

LIVERPOOL.—Mr. J. K. Catterson-Smith has been appointed demonstrator in electrotechnology, and Dr. G. D. Hope demonstrator and assistant lecturer in organic chemistry.

From the interest of funds bequeathed to the University by the late J. L. Bowen, the council has decided to allot 100*l.* per annum towards the permanent endowment of the lectureship on organic chemistry.

Grants have been made out of funds provided by H.M. Treasury for the following researches at present being carried out in science laboratories:—for investigation of absorptive properties of vegetable fibres; for plates to illustrate a monograph on the edible crab; for materials used in the investigation of Röntgen radiation; for apparatus for research on brass annealing; for apparatus for investigating high-temperature combustion; for research on three-membered heterocyclic derivatives; for research on continuous and momentary arcs; for suction of gases in pipes; and for research on blood pressure.

The University has decided to confer the degree of D.Sc., *honoris causa*, at the forthcoming graduation in July, on the following men of science:—Prof. A. R. Forsyth, F.R.S.; Prof. F. Gotch, F.R.S.; Dr. C. L. A. Laveran, Chef de Service Honoraire of the Institut Pasteur, Paris; Sir Oliver J. Lodge, F.R.S.; Sir John Murray, K.C.B., F.R.S.; Prof. W. Osler, F.R.S.; Prof. W. Ostwald; Sir William Ramsay, K.C.B., F.R.S.; and Sir Henry E. Roscoe, F.R.S. The degree will be conferred on Dr. Laveran *in absentia*.

MANCHESTER.—His Grace the Duke of Devonshire, who for many years has held the office of president of the Owens College, and more recently of the University, has been elected Chancellor of the University upon the resignation of Earl Spencer. The installation ceremony has been fixed for July 10, and on this occasion a number of honorary degrees will be conferred. Prof. E. Rutherford, F.R.S., whose appointment as Langworthy professor of physics and director of the physical laboratories has already been noted, is now in Manchester making arrangements for taking over the duties of his office in October.

Prof. Arthur Schuster, F.R.S., has been offered, and has accepted, an appointment as honorary professor of physics; his continued cooperation in the work of the department is thus assured.

Mr. W. H. Jackson, who has for the past five years held the position of assistant lecturer in mathematics, has been appointed assistant professor of mathematics at Haverford College, Pa., U.S.A.

OXFORD.—Mr. D. L. Chapman has been selected for the official fellowship in natural science at Jesus College. Mr. Chapman was an exhibitor at Christ Church, and since 1897 has been a demonstrator in Prof. Dixon's laboratory at the Victoria University of Manchester.

On Thursday, June 6, the Buckinghamshire Education Committee closed all their schools, so that the teachers could attend a conference, organised by Mr. C. G. Watkins, at Aylesbury, at which a number of the delegates of the Federal Conference on Education were present. Among the subjects discussed was the question as to how the rural schools might be kept in touch with the progress and development of educational life. An important difference between rural schools in the colonies and in the mother country was brought out. In the former the teachers are the best teachers, and quickly move as they are promoted according to the work that they can do. Here the best teachers go at once to the better-paid posts in towns; those in the rural districts stay where they are, as there is no system of promotion. Among those from the colonies who spoke on this and other topics were the Hon. Colin Campbell (Minister of Education, Manitoba), Mr. Frank Tate, I.S.O. (Victoria), Mr. A. Williams (South Australia), Mr. J. A. Douglas (Southern Nigeria). Mr. W. M. Webb pointed to the use that could be made of museums fixed and circulating in the training of teachers, particularly in rural districts, and he mentioned the resolutions passed at the Federal Conference with regard to a collection that should bring before teachers fresh methods and new appliances.

The board of trustees of the University of Illinois has voted that the Engineering Experiment Station be authorised to offer ten research fellowships in the college of engineering, each of an annual value of 100*l.* A pamphlet received from the University gives information concerning these fellowships, and describes the facilities for experimental work now available in the college of engineering.

