as the result of the crystallisation of igneous magmas of exceptional composition. In many cases, if not in all, the presence of these minerals in igneous rocks is the result of the solution of argillaceous material. It seems fair to conclude, from their general absence from masses of granite and other igneous rocks, that the absorption of argillaceous sediments has not taken place on any large scale. But in drawing this inference caution is necessary because, under plutonic conditions, the presence of water may lead to the formation of micas instead of them. Fused biotite gives rise to spinelle, and fused muscovite to sillimanite and corundum.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Dr. G. Sims Woodhead has been appointed professor of pathology in succession to the late Prof. Kanthack.

The Balfour studentship, of the annual value of 200*l.*, for original research in biology, especially animal morphology, has been awarded to Mr. J. Stanley Gardiner, Fellow of Gonville and Caius College, for three years from March 25, 1899. Grants from the Balfour fund of 50*l.* each have been made to Mr. J. S. Budgett, of Trinity College, in aid of his researches on the development of polypterus, and to Mr. L. A. Borradaile, of Selwyn Hostel, in aid of the expenses of his proposed journey in company with Mr. Gardiner, the Balfour student.

DR. H. E. ANNETT has been appointed demonstrator of tropical pathology in the newly-founded school of tropical diseases in Liverpool.

WE are asked to state that the offices of the National Association for the Promotion of Technical and Secondary Education have been removed from 14 Dean's Yard to 10 Queen Anne's Gate, Westminster, S.W.

AT the annual meeting of the shareholders of the Patent Nut and Bolt Company (Limited), held on Monday at Birmingham, it was resolved that the company should contribute 5000*l.* to the fund which is being raised for the establishment of a University in Birmingham.

THE London School Board have strongly protested against the application of the London County Council to the Science and Art Department to be recognised as the organisation responsible for science and art instruction in the County of London. A memorial has been drawn up and presented to the Lord President of the Council, asking him not to assent to the application of the County Council, and giving reasons why the Board should be largely represented upon whatever authority was given control over science and art instruction in London.

A COPY of the address delivered at the recent annual meeting of the Association of Technical Institutions, by Earl Spencer, has been received. In the address, the importance attached to a thorough system of technical instruction in America and Germany is pointed out, and the intimate and necessary relations which exist between technical and secondary education are mentioned. Just as it is difficult to give technical instruction without a foundation of good secondary education, so secondary education is retarded and often completely stopped by the poor education of pupils who come from the primary schools to seek it. Earl Spencer made special reference to this lack of system in educational efforts, and remarked that in order to secure sound and good technical education for the population as a whole, many defects of primary education will need to be remedied.

THE Calendar of the Department of Science and Art has been issued. As in former years, the volume contains a history and general description of the Department, with a summary of the rules, and a list of the science and art schools and classes. The total number of individual students who presented themselves for examination in science subjects of the Department in 1898 was 157,306. The six subjects in which the most students were examined are—mathematics (stages 1, 2, 3), 35,945; physiography, 24,877; inorganic chemistry, 23,966; practical plane and solid geometry, 20,238; machine construction and drawing, 18,073; building construction, 13,653. Of the subjects in which practical examinations were held, the first four are—inorganic chemistry, 15,012; magnetism and electricity, 2550; organic chemistry, 1195; sound, light and heat, 1141.

SOCIETIES AND ACADEMIES

LONDON.

Royal Society, January 26.—"On the Structure and Affinities of Fossil Plants from the Palæozoic Rocks. III. On *Medullosa anglica*, a new Representative of the Cycadofilices." By D. H. Scott, M.A., Ph.D., F.R.S., Hon. Keeper of the Jodrell Laboratory, Royal Gardens, Kew.

The existence of a group of fossil plants, combining in their organisation certain characters of the Ferns and the Cycads, has been recognised, of late years, by several palæobotanists. The convenient name, Cycadofilices, has recently been proposed to designate the group in question, which now includes several, somewhat heterogeneous, genera, among which *Lyginodendron*, *Heterangium*, and *Medullosa* may be mentioned.

