

glass, losses up to as much as four-fifths of the whole electrification were sometimes observed, but never complete diselectrification. The results, however, were very irregular. Non-electrified air never became sensibly electrified by being drawn through the hot glass tubes in our experiments, but it gained strong positive electrification when pieces of copper foil, and negative electrification when pieces of carbon, were placed in the tube, and when the temperature was sufficient to powerfully oxidise the copper or to burn away the charcoal.

§ 12. Through the kindness of Mr. E. Matthey, we have been able to experiment with a platinum tube 1 metre long and 1 millimetre bore. It was heated either by a gas flame or an electric current. When the tube was cold, and non-electrified air drawn through it, we found no signs of electrification by our receiver and electrometer. But when the tube was made red or white hot, either by gas burners applied externally or by an electric current through the metal of the tube, the previously non-electrified air drawn through it was found to be electrified strongly positive. To get complete command of the temperature we passed a measured electric current through 20 centimetres of the platinum tube. On increasing the current till the tube began to be at a scarcely visible dull red heat, we found but little electrification of the air. When the tube was a little warmer, so as to be quite visibly red hot, large electrification became manifest. Thus 60 strokes of the air-pump gave 45 scale divisions on the electrometer when the tube was dull red, and 395 scale divisions (7 volts) when it was a bright red (produced by a current of 36 amperes). With stronger currents, raising the tube to white-hot temperature, the electrification seemed to be considerably less.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—There are few changes of importance in the lists of lectures issued by the Board of Faculty of Natural Science for Academical year.

Prof. Gotch has come into permanent residence, and has appointed Dr. Gustav Mann, of Edinburgh University, to be Demonstrator in Physiology, in place of Dr. Pembrey, who has been appointed Lecturer in Physiology at the Charing Cross Hospital.

The new pathological laboratory in the Department of Regius Professor of Medicine is approaching completion, and Dr. J. Ritchie will give a course of practical Pathological Bacteriology for the Regius Professor. The present pathological laboratory is on a modest scale, and it is hoped that before long the University will be in a position to afford a building and equipment more worthy of the growing needs of the medical school at Oxford.

The examination for the Burdett-Coutts' Scholarship is to begin on October 21. There are this year two scholarships to be awarded, as none was awarded last year.

Mr. Frederic Lucien Golla, of Tonbridge School, has been elected to a Demyship in Natural Science at Magdalen College.

Four scholarships are announced for election at Wadham College on December 1, 1895, and in addition the Warden and Fellows have power to give exhibitions of £30 to £40 a year. No papers in Natural Science will be set, but in the case of one of the exhibitions preference will be given to any candidate who shall undertake to read for honours in Natural Science, and to proceed to a degree in Medicine in the University of Oxford.

CAMBRIDGE.—The election to the vacant professorship of botany will take place on Saturday, November 2, at 2.30 p.m. Candidates are to send their names and testimonials to the Vice-Chancellor, Sidney Sussex Lodge, by October 26. The electors are Dr. Vines, Mr. Sedgwick, Dr. Allbutt, Dr. D. Oliver, Dr. Phear, Mr. F. Darwin, Sir J. D. Hooker, and Prof. Foster.

The election of a head of a college to be an elector to the Sadlerian Professorship of Pure Mathematics will take place on Tuesday, October 22, at 1 p.m. The vacancy is caused by the resignation of Dr. Phear, late Master of Emmanuel. The electors are those persons whose names are on the electoral roll of the University. Dr. Ferrers, of Caius, and Dr. Taylor, of St. John's, are the present "heads" on the board of electors to the professorship.

Mr. C. T. R. Wilson, of Sidney Sussex College, has been appointed assistant-demonstrator of experimental physics in the place of Mr. Capstick, resigned.

The Clerk-Maxwell Scholarship in Physics is vacant by the

resignation of Mr. Whetham. Candidates are to apply to Prof. Thompson, at the Cavendish Laboratory, by November 1. The scholarship is worth about £180 a year, and is tenable for three years. Candidates must be members of the University who have worked for a term or more at the Cavendish Laboratory.

