on the borderland of animal and vegetable chemistry (proteins, lecithins, pigments, &c.) at King's College on Mondays, beginning on November 25, at 4.30 p.m.

THE Board of Education, South Kensington, has just issued the following list of successful candidates this year for Royal exhibitions, national scholarships, and free studentships (science):—*Royal exhibitions:* W. F. Frew, Plymouth; G. E. Morgan, Portsmouth; E. Grigg, Southsea; E. A. Steed, Devonport; W. E. Curtis, London; H. Carter, Triangle, Halifax; H. W. Turner, Portsmouth. *National scholarships for mechanics (Group A):* A. W. Judge, Portsmouth; A. Regnauld, London; F. R. Rogers, Devonport; C. Bartlett, Plymouth; F. H. G. Marks, Plymouth; J. H. Thomas, Ovenden, Halifax. *Free studentships for mechanics (Group A):* S. Ll. Symns, London; F. A. Bumpus, Birmingham; R. G. M. Frost, Plymouth; E. W. Stedman, Sheerness. *National scholarships for physics (Group B):* A. G. Tarrant, London; J. Hill, Glasgow; J. Macpherson, Manchester; A. Holmes, Gateshead; W. White, Glasgow. *Free studentship for physics (Group B):* W. C. Simmons, Southampton. *National scholarships for chemistry (Group C):* S. R. Illingworth, Shipley; H. Griffiths, Middlesbrough; A. T. Eggington, Ibstock, Leicester; A. Caruth, Birkenhead; L. W. Burridge, London. *Free studentship for chemistry (Group C):* F. A. Knott, London. *National scholarships for biology (Group D):* E. Bateson, Bradford, Yorks; J. Sharpe, Burnley; W. Rushton, Burnley. *National scholarships for geology (Group E):* C. H. Cunnington, London; T. Eastwood, Burnley; E. J. Wayland, London.

MACDONALD COLLEGE, Quebec, established and endowed by Sir William Macdonald, of Montreal, was opened to students on November 7. The object of the founder is the advancement of education, the carrying on of research, the spreading of knowledge likely to benefit rural districts, and the training of teachers for rural schools. From an article in the *Times* of November 9, we learn that the college property comprises 561 acres, and has been divided into the campus of 74 acres, where the buildings are located, with demonstration plots for grasses and flowers; a farm of 100 acres for horticulture and poultry keeping; and a live-stock and grain farm of 387 acres. The buildings have been planned in accordance with the most modern scientific principles. The main building includes departments for nature-study and household science, both with appropriate laboratories. Near the main building are buildings for biology and chemistry, each furnished with laboratories and lecture rooms. The main agricultural building contains greenhouses and laboratories of the live-stock farm, dairy, and horticulture department, the farm machinery hall, and a pavilion for live-stock judging. A poultry building with an annexed brooder house are adjacent to the poultry yards, and in addition there is provision for many other agricultural activities. The cost of the buildings and equipment exceeds 300,000*l.*, and, in addition, Sir William Macdonald has provided a permanent endowment of 400,000*l.* The college is incorporated with McGill University, and Dr. James W. Robertson, C.M.G., is the principal. The college includes a school for teachers, a school of household science, and a school of agriculture. Tuition will be free to residents in the Province of Quebec. There will be a small laboratory fee not exceeding 1*l.* to cover the actual cost of the materials used, and a contingency fee to cover possible breakages, penalties, and other demands. Board, room, and washing will be furnished for 13*s.* per week each, where two students occupy one room, and, in the case of students occupying single rooms, for 14*s.*

