

to-day, June 17, recommending that Mr. Smart's offer be gratefully accepted.

The special board for divinity has nominated Dr. Humphry as assessor to the regius professor of physics for the ensuing year, and the special board for mathematics has nominated Sir Robert Ball as an elector to the Isaac Newton studentships until September 30, 1913.

The Cavendish professor of experimental physics announces that a course of demonstrations in practical physics will be given during the long vacation, beginning July 5.

The first three names in the Mathematical Tripos list, part i. (old regulations), are P. J. Daniell, Trinity; E. H. Neville, Trinity; and L. J. Mordell, St. John's.

DR. H. A. WILSON, F.R.S., professor of physics in King's College, London, has accepted the appointment of professor of physics in McGill University, Montreal.

THREE lectures on "Aëronautics" are being delivered at the East London College by Mr. A. P. Thurston. The first lecture, on Monday, June 14, was on flying machines (heavier-than-air type). The second, on Wednesday, June 23, will deal with balloons, airships, and kites, and the subject of the third, on Wednesday, June 30, will be the mechanical principles of flight. Applications for tickets of admission to the lectures should be sent to the registrar at the college.

THE Department of Agriculture and Technical Instruction for Ireland will in August next award not more than six industrial scholarships to persons engaged in industries, such as the woollen, linen, leather, and tanning industries. The object of these scholarships is to enable selected persons, who must already have been engaged in one of the higher branches of the industry, to take a full course of instruction in an institution providing special courses of an approved character with the view of training them for the management of such an industry. The scholarships will be tenable at some higher institution, to be approved by the Department, in which the industry, and the principles underlying it, are taught. They will be of the value of 80*l.* each, and may be renewed for a second or a third year at the discretion of the Department. Candidates must fill in and return, addressed to the secretary of the Department, not later than June 30, Form S. 192, copies of which may be had on application.

THE philanthropic aspects of the work of the administrators of the Children's Country Holidays Fund are appreciated and understood widely, but it is not generally known that, without some preliminary training, the ordinary town child is unable to benefit educationally from a short stay in the country. We are glad to learn, therefore, that a subcommittee, called the countryside committee, of the workers who organise the holidays was formed some time ago to develop means of interesting the children sent into the country in the natural wonders of countryside life. The subcommittee has arranged for the children, who will in August be sent by the fund into the country, a series of lantern lectures and nature talks about common animal and plant life, and also a succession of short rambles into metropolitan environs on Saturday afternoons to secure for them some preliminary practice in observation and general open-eyed intelligence. An appeal is made to competent men and women who love children to give, during the present month and the first weeks of July, nature talks to the children in the schools they attend, or to arrange for Saturday afternoon rambles in the immediate neighbourhood of London. Similar persons who live in the country and are willing to assist in making the fortnight's holiday a profitable time physically and mentally for the children are asked to communicate with the honorary secretary of the countryside committee, Mrs. Douglas Wilson, 17 Buckley Road, Brondesbury, London, N.W.

BEDFORD COLLEGE (University of London), the oldest university college for women, celebrates this year the sixtieth anniversary of its foundation. Since 1849, when it was first opened, its progress has been continuous, and the number of students entered this year exceeds three hundred. It is the only college exclusively for women