We have received a copy of a brochure, presented to the British editors on the occasion of their visit to Berlin last month, which provides an instructive account of the Handelshochschule founded by the Berlin Merchants' Corporation. It is the only institution of its kind in Germany which owes its existence to the efforts of a body of business men, and is maintained solely at their expense. The school is particularly meant for commercial students who have gone through a regular apprenticeship, and, besides, have attained that degree of general training which entitles to the privilege of serving the shorter term of one year in the German Army or Navy. Exceptions are made in the case of students otherwise suitably prepared. The object constantly held in view is "to provide instruction and opportunities for research in the sciences necessary and most useful for a commercial career." The approved course of work extends over two years. The school was opened in October, 1906, and during the first session 1371 persons were in attendance on lectures. The inauguration of the scheme serves to show that German merchants possess initiative enough themselves to supply any deficiency which may exist in the State system of education.

A DEPUTATION from the British Medical Association, the Board of Hygiene and Temperance, and the 1904 Committee of the Medical Profession, waited upon the President of the Board of Education on June 6 to urge the teaching of hygiene and temperance in all schools and training colleges under the Board, and the establishment of a medical bureau in the Education Department. Mr. McKenna, M.P., in reply, said that the chief difficulty is to obtain competent teachers, and the next is to get the teachers to teach the children. To come into immediate contact with the schools, it is necessary to have teachers to teach children in 21,000 schools, and these are not available. As to medical inspection, the Bill dealing with this subject has not yet passed through the House of Commons, but it is to be pressed, and Mr. McKenna believes it will obtain the support of the House and become law. Until the Bill is passed it would be undesirable to declare in advance what the settled policy of the Board is as to the details of carrying out the proposals of the Bill. Naturally the desire of the Board will be to have expert medical advice, if the Bill passes, upon the various topics with which it is concerned, but no definite lines could be laid down now on the proposal for the establishment of a medical bureau. On the general question, Mr. McKenna expressed himself as heartily in sympathy, as the whole of the Government are, with the objects laid before him. It is most desirable for children in elementary schools to be taught hygiene and temperance.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, April 18 — "On Reciprocal Innervation of Antagonistic Muscles." Tenth note. By Prof. C. S. Sherrington, F.R.S.

This communication furnishes fresh examples of reciprocal innervation of antagonistic muscles. These examples are taken from the great flexion-reflex of the leg. The paper shows that in that reflex the extensors of the ankle are inhibited concurrently with excitation of flexors of the ankle. It also shows that the adductors of the hip are relaxed by inhibition concurrently with reflex contraction of the abductors, and that the external rotators of the hip similarly are relaxed by inhibition concurrently with contraction of the internal rotators. These new instances of reciprocal innervation of antagonistic muscles are important, because of the desirability of seeing how far reciprocal innervation may be considered a general or

widespread principle in the coordination of muscular actions.

The communication next proceeds to show that the muscles of the limbs are divisible into two groups; in one group the reflex action provokable excites the muscle itself and relaxes by inhibition its antagonist muscles. To this group belong, among others, the following muscles:—*biceps cruris*, *biceps brachii*, *gracilis*, *tensor fasciæ femoris*, *semi-tendinosus*, *tibialis anticus*, and *gluteus minimus*. In the other group the reflex action provokable from the nerve of the muscle inhibits that muscle itself while exciting reflex contraction in the muscles antagonistic to it. In this group come the following muscles:—*vastocruureus*, *gastrocnemius*, *soleus*, *triceps brachii*, *supraspinatus scapularis* and *anconeus*, *adductor magnus*, and *quadratus femoris*.

The communication finally reverts to the after rebound of contraction which, as pointed out in a previous communication on this subject, very usually follows reflex inhibition of the limb muscles. It is shown that this after-rebound to contraction is of central origin, and can be produced by direct electrical excitation of the cross-section of the spinal cord itself. The rebound contraction is illustrated by a graphic record of the rebound contraction following reflex inhibition of the gastrocnemius muscle in the cat.

