wealth of the country to the same extent as they used to do, or else that many boys often proceed to get up the subject from the point of view of satisfying a miserable minimum. What was asked for is a relaxation in favour of education in general and not in favour of any special class of people. The elimination of literary training in the country is not being sought.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 24, 1904.—"Preliminary Communication on Galvanic Cells produced by the Action of Light." By Dr. M. **Wilderman.** (From the Davy-Faraday Laboratory of the Royal Institution.)

The author finds that there is, under the action of light, a region of galvanic cells as wide and as varied as in the case of ordinary galvanic cells. He finds constant and inconstant cells, reversible and irreversible cells. The chemical reactions and chemical equilibrium in the galvanic combinations are now perfectly clear; they prove, however, to be all *sui generis*, all the phenomena being intermixed and characterised by phenomena of induction and deduction, peculiar to light cells only. The author also succeeded in placing this region of phenomena on a physico-mathematical basis, testing and proving the fundamental equations experimentally in all details. The principal results obtained are:—

(1) The total E.M.F. created by light consists of an E.M.F. produced by light at a constant temperature, owing to the increase of the chemical potential and of the solution pressure of the exposed plate, and of a thermo-E.M.F. caused by one of the plates in contact with the liquid being heated by light. Both E.M.F.'s are found to be directly proportional to the intensity of light; both give currents in the same direction, thus proving that light acts on the chemical potential as well as on the solution pressure of the electrode in the same way as does heat.

(2) The peculiar course of the induction and deduction periods enables one to distinguish constant and inconstant cells showing polarisation from one another. A consideration of the chemical composition and of the reactions going on in the systems under the action of the current leads to the same results.

(3) The induction period follows a law

$$d\pi/d\tau = c(\pi_0' - \pi)\ (\pi - \pi_0 + \mathrm{K}),$$

giving at the same time also the fundamental law of photography relating to the connection between the amount of silver salts decomposed and the time of exposure. The deduction period follows a similar law

$$-d\pi/d\tau = -c'(\pi_0 - \pi)\ (\pi - \pi_0' + \mathrm{K}').$$

(4) The fundamental equation for the E.M.F. of constant cells "reversible in respect of cation" (*e.g.* Ag plate in light, $AgNO_3$ solution in light, $AgNO_3$ solution in the dark, Ag plate in the dark) is

$$\Sigma\mathrm{E} = 0{\cdot}860\mathrm{T}\ (\log_e \mathrm{P}_l/\mathrm{P}_d - 2v/u + v \log_e p_l/p_d)10^{-4}\ \text{volt},$$

and for constant cells "reversible in respect of the anion" (*e.g.* Ag-BrAg plate in light, KBr solution in light, KBr solution in the dark, Ag-BrAg plate in the dark) is

$$\Sigma\mathrm{E} = 0{\cdot}860\mathrm{T}(-\log_e \mathrm{P}_l/\mathrm{P}_d + 2u/u + v \log_e p_l/p_d)10^{-4}\ \text{vol},$$

where P_l, P_d are the solution pressures of the electrodes in light and in dark, p_l, p_d are the osmotic pressures of the cation or anion in the solution in light and in dark, and T is the absolute temperature.

The theory of thermogalvanic cells is also given in the paper.

December 8, 1904.—"The *Rôle* of Diffusion during Catalysis by Colloidal Metals and Similar Substances." By Dr. Henry J. S. **Sand.** Communicated by Prof. J. H. Poynting, F.R.S.

This paper contains a criticism of the opinion expressed by Nernst (*Zeitschrift Phys. Chem.*, xlvii., 55) that the catalytic decomposition of hydrogen peroxide due to colloidal metals probably takes place practically instantaneously on the surface of the catalyser, so that the concentration of the hydrogen peroxide there is permanently maintained at zero, and the velocity of the reaction actually measured is that with which diffusion and convection renew the solute in contact with the catalytic particles.

As a result, it was shown that Nernst's hypothesis would lead us to expect the reaction to proceed as one of the first order, a conclusion which agrees with the experimental results found by Bredig and his pupils. The actual values of the experimental velocity-constants are, however, far too small to allow us to reconcile them with Nernst's suggestion, and the latter must therefore be rejected.

