Designers," by H. M. Hobart; "Single-phase Commutator Motors," by F. Punga; "A Treatise on Coal Mining," by G. L. Kerr and D. Burns; "Polyphase Electric Currents," by A. Still; and "A Text-book of Botany," part i., "The Anatomy of Flowering Plants," by L. M. Yates.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The board of the faculty of natural science has approved the supplication of Mr. Walter Garstang, Lincoln College, for the degree of doctor of science.

Prof. W. J. Sollas and Dr. T. G. Bonney have been appointed examiners in the honour school of geology.

The grant of 250*l.* a year to the pathological laboratory from the University Chest has been renewed for five years, and additional grants of 100*l.* a year to the Pitt-Rivers Museum and to the Hope department of zoology, and 50*l.* a year to the departments of mineralogy and geology have been authorised by Convocation.

The important collection of New Zealand birds formerly belonging to the late Mr. S. William Silver has been presented to the museum by his widow.

A fellowship examination in chemistry has been announced by Merton College to begin on Tuesday,

September 25. Candidates must have passed at the examinations required by the University for the degree of B.A. The value of the fellowship is 200*l.* a year for seven years, and the holder may be re-elected if he is duly qualified. Candidates may submit any dissertations or evidence of research work not later than September 20.

At a meeting of the Junior Scientific Club held on March 7, Mr. Henry Balfour read a paper on "The Natural History of the Bagpipe," and Mr. J. A. Brown one on "Electrons."

CAMBRIDGE.—The late Mr. Frederick James Quick having left his residuary estate to the University, the income to be used in promoting the study and research in the sciences of vegetable and animal biology, the council of the Senate has published a scheme for the administration of the fund. This has been approved by the trustees, to whom the will entrusts very considerable powers of emendation and alteration. It is proposed to establish a Quick professorship of biology with a salary of 1000*l.* a year, and with a sum not exceeding 300*l.* a year for the maintenance of a laboratory. In the first instance the professor is to devote himself to the study of the protozoa, especially such as cause disease. He will not be required to give lectures in more than one university term, when he will be expected to set forth the result of the researches carried on in his laboratory. By the terms of the will the professor must seek re-election every third year. The administration of the fund will rest with a board of managers, the members of which will also act as electors to the professorship.

The first report of the Studies and Examinations Syndicate with regard to the abolition of compulsory Greek having been rejected by the Senate, the Syndicate has tried again, and has issued a second report, in which it suggests what is known as a "bifurcation of studies." It is proposed that both in the honours and in the ordinary course for degrees the examinations shall be grouped into two sections, the literary and the scientific, and that while those who pursue the literary side must take in the Previous Examination two classical languages, those on the scientific side will be required "to take two languages other than English, one of the two being Latin or Greek." When the proposals come to be discussed a certain amount of opposition may be expected from the historians and moral science teachers, whose students are afforded no relief. Whether the masters of the situation, the non-resident members of the Senate, will allow the proposals to be accepted is doubtful. It is a well known fact that when the first report of the Syndicate was voted upon, a decided majority of the resident members of the University voted for reform. If the residents are again beaten they must put their trust in the Royal Commission which, from various signs, seems not so very far off.

The late master of Corpus Christi College, Dr. E. H. Perowne, has left his valuable collection of amber from the Norfolk coast to the University, to be deposited in the Sedgwick Geological Museum or in the Fitzwilliam Museum.

It is proposed to grant a sum of 75*l.* out of the works fund to Mr. W. G. Fearnside, of Sidney Sussex College, towards defraying the expense of a visit which he proposes to make to Sweden to study the Tremadoc and Arenig beds.

The following have been appointed examiners in the special examination in geography and the examination for the diploma in geography:—Mr. G. G. Chisholm, Mr. A. R. Hinks, Mr. H. Y. Oldham, and Prof. W. W. Watts.

The next combined examination for sixty-six entrance scholarships and various exhibitions at Pembroke, Gonville and Caius, King's, Jesus, Christ's, St. John's, and Emmanuel Colleges will be held on Tuesday, December 4, and following days. Mathematics, classics, and natural sciences will be the subjects of examination at all these colleges. Scholarships and exhibitions will also be offered for history, for modern languages, and for Hebrew.

WE learn from *Science* that Mrs. A. A. Anderson has given 20,000*l.* to Barnard College, Columbia University, toward the establishment of a course in science.