**Geological Society, May 15.**—Sir Archibald Geikie, Sec.R.S., president, in the chair.—The origin of certain cañon-like valleys associated with lake-like areas of depression: F. W. **Harmer**. In glaciated regions, as shown by Prof. P. F. Kendall, the invasion of a district by an ice-sheet would tend to obstruct the natural drainage, producing lakes, of which the outflow might take place over the advancing ice, between the ice and the hillsides, or it might escape laterally, in a direction at right angles to the longest diameter of the lake and to the course of the pre-existing stream. Overflow channels would assume a gorge-like character, and would present a comparatively recent appearance. During the Glacial epoch the North Sea ice appears to have invaded the plain of the Witham and the valleys of the Welland, Nene, and Ouse, over-riding also the higher land separating them; the Tees ice-stream moved up the Trent basin to the vicinity of Derby, and thence, inoculating with the Derwent glacier, up the Soar valley towards Leicester and Rugby; the Irish Sea ice passed into the northern part of the basin of the Lower Severn; ice from the Brecknock Beacons passed towards the Bristol Channel, and, combined with Irish Sea ice crossing Pembrokeshire from St. David's Head towards Cardiff, may have caused the accumulation of sedentary ice in the Severn valley. After considering the case of Lake Pickering and the Malton Gorge as a typical example, the author passes on to Lake Shrewsbury and the gorge at Ironbridge. Pre-glacial drainage of the upper Severn and Vyrnwy was probably northwards; when a glacial lake was first formed over the Cheshire plain it may have drained towards the Trent, possibly by Rudyard and Madeley; when these gaps were closed, the lowest outlet seems to have been towards the south, and the Severn Gorge at Ironbridge was cut. Lake Trowbridge and the gorges of Clifton and Bradford-on-Avon are next dealt with, the latter being attributed to the overflow of a glacial lake occupying the Trowbridge plain, and the former to the blocking of the Flax-Bourton valley by ice. The gaps in the Jurassic escarpment at Lincoln and Ancaster are explained as overflows from a lake caused by the damming of the Trent outlet towards the Humber. This gave rise at first to the more northern, and later to the southern gorge. Finally, Lake Oxford and the Goring Gap are dealt with in considerable detail.

**Royal Microscopical Society, May 15.**—Lord Avebury, F.R.S., president, in the chair.—Diffraction rings due to a circular aperture: Prof. A. W. **Porter** and P. F. **Everitt**. The differences between the theoretical and the observed radius of the first dark diffraction ring mentioned in Mr. Nelson's paper, read March 21, 1906, were considered to be due to the method of observation, because the values obtained from observations made by Mr. Everitt, under the best conditions, were in very close agreement with theory.

**Zoological Society, May 28.**—Dr. J. Rose Bradford, F.R.S., vice-president, in the chair.—The form of the brain in the extinct lemurs of Madagascar, with some remarks on the affinities of the Indrisinæ: Dr. G. Elliot **Smith**. This formed a supplement to the paper on recently discovered subfossil *Proxymia* from Madagascar, read before the society by Mr. H. F. Standing on March 19. From an examination of cranial casts of an extinct species of lemur and of *Mesopropithecus* and *Palæopropithecus*, and of brain casts of *Nesopithecus* and *Megaladapis*, in conjunction with information derived from the study of recent lemurs, the author had arrived at the conclusion that *Propithecus*, *Avahis*, *Indris*, *Mesopropithecus*, *Nesopithecus*, *Palæopropithecus*, *Chiromys*, and *Megaladapis* must be regarded as the diversely specialised members of one family, all of which exhibited in greater or less degree distinct evidence of retrogressive changes from a more primitive and also more pithecoïd type.—Some notes on the abdominal viscera of *Chlamydoselachus*: Mrs. O. A. Merritt **Hawkes**. Observations on the alimentary canal, including the associated glands, the dentition, and the spiral valve of this fish. The results were compared with the accounts of these organs previously given by Garman and Günther, and attention was directed to any discrepancies which had been noted. The female reproductive organs were also examined, and evidence was cited supporting the conclusion that *Chlamydoselachus* was viviparous. The interesting discovery was recorded that a vestigial seventh branchial arch was present.—Second report on the batrachians and reptiles collected in South Africa by Mr. C. H. B. Grant: G. A. **Boulenger**. The report dealt with fifty-eight species—nineteen Batrachia and thirty-nine Reptilia—of which two were described as new.—Hydroids of the Cape Verde Island marine fauna collected by Mr. Cyril Crossland: J. **Ritchie**. The collection contained twenty-seven species, and added considerably to our rather meagre knowledge of the hydroid fauna of the northerly portions of the west coast of Africa. The majority of the specimens hitherto described from Cape Verde Island had been obtained in comparatively deep water, but the present collection was a littoral one, and contained examples of only one species before recorded from the locality, viz. *Sertularia vershuysi*, Nutting. Of the twenty-seven species represented in the collection eighteen were already known, while the remaining nine were described as new to science. Of the new forms, the most interesting was a gymnoblast, the peculiar branching and simple gonophore of which separated it so widely from known genera that a new genus had been established for it.