which receives a Parliamentary grant. Recent developments in the work and the increase in numbers of students have caused serious pressure on the space available in the present buildings. In 1903 a building and endowment fund was started, which has received generous support; and the end of the lease of a Crown property in Regent's Park, known as South Villa, has been purchased, with a promise from the Crown for its renewal on a further lease of ninety-nine years. It is estimated that to erect on this site buildings well equipped for college purposes, including a library, laboratories, lecture-rooms, and a residence for students, will cost about 80,000*l.* The council of Bedford College, encouraged by the support it has already received (which includes a special bequest for a botanical laboratory), hopes that sufficient support may be forthcoming to enable it to obtain this sum, and to build a college in which the educational work so worthily begun may be carried on in worthy surroundings. In order to celebrate the sixtieth anniversary, and to make this desirable site known to their friends, the council and principal will hold a garden-party at South Villa on Tuesday, June 29, from 4 p.m. to 7 p.m., for which cards of invitation may be obtained from the secretary, Bedford College, York Place.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, June 10.—Sir Archibald Geikie, K.C.B., president, in the chair.—The functions of the pituitary body (Croonian lecture): Prof. E. A. Schäfer.—A wave-length comparator for standards of length: Dr. A. E. H. **Tutton**. Two and a half years ago the author was requested by the Standards Department of the Board of Trade to devise and superintend the construction of a new comparator, for comparing standards of length—the imperial standard yard, for instance, with official copies, and the latter with the copies constructed for local authorities—in terms of wave-lengths of light. The instrument now described is the result. Besides performing its functions as a wave-length comparator, and being the first instrument specifically constructed as such, it is also the most perfect instrument yet devised for measurement in wave-lengths in general. It is described to the Royal Society by permission of the President of the Board of Trade. The principle of the instrument is that of the author's interferometer, described to the society in 1898 in connection with an interference dilatometer, and again as improved in 1904 in connection with the author's elasmometer or interference elasticity apparatus. The interferometer, which is totally different from that of Michelson or that of Fabry and Perot, is adapted, as regards details, in a special manner for the specific object in view, but with the exception that a Hilger constant-deviation prism is employed instead of a train of two spectroscopic prisms, its principle is preserved intact. The essential point of the instrument is that one of the two microscopes, employed to focus the two defining lines on a standard yard bar, actually carries just above the objective one of the two glass plates of the interference apparatus, which reflect the monochromatic light (hydrogen or cadmium red radiation) which is caused to interfere and produce rectilinear dark bands. When the microscope is moved the plate consequently moves with it, and the amount of movement is absolutely afforded by the movement of the interference bands, being equal to half the wave-length of the light employed for every band which passes the reference spot in the centre of the field of the interferometer telescope. So perfectly has this fine movement been achieved that the microscope and the bands can be caused to move simultaneously, by rotation of a large, fine-adjustment wheel, so steadily that each band can be made to pass the reference spot as slowly as one wishes, and be arrested instantly, without the slightest tremor, at any fraction of its width, so that the control of the bands and the counting is a perfectly simple matter. In order to compare two standard bars, it is only necessary (1) to place the bar of known length, supported on an elaborate mechanism for the adjustment of the bars, also novel, under the two microscopes, carried on massive yet deli-

cately moving sliders on a 6-foot V-and-plane bed, so that the two defining lines are adjusted between the spider-lines of the micrometer eye-piece in each case; (2) to replace the standard by the copy to be tested, so that the defining line near one end is similarly adjusted under the corresponding microscope; then, if the other defining mark is not also automatically adjusted under the second microscope which carries the glass interference plate, as it should be if it is an exact copy, (3) to traverse that microscope until it is so adjusted, and (4) to observe and count the number of interference bands which move past the interference spot during the process. The difference between the bars is this number multiplied by the half-wave-length of the light in which the bands are produced. The paper also gives an account of the electrical and thermal arrangements, as well as of the foundation masonry of the new comparator room. The temperature of the whole room is controlled entirely electrically, being maintained constant at the official temperature, 62° F. The thermostatic arrangements are of an original character, and of two different independent types—a thermometric and a resistance type.—The use of wave-length rulings as defining lines on standards of length: Dr. A. E. H. **Tutton**. The delicacy of the method of measurement in wave-lengths described in the preceding communication calls for a corresponding refinement in the engraved lines which form the defining lines of the length of a standard yard or metre or other line-measure bar. The defining lines on the imperial standard yard are sharp-edged, but contain the equivalent of forty interference bands of red light in their thickness, and the Benoit defining lines of the platinum-iridium copy made in 1902 are not only very ragged-edged, but contain fifteen interference bands in their thickness. The author has been in communication with Mr. J. H. Grayson, of Melbourne, whose fine rulings have recently evoked such interest among microscopists, and after a long investigation has found that wonderfully satisfactory rulings on the scale of 40,000 to the inch can be made on polished speculum metal, covered with a thin cover-glass cemented only at the corners away from the rulings. Now the forty-thousandth of an inch is a single wave-length of red light (for $H\alpha = 1/38710$ inch and $Cd\ red = 1/39450$ inch), so that the interval between any adjacent pair of these lines is equivalent to only two interference bands. The thickness of each line, which is absolutely sharp-edged, is less than a single interference band. The author has therefore devised a defining mark in these rulings, which he terms a "Tutton location signal," to distinguish it from the "Benoit defining line." It consists of five such parallel lines spaced one forty-thousandth of an inch apart, with a pair of strong "finder" lines outside them and parallel to them, and another pair of similar finder lines perpendicularly transverse to them, to indicate a central part of the lines for use. The central line of the five fine Grayson rulings is the defining line. These location signals can also be ruled on platinum-iridium, and with less success on gold and invar; but the result on speculum metal is so very superior that a large number of location signals have been made on this metal by Mr. Grayson for the Standards Department. The paper indicates their possible mode of use, not only as the end-mark defining lines of standard bars, but for a new mode of determining, by a stepping-off process of repeated doublings, the total number of wave-lengths of red cadmium light contained in the British yard.

