which are applicable to the purposes of education. It is probable, however, that the responsibility for the whole of the evening school work, as contemplated by the regulations of the Board of Education for last year and this year, may involve them in an expenditure which their present resources are unable to meet. The Bill now before Parliament provides additional and, we believe, ample resources for all parts of the country except London. The present policy of the Board of Education is that evening schools, the great majority of which are intended for persons older than children, shall be provided and maintained by the local authorities for secondary education and receive grants under the regulations of the Board relating to secondary education."

SIR JOHN GORST spoke at Bradford on Saturday last upon the subject of the Education Bill of the Government. His remarks were aimed chiefly at the justification of the Government in making County and Borough Councils the local authorities for education. The necessity for this one authority in a particular sphere of influence has been almost universally accepted, but the difficulty is to determine the constitution of the body. Proceeding to describe the present position, Sir John Gorst said that the councils which are entrusted with technical instruction are entirely independent of central control. The consequence is that technical instruction as it is now carried out in this country is practically the entire creation of that new authority with very little assistance or direction from anybody. The councils are not bound to use the whisky money for technical instruction. They might have applied it to the relief of local rates, but in the last year for which statistics are available the total amount of the whisky money was 981,000*l.*, and of that sum 901,000*l.* was voluntarily devoted by the councils to technical instruction and only 80,000*l.* went to the relief of rates. Sir John Gorst remarked that the Duke of Devonshire and he selected the councils as the local authority rather than the School Boards, because a body which represented the ratepayers could not be a real local authority unless it had the absolute command of local finances, and if they had any other body levying rates without the consent of the body which properly represented the ratepayers they weakened the authority of the principal body and prevented it from gaining that proper influence over local affairs, expenditure and management which was essential to a properly constituted authority. A further question was whether the local authority was to be independent or to be tied down by the provisions of the statute. The effect of the working of the Technical Instruction Act was such as to be in favour of leaving these great local authorities to themselves. He preferred to trust them and give them ample powers, and leave them to exercise those powers for the benefit of the people whom they represented.

THE remarks made by Mr. Balfour at the Mansion House on April 23 upon the subject of commercial education are referred to in an article on the University of London which appears in another part of this issue. In the course of his address, Mr. Balfour said: "I would impress the doctrine, that important, necessary and essential as that narrow, technical training may be, we are ill learning the lesson of education which is now being taught us by other nations if we do not recognise that something more in the nature of general training and culture is absolutely necessary if we are to maintain the place so hardly won and so proudly maintained among the nations of the world. If commerce is to be treated as a subject of scientific study, it must not be approached simply in the spirit of those who desire to obtain a mastery of one particular instrument, one particular language, one particular form of knowledge, but must be approached, as all knowledge worthy the name should be approached, in the broader spirit of impartial scientific investigation. I do not think that higher praise can be given to the work in which Sir Albert Rollit and his colleagues are engaged than to say of it that, not merely have they given opportunities which would otherwise have been withheld to many persons in our community to learn the arts necessary for their work and success in life, but that they have also, and in addition to that merely technical training, in many cases laid the foundations on which may be built that solid and scientific knowledge of the commercial and economical forces of our time which are absolutely essential, as I think, to the proper conduct of the affairs of a great commercial country." Commercial education is so often understood to mean training in office routine that Mr. Balfour's statement as to what the term should imply ought to be widely known. All commercial and technical education of value must be founded upon sound primary and secondary education, and must be studied, not so much with the view of acquiring facility in carrying out the present duties of the office and workshop as with the intention to discover new methods and new processes. As with the individual, the nation that rests content with its achievements must eventually fall behind others which aim at obtaining and using new knowledge. It is in this spirit that commercial education must be viewed in order that it may assist national progress.

SCIENTIFIC SERIAL.