CAMBRIDGE.

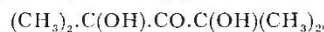
**Philosophical Society, May 6.**—Dr. Hobson, president, in the chair.—The influence of a strong magnetic field on the spark-spectra of lead, tin, antimony, bismuth, and gold: J. E. **Purvis**. The strength of the field was 40,000 units. The more important results were:—(1) Comparing the metals *separately*, there were lines belonging to the same type in having the same number of constituents, the same ratio of intensities of these constituents, the same polarisations, and the same distances apart when represented on the same scale of vibration numbers. (2) Comparing the metals *with one another*, there were lines which were comparable similarly, and this was particularly well marked amongst lines which were divided into four. (3) There were lines of Au, Sb, and Pb yielding four constituents which were essentially identical in every way with lines of the principal series in the spectra of Cu and Ag. (4) The constituents of some of the triplets of lines in the spectra of the different metals were also comparable with the constituents of some of the quadruplets in that the constituents vibrating perpendicular to the lines of force were polarised in the same direction and had the same distances apart when represented on the same scale of  $d\lambda/\lambda^2$ .—The  $\beta$  rays from potassium: N. R. **Campbell**. An account is given of an investigation into the nature of the rays from potassium which were described in a recent paper by the author and Mr. Wood. The experiments were directed mainly to showing that the rays carry a charge, and must therefore be  $\beta$  rays, since their penetration indicates that they cannot be  $\alpha$  rays. For

this purpose the deviation of the rays in an electrostatic field was observed and compared with that of the  $\beta$  rays from uranium. The conclusion reached in the earlier paper is confirmed, that the potassium rays are  $\beta$  rays the average velocity of which is less than that of the  $\beta$  rays of uranium. Incidentally, convincing proof was obtained of the photographic action of the rays. It seems beyond doubt that potassium must be classed among the radio-active elements.—The number of electrons in an atom: N. R. **Campbell**. A somewhat speculative calculation of the number of electrons in a radio-active atom based on the energy liberated in radio-active processes. The estimation of the average energy of an intra-atomic electron is based on observations of the velocity of the slow  $\delta$  rays from radium. The conclusion is reached that the number of electrons is probably of the same order of magnitude as that deduced on the assumption that the whole mass of an atom is the sum of the masses of the contained electrons. General arguments are offered for the view that the number of electrons in a radium atom cannot be less than 1300, and is probably very much greater.—The longitudinal impact of metal rods with rounded ends: J. E. **Sears**. The paper deals with the determination of the velocity of propagation of elastic waves in metal rods by means of observations on the duration of their longitudinal impact. The experiments were carried out with rods of steel, copper, and aluminium, and in every case the observed value of the wave-velocity was within  $\frac{1}{2}$  per cent. of that calculated from static tests by the formula  $v = \sqrt{Eg/\rho}$ , with the proper correction for adiabatic propagation. It was also observed that, for the exceedingly short times involved in these experiments, stresses far exceeding the elastic limit of the material can be applied without producing any permanent effects.—Selective absorption of Röntgen rays: G. W. C. **Kaye**. A Röntgen-ray bulb was constructed so that a pencil of cathode rays fell on an antikathode which was one of a batch of metals mounted on a small carriage which could be moved along inside the tube by a magnet from outside. The quantity of Röntgen rays passing through a thin aluminium window in the tube was measured by their ionising effect. Absorbing screens of different metals were placed in turn between the ionisation chamber and the aluminium window. Using a plate of aluminium as the absorber, the relation between the amount of transmitted radiation and the atomic weight of the metal used as antikathode was found to be approximately a linear one over a wide range of atomic weights. Screens of a few other metals were employed, and the results indicate that a metal is specially transparent to the Röntgen radiation from an antikathode of that metal, and that this abnormal transparency is shared in less degree by metals of atomic weight differing little from that of the antikathode. The effect seems to indicate that the Röntgen rays emerging from the interior of the antikathode to the surface undergo selective absorption, leaving the remainder specially penetrating to further layers of the same substance.—The transmission of earthquakes through the earth (second paper): Rev. O. **Fisher**.—Note on the influence of extraneous forces upon the proportion of the sexes produced by canaries: W. **Heape**. The breeding results in two aviaries are examined. In the one (N), the young produced were in the proportion of 76.99 cocks per 100 hens; in the other (G), 353.3 cocks per 100 hens were bred. This remarkable difference in the proportion of the sexes produced in these two aviaries is shown to be consistent both in detail and in the total results. Moreover, it is shown that a pair of N's birds transferred to G's aviary produced a large excess of cocks, and a pair of G's birds bred in N's aviary produced young of which the sexes were closely in accord with the average proportion obtained in the aviary that year. Examination of details regarding the food supplied and the temperature and surroundings to which the birds were subjected in these two aviaries indicates the probability that these factors exerted selective action on the generative elements debised by the parent birds, and may be interpreted as evidence of the exercise of extraneous forces on the proportion of the sexes produced.