Linnean Society, June 3.—Dr. D. H. Scott, F.R.S., president, in the chair.—*Calamites (Calamitina) Schutzei*, Stur, and on the correspondence between the length of internodes and the position and function of the short internode in the genus *Calamites* and in the recent *Equisetaceæ*: A. R. **Horwood**. The author stated that a specimen of *Calamites Schutzei*, Stur, shortly to be figured, exhibits graphically the fistular character of the stem in *Calamites*, a specimen 3 feet long having been split into two portions longitudinally and so preserved. In the same specimen (from the Main Coal, Stanton-under-Bardon, Leics.) and in another from Brighouse, Yorks, provisionally referred to this species, the regularly uniform length and position of a short internode at the commencement of each period

of uniformly longer internodes are specially marked. As a result of a study of this specimen and of a comparison made between it and specimens of the recent species of *Equisetum*, it is found that there is a strong resemblance between the two groups, *Calamariæ* and *Equisetaceæ*, in the position of the short internode, and a marked similarity in the uniform rate of increase or decrease in the length of the internodes in both groups also, most apparent in *Calamitina*, but probably in a modified form in *Eucalamites* and *Stylocalamites*, and in subterranean stems of *S. Suckowii* there is a strict homology.—The *Cephalochorda*—"amphioxides"—of the *Sealark* expedition: H. O. S. **Gibson**.—The *Alcyonaria* of the *Sealark* expedition: Prof. J. A. **Thomson**.

Mathematical Society, June 10.—Sir W. D. Niven, president, in the chair.—The behaviour at the poles of a series of Legendre's functions representing a function with infinite discontinuities: F. J. W. **Whipple**.—An analogue of Pascal's theorem in three dimensions: W. H. **Salmon**.—Some symbolical expressions for the eliminant of two binary quatics: A. L. **Dixon**.

EDINBURGH.