IN the *Journal of Botany* for April, H. W. Pugsley gives the first part of an article on the "British Capreolate Fumitories." Messrs. David Prain and Edmund Baker complete their "Notes on Indigofera." The various forms that have been included in the species *Indigofera tinctoria*, L., and *Indigofera Anil*, L., receive the fullest treatment, and the authors come to the following conclusions:—*I. tinctoria*, L., has been applied to three forms: (1) the wild form, which is probably indigenous to Africa; (2) the variety of the previous one, cultivated in southern India, at the present day more especially in Madras; (3) the plant cultivated in northern India, known as "Nil"; the differences between this and the other cultivated variety are so pronounced and constant that it seems justifiable to separate it off, when it becomes *I. sumatrana*, Gaertner. The specific name Anil, also given by Linnæus, is connected with the Egyptian vernacular word "Nil," which indicates any species that supplies the Indigo dye. In Egypt "Nil" would refer to *I. articulata*, Gouan, in India to *I. tinctoria*, L., while in neither of these countries would it include *I. Anil*, L., which will not grow in Egypt and does not find favour in southern India. De Candolle instituted three varieties of *I. Anil*, L., of which two call for comment. Var. α *oligophylla* is the same plant as *I. truxillensis*, H.B.K., which was probably cultivated in the West Indies in the time of Hans Sloane. Var. β. *polyphylla* is the plant now cultivated in the West Indies and other parts of the New World. This is the true *I. Anil*, L., but to avoid any confusion which may arise from the use of that specific name, it is suggested that it should be established, under another synonym, as *I. suffruticosa*, Miller. Arthur Bennett continues his "Notes on Potamogeton," and deals with some foreign species from Australia, America and Japan. The most interesting of four new British Hepaticæ described by S. M. Macvicar is *Aneura incurvata*. It comes near to *A. multifida* and *A. sinuata*. It may be expected to be recorded again, as it has been found in Austria, Germany and Scandinavia.

SOCIETIES AND ACADEMIES.

LONDON.

Physical Society, April 25.—Prof. S. P. Thompson, president, in the chair.—Dr. Dawson Turner exhibited and described a mechanical break for induction-coils. The use of induction-coils in the production of Röntgen rays and in wireless telegraphy has made the construction of a suitable break a matter of importance. The ordinary break is unsuitable because of the wearing away at the point of contact, and there are objections to the use of mercurial breaks. The portable mechanical break which was shown by Dr. Dawson Turner consists of two metallic rollers with their axes parallel and kept in contact by a spring. One of the rollers has a cam attached to its spindle, and can be made to rotate by means of a small electric motor. Once in each revolution the cam separates the rollers, thus making the break, and at the same time causing the second roller, which rides loose upon its axis, to turn about one-eighth of a revolution. As soon as the cam has passed, the rollers are brought into contact by the spring, and the next break occurs at a different place. The wearing is thus distributed evenly over a large surface. The break is placed in a box containing alcohol or petroleum, and works best when rotating rapidly. An objection to the arrangement is the noise it makes when working. Some experiments were then shown on the discharge of electrified bodies by ultra-violet light. A disadvantage of the electric arc when used to furnish ultra-violet light for use in medicine

is that the light is accompanied by heat, so that it is necessary to shield the patient from the heat without interfering with the passage of the light. A condenser spark between iron electrodes is useful because it gives a large amount of ultra-violet radiation without much heat. Dr. Turner showed that this light is capable of discharging bodies whether positively or negatively electrified. He then showed that glass and mica are opaque to the radiation while pure rock salt is transparent.—Mr. Wilson Noble exhibited a mechanical break similar to the one already shown. A roller and a disc, with their axes parallel, are placed in contact and made to rotate in the same direction by a motor. Longitudinal slots are cut upon the surfaces of both, and the break occurs when a slot in the roller comes opposite a slot in the disc. Since the two are moving in opposite directions at their point of contact the break is very sudden. To vary the length of the break without altering the rate of rotation, the slot in the roller is wider at one end than the other, and the disc can be placed so as to touch the roller at any point of its length.—Mr. R. S. Whipple exhibited a temperature indicator for use with platinum thermometers, in which readings are automatically reduced to the gas scale. The instrument is very similar to the well-known Callendar and Griffiths' temperature indicator, with the exception that it is so arranged that the readings obtained are automatically reduced to the gas scale, thus avoiding the necessity of applying a correction. It consists of a simple Wheatstone's bridge with equal ratio arms, the other arms being the thermometer and a long helical bridge wire together with the compensating leads. A travelling contact is moved round the wire until a balance is obtained. The bridge wire is wound on an ebonite drum on the outer surface of which a helix has been cut. The contact piece, which is connected electrically with the galvanometer, is carried from the inside of a cylinder fixed to a shaft. A white celluloid tube on which the scale is divided is fixed to the outer surface of the cylinder. A screw of the same pitch as the helix on the ebonite drum is cut on the shaft, so that by rotating the shaft the contact is caused to travel along the bridge wire, and at the same time the scale is carried past an index placed above it. The scale has been so constructed that the reading at the index gives directly the temperature of the thermometer reduced to the gas scale. The instrument reads from 0° to 1400° C.—Mr. S. A. F. White read a note on the compound pendulum. In the determination of the length of the equivalent simple pendulum for a compound pendulum the form of which is a symmetrical bar and bob with one fixed, one movable knife-edge and no sliding weight it is convenient to make the mass of the movable knife-edge small. In this case, small displacements of this knife-edge will not materially alter the position of the centre of gravity or radius of gyration of the pendulum about an axis through its centre of gravity. The time of swing about the fixed knife-edge will therefore remain practically constant. The best determination of the correct position of the movable knife-edge for an equal time of oscillation will be given when for the smallest displacement of this knife-edge there is the greatest variation in the time of oscillation about it. The author has determined the position which makes $\frac{dt}{dh}$ a maximum, h being the distance of the axis of suspension from the centre of gravity. He has also drawn the curve showing the relation between $\frac{dt}{dh}$ and h. The calculations have then been applied to the determination of the position of the movable knife-edge in a particular pendulum. The experimental value of the ratio of h to k deduced from this pendulum when the movable knife-edge is adjusted to its right position agrees well with that predicted by the theory. The author states that when the length of the equivalent simple pendulum is about a metre, it should be possible with a stop-watch reading to 0·2 second to determine "g" to about ·1 or ·2 per cent. If the fixed knife-edge were made the movable knife-edge, the value of $\frac{dt}{dh}$ would be very large, but there would be difficulties in the way of measuring the small time of swing and the small equivalent length.