No stem of a *Medullosa* has hitherto been recorded from this country, though specimens of *Myeloxylon*, now known to have been the petioles of *Medullosa*, are frequent in the calcareous nodules of the Lower Coal-measures.

The author has recently had the opportunity of investigating several excellent specimens of a new species of *Medullosa* from the Ganister Beds of Lancashire. These fossils are of special interest on several grounds; they are considerably more ancient than any members of the genus previously described, they are the first English specimens recorded, they are preserved in a more complete and perfect form than any others at present known, and lastly, the greater simplicity of their structure causes the essential characters of the genus to stand out with greater clearness than in the more complex species. The specimens were discovered by Mr. G. Wild and Mr. J. Lomax, in material from the Hough Hill Colliery, Stalybridge.

The species, which is very distinct from any form previously described, will be known as *Medullosa anglica*.

The most complete specimen of the stem has a mean diameter of rather more than 7 cm., including the adherent leaf-bases, which, to judge from the most perfect specimens, almost completely clothed the surface of the stem. The arrangement of the leaves was a spiral one, and in the only case where the phyllotaxis could be determined, the divergence proved to be 2/5.

In two of the specimens the external characters of the fossil are well shown. The habit of the stem, clothed with the long, almost vertical, overlapping leaf-bases, may have been not unlike that of some of the tree-ferns, such as *Alsophila procera*.

The vascular system of the stem consists of three (or locally four) steles, anastomosing and dividing at long intervals.

Each stele of *Medullosa anglica* is surrounded by a zone of secondary wood and bast, and shows the closest agreement in structure with the single stele of a *Heterangium*, so that the stem of this *Medullosa* might well be concisely described as a polystelic *Heterangium*.

The course of the leaf-trace bundles was followed very completely in consecutive series of transverse, and in longitudinal, sections. On becoming free the trace is a large concentric bundle; as it passes obliquely upwards through the cortex, the trace loses its secondary tissues, and undergoes repeated division into a number of smaller bundles, each of which has collateral structure. These collateral strands have in all respects the same arrangement of their elements as the well-known bundles of *Myeloxylon*.

The base of the leaf received a large number of bundles, consisting of the ultimate branches derived from the subdivision of several of the original leaf-traces. This distribution of the bundles is peculiar and unlike that in any known plants of Cycadean affinities.

The petioles branched repeatedly, the finest ramifications of the rachis having a diameter of about 1 mm. only, but retaining in essentials the "*Myeloxylon*" structure. The leaf was thus a highly compound one; the structure of the leaflets associated with the rachis, agrees well with that of the *Alethopteris* leaflets, figured by M. Renault.

The roots, never previously observed in any species of *Medullosa*, were of triarch structure, with abundant formation of secondary wood, bast, and periderm. The author is indebted to Mr. J. Butterworth and Mr. G. Wild, for specimens which have thrown important light on the connection between root and stem.

While *Medullosa* combines, in a striking manner, the characters of Ferns and Cycads, the author is not disposed to regard it as having lain very near the direct line of descent of the latter group. It is more probable, as Count Solms-

Laubach has suggested, that the Medulloseæ represent a divergent branch, which has left no descendants among existing vegetation.