Royal Society, May 17.—Dr. John Horne, F.R.S., vice-president, in the chair.—A simple radioscope and a radiometer for showing and measuring radio-activity: Dr. J. **Aitken**. The instruments were a natural development of his own and C. T. R. Wilson's investigations on cloudy condensations. A U-tube about 2 cm. internal diameter was filled partly with air and partly with water. The open end of the tube was in connection with a rubber ball, by which pressure on the enclosed air could be increased and diminished at will. The rubber ball was compressed by a simple, suitable mechanism of hinged levers. When the pressure was suddenly diminished by relief of the ball after compression had been applied, fog cloud might be observed in the air space. After a few alternate compressions and reliefs of pressure the cloud ceased to form, the air being purified of natural nuclei. When, however, a radio-active body was brought near, the relief of pressure was accompanied by formation of cloud. Various forms of the radioscope were described. To convert the instrument into a radiometer, Dr. Aitken made use of his method of counting the drops as they fell on a surface ruled into small squares. The instrument was not capable of the same accuracy as Wilson's form of apparatus, but it was simple and easily worked, and could give results of quantitative value in comparing the radio-activity of different substances.—Mendelian action on differentiated sex: Dr. D. Berry **Hart**. After referring to the well-known facts that the male and female genital tracts contain, not only the potent elements proper to the sex, but also non-potent elements of the opposite sex, Dr. Hart proceeded to apply the principles of Mendelism, regarding the non-potent elements as recessive and the potent elements as dominant in Mendel's sense. If the genital tract contained dominant and recessive determinants, then, in Weismann's terminology, the zygote from which they arose contained dominant and recessive determinants, and this made it an impure determinant. To get such a heterozygote two varieties of gamete seemed to be necessary, viz. a non-sex and sex male gamete and a non-sex and sex female gamete. By the crossing of a sex male gamete and a non-sex female gamete, and of a sex female gamete and a non-sex male gamete, respectively, male and female zygotes were produced—variation zygotes. Evidence was given that the dominant and recessive genital determinants were not segregated in the gametes, but combined in the sex gamete. The origin of the gametes was discussed in relation to the Owen-Weismann law of the continuity of the germ-cells. Ovarian and testicular teratomata were regarded as derived from a non-sex gamete, which, owing to imperfect reduction from a primitive germ-cell, retained some power of zygotic development. The general view was that dominance and recession acted on differentiated sex, but that the dominant and recessive genital determinants were in the sex gamete, and were not segregated in the gametes as the theory of gametic segregation demands. The dominant and recessive elements are not segregated in the human race, but are segregated in the free-martin, and probably in

bees. In the free-martin—a sterile bull usually with a potent twin—the potent bull has the dominant determinates as the result of the division of the zygote, while the free-martin has the recessive determinates.

DUBLIN.

Royal Dublin Society, May 25.—Prof. Sydney Young, F.R.S., in the chair.—Injurious insects and other animals observed in Ireland during the year 1908: Prof. G. H. **Carpenter**. Observations were given showing the uselessness of sprays recommended for destroying the eggs of the apple sucker (*Psylla mali*), the early stages of which are described and figured. The larva of the beetle *Dascillus cervinus*, which feeds on the roots of oats and cereals, is described, and some details of its external structure are given; in many respects it appears a remarkably primitive larval form. Attention was directed to the unusual abundance in Ireland during the autumn of 1908 of the laburnum moth (*Cemiostoma laburnella*).—The analysis of beeswax: Prof. Hugh **Ryan**. By a method in principle similar to, in detail different from, that of Hehner, the author determines the percentage of beeswax in mixtures of that substance with other waxes. The acid number of the wax is first found, sand is added, and the mixture is evaporated to dryness; the esters and hydrocarbons are then extracted with low-boiling petroleum-ether in a Soxhlet apparatus. From the percentage by weight of the free acids and the acidity of the wax, the percentage of cerotic acid can be calculated, and from the latter the amount of beeswax in the mixture. If Montana (Montan) wax and stearic acid be present, the method will yield incorrect results. In the latter case it will be necessary to find the percentage of hydrocarbons, and the mean molecular weight of the combined acids in the wax, before the true percentage of beeswax can be calculated. Analyses of waxes from Ireland, Chili, Sierra Leone, and Madagascar, and of an artificial wax composition containing, amongst other substances, Montana (Montan) wax, are given to illustrate the methods described.—Montanin and Montana (Montan) waxes: Prof. Hugh **Ryan** and T. **Dillon**. A sample of wax called Montana wax, identical with that known in Germany as Montan wax, examined by the authors, melted at 76° C., had an acid number 73.3, an ester number 0.6, and contained 47 per cent. of unsaponifiable matter. The iodine number of the wax was 16, and that of the unsaponifiable matter was 31.13. The saponifiable portion consisted of an acid (montanic) the molecular weight and analysis of which agreed with the formula $C_{28}H_{36}O_2$. Montanin wax is a white, hard, brittle wax of melting point 96° C., much higher than that of Montana wax, with specific gravity (15° C.) 0.980, acid number 56.9, ester number 1.0, and containing 34.8 per cent. of unsaponifiable matter. The acid liberated from the saponifiable matter proved to be montanic acid, and the unsaponifiable matter was identical in composition with that obtained from Montana wax. The great difference in the physical properties of the two waxes is due to the presence of 23.87 per cent. of sodium montanate in montanin wax, and the absence of the sodium salt from the Montana wax.