Chemical Society, April 17.—Prof. Tilden, F.R.S., in the chair.—Dimercurammonium nitrite and its haloid derivatives, by Dr. P. C. Rây. This salt was prepared by the addition of aqueous ammonia to a solution of sodio-mercuric nitrite. On solution in hydrochloric acid the new compound furnishes a mercuric ammonium chloride of the formula $2HgCl_2.NH_4Cl$, and with hydrobromic acid the corresponding bromide. These salts in turn, with sufficient potash, furnish respectively the chloride and bromide of dimercurammonium. The author's observations on these substances support the Rammelsberg-Pesci representation of the general structure of ammoniated-mercury salts.—Preparation and properties of 4-isopropyl-dihydroresorcinol, by Dr. Crossley. A correction in the nomenclature of this substance is made from 2:6-diketo-4-isopropylhexamethylene to that given above, since further investigation has shown that its usual structure is thereby better indicated.—Oxonium salts of fluoran and its derivatives, by Dr. Hewitt and Mr. Tervet. The authors have observed that fluoran and substances related to it, such as fluorescein, form salts with mineral acids, and of these the nitrate and sulphate of fluoran, chloride and sulphate of fluorescein and others have been prepared, analysed and described.—Influence of substitutions on the reactivity of the aromatic diamines, by Dr. G. S. Morgan. The author has studied particularly the influence exerted by the introduction of alkyl groups in various positions into the molecule of aromatic diamines on the reactivity of these substances with methylating agents.—The influence of certain acidic oxides on the specific rotations of lactic acid and potassium lactate, by Drs. Henderson and Prentice. It was found that antimonious oxide exerts no action on lactic acid and its potassium salt, and consequently has no influence of their rotations in solution. On the other hand, arsenious and boron oxides produce a change in the rotation of these substances which is greatest when they are present in quantity sufficient to form with the potassium salt compounds of the formulæ (AsO) $C_3H_4O_3K$ and (BO) $C_3H_4O_3K$ respectively.—The amounts of "ammonia" and "nitric" nitrogen and of chlorine in rain water collected at Rothamsted, by Dr. Miller. This paper gives the amounts of ammonia, nitrates and chlorine contained in Rothamsted rain water for each month from September 1888 to August 1901. The results show that the total nitrogen available to the soil from this source varied during this period from 3·31 to 4·43 lb. per acre per annum, the average being 3·84 lb., of which 1·8 lb. is secured during the winter and 2·03 lb. during the summer months. Of this total nitrogen, 70 per cent. is present as ammonia and 30 per cent. in the more easily available form of nitrates. Chlorine, on the other hand, is found in greatest quantity during the winter, the average content per annum for the period being 14·87 lb., of which 10·12 lb. is obtained during the winter season.—The amounts of nitrogen as nitrates and chlorine in the drainage through uncropped and unmanured land, by Dr. Miller. During the last twenty-four years—September 1877 to August 1901—the loss of nitrates in drainage water has been systematically investigated at Rothamsted, and this paper gives the results obtained. The average loss of nitrogen in this way amounts to 30 lb. per annum per acre, but varies greatly with the amount of rain and distribution of drainage. There appears to be also a considerable loss of lime. The average yearly amount of chlorine per acre in the drainage is about the same as that found in the rain, but wide differences occur occasionally. Drain gauges at a depth of 20 inches have during the last twenty-four years received on an average 7 lb. more chlorine than they have lost in drainage; the values for the 40-inch gauge are 17·5 lb. lost and 31·9 lb. received.—Benzylidene-camphoroxime, by Dr. M. O. Forster. The method of preparation, properties and behaviour towards reagents of this substance have been studied as part of a proposed systematic examination of substituted camphoroximes.

