

Dr. J. N. Langley, F.R.S., is re-appointed deputy-professor of physiology until Michaelmas 1903, in the place of Sir M. Foster, M.P.

MR. R. T. SMITH has been appointed principal of the Northern Polytechnic Institute. He organised and equipped the South African College, Capetown, and acted as professor of mathematics and physics in the College for several years; and, more recently, was lecturer in mathematics and physics in the Goldsmiths' Institute, New Cross.

THE Secretary of State for War has appointed a committee to consider the education of candidates for commissions in the Army and the system of training at Woolwich and Sandhurst, and to report whether any changes are desirable in the present methods of entrance into the Army. The following will form the committee:—The Right Hon. A. Akers-Douglas, M.P. (chairman); the Rev. Dr. Warre, headmaster of Eton; Mr. F. W. Walker, high master of St. Paul's School, Hammer-smith; Colonel Jelf, C.M.G., Royal Engineers; Lieutenant-Colonel Hammersley, Lancashire Fusiliers; Captain Lee, M.P., late professor of strategy and tactics, Royal Military College, Canada; and Captain W. E. Cairnes, Royal Irish Fusiliers (secretary).

ADVOCATES of improvements in geometrical teaching will be glad to know that the Civil Service Commission has lately introduced a change of importance to all who are concerned with Civil Service examinations. Before this year an instruction at the head of examination papers in geometry stated that "Proofs other than Euclid's must not violate Euclid's sequence of propositions." Upon recent papers, however, this has been superseded by the note that "Correct demonstrations, whether those of Euclid or not, will be accepted." It thus becomes possible for teachers preparing pupils for the Civil Service to be independent of Euclid's sequence or proofs. Recent questions also encourage teaching of a less abstract character than that usually associated with Euclid's geometry. We understand that the Board of Education will accept alternative proofs of propositions in future examinations in geometry.

SOCIETIES AND ACADEMIES.

LONDON.

Physical Society, April 26.—Dr. R. T. Glazebrook, foreign secretary, in the chair.—A paper on the thermodynamical correction of the gas thermometer was read by Prof. H. L. Callendar. This paper commences by giving a short historical sketch of the thermodynamic correction of the gas thermometer, describing some of the solutions to Thomson's fundamental equation for the Joule-Thomson plug experiment. The assumptions made in the solutions have sometimes been erroneous and wrong corrections have been obtained. From 1885 to 1888 Chappuis made a series of careful comparisons between various gas thermometers and a very delicate mercury thermometer, and drew up a table of differences between the hydrogen and the nitrogen thermometer. The author has taken the observations of Chappuis and calculated a new table of differences. The index " n " in the modified Joule-Thomson equation is not constant. For steam it is about 3.5 and for carbonic acid about 2. The thermodynamic correction is very small, especially in the case of hydrogen and helium, and is very much less than the correction for the expansion of the thermometer bulb. Prof. Herschell asked whether the co-volume came into the correction. Dr. Harker looked forward to the experiments which Prof. Callendar proposes to make with a constant pressure thermometer. The chairman expressed his interest in the extreme delicacy of the observations of Chappuis.—A paper on the production of a bright-line spectrum by anomalous dispersion and its application, the "flash-spectrum," by R. W. Wood, was read and experimentally illustrated by Mr. Watson. It has been suggested by W. H. Julius that the "flash-spectrum" seen immediately at totality may be due to photosphere light abnormally refracted in the atmosphere of metallic vapours surrounding the sun. The light which will be thus abnormally refracted will be of wave-lengths almost identical with the wave-lengths which the metallic vapours are themselves capable of radiating. The sun is supposed to be surrounded by an atmosphere of metallic vapours, the refractive index of which decreases with increasing distance from the surface. In this atmosphere the rays of light coming from the photosphere move

in curved paths. The refractive index is, however, very small, except for wave-lengths very near those absorbed by the vapour, consequently the light which resembles that emitted by the vapours, is most strongly refracted, and therefore curves sufficiently to reach us after the photosphere has been hidden by the moon. The flash-spectrum of sodium was shown by focussing the light of an arc lamp on a horizontal slit in front of a flat metal plate supported so that the plane in which its under-surface lay coincided with the plane of the slit. At a distance of about two metres a direct vision spectroscope was arranged to give a vertical spectrum and placed at such a height that the prism barely caught the rays coming from the slit and grazing the plate. On looking into the spectroscope a bright continuous spectrum is seen. A Bunsen burner was then placed underneath the metal plate and fed with sodium. This produced a layer of sodium vapour of varying refractive index. On raising or lowering the spectroscope bright sodium lines are seen due to anomalous dispersion. By arranging screens these lines can be obtained so that, on cutting out the arc lamp, the flash-spectrum vanishes. Prof. Herschel expressed his interest in the experiments and their application to the case of the flash-spectrum seen at totality.

PARIS.