NEW SOUTH WALES.

Linnean Society, March 31.—Mr. C. Hedley, president, in the chair.—Notes on the geology of the Mount Flinders and Fassifern districts, Queensland: Dr. H. I. **Jensen**. Mount Flinders is a rugged peak attaining an altitude of 2240 feet, and situated about eleven or twelve miles S.S.E. of the town of Ipswich, Queensland. Surrounding the main peak there are a number of smaller cones and rugged rocks, most of which represent former parasitic vents or smaller foci of eruption which encircled the large volcano. It is noteworthy that the conical mountains are usually composed of breccia, with more or less of basic trachyte, dacite, and andesite, and, further, they are characterised by better soil (usually of a red or brown colour), and a thicker vegetation; patches of vine scrubs occur on them. The volcanic rocks of the Fassifern scrub are all post-Triassic, and probably post-Cretaceous. There seems to have been an old series of dolerites anterior to the trachytes, but the author has not satisfied himself on this point. The remaining links of the sequence are (1) trachyte, later (2) andesite, and still later (3) basalt.

NO. 2068, VOL. 80]

—Can opsonins be obtained directly from bacteria and yeasts? Dr. R. **Greig-Smith**. Since the inoculation of dead cultures of bacteria and the ingestion of yeast give rise to an increased production of opsonin in the blood, there is the possibility that this might be derived directly from the digestion of bacteria and yeast. *Staphylococcus* and yeast were attacked with pepsin and with pancreatic extract, but while anti-opsonin was clearly present, no evidence of the formation of opsonin could be obtained.—The coagulation of condensed milk: Dr. R. **Greig-Smith**. Condensed milk which became coagulated or "jellified" in the course of a few months was found to contain a micrococcus closely allied to *Staphylococcus albus*. Pure cultures of the micro-organism produced a coagulation in sterile condensed milk. The coagulation was hastened by the presence of traces of calcium carbonate, and the trouble appeared to have been aggravated by the small quantity of residual air in the tins.

PARIS.