Physical Society, February 10.—Annual General Meeting.—Mr. Shelford Bidwell, F.R.S., President, in the chair.—The report of the Council was read by Mr. H. M. Elder. Dr. Atkinson then presented the Treasurer's report, and showed that although there was only a small balance in the bank, the financial position had somewhat improved. The list of Fellows lost to the Society by death was read. After some remarks with regard to the library and the subscriptions, votes of thanks were passed to the Council, the auditors, and to the other officers of the Society. The President then moved a vote of thanks to the Chemical Society for the use of the rooms at Burlington House. Council and officers for the forthcoming year were elected as follows: President, Prof. Oliver J. Lodge, F.R.S.; vice-presidents who have filled the office of president, Dr. J. H. Gladstone, F.R.S., Prof. G. C. Foster, F.R.S., Prof. W. G. Adams, F.R.S., the Lord Kelvin, F.R.S., Prof. R. B. Clifton, F.R.S., Prof. A. W. Reinold, F.R.S., Prof. W. E. Ayrton, F.R.S., Prof. G. F. Fitzgerald, F.R.S., Prof. A. W. Rücker, F.R.S., Capt. W. de W. Abney, C.B., F.R.S., Shelford Bidwell, F.R.S.; vice-presidents, T. H. Blakesley, C. Vernon Boys, F.R.S., G. Griffith, Prof. J. Perry, F.R.S.; secretaries, W. Watson (Physical Laboratory, South Kensington) and H. M. Elder (50 City-road, E.C.); foreign secretary, Prof. S. P. Thompson, F.R.S.; treasurer, Dr. E. Atkinson; librarian, W. Watson. Other members of Council: Prof. H. E. Armstrong, F.R.S., Walter Baily, R. E. Crompton, Prof. J. D. Everett, F.R.S., Prof. A. Gray, F.R.S., E. H. Griffiths, F.R.S., Prof. J. Viriamu Jones, F.R.S., S. Lupton, Prof. G. M. Minchin, F.R.S., and J. Walker.—The newly-elected President, Prof. Oliver Lodge, then took the chair, and an ordinary meeting was held. In his address he referred to the heavy death-roll of the Society during the past year, and to the tribute paid to the memory of John Hopkinson at Cambridge University. Prof. Lodge then commented on the quickness with which scientific discoveries were now applied to practice, and to the interest taken in such applications by men of science. He did not know whether this was due to the example and inspiration of Lord Kelvin, or to the progress of education among the public. He regretted that the public were so ignorant of scientific subjects. Rapidly reviewing the work done in physics during the past year, he spoke of the experiments of Righi, Preston, Michelson, and J. J. Thomson, and called attention to a prediction, lately published in NATURE by Prof. G. F. Fitzgerald, with regard to the probability of being able to obtain magnetic effects by passing circularly polarised light through absorptive media. After commenting upon the important position now occupied by terrestrial magnetism among the sciences, and the advantages of the publication now known as *Science Abstracts*, Prof. Lodge said there was one event of exceptional significance to physics, that had happened during the past year, an event of which science would feel the effect for centuries to come—the Government had decided to begin to establish a national laboratory. He wished to congratulate Sir Douglas Galton, and himself, on the speedy result of their urging the matter upon the British Association. He thought the thanks of the Physical Society were due to the Committee appointed by the Treasury, especially perhaps to Prof. Rücker, as acting-chairman of that Committee, and to Mr. Chalmers, who represented the Treasury, for the way in which the work had been brought to an issue. There was much for which the present Government deserved praise during the past year; he wished there could be added to their laurels the inauguration of a University for London. Prof. Lodge then went on to the specific subject of his address—the opacity of conducting media to light and to electric waves generally, emphasising the brilliant work of Mr. Oliver Heaviside in unifying phenomena apparently different, discussing the effect of boundaries, and dealing specially with the question, first attacked by Maxwell, of the theoretical opacity of gold-leaf. (This part of the address will be published in full in the *Phil. Magazine*.) Prof. Ayrton said, with regard to the attenuation of electric waves by the earth, that Mr. Whitehead, some months ago, came to the conclusion that when the primary and secondary coils were placed flat on the earth at a distance from one another, nearly all the energy of the primary was absorbed by the earth before reaching the secondary. The degree of absorption was so great that Mr. Whitehead had hesitated to publish his theoretical results until experiment should confirm them. Prof. Lodge concurred with Mr. Whitehead's result. Three cases were to be considered. In the first, one horizontal coil is superposed to the other, with sea-water or some other absorbing medium between them; in this case the absorption at moderate distances is not excessive. But, of course, if the coils are formed of cable sheathed with iron, as in the recent experiments made by the Royal Commission, the iron itself prevents the progress of electric waves from primary to secondary. In the second case the coils are wholly in the same horizontal plane. The earth, owing to its great magnitude, behaves almost as a perfect conductor; if the coils are now near the earth, there is no normal magnetic force between them—it is all tangential. In the third case the coils are opposed to one another, both being vertical, and near to the earth. The high conductivity of the earth is here acting to the advantage of wave propagation, for the image of the primary coil is in phase with the coil itself, and the total effect is approximately doubled.—Prof. Carey Foster then took the chair, and Prof. Oliver Lodge read a paper by Mr. Benjamin Davies, on a new form of amperemeter and voltmeter with a long scale. These instruments are already well known, although no account of them has actually been published. They are of the moving-coil, long-range, portable type, with a very uniform scale from zero to maximum. The magnetic circuit has only one air-gap, which is generally the space between a central cylinder of iron or steel and a concentric tube of iron, modified in various ways for facilitating the adjustment of the magnetic induction and the placing of the coil. The central cylinder is bored axially, and one side of the rectangular coil is pivoted at the top and bottom of the hole thus made. The second side of the coil moves in a circular path in the annular air-gap. Photographs of the instruments in several modified forms were exhibited. Prof. Ayrton said the instruments appeared to be very successful; he could bear witness of their value, particularly as regards the length of range. The general principle by which long-range was to be obtained on moving-coil, portable, instruments, was developed some ten years ago by M. Carpentier of Paris, who used a central magnet surrounded by a concentric hollow cylinder, with only one side of the coil in the magnetic gap between them; but it was not then a portable form of instrument, for the coil was suspended. Prof. Ayrton had himself worked in this direction in the "static station-voltmeter," in that instrument there were three magnetic circuits arranged to give staticism; this was described in 1892 or 1893.—The Vice-President (Prof. Carey Foster) proposed a vote of thanks to the author, and the meeting adjourned until February 24.

