

probably due to the fact that the instantaneous heat of condensation is able to superheat the supersaturated steam as it arrives at the surface. The velocity of condensation increases markedly with the pressure; and since the initial velocity of the jet and the rate of decrease of its velocity in ascending also increase with the pressure, the amplitude of the oscillations decreases with it.—Abnormal hickory nuts, by F. H. Herrick. The author describes two hickory nuts of ordinary external appearance, but containing an endocarp strongly resembling an acorn, and supposed to be cases of hybridism between the oak and the hickory. The minute anatomy of their structure gives no direct evidence of hybridism, but the variation undoubtedly arose at the time of fertilisation, and is at present unexplained.—Separation and identification of potassium and sodium, by D. A. Kreider and J. E. Breckenridge. These metals may be effectively and delicately separated by converting their salts into perchlorates and precipitating the potassium with 97 per cent. alcohol. The sodium is then precipitated by blowing gaseous hydrochloric acid into the alcoholic filtrate.—A new method for reading deflections of galvanometers, by C. B. Rice. The method is based upon Gauss's mirror and scale method, but the telescope is replaced by a lens at a short distance from the mirror. The latter is perforated in the centre, and through the hole is seen a black arrow on a white ground placed at an equal distance beyond the mirror, which, being in the same plane as the reflected scale, serves as a pointer, and obviates the necessity of a telescope.—The action of ferric chloride on metallic gold, by P. C. McIlhiney. Ferric chloride by itself, or hydrochloric acid in presence of air, have no action on gold. But a mixed solution of hydrochloric acid and ferric chloride dissolves gold when oxygen is present, the ferric chloride acting as a carrier.

American Journal of Mathematics, vol. xviii. No. 4, October.—Mr. E. H. Moore concludes his tactical memoranda i.-iii. with several more "whist-tournament arrangements," and gives a short list of the published literature of the subject.—In the *Étude de Géométrie Cinématique réglée*, M. René de Saussure proposes to establish a purely synthetical correspondence entre les points de la surface imaginaire et les droites de l'espace, de manière à obtenir une géométrie de l'espace réglée basée sur la géométrie supposée connue, de la surface. He discusses first the principles of the synthetic geometry of such a space, and then the kinematic geometry of the same space. He next gives applications of his theory. In this theory la ligne droite est prise comme élément d'espace, non-seulement au point de vue géométrique, mais aussi au point de vue mécanique; cette manière de voir conduit à la conception d'une *cinématique réglée*. La raison d'être de cette branche de la cinématique provient du fait que le déplacement le plus général d'un corps solide est une torsion et l'effort le plus général exercé sur un solide est ce que Plücker appelle un *dyname* et Ball un *torseur* (wrench); car l'effort que développe un *dyname* ou un *torseur* s'exerce sur une droite de même qu'une force s'exerce sur un point, puisque le vectangle est à la droite ce que le vecteur est au point.—The volume closes with a paper by Goursat, entitled "Sur les équations linéaires et la méthode de Laplace." In it the author develops, at some length, a recent note which he presented to the Academy of Sciences (*Comptes rendus*, t. cxxii., January 27, 1896).

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, October 19.—M. A. Chatin in the chair.—The President announced the death of M. Trécul, Member of the Botanical Section, on October 15.—New researches relating to the decomposition of sugars, under the influence of acids, and especially with the production of carbonic acid, by MM. Berthelot and G. André. The experiments were partly conducted in sealed tubes at 100°, partly in open flasks, at the boiling point. Estimations were made of carbonic acid, carbon monoxide, formic acid, levulic acid, humic acid, and unattacked glucose. Besides glucose, experiments were carried out with levulose, galactose, and maltose. The principal reaction appears to be the formation of humic acid; carbonic acid is also formed in not inconsiderable quantity.—Determination of the magnetic elements at sea. Applications of the observations made by M. Schwerner on the *Dubourdieu*, by M. E. Guyon. Since the formulæ developed by Archibald Smith and by Börgen for