Academy of Sciences, April 22.—M. Fouqué in the chair.—On the residues and periods of double integrals of rational functions, by M. Émile Picard.—On an apparatus designed to move the photographic plate which received the image furnished by a siderostat, by M. G. Lippman. In an image given by a siderostat only one point is really fixed, the other points appearing to move round this with a variable velocity. It is shown that a suitable motion can be given to the photographic plate capable of overcoming this defect by means of a gear driven by the clockwork of the siderostat.—On the existence of nitrides, argonides, arsenides and iodides in crystalline rocks, by M. Armand Gautier. The finely powdered granites and basalts were decomposed by heating at 100° with phosphoric acid. Determinations are given of the amount of nitrogen, arsenic and iodine in various rocks.—Comparison of the work done by a muscle in sustaining and lifting a charge, by M. A. Chauveau.—On the propagation of discontinuities in a viscous fluid; extension of the law of Hugoniot, by M. P. Duhem.—On a question relating to a displacement of a figure of invariable size, by M. R. Bricard.—On entire functions of several variables and their modes of growth, by M. Émile Borel.—Some isotherms of ether between 100° and 206°, by M. Edouard Mack. The pressure of the ether vapour was balanced by a piston floating on a very viscous liquid, and the volume of the ether, which was completely surrounded by a mercury bath, was deduced from the motion of the piston.—Cryoscopic researches, by M. Paul Chroustchoff. An account of some of the precautions necessary in applying the platinum thermometer to the measurement of the lowering of the freezing-point of dilute solutions.—On a new system of ammeters and voltmeters independent of the intensity of their permanent magnets, by M. Pierre Weiss. In an instrument of the d'Arsonval type a decrease in the strength of the permanent magnet causes a decrease in the sensibility of the instrument; in instruments having a movable magnetic needle controlled by a permanent magnet the opposite is the case. If, in an instrument of the moving coil type, the coil carries a small piece of soft iron, these two effects may be made self-compensating. It was found possible to construct a galvanometer of this type in which the sensibility was practically invariable.—On the influence of self-induction upon spark spectra, by Mr. G. A. Hemsalech. Three photographs are given showing the progressive changes produced in the spark spectra of cobalt, lead and magnesium by an alteration in the self-induction of the spark circuit.—Periodic oscillations productions by the superposition of an alternating current on a continuous current in an electric arc, by M. E. Koenig.—On an apparatus which imitates the effect of luminous fountains, by M. G. Trouvé.—On barium hydride, by M. Guntz. Barium hydride, the existence of which was first indicated by Winkler, has been obtained in a pure state and found to have the composition BaH₂. This compound is of remarkable stability; it can be slowly sublimed in a current of hydrogen at 1400° C. without decomposition. Heated in a current of nitrogen, barium nitride is formed.—The estimation of nitric acid in waters by means of stannous chloride, by M. H. Henriet. The fact discovered by Divers and Haga that nitrates react with stannous

chloride giving hydroxylamine chloride has been applied by the author to the quantitative determination of nitrates in potable waters.—The action of various alcohols upon some acetals of monovalent alcohols, by M. Marcel Delépine.—On three new alkaloids from tobacco, by MM. Amé Pictet and A. Rotschy. Further particulars of the physical and chemical properties of the three alkaloids nicotine, nicotimine and nicotelline.—The action of phenylhydrazine and of hydrazine upon the two isomeric methyl butyrylacetylacetates, by M. Bongert. On paraoxyhydratropic acid, by M. J. Bougault.—Some new reactions of organometallic derivatives, by M. E. E. Blaise.—On a new base derived from glucose, by MM. L. Maquenne and E. Roux. The base, which is termed glucamine, is obtained by reducing glucosoxime with sodium amalgam.—Action of the alkylcyanacetic esters on the diazo chlorides, by M. G. Favrel.—Reduction of the nitro-derivatives of the azoic colouring matters, by M. A. Rosenstiehl.—On two new acetylenic acids. Synthesis of caprylic and pelargonic acids, by MM. Ch. Moureu and R. Delange.—On the indoxyllic origin of certain red colouring matters of urine, by M. L. Maillard.—The calculation of the results of milk analyses, by MM. Louise and Riquier.—Segmentation in the genus *Trochus*, by M. A. Robert.—Action of isotonic solutions of chlorides and of sugar on the eggs of *Rana fusca*, by Mme. Ronfeau-Luzeau.—The stimulation of nerve and muscle by waves of very short duration, by M. G. Weiss.—Action of alcohol upon the gastric secretion, by MM. Albert Frouin and M. Molinier. The increased secretion of the gastric juice caused by alcohol is shown experimentally not to be due, as has been usually supposed, to a direct local action, nor is it due to an effect produced upon the nerves of taste.—On the second fermentation of the wines of Champagne, by M. E. Manceau.—Apparatus for the exact measurement of the skeleton and of other organs giving a clear image in radiography, by M. G. Contremoulins.—On the origin and mode of formation of the Oolitic iron ore of Lorraine, by M. Stanislaus Meunier.

DIARY OF SOCIETIES.

THURSDAY, MAY 2.