Chemical Society, February 2.—Prof. Dewar, President, in the chair.—The following papers were read:—Maltodextrin, its oxidation products and constitution, by H. T. Brown and J. H. Millar. Pure maltodextrin, isolated from the products of starch hydrolysis, yields, on very careful oxidation, a carboxylic acid which the authors term provisionally maltodextrinic acid A, and to which they assign the constitution

$$C_{12}H_{21}O_{10}.O.C_{12}H_{20}O_9.O.C_5H_9O_5;$$

this on further oxidation yields a maltodextrinic acid B,

$$C_{12}H_{21}O_{10}.O.C_5H_9O_5$$

and maltose. The constitution

$$C_{12}H_{21}O_{10}.O.C_{12}H_{20}O_9.O.C_{12}H_{21}O_{10}<,$$

is assigned to maltodextrin, the sign < denoting the open carbonyl.—On attempts to prepare pure starch derivatives through their nitrates, by H. T. Brown and J. H. Millar.—The stable dextrin of starch transformations, and its relation to maltodextrin and to soluble starch, by H. T. Brown and J. H. Millar. A stable dextrin is obtained at an early stage in the diastatic transformation of starch, and yields a carboxylic dextrinic acid on cautious oxidation. The following constitutions are assigned to the dextrin and the dextrinic acid respectively:—

$$O_{39}\begin{cases} C_6H_{11}O_5 \\ (C_{61}H_{10}O_4)_{39} \\ C_6H_{11}O_5< \end{cases} \qquad O_{39}\begin{cases} C_6H_{11}O_5 \\ (C_6H_{10}O_4)_{38} \\ C_5H_9O_5 \end{cases}$$

Propylbenzenesulphonic acids, by G. T. Moody.—The chemistry of the so-called nitrogen iodide. Part I. The preparation and properties of nitrogen iodide, by F. D. Chattaway and K. J. P. Orton. Well-defined crystals of nitrogen iodide are slowly

