

essential reform within the Board of Education is that there shall be such advice given to the Minister of Education as will enable him to grasp the principles of scientific education. It is the business of the State to see that the code and curriculum of education are arranged on a scientific and common-sense basis, and this will necessarily include the hygiene of common life and instruction in temperance. Sir Victor Horsley contended that we shall not make any headway unless we have expert advice at headquarters. It is clear that the whole system of education requires revision from a medico-scientific standpoint. The following resolutions were unanimously adopted:—

- (1) "That this conference has heard with great satisfaction that instruction in hygiene and temperance is systematically given in the elementary schools of the colonies of the Empire, and that there is strong evidence of the value of this teaching. While cordially acknowledging what has been already accomplished in the United Kingdom by certain educational bodies, this conference urges upon all local authorities the necessity of providing that the teaching of hygiene and temperance shall form an essential part of the whole curriculum of education of all children."
- (2) "This conference is of opinion that to meet adequately the responsibilities of the State towards school children, it is essential that a medical department should be instituted in the Board of Education."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, February 7.—"On the Combining Properties of the Opsonin of an Immune Serum." By Prof. Robert **Muir** and W. B. M. **Martin**. Communicated by Dr. C. J. Martin, F.R.S.

(1) The thermolabile opsonin of a normal serum and the thermostable opsonin of an immune serum are two distinct classes of substances. In addition to differing markedly as regards their resistance to heat, they differ in their combining relationships.

(2) The thermostable opsonin of the anti-serum investigated is a true anti-substance, and possesses the comparatively specific characters of anti-substances in general; it is left undetermined whether it has the constitution of an agglutinin or of an immune body, though certain facts point in favour of the former.

(3) Emulsions of other organisms other than the organism used in immunisation (*Staphylococcus aureus*) do not absorb the immune opsonin; on the other hand, they absorb large amounts of the normal complement-like opsonin.

(4) Powerful complement-absorbers—red corpuscles or bacteria treated with immune body or serum precipitate—have no effect on the thermostable immune opsonin, whereas they remove almost completely the labile opsonin of the normal and the immune serum alike.

Faraday Society, March 10.—Dr. T. Martin Lowry in the chair.—The potential of hydrogen liberated from metallic surfaces: H. **Nutton** and H. D. **Law**. The paper is chiefly concerned with the chemical reducing power of hydrogen when liberated from the surface of various metallic electrodes, and also the retarding action caused by the presence of small quantities of metallic salts. The metals are arranged in the following order:—mercury, lead, cadmium, tin, silver, bismuth, gold, nickel, platinum (black), the first-mentioned metal being the most capable of bringing about the reduction of a compound not readily attacked; platinised platinum, on the other hand, possesses this property in the lowest degree. Zinc as a reducer behaves in a very irregular manner; both copper and platinum (black) show a remarkable activity in the reduction of aromatic aldehydes, and iron and aluminium are variable. It was hoped by a careful study of the electrode potentials that it might be possible to differentiate between the purely chemical changes and those which were due to physical causes.—Electrode potentials in liquid ammonia: N. T. M. **Wilsmore** and F. M. G. **Johnson**. The measurements of electrode potentials in liquid ammonia were undertaken with a view to the determination of the free energy of formation of a series of metallic salts, and thereby to compare the

relative affinities of the corresponding metallic elements under conditions differing as much as possible from those obtaining in the case of measurements in aqueous solutions. To this end the electrode potentials of the metals against solutions of their salts of known strength were measured against a standard electrode (cadmium in a saturated solution of cadmium nitrate). The results are given in the paper in tabular form.—The impedance of solutes in solvents as manifested by osmotic pressure: J. G. A. **Rhodin**. The author's object is to substitute for the theory of van 't Hoff, the main objection to which, in his opinion, is the direction of pressure, a theory which regards the solvent—and not the solute—as the source of the energy manifested in osmotic-pressure experiments.—The electrolytic deposition of zinc, using rotating electrodes, part ii.: Dr. T. Slater **Price**. The effect of the addition of various electrolytes on the electrolytic deposition of zinc, using a rotating cathode and the apparatus described in the previous paper, has been investigated. In all the experiments the cathode was silvered before the zinc was deposited. Excellent results were obtained, using 2 grams of sodium sulphate and 1 gram of sodium acetate for each gram of crystallised zinc sulphate, the addition of free acetic acid being unnecessary. The number of revolutions per minute of the cathode was 600–700, and the time of deposition was fourteen minutes.