Academy of Sciences, June 7.—M. Bouchard in the chair.—Presentation of the *Comptes rendus*, reports and communications of the first International Low Temperature Congress, Paris, October 5-12, 1909: M. **d'Arsonval**.—Presentation of a meridian catalogue of the Observatory of Bordeaux: B. **Baillaud**. The catalogue contains 6999 stars, the declinations of which are comprised between -15° and -20° .—Hertzian waves and Fredholm's equation: H. **Poincaré**.—Preparation of the three oxy- and the *p*-dimethylamido- and diethylamidobenzylidencamphors and the *p*- and *m*-tolylidencamphors: A. **Haller** and Ed. **Bauer**. A general method is given for the preparation of these substances by condensation of camphor with aldehydes in presence of sodium amide. The chemical and physical constants of several of these compounds are detailed, special attention being given to the influence of the introduction of various groups into the benzene ring upon the colour and optical properties.—Congruences the two focal surfaces of which are quadrics: C. **Guichard**.—The total eclipse of the moon of June 3, 1909, observed at Marseilles by MM. Borrelly and Coggia: H. **Bourget**.—Surfaces such that the geodesic lines of curvature are respectively functions of the principal corresponding curvatures: A. **Demoulin**.—A generalisation of the geometry of the cyclid: B. **Hostinsky**.—The altimetry of the Pelvoux-Écrins massif: P. **Helbronner**. A preliminary paper giving the heights of thirty peaks. Comparison is made with data furnished by the *Carte de l'Etat-Major*, and the causes of the divergences discussed.—A physical representation of the θ -functions: H. **Larose**.—The standardisation of condensers: M. **Devaux-Charbonnel**. The results of the application of the tuning-fork method are described. The convenience and exactitude of this method (0.1 per cent.) is pointed out. The capacity of an air condenser was found to be constant and independent of the vibration frequency of the fork, but the capacity of a mica condenser was found to be slightly less with a higher frequency.—The absolute measurement of an electrical resistance in electrostatic units: M. **Hurmuzescu**.—Catalytic action produced by moisture: J. **Meynier**. Mixtures of dried nitric oxide and oxygen were treated with minute quantities of water vapour, freed from large ions by filtration through cotton wool. No proportionality could be traced between the velocity of the reaction and the amount of water vapour present.—Chemical reactions in gaseous mixtures submitted to very high pressures: E. **Briner** and A. **Wroczyński**. The gaseous mixture is liquefied by cold in a thick-walled tube, the latter sealed, and allowed to assume the ordinary temperature. Results are given for the mixtures (NO, HCl), (NO, SO₂), (HCl, SO₂), (NO, CH₃Cl), and (SO₂, O₂).—The hydrated combinations of thorium chloride with alkaline chlorides: Ed. **Chauvenet**.—Normal butine and some of its derivatives: Georges **Dupont**. The most satisfactory yields were obtained by starting from normal butyl alcohol; this was converted into butylene by the Senderens reaction, absorbed by bromine, and the resulting bromide heated with dry potash. The pure butine, C_4H_8 , $C\equiv CH$, boils at 18.5° and melts at -130° . Numerous derivatives are described.—The synthesis of derivatives of racemic fenone: MM. **Bouveault** and **Levallois**.—The maltase from buck-

wheat: J. **Huerre**. This maltase acts between 3° C. and 70° C., the maximum effect being produced at 55° C. The activity is increased either by a partial neutralisation of the alkalinity or by the addition of amino-acids or acetamide.—Some Tertiary French basalts of the Alpine Vorland: Albert Michel **Lévy**.—The reddening of the branches of *Salicornia*: H. **Colin**. The accumulation in the plant cells of a considerable proportion of mineral compounds, such as sodium and magnesium chlorides, does not prevent the production of anthocyanine.—The influence of various nutritive media on the development of the embryos of *Pinus pinea*: J. **Lefèvre**. Sugar is the essential food of the embryo; small quantities of nitrogenous materials, such as peptones, are only accessory foods.—The phytogeographical subdivisions of the Kabylie of Djurdjura: G. **Lapie**.—Some observations relating to anaphylactic phenomena: P. **Delanoë**.—The effects of chocolate and coffee on uric acid and the purins: Pierre **Fauvel**. In a healthy man, on a vegetarian diet, chocolate and coffee increase the excretion of purins, diminish the excretion of uric acid, and prevent the precipitation of the latter, and this diminution of uric acid is not due to retention in the body.—The problem of cinematographic vision without vibrations: C. **de Proszynski**. The frequency of interposition of the shutter which cuts off the light during the motion of the film is increased from fourteen to fifty-six per second. In this way the painful vibratory sensation is completely suppressed.—The treatment of nævus by electrolysis and radium combined: Fouveau **de Courmelles**. Positive electrolysis with multiple needles followed by the application of radium reduces the necessary time of treatment to three or four days.—The signification of the *Rhabdospora*, supposed parasitic Sporozoa in fishes: L. **Léger** and O. **Duboscq**. The conclusion is drawn that this is not a parasite, but a normal histological element in fishes, a glandular secretion cell, and hence that *Rhabdospora thelohani* should be deleted as a species.—The madrepores of the islands of San-Thomé and Prince (Gulf of Guinea): Ch. **Gravier**.—Contribution to the experimental analysis of the process of fecundation in the Amphibia: E. **Bataillon**.—The skeleton of the trunk and limbs of the fossil man of La Chapelle-aux-Saints: Marcellin **Boule**. The characters of the skeleton show that the fossil distinctly belongs to the human group. It presents, however, a mixture of characters; some correspond to those found in the lowest type of the existing races, others belong more to the anthropoid apes.—Earth induction currents in the Polar regions: Kr. **Birkeland**.—The compensation between the types of seasons in certain regions of the earth: H. Hildebrand **Hildebrandsson**.