Among the Fellows of Trinity College elected on October 10, are Mr. C. P. Sanger, bracketed second wrangler 1893; the Hon. W. Russell, bracketed eighth wrangler 1893; and Mr. I. L. Tuckett, first class Parts I. and II. Natural Sciences Tripos, and Coutts Trotter student in physics and physiology. Mr. Sanger and Mr. Russell were also placed in the first class of Part II. of the Moral Sciences Tripos 1894.

THE London University Guide for the year 1895-96 has just been published by the University Correspondence College Press.

DR. DUNN, head master of the Plymouth Technical Schools, has been appointed principal of the Northern Polytechnic Institute, Holloway Road.

MR. HENRY LOUIS has been elected Professor of Mining at the Durham College of Science, Newcastle-upon-Tyne, by a Joint Committee nominated by the College and the Coal Trades Associations of Durham and Northumberland.

THE October *Record* of Technical and Secondary Education contains an illustrated article on the Yorkshire College, Leeds; and also a comparative summary of recent progress in technical education in various counties. This latter article continues and concludes a review of the work done by the Technical Education Committees of the English counties, commenced in the April number of the *Record*.

THE entrance scholarships at the London Hospital Medical School have been awarded as follows:—Price scholarship in science, £120, Mr. H. Balean; Science scholarships, £60 and £35, Mr. O. Eichholz and Mr. A. B. Soltau; Price scholarship in anatomy and physiology, for university students, £60, Mr. R. C. Wall and Mr. J. H. Evans.

THE following awards have been made at St. Bartholomew's Hospital:—Scholarship of £75 in biology and physiology, to Mr. C. S. Myers; scholarship of £75 in chemistry and physics, to Mr. J. S. Williamson; scholarship of £150 in biology, chemistry, and physics, to Messrs. R. C. Bowden and R. H. Paramore; preliminary scientific exhibition of £50 in biology, chemistry, and physics, to Mr. J. C. M. Bailey.

AT St. Mary's Hospital Medical School the two university scholarships, of the value of £52 10s. each, have been awarded to Mr. R. Wade and Mr. G. S. Keeling; the first natural science scholarship, value £105, has been awarded to Mr. W. H. Willcox, and the three value £52 10s. each to Mr. H. Lovell-Keays, Mr. E. W. Holyoak, and Mr. A. F. Hayden.

AT St. George's Hospital Medical School, science entrance scholarships of £85 have been awarded to Mr. Herbert Stringfellow Pendlebury, to Mr. Henry Goodridge Deller, and to Mr. John Howell Evans.

THE following recent appointments are announced:—Prof. W. A. Setchell to the chair of botany in the University of California; Prof. H. Talbot to be associate professor of chemistry in the Massachusetts Institute of Technology; Dr. O. Jaekel, Privat-docent in geology in Berlin University, to be Extraordinary Professor; Dr. P. Lenard to the chair of physics in the Technische Hochschule at Aachen.

SCIENTIFIC SERIALS.

American Journal of Mathematics, vol. xvii. No. 4 (Baltimore, October).—On the deformation of thin elastic wires, by A. B. Basset. In the author's previous paper (vol. xvi.) on the deformation of thin elastic plates and shells, whilst commending the novelty, power and elegance of the *geometrical* investigations employed in Mr. Love's treatise on elasticity, he impugned the treatment of the *physical* portion of the subject. It is on the same ground of defective treatment that Mr. Basset considers that a further exposition on the theory of wires is needed, and this is what is furnished in the present paper. A useful table of contents precedes the text.—Investigations in the lunar theory, by Prof. E. W. Brown, is a memoir to which reference has already been made in our columns (No. 1352, p. 533).—The closing paper is by Otto Staudé, "Ueber den Sinn der Windung in den Singulären Punkten einer Raumcurve."