Linnean Society, March 21.—Prof. W. A. Herdman, F.R.S., president, in the chair.—The origin of Angiosperms: E. A. Newell **Arber** and John **Parkin**. In attempting to trace the ancestry of this group, the authors commence by a survey of living Angiosperms with a view to determine which among them present primitive features, and also with the hope of arriving at some hypothesis as to the type of fructification possessed by the earliest members of the group. They dissent emphatically from the view generally held, and especially advocated by Engler, that the most primitive Angiosperms to-day are those with unisexual flowers, and without perianth, e.g. Piperales, Pandanales, &c. This conclusion is criticised on the grounds that (1) the perianth must be assumed to arise *de novo*, and to be an organ *sui generis*; (2) such plants have a sharply defined and highly complicated inflorescence, which can hardly be regarded as primitive; (3) it has so far proved barren from a phylogenetic standpoint. On the contrary, they urge the acceptance of a strobiloid theory of the angiospermous fructification on the grounds that it is typically and primitively a diplosporangiate (hermaphrodite) cone with a well-marked perianth, and one in which all the organs were originally numerous, spirally arranged, and hypogynous. It is pointed out that some of these primitive features are still retained among members of the Magnoliaceæ, Ranunculaceæ, Alismaceæ, &c. From such a cone the authors would derive by reduction the apetalous, unisexual flowers. The flower is recognised as a special type of strobilus, to which the name Anthostrobilus is given, and of which two forms can be distinguished, the one gymnospermic, the other angiospermic. Both, however, are essentially of similar construction, especially as regards the peculiar juxtaposition of the micro- and mega-sporophylls, and the presence of a perianth. The view is expressed that the "motive force," which called the Angiosperms into existence, was a radical change in the method of pollination.

Physical Society, March 22.—Prof. J. Perry, F.R.S., president, in the chair.—Experimental mathematics: Mr. **Pochin**. An instrument for describing logarithmic spirals was exhibited, and it was shown how the principal properties of logarithms and of the equiangular spiral may be established as experimental results. A spiral was described with an angle of 45°, and the positions of the radius vector, representing the first ten natural numbers, were drawn in. Cardboard sectors having been cut to fit the various angles, under the successive positions of the radius vector, it was shown that these sectors represented the logarithms of the numbers. Multiplication and division were illustrated by placing the sectors in juxtaposition, so that the angles were added or subtracted, the result being read off directly from the curve. A table of natural logarithms was also prepared from the spiral, by direct

measurement with a foot-rule and a protractor graduated in radians. A geometrical analysis was given, confirming the accuracy of the experimental results, and affording an independent proof of the exponential theorem. A second spiral was drawn with an angle $\tan^{-1}M$, thus giving common logs. in terms of the radian, and it was shown that, by using a suitably graduated protractor or modulus, one system transformed into the other. A Boucher's circle and a slide-rule were also derived practically from the spiral. The differentials $d \log_e r / dr$ and $d \log_{10} r / dr$ were shown graphically, as well as the properties of the evolute and involute.—Logarithmic lazy-tongs and lattice-works: T. H. **Blakesley**. If two straight rods, AB, CD are jointed at E, and so related that the extremities ACBD lie in the circumference of a circle, they will fulfil this condition when the angle between is changed. Suppose that AE is taken as unity, and that $ED=n$, $EC=m$, m and n being quite independent. Then $EB=mn$ as a consequence. If another pair of rods, DF, BG, similar to the first pair but bearing the ratio $n:1$ to it, be jointed at D and B to the first pair, and to the extremities FG of this pair a third pair be again jointed, and a fourth to this and so on, the ratio of each pair to the preceding one being $n:1$, the resulting linkage is called by the author a logarithmic lazy-tongs. A lazy-tongs constructed as above is said to be in the n direction. Any of the four sides AC, CB, BD, AD might be chosen as that to which the next pair of rods is to be attached, care being taken to make the ratio correspond to the direction chosen. If CB is chosen the ratio must be $m:1$, and a lazy-tongs in the direction m will result, the angular shift at each step being EAD—EDA. Suppose pairs added in the m direction to both CB and BF; then these two pairs will have, in addition to B, another common point, viz. that which is homologous to B in the m direction. In fact, the same pair is arrived at whether by moving once in the n direction and then once in the m direction, or *vice versa*. It is clear that a joint may be added at the common point, and that the rule is a general one, hence all plane space may be occupied by such a linkage, which is called a logarithmic lattice-work. Such a lattice-work moves so that the angles at E, and points homologous, will remain equal.