deposited on adding ammonia to dilute potassium hypoiodite solution; they are copper-coloured and have a density of 3·5. Part II. The action of reducing agents on nitrogen iodide, by F. D. Chattaway and H. P. Stevens. Part III. The composition of nitrogen iodide, by F. D. Chattaway. Nitrogen iodide, however prepared, has the composition $N_2H_3I_3$. Part IV. The action of light on nitrogen iodide, by F. D. Chattaway and K. J. P. Orton. Nitrogen iodide is decomposed by light, yielding nitrogen and hydrogen iodide; slight hydrolysis also occurs with formation of ammonium hypoiodite and ammonia. Part V. The action of alkaline hydrates, of water and of hydrogen peroxide on nitrogen iodide, by F. D. Chattaway and K. J. P. Orton. Alkaline hydrates hydrolyse nitrogen iodide with formation of ammonia and an hypoiodite; some decomposition occurs simultaneously, nitrogen and hydrogen iodide being produced. Water causes a similar decomposition, but the hypoiodous acid and hydrogen iodide in this case react with liberation of iodine. Hydrogen peroxide in potash solution decomposes nitrogen iodide with formation of ammonia, potassium iodide and a little iodate, whilst oxygen and nitrogen are evolved. Part VI. The action of acids on nitrogen iodide, by F. D. Chattaway and H. P. Stevens. Part VII. Theory of the formation and reactions of nitrogen iodide, by F. D. Chattaway and K. J. P. Orton. Iodine and aqueous ammonia react with formation of equimolecular quantities of ammonium iodide and hypoiodite; the latter then decomposes with formation of nitrogen iodide in accordance with a reversible reaction.—An isomeride of amarine, by H. L. Snape and A. Brooke. The action of chlorosulphonic acid on paraffins and other hydrocarbons, by S. Young.—Derivatives of dibenzylmesitylene, by W. H. Mills and T. H. Easterfield. Dibenzoylmesitylene on reduction yields dihydroxydibenzylmesitylene, which on further reduction gives dibenzylmesitylene.—On pseudocampholactone and pseudolauronolic acid, by F. H. Lees and W. H. Perkin, jun. Camphoric anhydride is converted by aluminium chloride in chloroform solution into isolauronolic acid and a new lactone, ψ-campholactone; the latter on hydrolysis yields a mixture of two isomeric acids of the composition $C_9H_{16}O_3$.—Nitrocamphor as an example of dynamic isomerism, by T. M. Lowry.—Position-isomerism and optical activity; the methylic and ethylic salts of benzoyl-, and of ortho-, meta- and para-toluyl-malic acid, by P. Frankland and F. M. Wharton. A considerable quantity of data respecting the rotations of the aromatic derivatives of methylic and ethylic malate is given.—Some regularities in the rotatory power of homologous series of optically active compounds, by P. Frankland.—On brasilin and hæmatoxylin, by A. W. Gilbody and W. H. Perkin, jun.

Zoological Society, February 7.—Prof. G. B. Howes, F.R.S., Vice-President, in the chair.—Mr. F. E. Beddard, F.R.S., read a paper on the cerebral convolutions of the gorilla, in which he reviewed our previous knowledge of the subject, and recorded his own observations on five brains of this animal which he had in his possession.—A communication from Dr. R. O. Cunningham, contained a note on the presence of supernumerary bones occupying the place of prefrontals in the skulls of certain mammals. These bones had recently been observed by the author in skulls of *Macropus giganteus* and *Phascolomys platyrhinus*.—Mr. G. E. H. Barrett-Hamilton read a paper on the mice of St. Kilda, of which he recognised two species—*Mus hirtensis*, sp. nov., a representative of *M. sylvaticus*, and *M. muralis*, sp. nov., representing *M. musculus*. Both of these species showed good distinctive characters from their well-known prototypes.—A communication was read from Prof. W. Blaxland Benham containing a detailed anatomical account of the structure of *Notornis*, based on the examination of a young female specimen of this bird recently received at the Otago Museum, Dunedin, New Zealand.—A communication was read from Mr. E. N. Buxton, containing some notes on the herd of bisons living in the Emperor of Russia's forest of Bielovege in Lithuania, which he had made during a visit to that place in the past autumn.—Mr. G. A. Boulenger, F.R.S., described two new species of lizards, under the names of *Lacerta jacksoni* and *Chamaesaura annectens*, from specimens contained in a collection of reptiles recently sent to the British Museum by Mr. F. J. Jackson, C.B., from the interior of British East Africa.—Mr. Boulenger read the second part of a memoir, entitled "A Revision of the African and Syrian Fishes of the Family *Cichlidae*." Owing to the large amount of material contained in collections recently received from Lake Tanganyika and the Congo, the author had been obliged to make an alteration in the plan of arrangement proposed in Part I. of the paper, and instead of dividing the family into nine genera, he had found it necessary to recognise nineteen genera. The present part contained a synopsis of all the known African and Syrian genera, an enumeration of all the species, and definitions of the genera *Tilapia*, *Steatocranus*, *Docimodus*, and *Paretroplus*, and their species, several of which were described as new.

