gift. Harvard University has received three large bequests: 450,000 dollars from the late Mr. George Smith, 100,000 dollars from the late Mr. Robert C. Billings, and 100,000 dollars from the late Mr. Jacob Wheelock. Mr. Wheelock also bequeathed 100,000 dollars to Clark University, and Mr. Billings bequeathed 100,000 dollars each to the Massachusetts Institute of Technology and the Boston Museum of Fine Arts. The University of Wooster, Wooster, O., successfully completed a campaign to raise 140,000 dollars in order to secure two large conditional gifts, 100,000 dollars by Mr. Andrew Carnegie and 50,000 dollars by Mr. L. H. Severance, of Cleveland. By the will of Mrs. Lila Currier, 50,000 dollars will go to Columbia University and 100,000 dollars to Yale University upon the death of Mr. Edward W. Currier.

AN address on "The Profession of Teaching," delivered recently at Kendal by the Ven. J. M. Wilson, Archdeacon of Manchester and formerly head-master of Clifton College, has been issued by the Kendal *Mercury and Times*, and it will do a good service by directing attention to desirable objects of education. A school preparation should be of a kind which will foster the desire and develop the power to overcome difficulties; it should give self-reliance and sufficient knowledge of scientific principles to enable the pupil in after life to understand changing conditions and see their trend. Above all, school work should encourage the spirit of inquiry which finds delight in making new observations and experiments with whatever resources are available. The principle upon which Humboldt constructed Prussian education a century ago was: "Whatever we wish to see characteristic of our nation we must first implant in our schools." Remembering this, the teacher's aim should be to give the pupil an observant eye, alert curiosity that inquires into phenomena and their causes, the habit of accurate expression, and varied interests; for then whatever work is afterwards taken up will be satisfactorily done. Archdeacon Wilson strikes the fundamental note of true education in the following remarks from his address:—"The soldier may know all the campaigns of great commanders, from Alexander the Great to Lord Kitchener; but his knowledge avails little unless he has cultivated inventiveness and resource that meets wholly new conditions. The existence of our nation may depend some day on the nerve and originality of the officers of our navy. Every war is a new one; and the next will be utterly unlike the last or the present. It is the same in commerce. The new problems, with combines and international unions, with a shrunken world and new modes of transit, are not like the old. It is the same with agriculture, with mechanical and chemical industries, with engineering. Everything is new, and new every day. It is the same with philosophy and critical studies and theology. It is emphatically the same with statesmanship, municipal and imperial. What utterly new problems in international politics, in international economics and in domestic finance does the world present to-day. Assuredly if we would prepare our scholars for life, the supreme intellectual preparation is found in methods which evoke the faculty, the originality, the mental resourcefulness of our pupils." It is for us to see that the subjects and methods of teaching in our schools are such as promote the development of these qualities, for national progress depends upon them.

SOCIETIES AND ACADEMIES.

LONDON.

Physical Society, April 11.—Prof. S. P. Thompson, president, in the chair.—Dr. R. A. Lehfeldt exhibited an electric heater. The apparatus consisted of a vacuum jacketed glass tube, containing water which was boiled by passing a current through a platinum spiral immersed in the liquid. Tap water is preferable to distilled water, because the small electrolytic action in the former case causes the boiling to proceed quietly. Different temperatures can be obtained by using other liquids.—Mr. Grant exhibited and described an apparatus for vapour pressure measurements. The liquid of which the vapour pressure is required is introduced into the vacuum of a syphon barometer. This is mounted alongside an ordinary syphon barometer, and the upper extremities of both are surrounded by a bath, which can be kept at any desired temperature. The levels of the mercury in the open tubes are then adjusted until the upper mercury surfaces are at the same level. The vapour pressure is then measured by the difference of level in the open tubes. By a simple modification it is easy to investigate the vapour pressure of a liquid in the presence of air. The two chief advantages of the method are (1) the simplification of the temperature correction and (2) the wide range of temperature over which it can be employed with the use of a small bath. Prof. Callendar referred to the advantages of the apparatus, and said that it appeared specially suitable for elementary laboratory measurements.—Mr. J. T. Morris showed an experiment illustrating the use of kathode rays in alternate current work. The usual form of Braun tube was used, the rays falling upon a luminescent screen and forming a blue spot. A solenoid conveying an alternating current was fixed near the tube. The varying magnetic field caused the spot to oscillate about its mean position. To determine the maximum value of an alternating current, a switch should be arranged to rapidly replace the alternating current by a continuous one. The continuous current is then adjusted until the maximum excursion of the spot is the same as before and the value of the current read off from an ammeter in the circuit. For accurate work, the frequency of the discharge from the induction coil exciting the tube should be adjusted until it is almost exactly in synchronism with the alternating current. The unsteadiness of the spot of light in the zero position limits the accuracy of the measurements. Mr. Morris has tried to reduce this unsteadiness by using an earthed aluminium diaphragm instead of a glass one.—Mr. Morris then showed an experiment on the growth of electric currents in an inductive circuit. An E.M.F. of 0·8 volt was applied to a coil wound on a ring-shaped laminated iron core. When the current had attained its steady value, the E.M.F. was reversed and the variations of the current strength shown by an ammeter. About twenty seconds were required for the current to attain its maximum value in the opposite direction. A secondary coil was also wound upon the same core, and the effect produced upon the growing current by the closing of this secondary circuit was shown. Mr. Morris has determined curves of growth for different currents, and he showed how similar curves could be used to determine experimentally the hysteresis loss in transformers.—Mr. Croft showed some apparatus and devices useful in teaching. The method of determining graphically the focal length of a lens from the distances of conjugate foci from the centre was illustrated. The graphical solution of a quadratic equation was also shown. An apparatus for producing and demonstrating the properties of three-phase currents was exhibited and described. Mr. Croft then showed crystals illustrating the five regular solids, and an electric lamp with the filament in one plane useful for optical work. The flatness of a piece of plate glass can be tested with a scribing block. The point is adjusted to touch the glass in one position. By breathing on the glass and moving the block about it is easily seen if the point leaves the surface.