AT the Mansion House, London, a meeting was held on November 6 in furtherance of the interests of the permanent buildings fund of the University College of North Wales, Bangor. At the opening of the proceedings Lord Kenyon read a letter from the Prince of Wales, who, as Chancellor of the University of Wales, heartily wished success to the meeting, and pointed out that since the question of higher education in Wales was taken up by the Government twenty-seven years ago, it has been zealously supported by the people of the Principality. They have recognised it as an essential to their progress and prosperity, and this fresh effort should help Wales to render the highest services to the kingdom and Empire. A striking proof of this spirit is to be found in the support received from all classes to the original scheme for the college, when 30,000*l.* was raised by 8000 subscribers, of whom only sixty-eight contributed sums of more than 100*l.* and upwards. This spirit has been equally conspicuous in the case of the present appeal, towards which 30,000*l.* has been collected. During the last twenty-three years the successful and steadily increasing work of the college has been carried on in temporary buildings; but from the outset it was the deliberate policy of the college to provide a first-rate staff, and to postpone the question of buildings until the character of the institution had been determined by their efforts. When the Prince of Wales visited Bangor five years ago, the first step towards providing buildings had just been completed by the munificent gift of a site of the value of 15,000*l.* from the corporation. The laying of the foundation-stone by the King this year has now happily inaugurated the actual work of construction. The present intention is to endeavour to complete the arts and administrative section, but it is hoped that in the near future means may be forthcoming to erect the buildings for the science departments, the work of which must for the present be carried on in the old laboratories. A further contribution of 100*l.* towards the building fund was also received from the Prince of Wales, and announced at the meeting. In addressing the meeting, Lord Kenyon referred to the exhaustion of the resources of North Wales and to the depressed state of the slate trade, in connection with which reference was made to the large amount of support the college had received from the ordinary working quarrymen. Sir Harry Reichel, the principal, gave some interesting statistics showing the same spirit of spontaneous effort in the interests of the Welsh university movement on the part of the middle and working classes of North Wales that was referred to in last week's NATURE in connection with the visit of the Chancellor of the Exchequer to Aberystwyth. It was announced that 11,800*l.* had already been subscribed in London alone. It may be interesting to mention that the progress of the college and its influence on the schools of Wales is shown quite as much in the higher standard of attainment of the students as in the increase in numbers. The unmatriculated students, who used to form a large percentage, have now dwindled down to the vanishing point.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Microscopical Society, October 16.—Dr. J. W. H. Eyre, vice-president, in the chair.—Mr. **Taverner** exhibited a number of stereo-photomicrographs of water mites, taken with a stop behind the objective, as described before a previous meeting. They were taken in their natural colours by the Sanger Shepherd three-colour process.—Ghost images in the secondaries of *Coscinodiscus asteromphalus,* with some remarks on the highest useful ratio of magnifying power to aperture: A. A. C. E. **Merlin.** In an experiment suggested by some remarks of Mr. Nelson, the author was able to distinguish perfectly well-defined ghost images of the condenser stop in many of the cap perforations of *Coscinodiscus asteromphalus.* He used a selected Zeiss 3 mm. apochromat of N.A. 1·42 and a 40 ocular in conjunction with a Powell's dry apochromatic substage condenser. The exact size of the perforations was measured and found to be 1/83,300-inch.—A new prismatic ocular: A. A. C. E. **Merlin.** The author found that prolonged observations with the microscope in an upright position entailed great fatigue to the eye, and it occurred to him that by means of a properly designed prism a comfortable position might be secured. He obtained the assistance of Mr. E. M. Nelson, who computed a prism of the kind required, a diagram of which was drawn on the blackboard. It was constructed for the author by Carl Zeiss, and has proved efficient and satisfactory in use.—A new 1/6-inch semi-apochromatic objective: E. M. **Nelson.** The objective had a working distance of 1 mm.; its N.A. was 0·74, and its initial power 60.—Systematic exposure with transmitted light in photomicrography: A. **Letherby.**