DIARY OF SOCIETIES.

THURSDAY, JUNE 17.

ROYAL SOCIETY, at 4.30.—On the Origin of Certain Lines in the Spectrum of ϵ Orionis (Alnitam): Sir Norman Lockyer, K.C.B., F.R.S., F. E. Baxandall, and C. P. Butler.—On Electrostatic Induction through Solid Insulators: Prof. H. A. Wilson, F.R.S.—The Effect of Pressure on the Band Spectra of the Fluorides of the Metals of the Alkaline Earths: R. Rossi.—The Ionisation produced by an α Particle. Part I.: Dr. H. Geiger.—On the Diffuse Reflection of the α Particles: Dr. H. Geiger and E. Marsden.—The Decay of Surface Waves produced by a Superposed Layer of Viscous Fluid: W. J. Harrison.—The Passage of Electricity through Gaseous Mixtures: E. M. Wellisch.—A Study of the Use of Photographic Plates for the Recording of Position: Dr. C. E. K. Mees.—The Coefficients of Capacity and the Mutual Attractions or Repulsions of Two Electrified Spherical Conductors when close together: Dr. Alexander Russell.—On the Effect of Previous Magnetic History on Magnetisation.—Prof. E. Wilson, G. F. O'Dell and H. W. K. Jennings.

LINNEAN SOCIETY, at 8.—On the Growth of a Species of *Battarea*: J. G. A. Tepper.—The Deposits in the Indian Ocean: Sir John Murray, K.C.B., F.R.S.—The *Sealark* *Perseidea*, *Stenopidea*, and *Reptantia*: L. A. Borradaile.—The *Sealark* *Polychaeta*. Part II.: F. A. Potts.—The *Sealark* *Lepidoptera*: T. Bainbridge Fletcher.—New Species of Malesian and Philippine Ferns: Dr. H. Christ.—The African Species of *Triumfetta*, Linn: T. A. Sprague and J. Hutchinson.—The Acaulescent Species of *Malvastrum*: A. Gray and A. W. Hill.

ROYAL GEOGRAPHICAL SOCIETY, at 5.—Research Department. Annual Meeting.

FRIDAY, JUNE 18.

ROYAL INSTITUTION, at 9.—A Recent Visit to the Panama Canal: A. H. Savage Landon.

MONDAY, JUNE 21.

VICTORIA INSTITUTE, at 4.—Annual Meeting: Presidential Address by the Earl of Halsbury, F.R.S.

THURSDAY, JUNE 24.

ROYAL SOCIETY, at 4.30. (Meeting at the Royal Astronomical Society).—*Probable Papers*: The Possible Ancestors of the Horses living under Domestication. Part I., Introductory: Prof. J. C. Ewart, F.R.S.—The Electrical Reaction of Certain Bacteria, and an Application in the Detection of Tubercle Bacilli in Urine by Means of an Electric Current: Charles Russ.—(1) On Pressure Perpendicular to the Shear Planes in Finite Pure Shears; and on the Lengthening of Loaded Wires when Twisted; (2) The Wave Motion of a Revolving Shaft, and a Suggestion as to the Angular Momentum in a Beam of Circularly Polarised Light: Prof. J. H. Poynting, F.R.S.—Thermal Conductivity of Air and other Gases: George W. Todd.—The Effect of the Injection of Intra-cellular Constituents of Bacteria (Bacterial Endotoxins) on the Oponising Action of the Serum of Healthy Rabbits: R. T. Hewlett.—On the Occurrence of Protandric Hermaphroditism in *Crepidula fornicata*: J. H. Orton.—The Alcoholic Ferment of Yeast-juice. Part IV., The Fermentation of Glucose, Mannose, and δ Fructose by Yeast-juice: Dr. A. Harden, F.R.S., and W. J. Young.—Studies of the Processes Operative in Solution. XI., The Displacement of Salts from Solution by Various Precipitants: Prof. H. E. Armstrong, F.R.S., and Dr. J. V. Eyre.—And other Papers.

