

some valuable information as to the width of gusts, *i.e.* as to the lateral variation in the velocity of the wind. From observations taken at two points 40 ft. apart in a line approximately at right angles to the direction of the wind, the conclusion is drawn that the pressures due to the wind velocities at the same instant at two points 40 ft. apart may differ by as much as 50 per cent., and will frequently differ by 25 per cent. Differences of corresponding amount must, therefore, occur in the velocities of the natural wind striking the two wing tips of an aeroplane; thus, in a wind of 10 miles an hour, for an aeroplane travelling at 50 miles an hour, the difference between the pressures at the wing tips might amount to 10 per cent. The observations were, for the most part, taken in strong winds of the order of 30 miles an hour, but the same proportionate variation has been found in lighter winds, though with diminution in the mean velocity of the wind the gusts become of less importance.

#### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—At Emmanuel College a grant of 50*l.* a year for three years has been made to Mr. C. E. Moss, in aid of his researches in connection with his forthcoming work on the British flora. From the Studentship Fund the following award has been made for research by graduates of the college:—a studentship of 120*l.* in stratigraphical geology to Mr. R. D. Vernon.

The summer meeting is to be held from July 27 to August 20, and the principal subject of study will be "The British Empire"; other subjects will, however, also be dealt with. Among the lectures announced we notice the following:—"The Early Exploration of the Empire," H. Yule Oldham; "The Races of the Empire," Dr. E. A. Parkyn; "Australian Resources and Prospects," Sir George Reid; "New Zealand—its Historical, Scientific, and Educational Aspects," Prof. C. Chilton; "Our Frontier Neighbours in India," Col. Sir T. H. Holdich; "Nigeria, British Central Africa, and British East Africa and Uganda," Sir H. H. Johnston; "Universities of the Empire," Dr. A. Hill; "Eugenics and Genetics," Prof. R. C. Punnett, F.R.S.; "Principles of Aërial Flight," G. P. Bailey. In the education section there will be a practical course on "Elementary Experimental Science," by R. H. Adie.

EDINBURGH.—Prof. Greenfield has resigned the holding of the chair of pathology. His resignation is to take effect from September 30 next.

LONDON.—At an extraordinary meeting of the Senate held on July 17, resolutions were adopted approving of the Foundling Hospital site in Bloomsbury for the proposed new headquarters for the University, in accordance with the recommendations contained in a report of the Special Sites Committee, over which Sir Philip Magnus, M.P., presides. Representations are to be made to the Government with the view of obtaining support for the scheme, and the Drapers' Company are to be asked whether they consider the site suitable for the proposed Senate House which they have offered to provide at an estimated cost of 60,000*l.* Lord Haldane is also to be asked to use his influence so that offers of financial support already made to him may be available for the Foundling Hospital site. A motion to refer back the report for further consideration was negatived by a small majority.

Mr. Otto Beit has been appointed a member of the governing body of the Imperial College of Science and

Technology, in succession to the late Sir Julius Wernher, for the remainder of Sir J. Wernher's unexpired term of office, *viz.*, four years from June 1, 1911.

OXFORD.—A director of the Agricultural Economics Institute, which is being established by the University in conjunction with the Board of Agriculture and the Development Commission, is to be appointed by the Committee for Rural Economy in October next. Applications must reach the secretary, the School of Rural Economy, by September 30.

PROF. W. M. DAVIS has resigned the professorship of geology in Harvard University. The chair will in future be filled by Prof. R. A. Daly, of the Massachusetts Institute of Technology.

*Science* announces that by the bequest of the late Dr. F. Bacon, Yale University will benefit by, probably, 500,000 dollars, of which 300,000 will go to the library and 200,000 to the Sheffield Scientific School, for the assistance of students.

THE sum of 3000*l.* has been left to the University of Belfast by Mrs. F. Magrath for the foundation of a "Magrath clinical scholarship," to be given for proficiency in reports of bedside cases open to fourth-year medical students. The Vice-Chancellor, in announcing the legacy, said that it was certain to be of the utmost value in the medical school of the University. A further gift to the University is that of an equatorial telescope, the donor of which is Mr. W. H. S. Monck.

#### SOCIETIES AND ACADEMIES.

LONDON.