In order to arrive at this result, minimum theoretical values for the rate of the reaction were calculated on Nernst's hypothesis. For this purpose the particles were assumed to be spheres with a diameter of $0{\cdot}5\mu$, a value which, according to Bredig, is greater than any which was met with in his solutions. The particles were supposed to be in a state of continual movement, performing the so-called Brownian motions, but in travelling through the solution were assumed to take with them a film of adhering liquid. In order to obtain a minimum value for the reaction velocity the total volume of the films was supposed to be equal to that of the whole liquid. The diffusion-coefficient of hydrogen peroxide at 25° was taken as 10^{-5} cm.^{2}/sec., a value which is smaller than that of most substances with heavier molecules.

The great part played by convection due to the Brownian motions of the particles and stirring by gases, &c., was demonstrated, it being pointed out that the experimental results regarding the dependence of the velocity-constants on the concentration of the catalyser can only be reconciled with the idea of a heterogeneous reaction if convection plays an important part.

Lastly, it was shown that the experimental facts all agree with the assumption that the actual velocity of the reaction on the surfaces of the particles always has a finite value which is proportional to the concentration of the solute in immediate contact with them.

In conclusion, Nernst's views regarding reaction-velocities in heterogeneous systems were criticised from a thermodynamical point of view, and it was shown that whereas they may possibly be correct for the majority of physical processes, great caution should be exercised in applying them to processes of a chemical nature.

January 19.—"The Dual Force of the Dividing Cell. Part i.—The Achromatic Spindle-Figure, elucidated by Magnetic Chains of Force." By Prof. Marcus **Hartog.** Communicated by Sir William T. Thiselton-Dyer, K.C.M.G., C.I.E., F.R.S.

The essential points of this research are described as:—

(1) The introduction of a convenient apparatus for the study of the axial section of fields produced by isolated poles of a dual force.

(2) The formation of *chains of force* in a viscid material, the recognition of their character as a distinct type of material configuration, and the study of their properties.

(3) The application of the conception of *relative permeability*, and of the recognition of chains of force to the problem of the cell-figure.

Zoological Society, January 17.—Mr. G. A. Boulenger, F.R.S., vice-president, in the chair.—(1) Some notes on the cranial osteology of the mastigure (Uromastix); (2) a contribution to the anatomy of Chlamydosaurus and some other Agamidæ; and (3) a note on the brain of *Cynopithecus niger*: F. E. **Beddard,** F.R.S.—(1) A collection of sipunculids made at Singapore and Malacca; (2) a collection of gephyrean worms from Zanzibar; and (3) the sipunculids and echiurids collected during the "Skeat Expedition" to the Malay Peninsula: W. F. **Lanchester.** Four new species were described in the second paper and nine in the last.—On the oral and pharyngeal denticles of elasmobranchs: A. D. **Imms.** The author had found that these denticles were present in varied abundance over the mucous membrane lining both the oral and pharyngeal cavities in many of these fishes. Out of the specimens of the nineteen species

(representing eighteen genera) examined, only five, belonging to as many genera, were found to be totally devoid of these structures.—The skull of a musk-ox from the river-gravels of the Severn Valley at Frampton-on-Severn, near Stonehouse, Gloucestershire: Dr. C. W. **Andrews.** The specimen consisted of the cranial portion of the skull of an old bull, and was found by Mr. W. T. Rennie, of Chepstow, who had presented it to the British Museum. Remains of this species were comparatively rare in Britain, and the nearest previously recorded locality to that described was Barnwood, near Gloucester.—Three new birds obtained by Colonel Waddell, C.B., on the recent expedition to Lhassa: H. E. **Dresser.** The birds exhibited and described were:—*Babax waddelli,* nearest to, but differing widely from, *Babax lanceolatus*; *Garrulax tibetanus,* a much darker and more uniformly coloured bird than *Garrulax sannio,* with the terminal part of the tail white; and *Lanius lama,* a much darker bird than *Lanius schach,* with less white on the forehead, no rufous on the back or scapulars, and no trace of an alar speculum.