Geological Society, March 27.—Sir Archibald Geikie, Sec.R.S., president, in the chair.—The southern origin attributed to the northern zone in the Savoy and Swiss Alps: Prof. T. G. **Bonney**. Prof. Lugeon, with some other eminent Continental geologists, explains certain peculiar flat folds, the higher of which sometimes project considerably beyond the lower, in the more northern sedimentary zone of the Swiss and Savoy Alps, by supposing that to no small extent the strata have been thrust forward from an original position south of the watershed of the Pennine-Leptontine Alps, overriding, as they advanced, their crest and that of the Oberland (neither having then attained its present altitude). This pressure was produced by the greater thickness of deposits of mid-Tertiary age, speaking in general terms. Prof. Sollas, in concluding a very interesting and suggestive paper on some experiments with cobbler's wax, published in the last volume of the Quarterly Journal of the society, p. 716, suggests that the results are favourable to the views of the Lausanne professor. The author takes exception to some of the cases, especially two to the east of the Simplon Pass, which are adduced by Prof. Lugeon in support of his hypothesis. It is maintained that the hypothesis receives no real support from Prof. Sollas's experiments, and involves mechanical difficulties which are practically insuperable.—The coral-rocks of Barbados: Prof. J. B. **Harrison**. The results of the author's extended, and in many places detailed, re-examination of the coral-rocks in the southern half of Barbados give no support to Dr. J. W. Spencer's theory of the existence of strata of the "Antigua formation" in that island. It is now shown that a certain knoll, whence Dr. Spencer collected corals which in his estimation proved that it and other parts of the coral-rocks were of Oligocene age, is in part made up of corals which, as stated by Prof. J. W. Gregory, "certainly show no evidence of any age greater than the Pleistocene." The author has failed to find any signs of

the widespread formation, described in Dr. Spencer's paper as extending from Mount Misery to near Ragged Point, a distance of about eleven miles, and dipping south-eastward at from 12° to 20° .

Society of Chemical Industry, April 8.—Mr. R. J. Friswell in the chair.—Observations on cotton and nitrated cotton: H. **de Mosenthal**. This paper deals with the appearance of celluloses and nitrocelluloses in polarised light, their refractive indices and optical activity, as well as densities. Fourteen samples of nitrated cottons of different degrees of nitration, different solubility and viscosity, three samples of nitrated wood cellulose, and two each of nitrated ramie and flax, were examined. The appearance in polarised light was found to vary with the degree of magnification and the light used, fibres appearing differently when dry and when moistened. Various moistening liquids gave different results. The colours shown in polarised light under the same conditions seemed to be chiefly dependent on the material nitrated and the method of nitration, and they cannot be regarded as a function of the degree of nitration. The densities of celluloses and of nitrocelluloses examined were found to be higher than those recorded in text-books. The densities of the nitrated material in solution were also determined, and found to be higher than in the solid state. Observations of the refractive index of nitrated cotton in solution gave results which were not concordant, and therefore determinations were made on transparent films of nitrated cotton, ramie, and flax. The refractive index of cellulose was found by examining denitrated films and then by placing fibres in a liquid of like refraction. Atomic refractions were applied to some of the proposed formulæ for cellulose, and showed that the cellulose molecule has no double bonds.