**Physical Society**, June 28.—Mr. A. Campbell, vice-president, in the chair.—Prof. E. Wilson, B. C. Clayton, and A. E. Power: Hysteresis loss as affected by previous magnetic history. Hysteresis loss in iron at atmospheric and liquid air temperatures under three different conditions: (1) after the iron has been carefully demagnetised; (2) after it has been subjected to a large force (previous history) of about 26 C.G.S. units; and (3) whilst it is under the influence of an external constant magnetising force after demagnetisation.—Prof. W. M. Thornton: Dielectric hysteresis at low frequencies. An attempt to determine from dielectric hysteresis loops the nature of the change of polarisation which gives rise to the absorption of energy.—Prof. G. W. G. Howe and J. D. Peattie: The efficiency of generation of high-frequency oscillations by means of an induction coil and ordinary spark-gap. The apparatus used was similar to that employed in small radio-telegraph stations. A 10 in. induction coil, operated from cells through a mercury interrupter, supplied power to an oscillatory circuit containing a spark-gap between spherical electrodes. Coupled to this circuit was another oscillatory circuit representing the aerial, and containing a variable resistance which constituted the high-frequency load. The input, output, and efficiency were determined for various degrees of coupling, various aerial decrements, different lengths of spark-gap and with various primary voltages, the object being to determine the effect of these various factors on the working of a small radio-telegraph station.—Dr. A. Griffiths and Miss C. H. Knowles: The resistance to the flow of water along a capillary soda-glass tube at low rates of shear.—S. W. J. Smith and J. Guild: The self-demagnetisation of steel. The constituents, iron and iron carbide, are easily traceable in annealed steel, owing to the differences between their magnetic properties. The ferro-magnetic transition point of the carbide is about 500° C. lower than that of the iron.

The carbide is also magnetically harder at ordinary temperatures and possesses greater coercive force, although, like iron, it is magnetically very soft at temperatures near the transition point. In consequence of these facts, the effect of heat upon the residual magnetism of an annealed steel rod is peculiar and at first sight mysterious. As the temperature rises the residual magnetism falls continuously until it becomes zero in the neighbourhood of  $200^{\circ}$  C. It then changes sign and reaches a maximum negative value at about  $220^{\circ}$  C. Beyond this, the negative magnetisation decreases slowly, and finally becomes imperceptible between  $700^{\circ}$  C. and  $800^{\circ}$  C. If the rod is cooled from  $800^{\circ}$  C. it remains without perceptible polarity as the temperature falls; but if the heating is interrupted before the whole of the residual magnetism is destroyed the behaviour on cooling is quite different.

## EDINBURGH.

**Royal Society**, July 1.—Dr. Horne, F.R.S., vice-president, in the chair.—The late Dr. Alexander Bruce and Dr. J. W. Lawson: Multiple neuroma of the central nervous system; their structure and histogenesis. The paper was based upon the record of a rare condition found *post-mortem*, in which a number of small nodules were discovered scattered through the spinal cord and the *medulla oblongata*; and its main import was the question of the origin and relation of the nerve fibre to the nerve cell. Of the two views (1) that the fibre is an outgrowth of the cell, (2) that the fibre arises separately from the cell and afterwards unites with it, the latter seemed to fit in better with the observations.—Dr. G. E. Allan and John Brown: The transformation of ferric oxide into magnetic oxide. On the experimental side the paper was an elaborate investigation into the magnetic changes which accompany heating and cooling of ferric oxide. These changes indicated certain chemical transformations. One of the conclusions was that magnetite may be formed at a comparatively low temperature in rocks which contain hæmatite.

## PARIS.

**Academy of Sciences**, July 8.—M. Lippmann in the chair.—J. Boussinesq: Errors, sometimes important from the theoretical point of view, introduced in the simplifications necessary for the consideration of actual systems.—G. Bigourdan: Time signals, and a method of producing them.—Henry Le Chatelier: The determination of atomic weights by Hinrichs's method. The author points out the fallacy of this method of calculating the "true" atomic weights.—El. Metchnikoff and Al. Besredka: Inoculation against typhoid fever. Experiments made on chimpanzees showed that, after injection under the skin, the bacilli were absent from the general circulation and from the excreta, and that the animals did not act as carriers of typhoid. The method has since been used in a large number of cases, and a full account will be published in the *Annales de l'Institut Pasteur*.—M. Gouy: Pressure at the surface of the sun. The author concludes that the visible portions of the sun consist of gases and vapours in a state of very great rarefaction.—R. de Forcrand: The system water-cyclohexanol. The existence of a hydrate is possibly indicated by the solidification curve.—A. Buhl: The extensions of the formula of Stokes.—Ch. N. Moore: The factors of convergence in double series, and on the double series of Fourier.—Patrick Brown: The generalised problem of Abel and its applications.—Jean Chazy: The limitation in degree of the coefficients of differential algebraic equations with fixed critical points.—Arnaud Denjoy: The absolute convergence of trigonometrical