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PARIS.

**Academy of Sciences**, June 3.—M. Henri Becquerel in the chair.—The origin of the irregularities of the lunar surface: MM. **Loewy** and **Duressaux**. A critical discussion of the theories of Laplace and G. H. Darwin concerning the moon's origin, and the present condition of its surface.—Selenium hexafluoride: Sir W. **Ramsay**. A reply to the criticisms of M. Lebeau on the selenium hexafluoride discovered by Prideaux.—Magnetic observations at Tananarivo: Ed. É. **Colin**. The results are summarised in three tables showing the absolute measurements of declination, inclination, and the horizontal component from May, 1906, to April, 1907.—Tetramethyl-dioxy-acetone: Louis **Henry**. An account of the study of the reaction between mesoxalic ester and magnesium methyl bromide by M. Joseph Lemaire. The magnesium compound being used in excess, the pentamethyl derivative  $(\text{CH}_3)_2\text{C}(\text{OH})\text{C}(\text{CH}_3)(\text{OH})\text{C}(\text{OH})(\text{CH}_3)_2$  was looked for. The actual product, however, proved to be



the physical properties of which are given.—Some applications of the theorem of Landau-Picard: C. **Carathéodory**.—Integral invariants: E. **Goursat**.—An apparatus for the study of telephonic currents: Henri **Abraham** and M. **Devaux-Charbonnel**. The essential part of the apparatus is the moving coil galvanometer for alternating currents described by H. Abraham in an earlier paper. This can be arranged so as to measure, not only the amplitudes, but also the phases and strength of telephone currents.—The speaking condenser: Pierre **Sève**.—A self-recording pyrometer with fixed photographic plate: M. **Wologdine**. The time ordinate is obtained by a mirror rotating round a horizontal axis at a uniform rate.—An apparatus for the preparation of a constant stream of pure oxygen: Gustave D. **Hinrichs**. The centre bulb of a Kipp is filled with well-washed granular pyrolusite, the liquid consisting of hydrogen peroxide acidified with one-twelfth of its volume of concentrated sulphuric acid.—The action of silicon tetrachloride on silver and copper: Em. **Vigouroux**. With silver, the tetrachloride is partially reduced to the sesquichloride; the silver not converted into chloride is free from silicon. With copper, the metallic ingot remaining contains about 2.4 per cent. of silicon.—The transformation of the esters of the  $\alpha$ -bromo-fatty acids into the corresponding  $\alpha$ -iodo-compounds: F. **Bodroux** and F. **Taboury**. The  $\alpha$ -bromo-ester is treated with anhydrous magnesium iodide in presence of ether. The reaction is energetic and practically quantitative.—A new method of synthesis of biprimary compounds containing an odd number of atoms of carbon: dimethoxyheptane,  $1.7 \text{ CH}_3\text{O}(\text{CH}_2)_7\text{O}\text{CH}_3$ : J. **Hamonet**.—The synthesis of the auramines by means of the oxalic esters: A. **Guyot**.—The action of organo-magnesium compounds on the cyclic alkylidene ketones: Henri **de Béville**.—A new type of bisazoic compound: H. **Duval**.—An alkaline microgranite collected at Graham's Land by Dr. Charcot's Antarctic Expedition: E. **Gourdon**.—The dehiscence of some stamens: M. **Pauchet**.