EDINBURGH.

Mathematical Society, January 13.—Dr. Morgan, President, in the chair.—Elementary notes, by Mr. C. Tweedie.—Against Euler's proof of the binomial theorem for negative and fractional exponents; a note on continued fractions; a proof of the binomial theorem when the exponent is a positive integer, by Mr. R. F. Muirhead.

PARIS.

Academy of Sciences, February 6.—M. van Tieghem in the chair.—New researches relating to the action of sulphuric acid upon acetylene, by M. Berthelot.—The Hall phenomenon and Lorentz's theory, by M. H. Poincaré. The application of the theory of Lorentz to the Hall phenomenon leads to the conclusion that if the conductor is very strongly charged the electromotive force produced should change in sign. The author points out that although it would be of great interest to examine this experimentally, the result, if in agreement with the above conclusions, would not necessarily prove the Lorentz theory to be true, as a similar expression can be got in other ways.—Life in a confined space, by M. d'Arsonval. The apparatus described is so arranged that after the carbon dioxide produced by the breathing of the animal has been absorbed by soda lime, the diminution of pressure thus produced within the closed apparatus is caused to bring together chromic acid and hydrogen peroxide, the oxygen thus being automatically evolved, and the composition of the air remaining constant.—New facts relating to the sub-periosteal amputation of the elbow. Autopsy of an elbow totally amputated twenty-eight years ago, by M. Ollier.—Remarks by M. Lœwy on the presentation to the Academy of the eighth volume of the *Annales de l'Observatoire de Bordeaux*.—On a theorem of M. Hadamard, by M. A. Hurwitz.—Molecular theory of friction of polished bodies, by M. Marcel Brillouin.—Disruptive discharge in a vacuum. Formation of anode rays, by M. André Broca.—On the effects of light at very low temperatures, by MM. Auguste and Louis Lumière. A sensitised gelatino-bromide plant, immersed in liquid air and exposed for a short time to light, shows no appreciable tint on developing. Quantitative experiments showed that with plates of maximum sensibility, to produce equal effects, the exposure at $-191°$ must be about four hundred times as great as at ordinary temperatnres. Plates immersed in liquid air and allowed to regain ordinary temperatures without exposure, undergo no change in any of their properties.—On the employment of sodium peroxide in the study of the respiratory function, by MM. Desgrez and Balthazard. In respiratory studies in a confined space, the products of the reaction between water and sodium peroxide (oxygen and caustic soda) are just those necessary to absorb carbon dioxide and replace it with oxygen.—Formaldoxim as a reagent for detecting minute traces of copper, by M. A. Bach. The chlorhydrate of trioximidomethylene $(CH_2{:}NOH)_3HCl$ gives in presence of caustic potash and traces of copper salts, an intense violet coloration. This violet tint is clearly perceptible in a solution containing one part of copper sulphate in 1,000,000 of water.—On the oxidation of some ureas, by M. Œchsner de Coninck.—Studies of the latent heat of vaporisation of piperidine, pyridine, acetonitrile, and capronitrile, by M. W. Louguinine.—New observations on the development of aromatic principles by alcoholic fermentation in presence of certain leaves, by M. Georges Jacquemin. The addition of an extract of vine-leaves containing glucosides to the must before fermentation causes a distinct improvement in the flavour of the resulting wine.—On methyloctenonal, by M. G. Leser. A study of the products arising from the action of hydroxylamine, aniline, and methylaniline upon this β-ketonic aldehyde.—On crystallised fibrin, by M. A. Maillard. The crystallised fibrin was noticed in some antidiphtheric serum tubes which had been standing for some months.—On the nature of the sugar in diabetic urine, by M. M. G. Patien and E. Dufau. The differences frequently obtained between sugar estimation, by Fehling and by the polariscope, are often due to the fact that lead sub-acetate does

not completely precipitate the lævorotatory substances present in urine. If acid mercurous nitrate is used as the precipitating agent, the two methods agree.—Influence of light on the formation of living nitrogenous substances in the tissues of plants, by M. W. Palladine.