Bulletin de l'Académie Royale de Belgique, No. 6.—The conditions under which hydrogen peroxide is decomposed, by W. Spring. The catalysis of hydrogen peroxide takes place without chemical action by contact with various substances when the formation of water is favoured. Any substance which is more easily impregnated with water than with H_2O_2 brings about the decomposition of the latter. A solution of H_2O_2 containing salts is the seat of a decomposition whose activity increases with the temperature.—Chemical study of eight earths of the Lower Congo, by E. Stuyvaert. The analysis of earths from Boma, Zenze, Banza-Kasi, Mayombe, and Vungu-Mumba proves that the soils of the Lower Congo, sandy as well as calcareous, are provided with reserves of phosphoric acid and potash which insure a high fertility. It is certain that in the territories where the disappearance of forests has not modified the rainfall, as in Mayombe, the cultivation of coffee, cocoa, and other economic plants can be carried on for a long time without the use of manure.—On the critical temperatures of solution and their application to general analysis, by L. Crismer. The critical temperatures of solution may be used for the identification of chemical bodies without the necessity of weighing them, and they form a valuable additional criterion for the purpose of qualitative analysis. The critical temperature of solution is independent of the amount of either body present. It varies very much from one substance to another, but is constant for the same substance. For a mixture of two bodies, it is sensibly equal to the arithmetical mean of those of the constituents taken singly. Just as the surface tension of a liquid is reduced to zero at the critical temperature of vaporisation, so the surface tension of the lower liquid tends towards zero at the critical temperature of solution, and the meniscus separating them becomes a plane. An optical method of determining these critical temperatures may be based upon this fact.

Wiedemann's Annalen der Physik und Chemie, No. 9.—Double refraction of electromagnetic rays, by Peter Lebedew. The author succeeded, by a modification of Hertz's apparatus, in dealing with waves not more than 0.6 cm. long, and in demonstrating the phenomena of polarisation, reflection, and refraction with apparatus of the size ordinarily used in optics. The resonator used was a small thermo couple of iron and "constantane." An ebonite prism 1.8 cm. long showed refraction to within 3° of arc. Rhombic sulphur showed measurable double refraction, and a "Nicol prism" was successfully constructed of two sulphur prisms with a plate of ebonite in place of the Canada balsam.—Luminescence of organic substances in the three states, by E. Wiedemann and G. C. Schmidt. Many organic vapours show true fluorescence, and some, like naphthalene, give composition spectra under the electric discharge, without being dissociated. Kathode luminescence is shown by many organic liquids, and the colour corresponds to that of the vapour. But the luminescence of the solid bodies often differs from that in the liquid state. Solid anthracene shows green, gaseous anthracene blue luminescence.—A vibration galvanometer, by H. Rubens. This instrument somewhat resembles Wien's optical telephone, and is used for measuring the intensity of alternating currents. It consists of a soft iron armature attached to a stretched wire. This executes torsional vibrations which are timed to the period of the alternating current. The latter traverses four electromagnets ranged round the armature, and when the periods are identical the armature executes strong torsional vibrations whose amplitude is measured by the width of a slit as seen reflected in a mirror attached to the wire. This arrangement is much more sensitive than the electro-dynamometer.—Theory of the broadening of spectrum lines, by B. Galitzin. The molecular theory is superior to those based upon Doppler's principle, upon Kirchhoff's law, or upon damping. It admits of a development based upon the electromagnetic theory, that of molecular resonators. The broadening is a consequence of the forced vibrations produced by the collision of molecules. The want of symmetry of the broadening, and the influence of temperature and pressure are immediate consequences of the molecular theory as developed by the author.

THE numbers of the *Journal of Botany* for August-October contain several articles of interest to descriptive botanists. Mr. E. G. Baker concludes his revision of the African species of *Eriosema*, and Mr. A. B. Rendle his description of Mr. Scott Elliot's tropical African orchids, including a large number of new species; Mr. D. Prain continues his account of the genus *Argemone*; Mr. E. A. L. Ballers contributes a list of Marine Algae new to Britain; and Mr. Arthur Bennett

some notes on British Characeæ.—There are biographical notices of the late Profs. W. C. Williamson and C. C. Babington, with a portrait of the latter.