series.—René Garnier: The representation of the integrals of irreducible equations of the second order, with fixed critical points, by means of the theory of linear equations.—A. Guillet and M. Aubert: Expression for the force between two electrified conductors.—A. Tian: Variations in the radiation of the quartz-mercury lamp with treatment and time of use. The formation of hydrogen peroxide from water containing oxygen, and also the ozonisation of oxygen, are produced by rays of very short wave-length. On the other hand, ozone and the peroxide are energetically decomposed by rays in the middle portion of the ultraviolet. The feeble production of hydrogen peroxide and of ozone by quartz-mercury lamps with a high voltage is due, not to a diminution in the radiation producing these substances, but to a great increase in the rays which cause their destruction.—L. Dunoyer: The conductivity of sodium vapour. The conductivity of pure sodium vapour does not differ greatly from that of ordinary gases.—G. Millochou: A contribution to the study of oscillatory discharges.—Ph. A. Guye: The law of mass-action. Considerations as to the conditions under which the law of mass-action is rigorously applicable.—Eugène Wourtsel: Density and compressibility of nitrosyl chloride. The exact weights of a litre of NOCl at  $0^{\circ}$  C., and under pressures of 287 mm. and 720 mm., were determined in order to control the atomic weight of chlorine and to examine the deviations of nitrosyl chloride from Boyle's law. The weight of one litre (N.T.P., latitude of  $45^{\circ}$ , at sea-level) was 2.9919 grams, and the molecular weight thus found differs by only  $1/5500$  from the calculated value, taking  $N=14.008$  and  $Cl=35.460$ , a difference which is within the limits of experimental error.—C. Chéneveau: The viscosity of solutions. Experiments show that if the existence of hydrates in solution be admitted, those indicated by the viscosity measurements are not in general the same as those indicated by measurements of the refractive index.—M. Chouriguine: The alloys of platinum with aluminium. These metals form a coloured compound of the formula  $PtAl_3$ , and also another compound richer in platinum.—M. Lasègue: Chlorous acid. Barium chlorite was obtained by passing the gases produced by the reduction of chloric acid by tartaric acid into baryta water. It was purified by conversion into the insoluble yellow lead chlorite, and then reconverted into chlorite of barium, from which the acid was obtained by the action of sulphuric acid. Chlorous acid is very unstable, and decomposes according to the equation  $4HClO_2=2H_2O+3ClO_2+Cl$ .—Marcel Guichard and Pierre Roger Jourdain: Gases evolved from aluminium.—Paul Lebeau: A new determination of the atomic weight of uranium. The salt  $UO_2(NO_3)_2 \cdot 2H_2O$  (which does not lose its water even on exposure over phosphorus pentoxide) is reduced to  $UO_2$  by heating in a current of hydrogen. The ratio thus found gives  $U=238.5$ , a number agreeing exactly with that found by Richards and Merigold by analysis of the tetrabromide,  $UBr_4$ .—Henri Golblum and Mlle. Hélène Gunther: Electrolytic estimation of manganese and its separation from iron.—J. B. Senderens and J. Aboulenc: Catalytic production, in the wet way, of esters of the cyclohexanols. The best yields of esters are obtained by heating the mixture of cyclohexanol and organic acid with 3 per cent. by volume of sulphuric acid to  $100^{\circ}$ – $110^{\circ}$  C., for about an hour.—Maurice Lantry: Action of hydrogen peroxide on acetothienone.—E. Léger: Constitution of the aloins from Natal aloes. These substances are glucosides derived from *d* arabinose.—J. Pavillard: Concerning *Diplopsalis lenticula*.—A. Eckley Lechmere: Some new moulds from the Ivory Coast.—M. Radais and A. Sartory: Comparative toxicity of various poisonous

fungi, *Amanita phalloides*, *A. verna*, *A. mappa*, and *Volvaria gloiocephala* are all about equally toxic in the fresh state; but on drying, *A. mappa* loses its toxicity, whereas the others are not affected to any extent.—A. **Magnan**: Influence of diet on the liver and kidneys of ducks.—J. **Vallo**: The appearance of large quantities of *Desoria glacialis* on the surface of a glacier.—E. **Kayser**: influence of nitrogenous matter on the production of ethyl acetate in alcoholic fermentation.—Pierre **Thomas** and Mlle. Madeleine **Lebert**: Action of certain cholesterol derivatives in increasing the number of red blood-corpuscles.—M. **Javillier**: The influence of zinc on *Aspergillus niger*.—A. **Kiesel**: The influence of various acids and acid salts on the development of *Aspergillus niger*.