—The rôle of comparative anatomy in the distinction between the species of the genus *Cistus*: M. **Gard**.—A new method of separating and estimating the organic acids in fruits and vegetables: J. M. **Albahary**.—The cultural mutation of *Solanum tuberosum*: Edouard **Heckel**.—The xylophage parasites of *Mamihot Glazioui*: P. **Lesne**.—The structure of the spinal medulla: N. A. **Barbieri**.—Fluorine in the shells of non-marine molluscs: P. **Carles**. Fluorine was found in all the non-marine molluscs examined, but in quantities much smaller than in the shells of marine molluscs.—The influence of the rapid displacements of air caused by the motor-car on the general nutrition: A. **Mouneyrat**. Both in normal and anæmic persons the number of red corpuscles in the blood is increased by moderate use of the motor-car. In neurasthenia accompanied by insomnia there is also a marked improvement.—A new method for the experimental diagnosis of tuberculosis: H. **Vallée**. Von Pirket has recently proposed the lesions arising from the application of a dilute solution of tuberculin to the skin of tuberculous subjects as a means for diagnosing tubercu-

losis in man. The author has studied this skin reaction with animals with results generally confirming those of Von Pirket. In healthy animals (cattle, horses, guinea-pigs) no appreciable skin reaction is produced; with tuberculous animals, on the other hand, the skin reaction is well marked.

DIARY OF SOCIETIES.

THURSDAY, JUNE 13.

ROYAL SOCIETY, at 4.30.—Some Points in the Development of *Ophiotrix fragilis*: Prof. E. W. MacBride, F.R.S.—On Certain Phenomena of Inactivation and of Inhibition exhibited by Precipitin Antisera: D. A. Welsh and H. G. Chapman.—The Inhibitory Action upon Subsequent Phagocytosis exerted on Active Normal Serum by Inactive Normal Serum through which bacilli have been passed: J. C. G. Ledingham.—*Miademia membranacea*, Bertrand; a New Palaeozoic Lycopod with a Seed-like Structure: Miss M. Benson.—On the Identification of Chitin by its Physical Constants: Miss I. Sollas.

CHEMICAL SOCIETY (Extra Meeting), at 8.30.—Discourse entitled Some Borderline Problems in Botany: Prof. J. B. Farmer, F.R.S.

MATHEMATICAL SOCIETY, at 5.30.—On Partial Differential Equations of the Second Order: Prof. A. R. Forsyth.

INSTITUTION OF MINING ENGINEERS, at 11 a.m.—Improvements required in Inland Navigation: H. R. de Salis.—Bye-product Coking Plant at Clay Cross: W. B. M. Jackson.—Notes on Bye-product Coke-ovens, with Special Reference to the Koppers Oven: A. V. Kochs.—Bye-product Coke-ovens: P. Schwarz.—Water Supplies by Means of Artesian-bored Tube-wells: H. F. Broadhurst.—Gypsum in Sussex: W. J. Kemp and G. A. Lewis.—The Use of Duplicate Capell Fans: G. M. Capell.

MATHEMATICAL SOCIETY, at 5.30.—Note on a Special Set of Classes of Partial Differential Equations of the Second Order: Prof. A. R. Forsyth.—Various Extensions of Abel's Lemma: Prof. T. J. I'A. Bromwich.—On the Number of Representations of a Number as a Sum of  $2r$  Squares, where  $2r$  does not exceed  $18$ : Dr. J. W. L. Glaisher.—An Extension of Eisenstein's Law of Reciprocity: Mr. A. E. Western.—On Certain Singular Points of Surfaces: Mr. A. B. Basset.—The Minimum Necessary Postulates as to a Function to be Defined as Analytic over a Region: Prof. E. B. Elliott.