Entomological Society, April 10.—Mr. C. O. Waterhouse, president, in the chair.—Wet- and dry-season forms of Pierinæ: Dr. F. A. **Dixey**. Specimens were shown of Pierinæ belonging to the genera *Teracolus* and *Huphina*. The exhibit was intended to illustrate the fact that in species of which the wet-season phases were very distinct from each other, the corresponding dry-season phases often could only be discriminated with difficulty.—Forms of *Osphya* and concurrent species: J. **Edwards**. Five forms of *Osphya* were shown, together with certain other species occurring at the same time and place, and, having regard to gait and appearance, resembling them more or less closely. It was not suggested that these resemblances are protective. Attention was also directed to an important function of the hind-legs of the male, namely, to secure him in position at the time of pairing.—Antennæ-joints in Trachiscelis: H. J. **Carter**. A microscopic slide prepared to demonstrate that the antennæ of the genus *Trachiscelis* have eleven joints, and not ten as hitherto described.—Odonata collected by Lieut.-Colonel C. G. Nurse, chiefly in North-Western India: K. J. **Morton**.—The life-history of *Cydimon (Urania) leilus*: L. **Guppy**, jun. This paper was followed by a discussion on the migration habits and classification of the species.

EDINBURGH.

Royal Society, February 18.—Dr. Robert Munro, vice-president, in the chair.—The coat colour in horses: Prof. J. C. **Ewart**. (1) The remote common ancestor of the Equidæ was probably of a reddish-brown (foxy-red) colour. (2) Horses prior to domestication probably varied in colour and consisted of (a) species adapted for a forest life, having dark yellow-dun coat, a broad dorsal band, and stripes more or less distinct on the face, neck, trunk, and legs; (b) species like Prejvalsky's horse, adapted for a steppe life, having a brown yellow or reddish-brown coat, a narrow dorsal band, but only at the most vestiges of shoulder and leg stripes; and (c) species adapted for a life on the plains, having a light yellow-dun coat and, in addition to a narrow dorsal band, only faint vestiges of stripes on the legs. (3) Yellow duns belonging to different varieties may, when crossed, give rise to bay and chestnut as well as yellow-dun offspring. (4) Bays obtained by crossing yellow-duns may, when crossed with pure yellow-duns, yield black and chestnut as well as bay offspring. (5) Chestnuts derived from crossing yellow-duns may, when crossed with pure yellow-duns, yield white and bay as

well as chestnut offspring. (6) When crossed with a yellow-dun a white may yield grey-roan and white-dun offspring. (7) A black, crossed with a yellow-dun, may yield either yellow-dun or black offspring.—The geology of Ardrossan: Dr. J. D. **Falconer**. A brief description is given of the geological structure of the area in the immediate neighbourhood of Ardrossan, the suggestion being made that the Upper Old Red Sandstone and overlying volcanic series were folded over an anticlinal axis striking north-west and south-east behind Ardrossan. The petrographical characters of the Carboniferous lavas and intrusive rocks are described in detail. Of the latter, the most important is the sill at Castle Craigs, more than half of which is composed of picrite. This rock passes upward into hornblende-dolerite along the whole length of the sill. The upper portion of the intrusion is fine grained and banded parallel with the upper surface, and is crossed by small pink felspathic veins. The sill affords an excellent example of the differentiation of one and the same magma into a lower basic and an upper felspathic portion. It is supposed to present considerable analogy to the banded peridotites and gabbros of Skye, and to differ from the Blackburn and Barnton picrites near Edinburgh, in which the differentiation took place entirely after intrusion.