Royal Meteorological Society, January 18.—Capt. D. Wilson-Barker, president, in the chair.—The **President** delivered an address on the connection of meteorology with other sciences. He said that meteorology and astronomy were doubtless the first of the sciences to attract the attention of men—which of the two exerts most influence on the well-being of humanity is a matter dependent on the position of the globe; in many regions people are but slightly affected by the weather, while the heavenly bodies, particularly the sun, exert an enormous influence on human life. Everywhere in nature we find the effects of meteorological agencies. After speaking upon the effects of evaporation, winds, rain, ice, snow, and pointing out the influence of weather on animal life, vegetation, health, &c., he said that meteorology is a science deserving more attention than it receives. He thought it ought to be recognised as a preliminary to the studies of geography, geology, and kindred subjects, and he was of opinion that meteorological observatories might very well be fitted up in schools, and pupils taught to observe. This could be done at a small cost of time or money. The tendency at present is to particularise in all scientific work, but the true path to progress lies in keeping a comprehensive outlook on the whole field of investigation. The United States have devoted much attention to meteorology with most satisfactory results. It is to be regretted that official help and encouragement are so deficient in this country. The baffling, difficult nature of meteorological problems should but serve as an incentive to their elucidation. The persistent observer gains much, not only in knowledge of the subject, but in the habits of close and accurate investigation which he insensibly acquires, and all workers in this field learn to appreciate the difficulties which confront their fellow-labourers and to recognise the value of what has been done by the meteorological organisations of the world.—Mr. Richard Bentley was elected president for the ensuing year.

Entomological Society. January 18.—Prof. E. B. Poulton in the chair.—Mr. F. Merrifield was elected president for the session 1904–5.—The president, Prof. **Poulton,** delivered an address in which he discussed the part played by the study of insects in the great controversy on the question, "Are acquired characters hereditary?" He argued that the decision whether Lamarck's theory of the causes of evolution is or is not founded on a mistaken assumption largely depends upon evidence supplied by the insect world, and finally concluded that the whole body of facts strongly supports Weismann's conclusions. At the end of his address the president urged that the study of insects is essential for the elucidation and solution of problems of the widest interest and the deepest significance.

DUBLIN.

Royal Dublin Society, December 20, 1904.—Mr. W. E. Wilson, F.R.S., in the chair.—Unrecognised factors in the transmission of gases through water: Dr. W. E. **Adeney.** The author has described in this communication an experimental investigation of the downward streaming which has been met with in experiments on diffusion of gases in water, when the gas is placed above the water. Hüfner has ascribed this downward streaming to the water becoming heavier as it dissolves the gas, and so forming concentration currents. The author shows from his experiments that the streaming is a gravitational effect, but that it is not due to concentrated solution currents as understood by Hüfner. He also shows that when the surface layers of long columns of water, of small cross section, are continuously agitated by mechanical stirrers, or by currents of air drawn through them, the streaming becomes very rapid, with the result that the columns of water are saturated with the gas in the course of a few hours. The streaming takes place more rapidly in sea-water than in distilled water.—Secondary radiation: Prof. J. A. **McClelland.**—The partial differential equations of mathematical physics: Prof. A. W. **Conway.** A new method of obtaining singular solutions of these equations was obtained, applicable to non-homogeneous equations. A new class of functions called "kinetic functions" was introduced.—The Primary rocks of Ireland with their intrusive rocks: G. H. **Kinahan.** The first part of the paper gave a general account of the rocks from the Permian to the Cambrian, specially mentioning their characteristic shore accumulations. The second and more important portion treated of all the occurrences of Irish Archæans with their exotic adjuncts, and their probable equivalents in England, Wales, Scotland, Canada, and the United States of America.