THE fifth annual students' soirée of the Sir John Cass Technical Institute will be held on Saturday, March 17. The guests will be received by Sir Owen Roberts, chairman of the governing body, and Lady Roberts, Mr. George Baker, J.P., vice-chairman of the governing body, and Mrs. Baker. Short lectures and demonstrations on scientific subjects will be given during the evening.

At the last meeting of the council of the University of Birmingham several appointments to the staff were made. Mr. George S. West was appointed assistant lecturer and demonstrator in botany in succession to Dr. A. J. Ewart; Dr. Theodore Groom was appointed senior lecturer in geology and geography to succeed Prof. W. W. Watts, F.R.S., recently appointed to the chair of geology in the Royal College of Science, London; and Mr. Donald M. Levy was appointed demonstrator in metallurgy to succeed Mr. H. N. Schnurmann. Communications were received announcing the bequest by the late Mr. John Feeney of the sum of 20,000*l.*, a donation from Messrs. W. and T. Avery, Ltd., of 500*l.*, and valuable gifts from Messrs. Veritys, Ltd., Mr. J. C. Vaudrey, and Mr. Willoughby Ellis. An assistant lectureship and demonstratorship in civil engineering was established.

For the last few years Oberlin College has been engaged, says *Science*, in raising a fund of 100,000*l.* This is now almost complete. The fund was started by an anonymous donor of Boston, who promised 20,000*l.* At the time of the trustees' meeting in November last the fund had reached 67,000*l.* Since then numerous gifts have been made, including 100*l.* for library endowment, 400*l.* for additions to the women's gymnasium, 2000*l.* toward a men's building, 6600*l.* from the estate of Dr. C. N. Lyman, of Wadsworth, O., which will be devoted to library endowment, 15,000*l.* to be used as endowment for the Slavic department of the seminary, 2000*l.* for library endowment, and 1000*l.* for the art building. In the total of 97,000*l.* now raised is counted 25,000*l.* promised by Mr. Carnegie for a library, on condition that 20,000*l.* be raised for library endowment. To complete the fund, therefore, it will be necessary for the college to raise about 10,000*l.* more. It is expected that this will be done before commencement.

## SOCIETIES AND ACADEMIES.

### LONDON.

**Chemical Society**, March 1.—Mr. A. G. Vernon Harcourt, F.R.S., past president, in the chair.—Studies of dynamic isomerism, part iv., stereoisomeric halogen derivatives of camphor: T. M. Lowry. Measurements were given of the solubility in alcohol of  $\alpha$ -chloro- and  $\alpha$ -bromo-camphors,  $\alpha\beta$ - and  $\alpha\pi$ -dibromocamphors, and  $\alpha\beta$ - and  $\alpha\pi$ -chlorobromocamphors, both alone and in presence of a small proportion of sodium ethoxide. The increase of solubility on addition of the alkali is ascribed to the formation in the solution of a small proportion of the stereoisomeric  $\alpha'$ -compound.—The coagulating action of colloids, part i.: W. P. Dreaper and A. Wilson. The results obtained by the authors throw some light on dyeing and tanning processes. The influence of gallic acid in the manufacture of leather seems to be of a more direct nature than was previously supposed.—Studies on optically active carbimides, iii., the resolution of  $\alpha$ -phenyl- $\alpha'$ -4-hydroxyphenylethane by means of *l*-menthylcarbimide: R. H. Pickard and W. O. Littlebury. The *l*-menthylcarbimides formed by combination with *l*-menthylcarbimide can be separated by fractional crystallisation, and are then hydrolysed by alcoholic sodium hydroxide.—Experiments on the synthesis of the terpenes, part viii., synthesis of the optically active modifications of  $\Delta^3$ - $\beta$ -menthenol(8) and  $\Delta^{3:8(9)}$ - $\beta$ -menthadiene: F. W. Kay and W. H. Perkin, jun.  $\Delta^1$ -Tetrahydro- $\beta$ -toluic acid, *l*- $\Delta^3$ - $\beta$ -menthenol(8),  $\Delta^{3:8(9)}$ - $\beta$ -menthadiene, and *d*- $\Delta^{3:8(9)}$ - $\beta$ -menthadiene have all been synthesised. By fractional crystallisation of the brucine and strychnine salts of the first-named compound it was resolved into optical isomerides, and from these the two other compounds were prepared in an optically active condition.—Studies in the acridine series, iii., the methylation of chrysaniline: A. E. Dunstan and J. T. Hewitt.—Note on the application of the electrolytic method to the