ROYAL SOCIETY, at 4.30.—On the Variation in Gradation of a Developed Photographic Image when impressed by Monochromatic Light of Different Wave Lengths: Sir W. de W. Abney, F.R.S.—Ellipsoidal Harmonic Analysis: Prof. G. H. Darwin, F.R.S.—On the Small Vertical Movements of a Stone laid on the Surface of the Ground: Horace Darwin.—On the Intimate Structure of Crystals. Part V. Cubic Crystals with Octahedral Cleavage: Prof. W. J. Sollas, F.R.S.
 LINNEAN SOCIETY, at 8.—Studies in Heterogenesis: Prof. H. C. Bastian, F.R.S.
 CHEMICAL SOCIETY, at 8.—The Synthetical Formation of Bridged-Rings. Part I. Some Derivatives of Bicyclopentane: Prof. W. H. Perkin, jun., F.R.S., and Dr. J. F. Thorpe.—Ballot for the Election of Fellows.
 INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—An Instrument for Measuring the Permeability of Iron and Steel: C. G. Lamb and Miles Walker.—A Watt-Hour Meter: Frank Holden.
 RÖNTGEN SOCIETY, at 8.—Some X-Ray Improvements: James Cadett.

FRIDAY, MAY 3.

ROYAL INSTITUTION, at 9.—Memory: C. Mercier.
 SOCIETY OF ARTS, at 8.—Polyphase Electric Working: A. C. Eborall.
 ANATOMICAL SOCIETY, at 4.—(a) Additional Notes on the Articulations between the Occipital Bone, Atlas, and Axis in the Mammalia: (b) On the Development of Digits in Cetacea; (c) Observations on the Development of the Human Brain before and after Birth: Prof. Symington.—A Contribution to the Study of the Morphology of Adipose Tissue: Dr. H. Batty Shaw.—A Lantern Demonstration showing the Origin and Nature of the Hydatiform Bodies of the Testicle and Broad Ligament, with Special Reference to the Fate of the Mullerian Duct in the Epididymis: J. H. Watson.—Relation of Structure to Function, as illustrated by the Growth of the Inferior Femoral Epiphysis: Prof. Arthur Thomson.
 GEOLOGISTS' ASSOCIATION, at 8.—Geology and the Growth of London: A. Morley Davies.

SATURDAY, MAY 4.

ROYAL INSTITUTION, at 3.—Climate: its Causes and its Effects: J. Y. Buchanan, F.R.S.

MONDAY, MAY 6.

SOCIETY OF ARTS, at 8.—Alloys: Sir W. C. Roberts-Austen, K.C.B., F.R.S.

TUESDAY, MAY 7.

ROYAL INSTITUTION, at 3.—Cellular Physiology: Dr. A. Macfadyen.
 SOCIETY OF ARTS, at 4.30.—The Coal Problem—its Relations to the Empire: Lieut. Carlyon W. Bellairs, R.N.
 ZOOLOGICAL SOCIETY, at 8.30.—On the Spiders of the Family Attidæ found in Jamaica: Mr. G. W. Peckham and Mrs. E. G. Peckham.—On the Hymenoptera collected during the "Skeat Expedition" to the Malay Peninsula, 1899-1900: P. Cameron.—On the Arachnida collected during the "Skeat Expedition" to the Malay Peninsula, 1899-1900: M. Eug. Simon.

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WEDNESDAY, MAY 8.

SOCIETY OF ARTS, at 8.—School Work in Relation to Business: Sir Joshua Fitch.
 GEOLOGICAL SOCIETY, at 8.—The Influence of the Winds upon Climate during the Pleistocene Epoch: a Palæo-Meteorological Explanation of some Geological Problems: F. W. Harmer.
 IRON AND STEEL INSTITUTE, at 10.30.—Annual Meeting.

THURSDAY, MAY 9.

ROYAL SOCIETY, at 4.30.
 MATHEMATICAL SOCIETY, at 5.30.—(1) A Case of Algebraic Partitionment; (2) On the Series whose Terms are the Cubes and Higher Powers of the Binomial Coefficients: Major MacMahon, R.A., F.R.S.—A Property of Recurring Series: G. B. Mathews, F.R.S.—The Product of Two Spherical Surface Harmonic Functions: J. B. Dale.
 INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Storage Batteries in Electric Power Stations, controlled by Reversible Boosters: J. S. Highfield.
 IRON AND STEEL INSTITUTE, at 10.30.—Annual Meeting.

FRIDAY, MAY 10.

ROYAL INSTITUTION, at 9.—The Response of Inorganic Matter to Mechanical and Electrical Stimulus: Prof. J. C. Bose.
 SOCIETY OF ARTS, at 8.—Polyphase Electric Working: Alfred C. Eborall.
 MALACOLOGICAL SOCIETY, at 8.

SATURDAY, MAY 11.

ROYAL INSTITUTION, at 3.—The Rise of Civilisation in Egypt: Prof. W. M. Flinders Petrie.

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