January 17.—Dr. W. E. Wilson, F.R.S., in the chair.—Improvements in equatorial telescope mountings: Sir Howard **Grubb,** F.R.S. The author described a new form of slow motion for large equatorial telescopes in which a small electric motor is used for actuating the differential wheels, which are ordinarily worked by an endless cord. This new form was first applied to the 24-inch photographic equatorial of the Radcliffe Observatory, Oxford, and is now being applied to the photographic equatorial at the Cape Town Observatory, which is of the same size. The working of the instrument, which was exhibited at the meeting, was demonstrated by the author, who also read a paper on a simplified form of his electrical control, which has lately been applied to several large instruments.—On the temperature of certain stars: W. E. **Wilson,** F.R.S. It seems probable that in the sun and some stars there are two quite distinct sources from which we can receive light which gives a continuous spectrum. First, the photospheric clouds, which are composed of droplets of matter in the solid form, probably carbon; secondly, layers of intensely hot gases which are under considerable pressure. Between these two sources of radiation lie principally the vapours of titanium and vanadium, and other elements of suitable atomic weight. In a sun-spot the temperature is locally so high that the photospheric clouds are volatilised, and we then get the radiation only from the gaseous layer below, the spectrum being darkened by the intervening layers, consisting principally of the vapours of titanium, &c., the lines of which are widened and darkened. It is then suggested that as a star like Arcturus, or type iv. stars, have a spectrum which is very similar to a sun-spot, in these bodies the temperature is so high that they have no photospheric clouds, and that their want of brilliancy is caused by their only receiving the radiations from the gaseous layers which lie at some depth in their atmospheres.—Mr. Richard J. **Moss** exhibited the absorption spectrum of liquid oxygen.

MANCHESTER.

Literary and Philosophical Society, December 13, 1904.—Mr. W. H. Johnson in the chair.—Note on the dissemination of seeds by birds: C. **Oldham.** The opinion expressed by Mr. F. Nicholson at a recent meeting of the society that birds rarely act as disseminators of seeds, by voiding them in their excrement, is not in accord with the experience of many field naturalists. Nearly fifty years ago Darwin proved ("Origin of Species," chapter xii.) that certain seeds extracted from the excrement of small birds germinated, as did others from the ejected pellets and the excrement of carnivorous and piscivorous birds. The evidence of Wallace and other observers may be cited to the same effect. In mid-Cheshire, during the spell of hard weather at the end of November, 1904, an examination of

the excrement of various birds showed that entire and apparently uninjured seeds are voided constantly. Redwings, fieldfares, and other thrushes were compelled during the frost to subsist largely upon hedgerow fruit, and entire seeds of the wild rose (Rosa) and hawthorn (Cratægus), among others, might have been collected from their droppings by thousands. From the excrement of smaller birds the author obtained many undigested seeds of the bramble (Rubus).—The Foraminifera from the coast of the island of Delos, part ii.: H. **Sidebottom.** Particular attention was directed to those species that are new to the Mediterranean. The dimorphic structure of many of the Foraminifera was also pointed out.

January 10.—Prof. W. Boyd Dawkins, F.R.S., in the chair.—On the supposed antagonism of Mendelian to biometric theory: A. D. **Darbishire.** The author, after referring to the conflict of the Mendelians and biometricians, explained the methods of investigation of the two schools. The biometricians apply statistical methods and deal with masses of individuals, and therefore with average characters; the Mendelians devote their attention to the study of the individual components of the mass, and endeavour by means of experiments to ascertain the nature and mode of modification of the characters of the units. Mr. Darbishire sought to show that the two views are not irreconcilable, but that the real truth was to be arrived at from a survey of both.—The cause of the period of chemical induction: C. H. **Burgess** and D. L. **Chapman.**

PARIS.