FRIDAY, JUNE 14.

ROYAL INSTITUTION, at 9.

ROYAL ASTRONOMICAL SOCIETY, at 5.—(1) Note on the Colours of  $\alpha$  and  $\sigma$  Ceti; (2) The Relation between Star Colours and Spectra: W. S. Franks.—On the "Owl Nebula," M 97, N.G.C. 3587: E. E. Barnard.—Ancient Eclipses: P. H. Cowell.—Note on the Visual Spectrum of Mira Ce i in December, 1906: Rev. A. L. Corrie.—The Spectrum of Mira Ceti in December, 1906, as Photographed at Stonyhurst College Observatory: Rev. W. Sidgreaves.—Observations of Comets  $d, e, g, 1906$ , from Photographs taken with the 30-inch Reflector of the Thompson Equatorial: Royal Observatory, Greenwich.—*Probable Papers*: Observations of Jupiter: Rev. T. E. R. Phillips.—Description of an Equatorial Reflecting Telescope driven by a Hydraulic Ram: T. E. Heath.—The Work of the Mount Wilson Observatory: Prof. G. E. Hale.

PHYSICAL SOCIETY, at 8.—Observations on the Electric Arc: W. L. Upson.—The Poulsen Arc as a Means of Producing Electrical Oscillations (with Experiments): Dr. J. A. Fleming.—Exhibition of a Direct Reading Conductivity Bridge for Rods: R. Appleyard.

INSTITUTION OF MINING ENGINEERS, at 10.30 a.m.—The Reform of British Weights and Measures: A. Hopkinson.—The Thick Coal of Warwickshire: J. T. Browne.—Description of the Ozokerite (Mineral Wax) Mine at Boryslaw, Galicia, Austria: D. M. Chambers.—Notes on the Structural Geology of South Africa: Dr. C. Sandberg.—The New Rand Gold-field, Orange River Colony: A. R. Sawyer.—Cast-iron Tubbing: What is the Rational Formula? H. W. G. Halbaum.

MONDAY, JUNE 17.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—In the Equatorial Forests of Africa: Major P. H. G. Powell-Cotton.

TUESDAY, JUNE 18.

ROYAL STATISTICAL SOCIETY, at 5.

ZOOLOGICAL SOCIETY, at 8.30.—On Growth-forms and supposed Species in Corals (illustrated by Lantern Slides): Dr. F. W. Jones.—Notes on Limnocoelids from Lakes Tanganyika and Victoria Nyanza: R. T. Günther.—On *Lacerta ionica*, Lehrs, a Variety of *Lacerta taurica*, Pallas: G. A. Boulenger, F.R.S.—On Neotropical Lycanidae, with Descriptions of New Species: Hamilton H. Druce.—Descriptions of *Vesifer hypolepterus* and a New Fish of the Genus *Vesifer*: C. Tate Regan.—On the Anatomy, Classification, and Systematic Position of the Teleostean Fishes of the Sub-order Halotriognathi: C. Tate Regan.—A Monographic Revision of the Monkeys of the Genus *Cercopithecus*: R. I. Pocock.—Notes upon some African Species of the Genus *Felis* recently exhibited in the Zoological Gardens: R. I. Pocock.

WEDNESDAY, JUNE 19.

GEOLOGICAL SOCIETY, at 8.—The Constitution of the Interior of the Earth as revealed by Earthquakes (Second Communication): Some New Light on the Origin of the Oceans: R. D. Oldham.—(1) The Swansea Earthquake of June 27, 1906; (2) The Ochiil Earthquakes of September, 1900, to April, 1907: Dr. C. Davison.—(1) The Inferior Oolite and Contiguous Deposits of the Bath-Douling District; (2) The Inferior Oolite and Contiguous Deposits of the District between the Rissingtons and Burford: L. Richard-on.—The Flora of the Inferior Oolite of Brora (Sutherland): Dr. M. C. Stopes.