Chemical Society, October 24. Sir William Ramsay, K.C.B., F.R.S., president, in the chair.—The constitution of phenol- and quinol-phthalein salts: a contribution to the quinonoid theory of colour: A. G. **Green** and P. E. **King.** The authors have succeeded in preparing the coloured carboxylic esters of the phthaleins and of their mono- and di-methyl esters. These esters are orange to red, are extremely unstable, being readily saponified, not only by weak acids or alkalis, but even by water. The facts observed disclose an exact parallelism between the esters and salts of these phthaleins and those of fluorescein, and place the quinonoid structure of these substances almost beyond question.—Keten: N. T. M. **Wilsmore.** The gaseous substance keten, produced by the action of a hot platinum wire on acetic anhydride, which was discovered by Dr. A. W. Stewart and the author (NATURE, 1907, vol. lxxv., p. 510), has been further examined. It has the formula $C_2H_2O_2$, and reacts with primary amines to form the corresponding acetyl derivatives.—Derivatives of the multiple keten group: J. N. **Collie.** The group $-CH_2.CO-$ (which the author proposes to call the "keten" group) can be made to yield by the simplest reactions a very large number of compounds of types largely obtained from plants. Illustrations of this were given from the various published papers of the author.—Production of orcinol compounds by the action of heat on the sodium salt of ethyl acetoacetate: J. N. **Collie** and E. R. **Chrystall.**—A simple gas generator for analytical operations: J. McC. **Sanders.** A simple constant supply apparatus for hydrogen sulphide was described which is suitable for use in schools and in commercial laboratories.—Some double ferrocyanides of calcium, potassium, and ammonium: J. C. **Brown.** *Inter alia*, the conditions for the use of ammonium chloride and potassium ferrocyanide as a qualitative test for calcium were given.—Determination of halogen in organic substances: J. **Moir.** The new method described last year by the author has been improved by adopting the Volhard method of back-titration with standard thiocyanate.—Racemisation by alkali as applied to the resolution of *r*-mandelic acid into its optically active isomerides: A. **McKenzie** and H. A. **Muller.** Various methods of effecting the changes (1) *r*-mandelic acid→*r*-mandelic acid and *l*-mandelic acid, and (2) *r*-mandelic acid→*r*-mandelic acid and *d*-mandelic acid were indicated.—The optical activity of cyclic ammonium compounds: F. **Buckney** and H. O. **Jones.** Out of fourteen compounds of this type examined, only one—allylkairolinium-*d*-bromocamphorsulphonate—gave conclusive evidence of the existence of optical activity.—The action of phosphorus pentachloride on hydroxytrimethylsuccinic ester. 1:2-Dimethyl*cyclo*propane-1:2-dicarboxylic acid (1:2-dimethyltrimethylene-1:2-dicarboxylic acid): H. **Henstock** and Miss B. E. **Woolley.**—The condensation of acetaldehyde and its relation to the biochemical synthesis of fatty acids: H. S. **Raper.** It has been suggested that the formation of fatty acids in animals depends, firstly, on the breakdown of the carbohydrate to acetaldehyde, and, secondly, on the condensation of this with the formation of the higher fatty acids. This hypothesis is confirmed in part, since it has been found that β-hydroxybutyraldehyde, the first product of the condensation of acetaldehyde, on further condensation yields an aldehyde containing eight carbon atoms united in a straight chain.—The influence of solvents on the rotation of optically active compounds, part x., effect of the configuration and degree of saturation of the solvent: T. S. **Patterson,** A. **Henderson,** and F. W. **Fairlie.**—*para*Toluidine monohydrate: J. **Walker** and H. H. **Beveridge.**—Hydrates of some quaternary bases: D. C. **Crichton.**—Two volumetric methods for the determination of chromium: A. W. **Gregory** and J. **McCallum.** The authors describe (1) a modified form of the persulphate method for the estimation of chromium in iron and steel, and (2) a method depending on the oxidation of the chromium with sodium bismuthate.