Academy of Sciences, January 23.—M. Troost in the chair.—New researches on the secular alterations of hydrocarbon of organic origin: M. **Berthelot.** Details are given of the chemical examination of a fatty substance found in an Egyptian vase of about 1600 B.C.—Some metals found in archæological excavations in Egypt: M. **Berthelot.** Analyses of two specimens of bronze dating from about the second dynasty.—On the increase of volume of molten cast iron, saturated with carbon in the electric furnace, at the moment of solidification: Henri **Moissan.** Iron which is free, or nearly free, from carbon, in passing from the liquid to the solid state, follows the ordinary law, its density increasing. On the contrary, when saturated with carbon at the temperature of the electric furnace, it increases in volume when solidifying.—Study of lunar photographs. Considerations on the course of solidification in the interior of a planet: MM. **Lœwy** and **Puiseux.** As the result of an examination of photographs of the moon's crust, the author has been led to support the geological view of the constitution of the earth, that of a thin crust with a liquid core, as against the rigid solid theory of the mathematicians.—Note on the three volumes of the *Annales de l'Observatoire de Nice*: M. **Bassot.**—On a recent ascent of Vesuvius: J. **Janssen.** Numerous specimens of gases from the fumerolles and of lava and scoria were collected, and photographs taken of the absorption spectra of the vapours issuing from the cone during an eruption. The description of a detailed examination of these is reserved for a future communication.—The calculation of ordinary and suspension bridges: M. **Considère.**—Observations of the Borrelly comet (1904 *e*) made by F. Courty with the large equatorial at the Observatory of Bordeaux: G. **Rayet.**—On families of surfaces with plane orthogonal trajectories: S. **Carrus.**—Remarks on the preceding communication: Gaston **Darboux.**—On the approximation of functions by polynomials considered in relation with the theory of partial differential equations: application to the problem of the initial state in mathematical physics: A. **Buhl.**—On a hyperelliptic surface: E. **Traynard.**—On the integrals of total differentials belonging to an irregular surface: G. **Castelnuovo.**—On linear differential equations of the second order containing one parameter: M. **Tzitzeica.**—On a theorem of M. Borel: F. **Riesz.**—On the deviation of falling bodies towards the south and on the curvature of lines of force: Maurice **Fouché.**—On the magnetic field to which a body in motion in an electric field is submitted: H. **Pellat.**—On the ions of the atmosphere: P. **Langevin.** The experiments of the author lead to the conclusion that there are only two kinds of ions present in the air, one having a mobility several thousand times smaller than the other. The apparatus used by Ebert only measures the first of these.—Contribution to the study of ionisation in flames: Pierre **Massoulier.**—On the specific coefficients of magnetisation of liquids: Georges **Meslin.**—The action of very low temperatures on the phosphorescence of certain sulphides: F. P. **Le Roux.** Remarks on a paper of MM. A. and L. Lumière dealing with the same subject.—On a new mineral containing radium: J. **Danne.** Some plumbiferous minerals, notably a pyromorphite, found in the neighbourhood of Issy-l'Évêque, have been found to contain radium, and it is a noteworthy fact that none of these minerals contain uranium. The amount of radium is variable, a ton of the mineral furnishing quantities of radium bromide of the order of a centigram.—The dissociation of strychnine salts as measured by the rotatory power. The rotatory power in homologous series. The influence of the double linkage: J. **Minguin.** The deviations were measured in the first place when the strychnine and acid were present in molecular quantities, and then in presence of an excess of acid. The differences observed point to a dissociation taking place.—On cæsium methylamide: E. **Rengade.** Cæsium dissolves in anhydrous liquid methylamine, forming at first a metal methylammonium; this soon evolves hydrogen and the methylamide is quantitatively formed. The amide detonates on heating, giving rise to cæsium cyanide and hydrogen. Water, allowed to act slowly, produces cæsium hydroxide and methylamine.—The action of phosphorus pentachloride upon some tertiary cyclic amines. Syntheses of colouring matters and formation of phosphorus: P. **Lemoult.**—The products of oxidation of anthracene octahydride: dihydro-oxanthranol and hexahydroanthrone: Marcel **Godchot.**—Thymomenthol and its derivatives: Léon **Brunel.** This is obtained from thymol by the Sabatier and Senderens reaction; its physical and chemical properties are given and the preparation of several derivatives described.—Contribution to the study of some derivatives of benzodihydrofurfurane: A. **Guyot** and J. **Catel.**—On the agricultural value of humic materials: J. **Dumont.**—On the elliptical character of the new Borrelly comet (*e* 1904): G. **Fayet.** It is shown that no parabola can satisfactorily represent all the observations, an elliptical orbit with a period of about eight years better representing the facts.—An electrical pendulum with free escapement: Ch. **Féry.** The arrangement described is remarkable for the small expenditure of electrical energy required to work it, less than 0.5 watt per annum. The diurnal variation of a clock beating half seconds fitted with the apparatus described is less than 0.3 second.—On the nitrates of potassium and ammonia and on the law of Bravais: Frédéric **Wallerant.**—The coal basin of French Lorraine: Francis **Laur.**—On the diatom-bearing level of the ravine of Égravats, near Mont Dore, Puy-de-Dôme: M. **Lauby.**—On the biology and anatomy of the suckers of *Osyris alba*: A. **Fraysse.**—On the biology of the Cestodæ: L. **James** and H. **Mandoul.**—The action of magnesium and of magnesia on micro-organisms: F. **Dienert.**