DIARY OF SOCIETIES.

THURSDAY, FEBRUARY 16.

ROYAL SOCIETY, at 4.30.—On the Reflex Electrical Effects in Mixed Nerve and in the Anterior and Posterior Roots: Miss Sowton.—The Characteristic of Nerve: Dr. A. D. Waller, F.R.S.—Observations on the Cerebro-spinal Fluid in the Human Subject: Dr St. Clair Thomson, Dr. L. Hill, and Prof. Halliburton, F.R.S.—The Thermal Deformation of the Crystallised Normal Sulphates of Potassium, Rubidium, and Cæsium: A. E. Tutton.

ROYAL INSTITUTION, at 3.—Toxins and Antitoxins: Dr. Allan Macfadyen.

LINNEAN SOCIETY, at 8.—On the Genus *Lemnalia*, Gray, with an Account of the Branching Systems of the Order Alcyonacea: Gilbert C. Bourne.—On some African *Labiatae*, with Alternate Leaves: J. H. Burkill and C. H. Wright.—Report on the Marine Mollusca obtained during the First Expedition of Prof. A. C. Haddon to the Torres Straits: James Cosmo Melvill and Robert Standen.

CHEMICAL SOCIETY, at 8.—On the Absorption Spectrum and Constitution attributed to Cyanuric Acid: W. N. Hartley, F.R.S.—Ballot for the Election of Fellows.

FRIDAY, FEBRUARY 17.

GEOLOGICAL SOCIETY, at 3.—Annual General Meeting.

QUEKETT MICROSCOPICAL CLUB, at 8.—Annual General Meeting.

SATURDAY, FEBRUARY 18.

ROYAL INSTITUTION, at 3.—Mechanical Properties of Bodies: Lord Rayleigh, F.R.S.

MONDAY, FEBRUARY 20.

SOCIETY OF ARTS, at 8.—Cycle Construction and Design: Archibald Sharp.

IMPERIAL INSTITUTE, at 8.30.—Thirty-eight Years in Queensland: Hon. Sir Horace Tozer, K.C.M.G.

VICTORIA INSTITUTE, at 4.30.—Life: Prof. Beale, F.R.S.

TUESDAY, FEBRUARY 21.

ROYAL INSTITUTION, at 3.—Morphology of the Mollusca: Prof. E. Ray Lankester, F.R.S.

SOCIETY OF ARTS, at 8.—Vitreous Enamels: Cyril Davenport.

ZOOLOGICAL SOCIETY, at 8.40.—On a Portion of Skin, named *Neomylodon listai*, from a Cavern near Consuelo Cove, Last Hope Inlet, Patagonia. With a Description of the Specimen by Mr. A. Smith Woodward: Dr. F. P. Moreno.—On the Formation of the Coral-Reefs of the North-west Coast of Australia: Surgeon P. W. Bassett-Smith.—On a Collection of Reptiles and Batrachians made by Mr. J. D. La Touche in North-west Fokien, China: G. A. Boulenger, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Paper to be further discussed: The Lake Superior Iron Ore Mines, and their Influence upon the Production of Iron and Steel: Jeremiah Head and Archibald P. Head.

ROYAL STATISTICAL SOCIETY, at 5.—Comparative Statistics of Australasian Railways: Price Howell.

ROYAL PHOTOGRAPHIC SOCIETY, at 8.—Demonstration with Violet Electric Waves for Actuating Photographic Apparatus, and for Photographing Lightning in Daylight: F. H. Glew.

WEDNESDAY, FEBRUARY 22.

SOCIETY OF ARTS, at 8.—Electric Traction, and its Application to Railway Work: Philip Dawson.

GEOLOGICAL SOCIETY, at 8.—On Varieties of Serpentine and Associated Rocks in Anglesey: Prof. T. G. Bonney, F.R.S., and Miss C. A. Raisin.—Remarks on the Genera *Ectomaria*, Koken, and *Hormotoma*, Salter; with Descriptions of British Species: Miss. J. Donald.