Linnean Society, April 3.—Prof. S. H. Vines, F.R.S., president, in the chair.—Mr. R. Morton Middleton exhibited two letters from Linnæus to Dr. David van Royen and Mr. Richard Warner, of Woodford, dated respectively April 18, 1769, and September 29, 1758, and also a letter from Sir J. E. Smith to N. Wallich on Nepalese plants, written in 1819.—Mr. R. A. Rolfe, on behalf of the Director, Royal Gardens, Kew, exhibited a series of specimens of *Pachira aquatica*, Aubl., and *P. insignis*, Savigny, from British Guiana, collected by the late G. S. Jenman, Government botanist, to illustrate the great variation which exists in the size and shape of the fruits. There was also a certain amount of variation in the leaves and flowers, though in the latter each species retained its own essential character. These trees were common over the great alluvial forest-region, extending also to Brazil, and were commonly cultivated for ornament.—On behalf of Mr. W. B. Hemsley,

F.R.S., Mr. Rolfe also exhibited some specimens illustrating the precocious germination of the seeds of a species of Dracæna. Germination had taken place through the pericarp while the berries were still hanging on the plant.—Mr. Spencer Moore read a paper entitled "A Contribution to the Composite Flora of Africa," in which he described a number of new species in the Herbarium of the British Museum. He found that the north-eastern tropics, especially British East Africa and the neighbouring parts of Somaliland and Southern Abyssinia, had yielded most of the novelties.—Prof. F. E. Weiss read a paper, illustrated by lantern-slides, on a biseriate halonial branch of *Lepidophloios fuliginosus*. The branch in question, about 7 in. in length, was found in a large nodule by Mr. George Wilde at Haugh Hill, near Stalybridge. Dr. Scott, in a preliminary communication to the British Association in 1898, had identified it with the plant described by Williamson as *Lepidodendron fuliginosum*, now generally included in the genus Lepidophloios. Prof. Weiss supported this identification, and brought forward several instances of halonial branches of Lepidophloios which possessed only two rows of tubercles, instead of the more usual quincuncial arrangement of the tubercles. The specimen referred to, and of which photographs were shown, were from the British and Manchester Museums, and instances were also cited from Williamson's published memoirs. The second part of the paper consisted of a detailed account of the anatomy of this well-preserved specimen, which went to confirm Dr. Scott's previous identification of it.

Geological Society, March 26.—Prof. Charles Lapworth, F.R.S., president, in the chair.—On a remarkable inlier among the Jurassic rocks of Sutherland and its bearing on the origin of the breccia-beds, by the Rev. J. F. Blake. On the coast of Sutherland due south of Port Gower is seen on the scars at low water a long rocky crest of Old Red Sandstone, with its flaggy beds dipping at a high angle. It is of considerable height, and is surrounded by nearly horizontal Jurassic beds containing large blocks of rocks similar to those of the crest, irregularly placed. The size, outline and relation to the surrounding rocks show that this cannot be a transported block, but must have been part of, or directly derived from, a neighbouring coast—like the modern sea-stacks of the present coast at Duncansby. From considerations of the character and distribution of the breccia-beds, it is concluded that they are the product of an ice-foot of Upper Jurassic age, which invaded the normal deposits of that period.—On a deep boring at Lyme Regis, by Mr. A. J. Jukes-Browne. During 1901 a boring was made near Lyme Regis in search of coal, and was carried to the depth of 1300 feet without reaching the base of the Upper Triassic Marls. The beds passed through were compared with those exposed along the cliffs from Lyme to Sidmouth. The author concludes that the boring did not reach the beds which near Sidmouth form a passage from the Keuper Marls to the Keuper Sandstones, and that the Keuper Marls proved by the boring are at least 1130 feet, and may amount to 1200 feet in thickness.