correcting the readings made at sea, were worked out for ships into the construction of which comparatively little iron entered, it became necessary to make a fresh study of the corrections to be applied to readings taken upon warships as built at present. In the method here indicated all the constants necessary for the corrections for each kind of observation (declination, inclination, and total force) are deduced exclusively from observations of the same nature.—On the work carried out at the Observatory of Mount Blanc in 1896, by M. J. Janssen. The work has been considerably impeded by the bad weather prevailing, the actinometric observations being especially interfered with. The large telescope (33 cm. diameter) has been successfully mounted, and the observations on the values of the acceleration due to gravity at different points on the mountain have been continued.—Study of the digestibility of cocoa-butter and ordinary butter, by MM. Bourot and F. Jean. Comparative experiments carried out with the same person showed that 95.8 per cent. of ordinary butter is digested, and 98 per cent. of cocoa-butter. An abnormally large quantity of fat in the food causes less disturbance if the fat is cocoa-butter than if it is present as ordinary butter.—Some colour reactions of brucine: detection of nitrous acid in presence of sulphites, by M. P. Pichard. The red colouration produced in an acid solution of brucine by a nitrite is capable of showing one part of nitrous acid in 640,000 parts of water, and is more sensitive in the presence of sulphites and hyposulphites than the tests proposed by Griess, Tromsdorff, and Piccini.—General principles relating to the physics of space, by M. J. Poulin.—Tempests and cyclones, by M. A. de Langrée.—Note on aerial navigation, by M. Caravanier.—On some peculiarities of solubility curves, by M. H. Le Chatelier. Some experiments on the melting points of some double salts and alloys, showed that in the neighbourhood of the composition corresponding to a definite combination (SnCu_3 , SbCu_2 , Al_2Cu , &c.), the curve showed a maximum temperature in the form of an angular point, which did not necessarily correspond exactly to the point of definite composition. The theoretical discussion elucidates the reason for this peculiarity.—Influence of pressure in the changes of state of a body, by M. A. Ponsot.—On the property of discharging electrified conductors, produced in gases by the X-rays and by electric sparks, by M. E. Villari. It is shown that a gas confined in a tube, and exposed to the X-rays, acquires rapidly the power of discharging an electrified disc, and keeps this property for some time. The passage of a series of sparks from a coil strengthened by a condenser, confers the same property upon a gas.—On the action of the silent discharge upon the property of gases of discharging electrified conductors, by M. E. Villari. Gases subjected to the action of a series of sparks acquire an increased conductivity for heat. The silent discharge is not able to put the gas into the condition in which it can discharge an electrified body, but if a gas which has been subjected to X-rays, and which therefore is in this condition, is subjected to the silent discharge, it is no longer able to affect a charged gold-leaf electroscope.—Succession of the atomic weights of the elements, by M. Delauney. An attempt to classify the elements according as their atomic weights are expressed by: $4n$, $4n + 3$, $4n + 2$, or $4n + 1$.—Phosphopalladic ethers. Ammoniacal derivatives of phosphopalladous and phosphopalladic ethers, by M. Finck.—Law of the establishment and persistence of the luminous sensation, deduced from new experiments upon rotating discs, by M. Charles Henry.—On the jaws in insects, by M. Joannes Chatin.—On the habits of *Evania Desjardinsii*, by M. E. Bordage.—New observations on the bacteria of the potato, by M. E. Roze.—Some remarks on the kerosine shale of New South Wales, by M. C. E. Bertrand.—On the microgranulites of the Ferret valley, by MM. L. Duparc and F. Pearce.—On the mode of formation of the Pyrenees, by M. P. W. Stuart-Menteth.—Contribution to the theory of the movements of storms, by M. J. Vinot.

AMSTERDAM.

Royal Academy of Sciences, September 26.—Prof. Stokvis in the chair.—Prof. Korteweg, who, as delegate of the Dutch Government, attended the Royal Society conference on the desirability of preparing a catalogue of scientific works, spoke of this conference, and entered into some details concerning its purpose, the nature of the resolutions passed, the task of the national bureaux, and the arrangement of the subject-index. Prof. Haga exhibited two negatives which prove the existence of different kinds of X-rays, a conclusion also arrived at by