March 4.—Prof. Crum Brown, vice-president, in the chair.—Algebra after Hamilton, or multenions: Prof. Alexander **M'Aulay**. This is a system resembling in its generality the *Ausdehnungslehre* of Grassmann, but built on the lines of Hamilton's quaternions. It differs from the *Ausdehnungslehre* in having only one method of multiplication. The theory of the "linity," analogous to the linear vector function in quaternions or to the matrix in algebra, is developed in considerable detail; also the closely connected method of differentiation, which is based upon the properties of the generalised ∇ .—Note on the change produced in the conductivity and density of lead wires by permanent stretching: J. A. **Donaldson** and R. **Wilson**. The experiments were carried out in the physical laboratory of Edinburgh University. The results were negative, there being within the errors of observation no appreciable change in either the electric conductivity or the density.—The dynamical theory of seismometers: Dr. C. G. **Knott**. Some account was given of the recent important results, both theoretical and experimental, obtained by Prince Galitzin in his discussion of the theory of the horizontal pendulum, and a general discussion of earthquake records, now familiar to all students of seismology, led to the conclusion that, except for small, comparatively rapid vibrations of the ground, the amplitudes of the records could not be regarded as reproducing the motion of the ground even to a first approximation.—Temperature observations in the North Sea: Prof. D'Arcy W. **Thompson**. In this communication the author gave an account of methods and results which form a part of the second report of the North Sea Fisheries Investigation Committee. The material which formed the basis of the investigation was obtained partly from regular observations made at lighthouses and on lightships, and partly from observations, furnished twice a day, by captains of passenger steamers. From these, by graphical interpolation, fair monthly means of water temperatures on the surface and at various depths were obtained. Many interesting results were arrived at, especially with regard to the changes of temperature throughout the year and the range of annual change in different regions of the North Sea. See the Blue-book recently published by His Majesty's Government.

March 18.—Dr. R. H. Traquair, vice-president, in the chair.—The influence of temperature on the photoelectric discharge from platinum: Dr. W. Mansergh **Varley** and F. **Unwin**. The experiments were made in air, in carbon dioxide, and in hydrogen, at pressures varying, in each gas, from atmospheric pressure to a pressure of 0.0035 mm. of mercury. In air and carbon dioxide at atmospheric pressure the photoelectric currents decreased with increase of temperature up to about 400° C., after which they began to increase again. The maximum diminution in current was about 80 per cent. of the normal value. The behaviour of these two gases was identical. In hydrogen at this pressure, on the other hand, the currents steadily increased as the temperature was raised

from the ordinary temperature of the air. At the lowest pressure (0.0035 mm.) the photoelectric discharge in each gas was found to increase when the temperature was raised from that of the atmosphere to 60° C. Further increase of temperature up to 400° C. produced no change in the photoelectric current. When the temperature was reduced to the ordinary temperature of the air, the sensibility of the surface gradually diminished with time, falling to half its value in about twenty-four hours. In all cases time was required for the sensibility to attain a steady value after any change in temperature.—*Spirophyllum ferrugineum*, a new genus and species of thread bacteria: D. **Ellis**. This flat, leaf-like, spirally wound organism was discovered by the author in iron-water ditches about a mile from Renfrew. The width varied from 1 μ to 6 μ according to age, and the length might reach 200 μ . The multiplication was by means of conidia, which germinated. Immediately after germination the organism had a slight motility, but this soon ceased. Before deposition of the iron the cell was semi-transparent. This new genus connects the iron bacteria, which at present are placed in the Chlamydbacteriaceæ, or thread-bacteria, with Spiromonas, a genus which must therefore be now included among the thread-bacteria.—The functions of the Rolandic cortex in monkeys: Drs. W. A. **Jolly** and Sutherland **Simpson**. The object of the experiments, which were carried out in the physiological laboratory of Edinburgh University, was to delimit accurately the motor areas in the cortex cerebri of the monkey. The method employed was a new one. The cortex was stimulated by unipolar faradisation, and the areas were isolated by the use of vulcanite plates. The sharp edges of these plates were inserted into the cortex to a depth sufficient to divide the grey matter without penetrating the underlying white substance. It was shown that the movements of muscles resulting from stimulation of the ascending parietal convolution were due to spread of current to the ascending frontal convolution. The motor centres in front of the fissure of Rolando and on the mesial aspect of the hemisphere were mapped out by application of the same isolation method.—Hydrates in aqueous solutions of electrolytes: Rev. S. M. **Johnstone**. The paper gave results of extensive series of observations of the elevation of the boiling point and lowering of the freezing point in strong solutions, with determinations of conductivities at 0° C. and 99.4° C. In most of the curves showing the relation between concentration and elevation per gram equivalent there was a minimum point, above which elevation per gram equivalent usually increased with concentration at a gradually diminishing rate. The hydration of the molecules and ions of the solutions examined was discussed on the admittedly doubtful assumption that the ionisation could be roughly determined from conductivity data. Freezing-point and boiling-point data were found to give very similar values of the extent of hydration, the deliquescent salts giving the higher percentage hydrations. The number of molecules of water of hydration per molecule of solvent for a highly concentrated solution of a non-deliquescent salt was found in some cases to be much less than the number of molecules of water of crystallisation.