INSTITUTION OF MINING ENGINEERS (Stoke-upon-Trent), at 11.30.—The following Papers will be read or taken as read:—Historical Sketch of the First Institute of Mining Engineers: Bennett H. Brough.—Further Notes on Pit-props: Prof. H. Louis.—The Working of the Boiler Explosions Acts, 1882 and 1890: E. G. Hiller.—Alternating Currents and their possible Applications to Mines: Sydney F. Walker.—Notes on Coal-cutting Machinery: L. W. de Grave.—Safety Explosives: W. J. Orsman.—The Occurrence of Anhydrite in the North of England: C. E. de Rance.—Sulphur-Mines in the South of Spain: Arthur P. Wilson.

THURSDAY, FEBRUARY 23.

ROYAL SOCIETY, at 4.30.—*Probable Papers:* The Efficiency of Man, or Economic Coefficient of the Human Machine: Dr. Marcet, F.R.S., and R. B. Floris.—Some Experiments bearing on the Theory of Voltaic Action: J. Brown.—Deposition of Barium Sulphate as a Cementing Material of Sandstone: Dr. F. Clowes.

ROYAL INSTITUTION, at 3.—Toxins and Antitoxins: Dr. Allan Macfadyen.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.

FRIDAY, FEBRUARY 24.

ROYAL INSTITUTION, at 9.—Coherers: Prof. Oliver Lodge, F.R.S.

PHYSICAL SOCIETY, at 5.—The Joule-Thomson Thermal Effect: E. F. J. Love.—(1) A Study of an Apparatus for the Determination of the Rate of Diffusion of Solids dissolved in Liquids; (2) Note on the Source of Energy in Diffusive Convection; Albert Griffiths.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Loss of Heat from Buildings: R. Gordon Mackay.

SATURDAY, FEBRUARY 25.

ROYAL INSTITUTION, at 3.—Mechanical Properties of Bodies: Lord Rayleigh, F.R.S.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—A Digest of Metabolism Experiments: Drs. Atwater and Langworthy (Washington).—De la Méthode dans la Psychologie des Sentiments: Prof. F. Rauh (Paris, Alcan).—La Photographie Animée: E. Trutat (Paris, Gauthier-Villars).—Medical Works of the Fourteenth Century: Rev. Prof. Henslow (Chapman).—The Story of the Mind: J. M. Baldwin (Newnes).—Les Formes Épitoques et l'Évolution des Cirratuliens: M. Caullery and F. Mesnil (Paris, Baillière).—The Foundations of Zoology: Prof. W. K. Brooks (Macmillan).—Commercial Cuba: W. J. Clark (Chapman).—Remarkable Comets: W. T. Lynn, 7th edition (Stanford).—General Physiology: Prof. Max Verworn, translated and edited by Dr. F. S. Lee (Macmillan).—Siddhánta-Darpana, a Treatise on Astronomy: M. S. S. C. Simha, edited, &c., by Prof. J. C. Ráy (Calcutta).

PAMPHLETS.—Biblical Antiquities: C. Adler and I. M. Casanowicz (Washington).—Manchester Museum, Owens College Museum Handbooks, Publication No. 24 (Manchester).

SERIALS.—Bulletin de la Académie Royale des Sciences, &c., de Belgique, 1898, No. 12 (Bruxelles).—Bulletin from the Laboratories of Natural History of the State University of Iowa, December (Iowa).—Atlantic Monthly, February (Gay).—Encyklopädie der Mathematischen Wissenschaften, Band 1, Teil 1, Heft 2 (Leipzig, Teubner).—Quarterly Journal of Microscopical Science, January (Churchill).—Monthly Weather Review, November (Washington).—Among British Birds in their Nesting Haunts: O. A. J. Lee, Part xiii. (Edinburgh).—Bulletin of the New York State Museum, November (Albany).—Quarterly Journal of the Geological Society, February (Longmans).—Agricultural Gazette of New South Wales, December (Sydney).—Himmel und Erde, February (Berlin).—Proceedings of the American Association, August 1898 (Salem).

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