Faraday Society, October 20.—Mr. N. T. M. Wilsmore in the chair.—The electrolysis of salt solutions in liquefied sulphur dioxide: Dr. Bertram D. **Steele.** Electrodes of various metals were used, and the changes at anode and kathode studied. With platinum and mercury a rapid diminution of current took place, when solutions of sulphur dioxide were electrolysed, possibly due to the formation of sulphur films. With electrodes of silver, copper, and iron of large area, constant currents were maintained. Iodine was liberated at anode, but no metallic potassium was obtained at kathode. The author concludes that sulphur cations exist in solution.—The action of aluminium powder on silica and boric anhydride: F. E. **Weston** and H. Russell **Ellis.** The authors show that it is possible to obtain silicon and boron by reduction of the respective oxides with extremely finely divided aluminium powder, the oxide being also excessively finely powdered. Great difficulty, however, is experienced in removing the alumina from the metalloids.—The reduction of metallic oxides with calcium hydride and calcium: Dr. F. M. **Perkin** and L. **Pratt.** A mixture of copper oxide and calcium hydride reacts with great ease according to the equation $2CuO + CaH_2 = 2Cu + CaO + H_2O$, the ignition taking place by means of a match. Pyrolusite, tinstone, and hæmatite also react readily, but require to be heated in a furnace or the reaction started by means of a fuse. Zinc oxide appears not to be reduced. Wolframite and rutile react only with difficulty. Lead sulphide and antimony sulphide also react vigorously. Boron can also be produced from boric anhydride or borax, and silicon (in small quantities) from silica. Dr. Perkin has already shown the extreme ease with which metallic oxides react with metallic calcium. The authors now show that the reaction with wolframite is particularly energetic, the tungsten being obtained as a fused regulus. Calcium will also replace strontium and barium from their chlorides and hydroxides. It likewise replaces all the alkali metals from their chlorides and hydroxides, the reactions being extremely violent.

PARIS.

Academy of Sciences, November 4.—M. H. Becquerel in the chair.—Comparative study of the phenols as parthenogenetic agents: Yves **Delage** and P. **de Beauchamp.** The successful results obtained with tannic acid, described in a previous paper, suggested the trial of other allied substances, the phenols and phenolic acids. Experiments have been made with phenol and the three dihydroxybenzenes, resorcinol being the only active substance of the three latter. Of the trihydroxybenzenes, phloroglucinol is nearly equal in activity to resorcinol, pyrogallol and the unsymmetrical isomer being much inferior. Difficulties of solubility prevented much work being done with the hydroxy-acids. Salicylic and vanillic acids gave poor results, about the same order as phenol; protocatechuic, and especially gallic, acid gave better and more constant results. The suggestion is put forward that the activity of the phenols in parthenogenesis may be proportional to their affinity for oxygen.—Contribution to the therapeutics of trypanosomes: A. **Laveran** and A. **Thiroux.** After reviewing the remedies that have been suggested, arsenious oxide, atoxyl, and mixtures of these with mercury salts, and describing their own experimental results on these substances, the authors propose the injection alternately of atoxyl and arsenic trisulphide. This treatment has given very good results in the cure of rats and guinea-pigs artificially infected with *surra*.—The sugar in the blood plasma: R. **Lepiné** and M. **Boulud.** The authors lay stress on the large errors introduced into the determination of the amount of sugar in the blood plasma by neglecting the glycolysis which goes on during the separation of the blood corpuscles. They detail the methods by which they in part surmount this difficulty, but conclude that the estimation of the sugar in the blood can only give, at the best, a rough approximation to the amount of sugar carried to the tissues.—Observations of the sun made at the Observatory of Lyons during the second quarter of 1907: J. **Guillaume.** Observations were possible on forty-eight days, and the results are expressed in tabular form showing the spots, their distribution in latitude, and the distribution of the faculæ in latitude.—Hyperelliptic surfaces: G. **Bagnera** and M. **de Franchis.**—The adjoint functions of M. Buhl: C. **Popovici.**—Some properties of integral equations: E. **Goursat.**—The free path and number of electrons in metals: L. **Bloch.**—The influence of pressure on the absorption spectra of vapours: A. **Dufour.** An experi-