PARIS.

Academy of Sciences, April 15.—M. A. Chauveau in the chair.—Primitive tuberculosis of the lung and of the bronchial and mediastinal ganglions, communicated to young calves by the ingestion of tuberculous virus of bovine origin: A. **Chauveau**. A review of the author's communications on the subject of tuberculous infection of the lungs through the alimentary canal, with especial reference to the recent work of Calmette.—The application to pyridine of the method of direct hydrogenation by nickel: Paul **Sabatier** and A. **Mailhe**. At moderate temperatures (120° C. to 220° C.) pyridine is scarcely affected by this reaction, less than 1 per cent. being acted on. The amine formed is shown with certainty to differ from piperidine, the expected reduction product, and may possibly prove to be amylamine. If the reaction is allowed to proceed at higher temperatures, ammonia and pentane are produced in considerable quantities.—Contribution to the pathogeny of pulmonary anthracosis: S. **Arloing** and E. **Forgeot**. A controversial paper directed against the

hypothesis of Calmette, Vansteenberghé, and Grisez.—Researches on ammonium: Henri **Moissan**. The contents of a sealed letter deposited November 5, 1906. The presence of water is not necessary to the production of ammonium amalgam, since it can be produced by the interaction of sodium on the chloride or iodide of ammonium in liquid ammonia at -40° C. This reaction is, however, only possible in the presence of an excess of sodium. If the excess of sodium be removed by repeated washings with a solution of an ammonium salt in liquid ammonia, the so-called ammonium amalgam no longer exists. An account is also given of the product obtained by the electrolysis of the double iodide of mercury and ammonia in liquid ammonia.—Prof. Witz was elected a correspondant for the section of mechanics in the place of the late Prof. L. Boltzmann.—The form of the geoid in the neighbourhood of Sahel, Algiers: MM. **Bourgeois** and **Noirel**.—A new method of regulating X-ray tubes: G. **Berlemont**. The arrangement proposed consists of an aluminium tube which can be connected at will to either the anode or kathode. The tube can be made either hard or soft in a few minutes.—The determination of the limits of inflammability of explosive mixtures of ether vapour and air: Jean **Meunier**. The lower limit of inflammability is about 75 milligrams of ether per litre of air; the upper limit is about 200 milligrams of ether per litre.—The reduction of magnesia by carbon: Paul **Lebeau**. Magnesia is reduced by carbon at the temperature of the electric furnace with the production of magnesium and magnesium carbide. Both products are in great part destroyed by the action of the furnace gases which diffuse through the carbon tubes. This gas contains much carbon monoxide, and it is known that magnesium reduces this gas with great facility.—Sulphide of aluminium and its combinations with manganese and iron sulphides: Marcel **Houdard**. Sulphide of aluminium, which is irreducible at the high temperatures of the electric furnace, forms with sulphide of manganese and sulphide of iron two double compounds, Al_2S_3Mn and Al_2S_3Fe , a description of the properties of these two substances being given.—A new chloride of tantalum: C. **Chabrie**. The new chloride is obtained by the reduction of tantalum pentachloride with sodium amalgam. Its composition is given by the formula $TaCl_{2.2}H_2O$, and an account is given of its chemical behaviour.—A method of synthesis of non-substituted β -ketonic amides: Ch. **Moureu** and I. **Lazennec**. The acetylenic amides, heated in alcoholic solution with a secondary amine, best with piperidine, give good yields of the corresponding ketonic amides.—The migration of compounds possessing smell in the plant: Eug. **Charabot** and G. **Laloue**. The migration of these products from the leaves during inflorescence is proved.—The Lutetian in the Soudan and the Sahara: R. **Chudeau**.