MANCHESTER.

Literary and Philosophical Society, April 15.—Mr. Charles Bailey, president, in the chair.—Dr. Henry Wilde, F.R.S., read a paper on the atomic weights and classification of the elementary gases, neon, argon, krypton and xenon. The recent determinations of the densities of the new gases by Prof. Ramsay and Dr. Travers prove conclusively that they belong to the seventh series of elements in Dr. Wilde's table, which includes nitrogen and the comparatively inert groups of the platinum metals. Within the limits of experimental error and residual interferences, all the members of this series are multiples of seven.—A paper on the hypnotic influence of prolonged vision of persistent motion and sparkling objects, by Mr. Thomas Kay, was read.—Mr. F. J. Faraday exhibited an old copy of Chateaubriand's "Atala," partly written in the huts of the American Indians in Louisiana and Florida during the author's first visit to the New World in 1789, and containing passages showing the continued existence amongst the Red Indians at the end of the eighteenth century of some of the religious beliefs and practices referred to in Mr. J. E. King's recent paper on the Jesuit records of 1611, noticeably with regard to the metempsychosis of the souls of infants, the exhuming of the bones of members of the family from the temporary village grave for reburial in a common national grave on the occasion of the "Feast of the Dead," or the "Feast of Souls," and the transporting of the bones of dead relatives during migration.—Prof. F. E. Weiss exhibited a specimen of *Welwitschia mirabilis*. This curious plant was discovered by Dr. Welwitsch in 1860 in the south-west of Africa, where it grows in very arid regions, rooted by a very long tap root. The upper part of the plant is protected by a very thick mantle of cork. It only possesses two leaves, which last throughout the life of a plant, being constantly renewed from the base, which lies protected in a groove of the stem. *Welwitschia* was first described by Sir Joseph Hooker, who considered it as belonging to the group of Gnetaceæ allied to the Conifers.

PARIS.

Academy of Sciences, April 21.—M. Bouquet de la Grye in the chair.—On some phenomena of voltaic polarisation, by M. Berthelot. Experiments on the polarisation effects of liquid cells, both with and without the addition of reducing agents.—On the methods of proving the electrolytic action of a battery, by M. Berthelot. An examination of the conditions under which the smallest possible quantity of gas set free in an electrolytic cell can be observed, together with some experiments in which formol instead of pyrogallol was used as the reducing agent.—On Abelian functions with complex multiplication, by M. G. Humbert.—The resistance due to companion waves, by M. de Bussy. The proportionality between the height of the companion waves and the square of the velocity of the vessel producing them was proved by three sets of experiments, on a model 1/16th natural scale, on the vessels *Guichen* and the American cruiser *Columbia*.—On Daniellia and their secreting apparatus, by M. L. Guignard. The existence of a secreting system distributed through the whole thickness of the wood is a characteristic feature of the Daniellia; with the Copaifera and the Eperua of tropical America, these are the only leguminous plants known possessing intraligneous secreting apparatus.—New observations on the fossil flora of the basin of Kousnetzk (Siberia), by M. R. Zeiller. The Permian flora of Siberia appear to be closely allied, at all events in the cases of the most abundant and characteristic species, with the normal Permian flora of Europe and North America, from which they are distinguished only by the presence of some particular types.—Observations of the sun, made at the Observatory of Lyons with the Brunner 16 cm. equatorial, during the third quarter of 1901, by M. J. Guillaume. The results are expressed in three tables, showing the number of spots, their distribution in latitude and the distribution of the faculæ in latitude respectively.—On the continuous deformation of surfaces, by M. G. Tzitzeica.—The laws of deformation, the principles of calculation, and rules for the scientific employment of mortars, by M. Rabut. It is shown that the mortar described is altered in shape when fired according to simple and precise laws, easily explained from the properties of the material. The laws resulting from these principles are in agreement with the methods of construction in practical use.—On a new method for the optical measurement of thicknesses, by M. Macé de Lépinay. A sketch of a new method is given which possesses the advantages of requiring no other reflecting surfaces than those of the plate studied, and of permitting exact measurements to be made even if the plate is not quite perfect from the point of view of homogeneity or parallelism of its surfaces.—On the absorption of radioactivity by liquids, by M. Th. Tommasina. Preliminary measurements of the absorptive power of various organic liquids for the radiation from radioactive substances are given.—On the formation of negative images by the action of certain vapours, by M. P. Vignon (see p. 13).—On a case of molecular rupture by bromine, by M. R. Fosse. In the reaction between naphthylol-dinaphthoxanthene and bromine, instead of the expected substitution by the halogen, a molecule of bromine is added on as with an unsaturated body, the trinaphthyl-methane molecule being then split up into a bromo-naphthol and bromo-methanal-1-naphthol-2.—On some derivatives of fumaric aldehyde, by M. R. Marquis. The acetin of nitrosuccinic aldehyde, the preparation of which is described in a previous paper, is decomposed by dilute acetic acid at 80° C. with formation of fumaric aldehyde, H.CO.CH=CH.CHO, the phenylhydrazone and oxime of which are described.—The transformation of new into stale bread, by M. L. Lindet. The amount of soluble dextrins in the crumb of bread as it leaves the oven amounts to more than 10 per cent. of the dry weight; this amount was found to decrease steadily on standing, until after four days there is only 2 per cent. The only alteration undergone by the crust is in the amount of water it contains.—On