mental study of the change in the absorption spectrum of bromine vapour under pressures varying from one to twenty atmospheres.—A new element, lutecium, resulting from the splitting of Marignac's ytterbium: G. **Urbain.** The separation was effected by fractional crystallisation of the nitrates from nitric acid of density 1·3. The characteristic lines in the arc spectrum of the new element are given. For the purified ytterbium resulting from the separation the name of neo-ytterbium is proposed.—Bi-secondary butylene chlorowydrin.: K. **Krassousky.** An account of this compound, recently described as new by M. Louis Henry, was published by the author in 1902. Further details of its preparation and properties are given. —The alkaline granite *massif* of Dahomey: Henry **Hubert.**—The uralitisation of pyroxene: Louis **Duparc.** —Remarks on the structure of the aleurone grains in the Graminaceæ: A. **Guilliermond.** The author modifies some conclusions drawn by him in previous publications. The aleurone grains in the Graminaceæ offer analogous characters to those of the lupin. They are distinguished only by their smaller content of protein (the latter constituting only a thin layer round the globoids), by the smaller number and larger size of the globoids, and by the insolubility of the protein in potash after fixation by Ladowsky's method or by alcohol.—The experimental production of grapes without pips: Lucien **Daniel.** The production of ripe grapes without pips can be caused by vigorous pruning immediately after the fruit is set, and is produced by overfeeding at the time when the fertilised seed starts developing with great activity.—The evolution of Frenzelina, intestinal parasites of decapod crustacea: L. **Leger** and O. **Duboscq.**—Classification of the Zygopterideæ according to the characters of their leaf impression: Paul **Bertrand.**—Variations of density and amount of oxygen of pools of sea water: R. **Legendre.** —Observation of a discontinuous lightning flash: M. **Luizet.**

DIARY OF SOCIETIES.

THURSDAY, NOVEMBER 14.

ROYAL SOCIETY, at 4.30.—On the Cranial and Facial Characters of the Neandertal Race: Prof. W. J. Sollas, F.R.S.—Some Features in the Hereditary Transmission of the Self-Black and the "Irish" Coat Characters in Rats: G. P. Mudge.—On the Inheritance of Eye-colour in Man: C. C. Hurst.—On the Result of Crossing Round with Wrinkled Peas, with Especial Reference to their Starch Grains: A. D. Darbishire. —On the Rate of Elimination of Chloroform from the Blood after Anæsthesia: G. A. Buckmaster and J. A. Gardner.—Implantation of Actively Proliferating Epithelium: Dr. J. O. Wakelin-Barratt.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Dielectric Strength or Insulating Materials and the Grading of Cables: Alexander Russell.

MATHEMATICAL SOCIETY, at 5.30.—Annual General Meeting.—Election of Council and Officers.—On Hypercomplex Numbers: J. H. Maclagan Wedderburn.—Addendum to a Paper on the Inversion of a Repeated Infinite Integral: T. J. I'A. Bromwich.—Generalisation of a Theorem in the Theory of Divergent Series: G. H. Hardy.—Uniform and Non-uniform Convergence and Divergence of a Series and the Distinction between Right and Left: Dr. W. H. Young.—Application of Quaternions to the Problem of the Infinitesimal Deformation of a Surface: J. E. Campbell.—Nodal Cubics through Eight given Points: J. E. Wright.—The Invariants of a Binary Quintic and the Reality of its Roots: Dr. H. F. Baker.—On a Transformation of Hypergeometric Series: Rev. Dr. E. W. Barnes.—On a Transformation of a Certain Hypergeometric Series: Prof. M. J. M. Hill.—A General Theorem on Integral Functions of Order less than One-half: J. E. Littlewood.

FRIDAY, NOVEMBER 15.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Labour-saving Appliances at the Mines of the New Kleinfontein Co., Transvaal: E. J. Way.

MONDAY, NOVEMBER 18.

SOCIOLOGICAL SOCIETY, at 8.—Mental Defects: Dr. Charles Mercier.

TUESDAY, NOVEMBER 19.

ROYAL ANTHROPOLOGICAL INSTITUTE, at 8.15.—Excavation of a Barrow on Chapel Carne Brea, Cornwall, and other Papers: H. King and B. C. Polkinghorne.—The Wild Tribes of the Ulu Plus: F. W. Knocher.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*Discussion*:—The Extension, Widening and Strengthening of Folkestone Pier: H. T. Ker.—*Probable Paper*:—The Tranmere Bay Development Works: S. H. Ellis.

ROYAL STATISTICAL SOCIETY, at 5.—Presidential Address: The Right Hon. Sir Charles W. Dilke, Bart., M.P.

WEDNESDAY, NOVEMBER 20.