DIARY OF SOCIETIES.

THURSDAY, APRIL 25.

ROYAL SOCIETY, at 4.30.—*Croonian Lecture*.—On the Essential Constituents of the Nucleus and their Relation to the Organisation of the Individual: Prof. J. B. Farmer, F.R.S.

INSTITUTION OF MECHANICAL ENGINEERS, at 8.—Address by the President: T. Hurry Riches.

INSTITUTION OF ELECTRICAL ENGINEERS at 8.—Depreciation Provision on Electricity Supply Undertakings: R. Hammond.

FRIDAY, APRIL 26.

ROYAL INSTITUTION, at 9.—New Illuminants: James Swinburne, F.R.S. PHYSICAL SOCIETY, at 5.—Electrical Conduction produced by Heating Salts: A. E. Garrett.—The Influence of Pressure upon Convection Currents, and a Criticism of J. Stark's Relation between Cathode Fall of Potential and Temperature: W. S. Tucker.—Solenoids which are turned by the Earth's Magnetic Field: W. B. Croft.—Simple Apparatus for mechanically illustrating the Tangent and Sine Laws: J. A. Tomkins.

SATURDAY, APRIL 27.

ROYAL INSTITUTION, at 3.—Studies in Magnetism: Prof. Silvanus P. Thompson, F.R.S.

MONDAY, APRIL 29.

SOCIETY OF ARTS, at 8.—Detergents and Bleaching Agents used in Laundry Work: Prof. Herbert Jackson.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Polar Problems: Dr. Fridtjof Nansen, G.C.V.O.

INSTITUTE OF ACTUARIES, at 5.—On Extra Premiums: H. E. W. Lutt.

TUESDAY, APRIL 30.

ROYAL INSTITUTION, at 3.—Stimulation, Luminous and Chemical: Prof. William Stirling.

SOCIETY OF ARTS, at 8.—Lustre Pottery: William Burton.

ANTHROPOLOGICAL INSTITUTE, at 8.15.—Lantern Demonstration of Two Contrasted Types of North American Indians: Dr. A. C. Haddon, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Annual General Meeting.

WEDNESDAY, MAY 1.

SOCIETY OF ARTS, at 8.—The Defence of the Sea Coast from Erosion: Alfred E. Carey.

ENTOMOLOGICAL SOCIETY, at 8.

GEOLOGICAL SOCIETY, at 8.—On the Xerophytic Character of Coal-Plants and a Suggested Origin of Coal-Beds: Prof. G. Henslow.—Petrological Notes on the Igneous Rocks lying to the South-East of Dartmoor: H. J. Lowe.

THURSDAY, MAY 2.

ROYAL SOCIETY, at 4.—Election of Fellows.—At 4.30.—The Spontaneous Crystallisation of Binary Mixtures. Experiments on Salol and Betol: Prof. H. A. Miers, F.R.S., and Miss F. Isaac.—On the Variation of the Pressure developed during the Explosion of Cordite in Closed Vessels: Prof. C. H. Lees, F.R.S., and J. E. Petavel.—Space described in a Given Time by a Projectile moving in Air: A. Mallock, F.R.S.

SOCIETY OF ARTS, at 4.30.—The Applicability to India of Italian Methods of Utilizing Silt: Sir Edward C. Buck, K.C.S.I.