other investigators. At a high degree of rarefaction in the vacuum-tubes the penetrating power of the rays through flesh and bone is very different, so that the outlines of the bones are very distinct, whilst, when the rarefaction is less great, these two bodies transmit the rays in about the same degree.—Prof. Kamerlingh Onnes made, on behalf of Dr. L. H. Siertsema, a communication on measurements of magnetic rotations, carried out in the Leyden Physical Laboratory. With the apparatus described in former communications determinations have been made of the absolute rotation constant of water, with the object of controlling the reduction-factor, with which the rotation determination has been reduced to an absolute measure. The result found is $0^{\circ}01302'$ at $13^{\circ}4'$, which corresponds very well with the constants found by Arons and by Rodger and Watson. A second communication again gave the results for gases, as they have undergone a slight alteration, owing to a necessary correction in the manometer readings.—Prof. Kamerlingh Onnes also communicated Dr. Zeeman's measurements on the variation of the absorption of electrical waves with the wave-length and the concentration of the electrolyte. The results, which hold good between limits given in detail in the paper, are: the coefficient of absorption changes as the square root of the conductivity of the solution, and it does not change, if conductivity and wave-length vary in the same ratio.—Prof. Engelmann communicated the results of an investigation into reflexes of the auricle of the heart, made by Mr. J. J. L. Muskens in the Utrecht Physiological Laboratory, by experimenting upon frogs' hearts.

DIARY OF SOCIETIES.

FRIDAY, OCTOBER 30.

PHYSICAL SOCIETY, at 5.—Special Meeting, after which, at an Ordinary Meeting—A Satisfactory Method of measuring Electrolytic Conductivity by means of Continuous Currents: Prof. W. Stroud and J. B. Henderson.—A Telemetric Spherometer and Focometer: Prof. W. Stroud.—An Experimental Exhibition: R. Appleyard.

SATURDAY, OCTOBER 31.

ESSEX FIELD CLUB, at 6.30 (at Chingford)—Short Report, by the Curator, on the first year's work at the Epping Forest Museum.—Our Forest Trees, and How they should be represented in the Museum: Prof. G. S. Boulger.—Notes on the Conference of Delegates of the Corresponding Societies of the British Association, Liverpool, 1896: T. V. Holmes.

MONDAY, NOVEMBER 2.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Production of Inoculating Materials for Use in Agriculture (Nitragin): Dr. J. A. Voelcker.—The Smelting and Refining of Cyanide Bullion: Arthur Caldecott.

TUESDAY, NOVEMBER 3.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Address by J. Wolfe Barry, C.B., F.R.S., the President.

WEDNESDAY, NOVEMBER 4.

GEOLOGICAL SOCIETY, at 8.—Additional Note on the Sections near the Summit of the Furka Pass (Switzerland): T. G. Bonney, F.R.S.—Geological and Petrographical Studies of the Sudbury Nickel District (Canada): T. L. Walker (communicated by J. J. H. Teall, F.R.S.).—On the Distribution in Space of the Accessory Shocks of the Great Japanese Earthquake of 1891.

ENTOMOLOGICAL SOCIETY, at 8.

INSTITUTION OF MECHANICAL ENGINEERS, at 7.30.—Research Committee on the Value of the Steam Jacket: Experiment on a Locomotive Engine: Prof. T. Hudson Beare and Bryan Donkin.—Transmission of Heat from Surface Condensation through Metal Cylinders: Lieut.-Colonel English and Bryan Donkin.

SOCIETY OF PUBLIC ANALYSTS, at 8.—Note on Ginger: Thos. B. Blunt.—The Determination of Searic Acid in Fats: Otto Hehner and C. A. Mitchell.—Further Note on Lead in Canadian Cheese: F. Wallis Stoddart.

THURSDAY, NOVEMBER 5.

CHEMICAL SOCIETY, at 8.—The Constitution of Nitrogen Iodide: Dr. F. D. Chattaway.—Note on the Solution and Diffusion of certain Metals in Mercury: Prof. Roberts-Austen, C.B., F.R.S.—Compounds of Metallic Hydroxides with Iodine: J. Rietze.—The Economical Preparation of Hydroxylamine Sulphate; The Reduction of Nitrosulphates; and Amidodisulphonic Acid: Dr. E. Divers, F.R.S., and Dr. T. Haga.—The Molecular Conductivity of Amidodisulphonic Acid: Joji Sakurai.—Physiological Action of Amidodisulphonic Acid: Dr. Oscar Loew.—Amidodisulphonates. Part II.: Dr. E. Divers, F.R.S., and Dr. T. Haga.—How Mercurous and Mercuric Salts change into each other: Seiichi Hada.—The Effect of Heat on Aqueous Solutions of Chrome Alum: Margaret D. Dougal.—The Saponification of Ethylic Dicarboxyl Glutamate: Dr. H. W. Bolam.—The Periodic Law: R. M. Desley.—The Colouring Matters occurring in British Plants: A. G. Perkin.—Carbohydrates of Cereal Straws: C. F. Cross, E. J. Bevin, and Claude Smith.