GEOLOGICAL SOCIETY, at 8.—Glacial Beds of Cambrian Age in South Australia: Rev. W. Howchin.—On a Formation known as "Glacial Beds of Cambrian Age" in South Australia: H. Basedow and J. D. Iliffe.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—The International Balloon Ascents, July 22 to 27, 1907: Reports by W. H. Dines, F.R.S., J. E. Petavel, F.R.S., W. A. Harwood, Capt. C. H. Ley, R.E., and Prof. W. E. Thrift.—Discussion of the Meteorological Observations made at the British Kite Stations, 1906–7: Miss M. White, T. V. Pring, and J. E. Petavel, F.R.S.

ENTOMOLOGICAL SOCIETY, at 8.

ROYAL MICROSCOPICAL SOCIETY, at 8.—(1) François Watkins' Microscope; (2) A Reply to Prof. Porter's and Mr. Everitt's Criticism upon the Paper, On the Limits of Resolving Power for the Microscope and Telescope: E. M. Nelson.—Mercury Globules as Test Objects for the Microscope: J. W. Gordon.—Light Filters for Photomicrography: E. Moffat.

SOCIETY OF ARTS, at 8.—Inaugural Address by Sir Steuart Colvin Bayley, K.C.S.I.

THURSDAY, NOVEMBER 21.

ROYAL SOCIETY, at 4.30.—*Probable Papers*:—Results of the Interaction of Mercury with Alloys of Other Metals: J. W. Mallet, F.R.S.—Note on the Sensibility of the Ear to the Direction of Explosive Sounds: A. Mallock, F.R.S.—On the Silver Voltameter: Part i., A Comparison of Various Forms of Silver Voltameters: F. E. Smith; and a Determination of the Electrochemical Equivalent of Silver: F. E. Smith and T. Mather, F.R.S.; Part ii., The Chemistry of the Silver Voltameter: F. E. Smith and Dr. T. M. Lowry.—On the Normal Weston Cadmium Cell: F. E. Smith.—On a Method of Depositing Copper upon Glass from Aqueous Solutions in a Thin Brilliantly Reflecting Film, thus Producing a Copper Mirror: Dr. F. D. Chattaway, F.R.S.—On Luminous Efficiency and the Mechanical Equivalent of Light: Dr. C. V. Drysdale.—The Dispersion of Double Refraction in Relation to Crystal Structure: T. H. Havelock.

CHEMICAL SOCIETY, at 8.30.—The Interaction of Metallic Sulphates and Caustic Alkalies: S. P. U. Pickering.—The Chemistry of Bordeaux Mixture: S. P. U. Pickering.—Aromatic Azoimides, Part iii., The Naphthylazoimides and their Nitro-derivatives: M. O. Forster and H. E. Fierz.—Studies of Dynamic Isomerism. Note on the Action of Carbonyl Chloride as an Agent for Arresting Isomeric Change: T. M. Lowry and E. H. Magson.—Emulsions: S. P. U. Pickering.—The Electrometric Measurement of the Hydrolysis of the Salts of Anilinium, Ammonium, Aluminium, Chromium, Thallium, Zinc, Magnesium, Cerium, Thorium, Nickel and Cobalt: H. G. Denham.

INSTITUTION OF MINING AND METALLURGY, at 8.

LINNEAN SOCIETY, at 8.—Abnormal Structures in Leaves, and their Value for Morphology: W. C. Worsdell.—Specimen-preservation in Australian Museums: J. G. Otto Tepper.—Revision of the Genus Illigera, Blume: S. T. Dunn.—*Exhibits*:—Luminous Larva from British Guiana: C. W. Anderson.—Living Specimens of Peripatus, from South Africa: Prof. A. Dendy.—*Linaria arenaria*, and other British Plants: G. C. Druce.

FRIDAY, NOVEMBER 22.

PHYSICAL SOCIETY, at 5.—On Singing Sand from New England: S. Skinner.—Exhibition of a Micromanometer: L. Bairstow.—A Diabolo Experiment: Vernon Boys.—Exhibition of a Gyroscope illustrating Brennan's Monorailway: Prof. H. A. Wilson.

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