NEW SOUTH WALES

Royal Society, November 2, 1904.—Mr. C. O. Burge, president, in the chair.—Pot experiments to determine the limits of endurance of different farm crops for certain injurious substances, part iii., barley and rye: R. **Helms** and Prof. F. B. **Guthrie.** The authors describe experiments with barley and rye in continuation of those on wheat and maize (*Proc.* Roy. Soc. New South Wales, xxxvi. p. 191, and xxxvii. p. 165) to determine the tolerance of these plants to certain ingredients commonly present in the soils and water used for irrigating in certain parts of the State, namely, sodium chloride and sodium carbonate; also the effect produced upon their growth by the presence of small quantities of plant poisons occasionally met with in fertilisers, such as ammonium sulphocyanide, sodium chlorate, and arsenious acid.—The classification and systematic nomenclature of igneous rocks: H. Stanley **Jevons.** The author concludes that the most convenient general classification for the present time would be one constructed as follows:—(1) Based on alkali-lime-content of principal and minor mineral constituents. Produces two series: alkaline and calcic. (2) Based on similarity of

principal mineral constituents. Produces seven sections, *e.g.* granitic, gabbroic, theralitic, &c. (3) Based on community of origin from similar parent magmas. The latter are defined by the presence of certain index minerals in the consolidated rocks (*e.g.* a granite, a granite-aplite, and a rhyolite, &c., may all be derived from one magma; other granites, rhyolites, &c., will be derived from similar magmas). Produces twelve orders, *e.g.* granates, essexates, &c. (4) Based on habit of mass. Produces seven families in each order, *e.g.* granophites, dioromicrites, gabbrolavites (basalts), &c. (5) Based on nature of minor mineral constituents. Produces a number of genera in each family, *e.g.* muscbigranophite, anaugi-hyper-peridotite (harzburgite). (6) Based on texture, but to be applied only in families where there is much variety of texture. Produces subgenera, *e.g.* spheri-mono-rhyolite, graphi-bi-rhyolite, &c. The system of nomenclature described is an elaboration of that already proposed by the author in a preliminary paper in the *Geological Magazine* (1901).

BENGAL.

Asiatic Society of Bengal, January 4.—Hierarchy of the Dalai Lama (1406–1726): Rai Sarat **Chandra Das.** The author gives a history of the origin and growth of power of the Dalai Lama.—On the prevalence of fevers in the Dinajpur district: Dr. L. **Rogers.** This paper deals with the results of a special inquiry into the causes of the very high mortality of above forty per thousand in the Dinajpur district. It is shown that the higher death rates in certain places are due mainly to malaria, the increased prevalence of which is closely related to a high ground water level due to unalterable physical conditions of the district. In the second part of the paper the varieties of fever met with and distribution of the anopheles which can carry the infection are dealt with, and the impracticability of mosquito destruction as a preventive measure in the district as a whole is pointed out. The wider distribution of quinine in each village through the agency of the primary schoolmasters so as to reach the children, who mainly die of the disease, is recommended as the only practicable method of lessening the death rates from malaria among the people of Lower Bengal.

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 2.

ROYAL SOCIETY, at 4.30.—On the Compressibility of Gases between One Atmosphere and Half an Atmosphere of Pressure: Lord Rayleigh, O.M., F.R.S.—On the "Blaze Currents" of the Gall Bladder of the Frog: Mrs. A. M. Waller.—The Theory of Photographic Processes: On the Chemical Dynamics of Development: S. E. Sheppard and C. E. K. Mees.—On the Relation between Variations of Atmospheric Pressure in North-East Africa, and the Nile Flood: Capt. H. G. Lyons.—Note on the Determination of the Volume Elasticity of Elastic Solids: Dr. C. Chree. F.R.S.—Theory of the Reflection of Light near the Polarising Angle: Prof. R. C. Maclaurin.

ROYAL INSTITUTION, at 5.—Forestry in the British Empire: Prof. W. Schlich.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY, at 8.—The Mechanics of Flour Milling: A. R. Tattersall.