LINNEAN SOCIETY, at 8.—The Fauna and Flora of Abyssinia compared with Those of West Africa: Prof. E. B. Poulton, F.R.S.—(1) Report on the Marine Biology of the Sudanese Red Sea (Communicated with an Introduction by the President); (2) Formation of the Shone Cliff near Alexandria; (3) Recent History of the Coral Reefs of the North-West Shores of the Red Sea: Cyril Crossland.—Polyplocophora collected by Mr. Cyril Crossland: E. R. Svkes.—On Chelonethi (Pseudoscorpion) from A-ia and Australia: C. J. With.—Note on the Function of the Spiracle in certain Elasmobranchs: A. D. Darbishire.—*Exhibits*: (1) Probate of the Will of Richard Anthony Salisbury; (2) Manuscripts of Dr. W. J. Burchell, F.L.S., Presented to the University of Oxford by Francis A. Burchell, Esq., Rhodes University College, Grahamstown, Grand-nephew of the Great Naturalist and Explorer: Prof. E. B. Poulton.

CHEMICAL SOCIETY, at 8.30.—(1) The Chemical Action of Exradio, Part I, Action on Distilled Water; (2) The Chemical Action of Exradio, Part II, Action on Copper Salts in Solution. Preliminary Note: Sir W. Ramsay.—Freezing Point Curves of the Menthyl Mandelates: A. Findlay and E. M. Hickmans.—The Constitution of Homo-eriodictyol. A Crystalline Substance from Eriodictyon Leaves: F. B. Power and F. Tutin.—The Relation between Valency and Heats of Combustion. Preliminary note: G. Le Bas.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Use of Wooden Poles for Overhead Power Transmission: C. Wade.

FRIDAY, MAY 3.

ROYAL INSTITUTION, at 9.—Dexterity and the Bend Sinister: Sir James Crichton-Browne, F.R.S.

GEOLOGISTS' ASSOCIATION, at 8.—The Igneous Rocks of the Bristol District: Prof. S. H. Reynolds.—The Carboniferous Limestone Sections of Burrington Combe and Cheddar: T. F. Sibly.—Recent Researches in the Lower Carboniferous Rocks: Dr. A. Vaughan.

SATURDAY, MAY 4.

ROYAL INSTITUTION, at 3.—Scientific Work in the Sea-Fisheries: Prof. W. C. McIntosh.

CONTENTS.

	PAGE
The Development of Chemical Theory. By W. R.	601
Niger Delta Negroes. By H. H. J.	602
Practical Plant-Physiology. By F. D.	602
Some Recent Mathematical Works. By G. H. B.	603
Our Book Shelf:—	
Bussard and Duval: "Arboriculture Fruitière"	605
Sommerfeldt: "Physikalische Kristallographie vom Standpunkt der Strukturtheorie"—H. H.	605
Letters to the Editor:—	
Electrical Method of Extracting Soot from Air in Flues.—George W. Walker.	606
Paradoxes and Principles.—Dr. W. Hampson; The Reviewer	606
Erosion at Niagara. (<i>Illustrated</i>). By G. A. J. C.	607
A Year's Work of the Carnegie Institution.	607
Aérodynamical Experiments and Observations in Russia. (<i>Illustrated</i>).	609
The Mexican Earthquake	610
Tuberculosis Research and Vivisection	610
Notes	611
Our Astronomical Column:—	
Comet 1907 <i>b</i> (Mellish).	615
A New Variable or Nova, 156.1906	615
The Albedoes of the Superior Planets.	615
The Second Globular Cluster in Hercules, Messier 92.	616
Halley's Comet	616
Eclipses of Jupiter's Satellites, 1878–1903	616
Rainfall in German South-West Africa	616
The River Pilcomayo	617
Cretaceous Ferns. By A. C. S.	617
Problems of Applied Chemistry. By Prof. George Lunge	617
University and Educational Intelligence	620
Societies and Academies	621
Diary of Societies.	624