### BOOKS RECEIVED.

The Love of Nature among the Romans. By Sir Archibald Geikie. Pp. xi+394. (London: J. Murray.) 9s. net.

Studies in Luminescence. By Profs. E. L. Nichols and E. Merritt. Pp. vii+225. (Washington: Carnegie Institution.)

The Influence of a Magnetic Field upon the Spark Spectra of Iron and Titanium. By A. S. King. Pp. iii+66+6 plates. (Washington: Carnegie Institution.)

Über die Einwirkung von Wasser und Natronlauge auf Baumwollcellulose. By Dr. M. Robinoff. Pp. ii+94. (Berlin: Gebrüder Borntraeger.) 3.60 marks.

Illustriertes Handbuch der Laubholzkunde. By C. K. Schneider. Zwölfte (Schluss-) Lieferung. Pp. 817-1070. (Jena: G. Fischer.) 8 marks.

The Tungsten-mining Industry in New South Wales. By J. E. Carne. Pp. 102. (Sydney: A. W. Gullick.) 2s. 6d.

Report on Scottish Ornithology in 1911, including Migration. By E. V. Baxter and L. J. Rintoul. Pp. 80. (Edinburgh: Oliver and Boyd; London: Gurney and Jackson.) 1s. 6d. net.

University of London. Francis Galton Laboratory for National Eugenics. Eugenics Laboratory Memoirs XVII. A Second Study of Extreme Alcoholism in Adults, with Special Reference to the Home Office Inebriate Reformatory Data. By Dr. D. Heron. Pp. iv+95. (London: Dulau and Co., Ltd.) 5s. net.

Les Cavernes de la Région Cantabrique (Espagne). By H. A. del Rio, L'Abbé Prof. H. Breuil, and Père L. Sierra. Pp. viii+265+100 plates. (Monaco: A. Chêne.)

Soil Conditions and Plant Growth. By Dr. E. J. Russell. Pp. viii+168. (London: Longmans and Co.) 5s. net.

Researches on Cellulose. By C. F. Cross and E. J. Bevan. III. (1905-10). Pp. x+173. (London: Longmans and Co.) 7s. 6d. net.

Black's Modern Guide to Harrogate. Edited by Gordon Home. Pp. 128. (London: A. and C. Black.) 1s.

An Introduction to Practical Physics for Colleges and Schools. By Prof. E. H. Barton and Dr. T. P. Black. Pp. vii+188. (London: E. Arnold.) 3s. 6d.

Maps: How they are Made; How to Read Them. By Prof. H. N. Dickson. Pp. 66. (London: G. W. Bacon and Co., Ltd.) 6d.

The British Museum Reading Room. A Handbook for Students. By R. A. Peddie. Pp. vii+61. (London: Grafton and Co.) 1s. net.

First Year's Course of Chemistry. By J. Sinclair and G. W. M'Allister. Pp. vii+165. (London: G. Bell and Sons, Ltd.) 1s. 6d.

L'Éducation Physique ou L'Entraînement complet par la Méthode Naturelle. Exposé et Résultats. By G. Hébert. Pp. 85. (Paris: Viubert.)

Vorlesungen über vergleichende Tier- und Pflanzenkunde. By Prof. A. Wagner. Pp. viii+518. (Leipzig: W. Engelmann.) 11 marks.

An Introduction to the Infinitesimal Calculus. By Prof. H. S. Carslaw. Pp. xii+137. (London: Longmans and Co.) 5s. net.

The Second Danish Pamir Expedition: Studies on the Vegetation of the Transcaspien Lowlands. By O. Paulsen. Pp. v+279. (Copenhagen: Gyldendalske.)

Allgemeine Elektrotechnik. By Prof. P. Janet. Translated by F. Süchting and E. Riecke. Erster Band. By F. Süchting. Pp. vi+269. (Leipzig and Berlin: B. G. Teubner.) 6 marks.

Bau und Leben der Bakterien. By Prof. W. Benecke. Pp. xii+650. (Leipzig and Berlin: B. G. Teubner.) 15 marks.

Norse Tales. By E. Thomas. Pp. 159. (Oxford: Clarendon Press.) 2s.

Illustriertes Handbuch der Laubholzkunde. By C. K. Schneider. Register. Pp. vii+136. (Jena: G. Fischer.) 5 marks.

Photographic Copyright. By G. E. Brown and A. Mackie. Pp. 89. (London: H. Greenwood and Co.) 1s. net.

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