FRIDAY, JUNE 25.

PHYSICAL SOCIETY, at 5.—A Transition Point in Zinc Amalgam: Prof. Carhart.—A Method of Producing an Intense Cadmium Spectrum, with a Proposal for the Use of Mercury and Cadmium as Standards in Refractometry: Dr. T. M. Lowry.—On the Measurement of Wavelength for High Frequency Electrical Oscillations: A. Campbell.—An Electro-magnetic Method of Studying the Theory of and Solving Algebraical Equations of any Degree: Dr. A. Russell and J. N. Alty.—The Sine Condition in Relation to the Coma of Optical Systems: S. D. Chalmers.—Exhibition of a new Fery Thermo-electric Calorimeter: C. V. Drysdale.—An Instrument for Measuring the Strength of an Intense Horizontal Magnetic Field: F. W. Jordan.—On a Method of Determining the Sensibility of a Balance: Prof. Poynting, F.R.S., and G. W. Todd.—The Balance as a Sensitive Barometer: G. W. Todd.

CONTENTS.

PAGE

| | |
|--|-----|
| Experimental Embryology. By B. | 451 |
| Elementary Botany | 452 |
| An Essay in Palæontology | 452 |
| Two Books on Theoretical Chemistry. By A. N. M. | 453 |
| Our Book Shelf:— | |
| Parsons: "Malleable Cast Iron."—A. McW. | 454 |
| Goodall and Washbourn: "A Manual of Infectious Diseases."—R. T. H. | 454 |
| Roosenburg: "Beschrijving en Onderzoek van den gyroscopischen Horizon Fleuriais (Model Ponthus et Therrode)" | 455 |
| "Revue de Géographie annuelle" | 455 |
| Greenhill: "Notes on Dynamics."—J. P. | 455 |
| Letters to the Editor:— | |
| The Temperature of the Upper Atmosphere. (With Diagram.)—W. H. Dines, F.R.S.; Charles J. P. Cave | 455 |
| The Sense of Proximity.—Charles H. Melland | 456 |
| The Pollination of the Primrose.—John J. Ward; W. E. Hart; and The Reviewer | 457 |
| An Optical Phenomenon.—Charles E. Benham | 458 |
| Dew-Ponds.—L. Gibbs | 458 |
| Spruce's Travels in South America. (Illustrated.) By A. W. H. | 458 |
| An Antarctic Album. (Illustrated.) By J. W. G. | 460 |
| American and Canadian Waterways | 461 |
| The Problem of an Ultra-Neptunian Planet | 463 |
| Notes | 463 |
| Our Astronomical Column:— | |
| The Ensuing Return of the Perseid Meteors | 468 |
| The Solar Parallax, from Observations of Eros | 468 |
| A Double-image Cœlostast for determining the Moon's Position | 468 |
| The Determination of the Solar Constant | 468 |
| The Welsh Gorsedd. By the Rev. W. Griffith | 468 |
| Scientific Work of the International Congress of Applied Chemistry. (Illustrated.) | 470 |
| The Supply of Secondary Education in England and Elsewhere. By A. J. Pressland | 473 |
| The South-Eastern Union of Scientific Societies | 476 |
| University and Educational Intelligence | 476 |
| Societies and Academies | 477 |
| Diary of Societies | 480 |