LINNEAN SOCIETY, at 8.—Descriptions of New Chinese Plants (with lantern slides): W. J. Tutcher.—European Cirolaninæ (Isopoda): Dr. H. J. Hansen.

RÖNTGEN SOCIETY, at 8 15.—Some Points in the Construction of a High Frequency Machine: Dr. Clarence A. Wright.

CHEMICAL SOCIETY, at 8.—Studies in the Camphane Series. Part xvi. Camphorylcarbimide and Isomeric Camphorylcarbamides: M. O. Forster and H. E. Fierz.

FRIDAY, FEBRUARY 3.

ROYAL INSTITUTION, at 9.—Blood Pressure in Man: Prof. T. Clifford Allbutt, F.R.S.

GEOLOGISTS' ASSOCIATION, at 7.30.—Address on Modern Methods in the Study of Fossils: the President, Dr. A. Smith Woodward, F.R.S.

MONDAY, FEBRUARY 6.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Theory of Dyeing. Part ii. Pseudo-solution and Desolution: W. P. Dreaper.—The Fading of Inks and Pigments: J. W. Lovibond.

SOCIETY OF ARTS, at 8.—Fountain Pens: James P. Maginnis.

TUESDAY, FEBRUARY 7.

ROYAL INSTITUTION, at 5.—The Structure and Life of Animals: Prof. L. C. Miall, F.R.S.

ZOOLOGICAL SOCIETY, at 8.30.—On Abnormal Ranid Larvæ from North-eastern India: Nelson Annandale.—On a Second Collection of Fishes made by S. L. Hinde in the Kenya District, East Africa: G. A. Boulenger, F.R.S.—On some Points in the Anatomy of Diademodon: Dr. R. Broom.—Notes on the Mammals of Southern Cameroons and the Benito: George L. Bates.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*Discussion*: Floating Docks: L. E. Clark.—*Papers*: Alfreton Second Tunnel: E. F. C. Trench.—The Reconstruction of Moncreiffe Tunnel: Dugald McLellan.

WEDNESDAY, FEBRUARY 8.

SOCIETY OF ARTS, at 8.—Time Development in Photography, and Modern Mechanical Methods of carrying it out: R. Child Bayley.

THURSDAY, FEBRUARY 9.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: (1) On the Conversion of Electric Oscillations into Continuous Currents by means of a Vacuum Valve: (2) On a Kummeter for the Measurement of the Length of Long Electric Waves, and also small Inductances and Capacities: Prof. J. A. Fleming, F.R.S.—Report on an Area of Local Magnetic Disturbance in East Loch Roag, Lewes, Hebrides: Captain A. M. Field, R.N.—Phosphorescence caused by the Beta and Gamma Rays of Radium: G. T. Beilby.—(1) The Spectrum of Scandium and its Relation to Celestial Spectra; (2) Note on the Spectrum of μ Centauri; (3) On the Stellar Line near λ 4686: Sir Norman Lockyer, K.C.B., F.R.S., and F. E. Baxandall.—On Europium and its Ultra-Violet Spectrum: Sir William Crookes, F.R.S.

ROYAL INSTITUTION, at 5.—Forestry in the British Empire: Prof. W. Schlich, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Fuel Economy in Steam Power Plants: W. H. Booth and J. B. C. Kershaw. (Conclusion of discussion.)—The Value of Overhead Mains for Electric Distribution in the United Kingdom: G. L. Addenbrooke.

MATHEMATICAL SOCIETY, at 5.30.—General Theory of Transfinite Numbers and Order-types: Dr. E. W. Hobson.—On the Reducibility of Covariants of Binary Quantics of Infinite Order. Part ii: Mr. P. W. Wood.

FRIDAY, FEBRUARY 10.

ROYAL INSTITUTION, at 9.—The Art of the Ionian Greeks: Dr. Cecil Smith.

ROYAL ASTRONOMICAL SOCIETY, at 5.—Anniversary Meeting.

MALACOLOGICAL SOCIETY.—Annual General Meeting. Address by the President, Mr. E. R. Sykes, on Variation (including Teratology) in Recent Mollusca.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Reconstruction of the Santa Lucia River Bridge, Uruguay: P. J. Risdon.

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