LINNEAN SOCIETY, at 8.—Mediterranean Bryozoa: A. W. Waters.—On some New Species of Crassula from South Africa: Dr. S. Schönland.—Holothurians of New Zealand: A. H. Dendy.

INSTITUTION OF MECHANICAL ENGINEERS, at 7.30.—Breakdowns of Stationary Steam-Engines: Michael Longridge.

FRIDAY, NOVEMBER 6.

GEOLOGISTS' ASSOCIATION, at 8.—Conversazione and Exhibition of Specimens.

BOOKS, PAMPHLET, and SERIALS RECEIVED.

BOOKS.—General Report on the Operations of the Survey of India Department, 1894-95 (Calcutta).—Practical Work in Physics; W. G. Woolcombe. Part 3. Light and Sound (Oxford, Clarendon Press).—Firth College. Sheffield, Sheffield School of Medicine, Calendar, 1896-97 (Sheffield).—Elements of Mechanics: Dr. T. W. Wright (Spon).—A History of Gardening in England: Hon. Alicia Amherst, 2nd edition (Quaritch).—Les Galets Coloriés du Mas d'Azil: Ed. Piette (Paris, Masson).—The Method of Darwin: F. Cramer (Chicago, McClurg).—Les Accumulateurs Electriques: F. Loppé (Paris, Gauthier-Villars).—Annalen der Kaiserlichen Universitäts-Sternwarte in Strassburg, i. Band (Karlsruhe).—Journal of the Right Hon. Sir Joseph Banks, edited by Sir J. D. Hooker (Macmillan).—Index Operum Leonardi Euleri: J. G. Hagen (Berolini, Dames).—Experience: Rev. W. Richmond (Sonnenschein).—A New Course of Experimental Chemistry, revised edition (Murby).—The Life and Letters of George John Romanes, new edition (Longmans).—Report on the Geodetic Survey of South Africa, executed by Lieut.-Colonel Morris in 1883-1892 (Cape Town, Richards).—Model Drawing and Sharing from Casts: T. C. Barfield (Chapman).—Cheese and Cheese-making, &c.: J. Long and J. Benson (Chapman).—An Introduction to Human Physiology: Dr. D. J. Waller, third edition (Longmans).—Die Mineralogie des Harzes, and Atlas: Dr. O. Luedecke (Berlin, Gehrüder Borntraeger).

PAMPHLET.—Sociedad Científica Argentina. Semillas y Frutos: Prof. A. Gallardo (Buenos Aires).

SERIALS.—Journal of the Chemical Society, October (Gurney).—Quarterly Review of Technical and Secondary Education, October (Macmillan).—Quarterly Review, October (Murray).—Psychologische Arbeiten, i. Band, 4 Hefte (Leipzig, Engelmann).—L'Anthropologie, tome vii. No. 4 (Paris, Masson).—American Naturalist, October (Philadelphia).—Journal of the Franklin Institute, October (Philadelphia).—Zeitschrift für Physikalische Chemie, xxi. Band, 1 Hefte (Leipzig).—The Bachelor of Arts, October (New York).—Journal of Anatomy and Physiology, October (Griffin).—Astrophysical Journal, October (Chicago).—Brain, Parts 74 and 75 (Macmillan).—Royal Natural History, Part 36 (Warne).—Bibliotheca Geographica, Band 2, Jahrg. 1893 (Berlin, Kuhl).—Proceedings of the Royal Society, Edinburgh, Session 1895-96, Vol. XXI. No. 2, Pp. 65 to 160 (Edinburgh).—Journal of the Asiatic Society of Bengal, Vol. lxxv. Part 2, No. 2 (Calcutta).—Sunday Magazine, November (Isbister).—Good Words, November (Isbister).—Himmel und Erde, November (Berlin, Paetel).—American Journal of Psychology, Vol. viii. No. 1 (Worcester, Mass.).

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