estimation of arsenic in wall-papers, fabrics, &c.: T. E. Thorpe.—Nitrogen halides from camphoryl- $\psi$ -carbamide: M. O. Förster and H. Grossmann. The action of potassium hypobromite and hypochlorite on camphoryl- $\psi$ -carbamide has been found to give rise to dihalogen derivatives which have all the properties of compounds containing halogen attached to nitrogen.—The relation of position isomerism to optical activity, vi., the rotation of the menthyl esters of the isomeric chloronitrobenzoic acids: J. B. Cohen and H. P. Armes. In the present investigation the combined effect of the halogen and nitro-group on the activity of the menthyl group has been examined.

**Mathematical Society**, March 8.—Prof. W. Burnside, vice-president, and subsequently Sir W. D. Niven, vice-president, in the chair.—Sommerfeld's diffraction problem and reflection by a parabolic mirror: Prof. H. Lamb. Sommerfeld's problem is that of the diffraction of plane waves by a plane screen bounded by a straight edge. It is shown that Sommerfeld's solution may be arrived at in a simple way by combining certain simple particular solutions of the general equation of wave motion when expressed in terms of the coordinates that define two systems of confocal parabolic cylinders, the edge of the screen being the line of foci of the cylinders. Slightly modified forms of these solutions lead to a complete solution of the problem of reflection by a convex mirror in the form of a parabolic cylinder. It appears that in this application of the wave theory the reflected waves, which the ordinary processes of geometrical optics represent as diverging from a line of sources coinciding with the line of foci of the cylinder, really diverge from a plane of sources, terminated in an edge at this line, and extending thence with continually diminishing strength to an infinite distance on the concave side of the mirror. The problems of reflection by concave parabolic and paraboloidal mirrors are also discussed.—Function-sum theorems connected with the series  $\sum_{n=1}^{\infty} x^{n^2}/n^2$ :

Prof. L. J. Rogers. The sums of the values of the function defined by the integral  $\int_0^1 (1-x)^{-1} \log x dx$  for various sets of values of the argument are shown to have definite constant values.—Investigations on series of zonal harmonics: Prof. T. J. I'A. Bromwich. The paper relates to the behaviour of series of the type  $\sum a_n r^n P_n(\cos \theta)$  in the neighbourhood of points on the boundary of the region of convergence.—The functions  $g_\beta(x, \theta)$  and  $f_\beta(x, \theta)$  Rev. E. W. Barnes. The paper deals with the asymptotic expansions of special types of integral functions.—The relations between the  $\beta$ -line determinants formable from a  $\beta$  by  $q$  array: Prof. E. J. Nanson.—An informal communication On the divisors of numbers of certain forms was made by Lieut.-Colonel A. Cunningham. The special forms are  $q2^q + 1$  and  $(a^2x + 1)^3 + 1$ .—Dr. F. S. Macaulay made an informal communication On the equilibrium of forces of given magnitudes the lines of action of which pass through given points.

### PARIS.

**Academy of Sciences**, March 5.—M. H. Poincaré in the chair.—The suboxides of carbon: M. Berthelot.—Some arithmetical consequences of the theory of Abelian functions: G. Humbert.—The propagation of a movement round a centre in an elastic, homogeneous, and isotropic medium: study of the wave produced without change of density: J. Bousinesq.—The bean containing hydrocyanic acid, *Phaseolus lunatus*: L. Guignard. Frequent cases of poisoning of animals by this bean have occurred, due to the hydrocyanic acid it contains. This acid arises from a glucoside, phaseolunatine, which is present in the bean. Determinations of the amounts of hydrocyanic acid obtainable from beans from various sources gave figures varying between 0.006 per cent. and 0.102 per cent. A new method for detecting traces of hydrocyanic acid is given.—The synthesis of three dimethyl-cyclo-hexanols: Paul Sabatier and A. Mailhe. The method of Sabatier and Senderens has been applied to the addition of hydrogen to the three xylanols. Details of the preparation of these substances are given, together with their physical properties and those of their immediate derivatives.—The mag-