the Fecampia, endoparasitic turbellaria, by MM. M. Caullery and F. Mesnil. The embryogeny of Fecampia is, on broad lines, similar to those described by Metchnikoff, Hallez and Jijima for certain Triclades and Rhabdoceles.—On a new type of Rhizocephalus, a parasite of the Alpheidæ, by M. H. Coutière.—Pathogenic and teratogenic actions, by M. Étienne Rabaud.—Some new attempts at experimental parthenogenesis in Amphibians, by M. E. Bataillon.—On the primitive form of crystallised bodies, by M. F. Wallerant.—On the geological constitution of the western Maroc, by M. S. Brives.—The recent discoveries of the Prince of Monaco at Baoussé-Roussé. A new type of human fossil, by M. R. Verneau. The cave known as the *Grotte des Enfants* has already yielded such valuable results in the hands of M. Rivière that the Prince of Monaco resolved to continue its exploration methodically. The most important result up to the present has been the discovery, at the depth of 7·75 metres, of a human skeleton of a new type, apparently negroid, for which the name of the Grimaldi type is suggested.—Researches on the experimental production of parasitic races of plants by harmful bacteria, by M. L. Lepoutre. Three abundant species of bacteria were studied—*B. fluorescens*, *B. mycoides* and *B. mesentericus vulgatus*—and attempts were made to infect the tubercles of potato plants grown under varying conditions.

DIARY OF SOCIETIES.

THURSDAY, MAY 1.

ROYAL SOCIETY, at 4.30.—Coefficients of the Cubical Expansion of Ice, Hydrated Salts, Solid Carbonic Acid, and other Substances at Low Temperatures: Prof. J. Dewar, F.R.S.—The Conditions determinative of Chemical Change and of Electrical Conduction in Gases, and of the Phenomena of Luminosity: Prof. H. E. Armstrong, F.R.S.—Contributions to a Theory of the Capillary Electrometer: I. The Insulation-Resistance of the Capillary Electrometer, and the Minimum Quantity of Electricity required to produce a Visible Excursion: G. J. Burch, F.R.S.

ROYAL INSTITUTION, at 3.—Recent Geological Discoveries: Dr. A. Smith Woodward, F.R.S.

LINNEAN SOCIETY, at 8.—(1) On the Mammalian Cerebellum, with special reference to the Lemurs; (2) On the Brain of the Elephant Shrew, *Macroscelides proboscideus*: Dr. Elliot Smith.—On the Early Condition of the Shoulder-Girdle in the Polyprotodont Marsupials, Dasyurus and Perameles: Dr. R. Brown.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Automatic Relay Translation for Long Submarine Cables: S. G. Brown.

RÖNTGEN SOCIETY, at 8.30.—The Relation between X-Rays and allied Phenomena in Light and Electricity: Ernest Payne. (*Discussion.*)

FRIDAY, MAY 2.

ROYAL INSTITUTION, at 9.—Experimental Researches on the Constitution of Crystals: A. E. Tutton, F.R.S.