PARIS.

Academy of Sciences, April 7.—M. Bouquet de la Grye in the chair.—Note by M. de Freycinet accompanying the presentation of a work on the principles of rational mechanics.—On the differentiation of Fourier's series, by M. Leopold Fejer. In general the trigonometrical series, which is obtained by differentiating term by term the Fourier's series of a function $f(x)$, is divergent in the cases which occur most frequently in its applications. A special case of Fourier's series is considered in the present paper, which, when differentiated term by term, is always simply indeterminate, and with the exception of the limits 0 and 2π has for its sum $f'(x)$.—On the conditions of stability of automobiles on curves, by M. A. Petot. Formulæ are developed showing the amount of time necessary to pass from one curvature to another. A study of the fundamental conditions arrived at in this paper leads to the conclusion that it is the neglect of these which is the true cause of a number of serious accidents which have been attributed to a faulty steering gear.—Oscillations peculiar to networks of distribution, by M. Brillouin. The theorem deduced by M. Pomey in a recent number of the *Comptes rendus* was announced and demonstrated fifty-one years ago by Helmholtz.—On the relation $L + S/T = Q/T = K$, by M. de Forcrand. The molecular latent heat of volatilisation of ammonia is calculated by the formula of Clapeyron from the data of Regnault, and this is applied to the proof of a theorem that in all physical and chemical phenomena the heat of solidification of a molecule of a gas is proportional to the absolute temperature of volatilisation under a pressure of 760 mm. of mercury.—On the classification of the atomic weights

of neon, argon, krypton and xenon, by M. H. Wilde. The author assumes, without proof, that the atomic weights of this series should be represented by the members of the series $7n$H, where n is 3, 6, or 9. This would give the atomic weights as neon, 7 (9·96); nitrogen, 14 (14); argon, 21 (19·96); krypton, 42 (40·78); and xenon, 63 (64), instead of the experimental numbers given in brackets.—On a type of compounds of glucinum, by M. H. Lacombe. The compounds are of the type A_6Be_4O, where A is the radical of a fatty acid. Particulars are given of the preparation and properties of the formate, acetate, propionate, isobutyrate, normal butyrate and isovalerate. All attempts to prepare the normal salts of the type BeA_2 were fruitless.—On the constitution of the chlorhydrins, by M. Marc Tiffeneau. The author has applied the synthesis of chlorhydrins from magnesium alkyl bromides and mono-chloracetone to determine the constitution of the chlorhydrins obtained from olefines and hypochlorous acid. The rule given by Markownikoff, that in the fixation of HClO on olefines the hydroxyl group attaches itself to the carbon possessing the least hydrogen, as generalised by Krassousky was verified in the experiments described.—On the nitration of furfurane, and on a derivative of nitrosuccinic aldehyde, by M. Marquis. The nitration of furfurane in solution in acetic anhydride opens up the ring with the formation of a monacetin of nitrosuccinic aldehyde. By the action of pyridine upon this, the ring is again closed and mono-nitrofurfurane is produced.—On a new mode of preparation of oxygen, by M. George F. Jaubert. The peroxides of sodium or potassium are compressed with the theoretical quantity either of a soluble permanganate or hypochlorite, or a trace of a nickel or copper salt. Oxygen is produced from these cubes in the cold by the action of water.—Mendel's law and the heredity of pigmentation in mice, by M. L. Cuenot. Up to the present all researches on Mendel's law have been carried out on plants, and it is not known whether this mode of heredity is met with in animals also. Experiments were therefore carried out with white and grey mice, and it was found that the progeny obtained by crossing these was invariably grey. The result of crossing with these grey mongrels was in complete accord with the theory.—On the structure and mode of multiplication of the flagellæ of the genus Herpetomonas, by M. Louis Leger.—On the *Daniellia* of Western Africa and on their resinous products, their relation with the *Hammout* or incense of the French Soudan, by M. Edouard Heckel.—On the seismic influence of the Armorican folds in the north-west of France and in the south of England, by M. F. de Montessus de Ballore.—On a new application of the principle of chrono-photography and on the construction of isonomal barometric charts, serving for the kinematographical study of the general movements of the atmosphere, by M. P. Garrigou-Lagrange. A series of charts showing the isobars over a given area at sufficiently short intervals of time may be regarded as instantaneous photographs representing the several phases of a movement. A series of charts issued by the Signal Office at Washington has been treated from this point of view, and a number of charts obtained which can be used in a hand kinematograph.