Boll. della Soc. Sismol. Ital., vol. i., 1895, No. 5.—Some observations made on Vesuvius on June 21, 1895, by M. Baratta.—Vesuvian notes (January-June 1895), by G. Mercalli.—Hydro-thermal observations at Fiumecaldo from January to April 1895, by C. Guzzanti.—Notices of Italian earthquakes, April 1895. A valuable record of the observations of the first after-shocks of the Laibach earthquake of April 14 from a large number of Italian stations.

SOCIETIES AND ACADEMIES.

LONDON.

Entomological Society, October 2.—Prof. Raphael Meldola, F.R.S., President, in the chair.—Mr. McLachlan exhibited, on behalf of Mr. Bradley, of Birmingham, the specimens of Diptera attacked by a fungus of the genus *Empusa*, of which an account had recently appeared in the *Entomologist's Monthly Magazine*.—Mr. H. Tunaley exhibited specimens of *Lobophora vretata* from the neighbourhood of Birmingham. Specimens of the green dark form were shown in their natural positions on the bark, and specimens of the yellow form were shown on leaves on which they rested.—Mr. J. W. Tutt exhibited cases formed by a lepidopterous insect received from the Argentine Republic, which he said he recognised as being either identical with, or closely allied to, *Thyridopteryx ephemeraformis*, which did great damage to many orchard and forest trees in North America. Mr. Tutt also exhibited a series of *Lycana agon* captured by Mr. Massey, of Didsbury, on the mosses in Westmoreland. The males were remarkable in bearing two very distinct shades of colour. The females also differed considerably from the form occurring in the South of England. He also exhibited a long series of *Hydræcia lucens*, captured in the mosses near Warrington, and for comparison a series of *Hydræcia paludis*, and he read notes on the various specimens exhibited.—Dr. Fritz-Müller communicated a paper entitled "Contributions towards the history of a new form of larvæ of Psychodidæ (Diptera), from Brazil."—Baron Osten-Sacken communicated a paper, supplemental to the preceding one, entitled "Remarks on the homologies and differences between the first stages of *Pericoma* and those of the new Brazilian species."—The Rev. A. E. Eaton also contributed some supplementary notes to Dr. Fritz-Müller's paper.—Lord Walsingham, F.R.S., read a paper entitled "New Species of North American Tortricidæ." In this paper twenty-nine species were dealt with, of which twenty-six were described as new, from Florida, California, N. Carolina, Arizona, and Colorado. The paper also included certain corrections made by the author in the nomenclature of genera.

PARIS.

Academy of Sciences, October 7.—M. Janssen in the chair.—On an ascension to the summit of Mont Blanc, and on the work carried out during the summer of 1895 on the "massif" of this mountain, by M. J. Janssen. The ascent is described, together with an account of the cloud phenomena observed during a day in the higher regions. Passing on to describe the 0.33 m. telescope about to be erected at the observatory, it is remarked that the parts, now all assembled at the summit, will be mounted as a polar siderostat. A 0.6 m. mirror is to be mounted with the telescope. The observer will control all movements from a chamber of observation, which will be heated as may be required. As the instrument could not be taken down and remounted, it was bodily moved on to a new base formed of strong plates frozen on to the ice, and its pendulum then beat as regularly as at Paris. Observations with a Duboscq two-prism spectroscope in this very dry atmosphere failed to show any rays of aqueous origin in the solar light. The observatory has suffered a slight downward settling towards Chamounix; this took place in 1893 and 1894, and the movement is now insignificant. (See Our Astronomical Column.)—Study of some meteorites, by M. Henri Moissan. Iron from Kendall county in Texas contained amorphous carbon, but neither graphite nor diamond. Iron from Newstead (Roxburghshire) yielded amorphous carbon and graphite, but not diamond. Déésite, found in 1866 in the Sierra Déesa in Chili, contained a form of graphite only. Caillite, iron from Toluca-Niquipils,