MONDAY, MAY 5.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—On the mixed Carbides of Manganese and Calcium: J. S. Brame and Prof. Vivian B. Lewes.—Dangerous Chemical Substances: Oscar Guttmann.

SOCIETY OF ARTS, at 8.—Glass for Optical Instruments: Dr. R. T. Glazebrook, F.R.S.

VICTORIA INSTITUTE, at 4.30.—Procopins's African Monument of Joshua's Conquest of Canaan: Martin L. Rouse.

TUESDAY, MAY 6.

ZOOLOGICAL SOCIETY, at 8.30.—On the Mammals collected during the Whitaker Expedition to Tripoli: Oldfield Thomas, F.R.S.—The Wild Sheep of the Upper Ili Valley: R. Lydekker, F.R.S.—A List of the Fishes, Batrachians and Reptiles collected by Mr. J. ffolliott Darling in Mashonaland, with Descriptions of new Species: G. A. Boulenger, F.R.S.

SOCIETY OF ARTS, at 8.—The Printing of Modern Illustrated or Decorated Books: C. T. Jacobi.

WEDNESDAY, MAY 7.

ENTOMOLOGICAL SOCIETY, at 8.—On a new Cricket of Aquatic habits, found in Fiji by Prof. Gustave Gilson: Prof. L. C. Miall, F.R.S., and Prof. G. Gilson.—On the Lepidoptera of the Chatham Islands: Edward Meyrick.—On Asymmetry in the Males of Hemarid and other Sphinges: Dr. T. A. Chapman.

SOCIETY OF PUBLIC ANALYSTS, at 8.

IRON AND STEEL INSTITUTE, at 10.30 a.m.—Report of Council.—The Bessemer Gold Medal for 1902 will be presented to his Excellency F. A. Krupp, of Essen.—A selection of the following papers will be read and discussed:—Report by the Committee appointed to investigate the Nomenclature of Metallography.—On a New Vacuum Tuyere for Blast Furnaces: H. Allen.—On the Microstructure of Hardened Steel: Prof. J. O. Arnold and A. McWilliam.—On the Compression of Fuel before Coking: J. H. Darby.—On Gas from Wood for use in the Manufacture of Steel: J. Douglas.—On a combined Blast-Furnace and Open-Hearth Process: P. Eyermann.—On the Physical and Chemical properties of Carbon in the Hearth of the Blast-Furnace: W. J. Foster.—On the Sulphur contents of Slags and other Metallurgical Products: Baron H. von. Jüptner.—On the Elimination of Silicon in the Acid Open-Hearth Furnace: A. McWilliam and W. H. Hatfield.—Report on Research Work carried out during the past year: J. A. Mathews.—On the Iron Ore of Brazil: H. Kilburn Scott.—On the Recovery of By-products in Coking: J. Thiry.—On Brinell's researches on the influence of Chemical composition on the soundness of Steel Ingots: Axel Wahlberg.

AUSTRALIAN CHAMBER OF COMMERCE (Australian Club), at 4.—The Coal Resources of Australia: James Stirling.

SOCIETY OF ARTS, at 8.—Origin and History of Carriages: A. Chancellor.

THURSDAY, MAY 8.

IRON AND STEEL INSTITUTE, at 10.30 a.m.—A Selection of Papers from the list given under May 7 will be read and discussed.

ROYAL INSTITUTION, at 3.—Recent Geological Discoveries: Dr. A. Smith Woodward, F.R.S.

SOCIETY OF ARTS (Indian Section), at 4.30.—The Past and Present Connection of England with the Persian Gulf: T. J. Bennett.

MATHEMATICAL SOCIETY, at 5.30.—On Groups in which every two Conjugate Operations are Permutable: Prof. Burnside, F.R.S.—Fermat's Theorem on Binary Powers: H. E. Western.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Form of Model General Conditions. (Conclusion of Discussion).

FRIDAY, MAY 9.

COLD STORAGE AND ICE ASSOCIATION (Society of Arts), Afternoon.—The Rationale of Cooling Phenomena: Dr. W. Hampson.—The Business Side of Cold Storage: R. J. Key.

ROYAL INSTITUTION, at 9.—Exploration and Climbing in the Canadian Rocky Mountains: Prof. J. Norman Collie, F.R.S.

ROYAL ASTRONOMICAL SOCIETY, at 8.

MALACOLOGICAL SOCIETY, at 8.

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