ROYAL METEOROLOGICAL SOCIETY, at 4.30.—Weather and Crops, 1891-1906: F. C. Bayard.—The Relation of the Rainfall to the Depth of Water in a Well at Cirencester, 1903-1906: C. P. Hooker.—*Exhibit*: The "Step" Anemometer, an Instrument designed to obviate the "Sheltering" Error: W. Child.]

ROYAL MICROSCOPICAL SOCIETY, at 8.—Eye-pieces for the Microscope: E. M. Nelson.—Lecture, illustrated by Lantern-slides, on the Life-history of the Tiger Beetle, *Cicindela campestris*: F. Enoch.

THURSDAY, JUNE 20.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: Bakerian Lecture, On the Atomic Weight of Radium: Dr. T. E. Thorpe, C.B., F.R.S.—On the Origin of the Gases Evolved by Mineral Springs: Hon. R. J. Strutt, F.R.S.—On the Presence of Sulphur in Some of the Hotter Stars: Sir J. Norman Lockyer, K.C.B., F.R.S.—The Fluted Spectrum of Titanium Oxide: A. Fowler.—Preliminary Note on a New Method of Measuring Directly Double Refraction in Strained Glass: L. N. G. Filon.—Studies of the Processes Operative in Solutions, II., The Displacement of Chlorides from Solution by Alcohol and by Hydrogen Chloride: Prof. H. E. Armstrong, F.R.S., E. V. Evre, and A. V. Hussey; III. The Sacroclastic Action of Nitric Acid as Influenced by Nitrates: R. Whymer; IV. The Hydrolysis of Methyl Acetate in Presence of Salts: Prof. H. E. Armstrong and J. A. Watson; V. The Discrimination of Hydrates in Solution: Prof. H. E. Armstrong, F.R.S., and R. J. Caldwell.

CHEMICAL SOCIETY, at 8.30.—Some Properties of Radium Emanation: A. T. Cameron and Sir W. Ramsay.—The Affinity Constants of Amino-sulphonic Acids as Determined by the Aid of Methyl Orange: V. H. Veley.—Azo-derivatives of 1:3-Diphenylbarbituric Acid. Dynamic Isomerism among the Coloured Hydrazines of 1:3-Diphenylalloxan: M. A. Whiteley.—A Series of Coloured Diazo-salts Derived from  $p$ -Amino-aceto- $n$ -naphthalide: G. T. Morgan and W. O. Wootton.—(1) Colour and Constitution of Azo-compounds, Part I.; (2) Colour and Constitution of Azo-compounds, Part II.: J. T. Hewitt and H. V. Mitchell.—The Oxidation of Hydrazines by Free Oxygen: F. D. Chattaway.—Calmatambin, a new Glucoside: F. L. Pyman.—The Decomposition of Hyponitrous Acid in Presence of Mineral Acids: P. C. Réay and A. C. Ganguli.—The Chemical Composition of Petroleum from Borneo: H. O. Jones and H. A. Wootton.—(1) The Synthesis of Phenonaphthacridines. Trimethylphenonaphthacridines; (2) The Condensation of Aldehydes with Mixtures of  $\alpha$ -Naphthol and  $\alpha$ -Naphthylamine; Synthesis of 7-Aryl  $\beta$ -Naphthacridines: A. Senier and P. C. Austin.—(1) An Improved Form of Apparatus for the Rapid Estimation of Sulphates and Salts of Barium; (2) The Determination of Sugar by Fehling's Solution: W. R. Lang and T. B. Allen.

LINNEAN SOCIETY, at 8.—Distribution of Conifers of China: Dr. Maxwell T. Masters, F.R.S.—Pre-glacial Flora of Great Britain: Clement Reid, F.R.S., and Mrs. Reid.—Cruise of H.M.S. *Sealark*, Part II.: Dr. J. Stanley Gardiner.—On Tubucellaria: A. W. Waters.—Cruise of the *Silver Belle*: Dr. N. Wolfenden.—Triassic Species of *Zamiko* and *Pterophyllum*: E. A. N. Arber.

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