DIARY OF SOCIETIES.

THURSDAY, APRIL 17.

ROYAL INSTITUTION, at 3.—The Oxygen Group of Elements: Prof. J. Dewar, F.R.S.

SOCIETY OF ARTS, at 4.30.—Recent Developments in Punjab Irrigation: Sidney Preston.

LINNEAN SOCIETY, at 8.—The Anatomy of Todea with Notes on the Affinity and Geological History of the Osmundaceæ: A. C. Seward, F.R.S., and Miss Sybil O. Ford.—On the New Zealand Phyllobranchiate Crustacea, Macrura: G. M. Thomson.

CHEMICAL SOCIETY, at 8.—Oxonium Salts of Fluoram and its Derivatives: J. T. Hewitt and J. H. Tervet.—The Influence of certain Acidic Oxides on the Specific Rotations of Lactic Acid and Potassium Lactate: G. G. Henderson and D. Prentice.—(1) The Amounts of Nitrogen as Ammonia and as Nitric Acid, and Chlorine in the Rain-water collected at Rothamsted; (2) The Amounts of Nitrogen as Nitrates and Chlorine in the Drainage through uncropped and unmanured land: N. H. J. Miller.

FRIDAY, APRIL 18.

ROYAL INSTITUTION, at 9.—The Autocar: Sir J. H. A. Macdonald.

EPIDEMIOLOGICAL SOCIETY, at 8.30.—Smallpox Hospitals and the spread of Infection: Dr. Thresh.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Erewash Valley Widening and Toton Sidings: H. C. M. Austen.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—The Standardisation of Pipe Flanges and Flange Fittings: R. E. Atkinson.

MONDAY, APRIL 21.

VICTORIA INSTITUTE, at 4.30.—Iceland, its History and Inhabitants: Dr. J. Stefansson.

SOCIETY OF ARTS, at 8.—Glass for Optical Instruments: Dr. R. T. Glazebrook, F.R.S.

TUESDAY, APRIL 22.

ROYAL INSTITUTION, at 3.—Recent Methods and Results in Biological Inquiry: Dr. A. Macfadyen.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*Discussion*: Locomotive Firebox Stays: F. W. Webb.

WEDNESDAY, APRIL 23.

INSTITUTION OF CIVIL ENGINEERS, at 8.—"James Forrest" Lecture: Metallurgy in Relation to Engineering: Sir W. C. Roberts-Austen, K.C.B., F.R.S.

SOCIETY OF ARTS, at 8.—Opto-technics: Prof. Silvanus P. Thompson, F.R.S.

THURSDAY, APRIL 24.

ROYAL SOCIETY, at 4.30.—*Probable papers*.—On Skin-currents. Part III.—The Human Skin: Dr. A. D. Waller, F.R.S.—Antarctic Origin of the Tribe Schœneæ: C. B. Clarke, F.R.S.—A New Interpretation of the Gastric Organs of *Spirula Nautilus* and the Gastropods: J. E. S. Moore and W. B. Randles.

ROYAL INSTITUTION, at 3.—The Oxygen Group of Elements: Prof. J. Dewar, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Problems of Electric Railways: J. Swinburne and W. R. Cooper. (Adjourned discussion).—Form of Model General Conditions, for use in connection with Contracts for Plant, Mains, and Apparatus for Electricity Works. As drafted by a Committee.

FRIDAY, APRIL 25.

ROYAL INSTITUTION, at 9.—X-Rays and Localisation: Dr. J. Mackenzie Davidson.

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