

THE London Technical Education Board will proceed in July next to award three junior scholarships in practical gardening, which will be tenable at the new School of Practical Gardening which has recently been opened at the gardens of the Royal Botanic Society in Regent's Park. This school has been established with the view of providing a complete course of instruction for lads who desire to become gardeners. The scheme of work, which has been drawn up by the Royal Botanic Society, combines thorough practical instruction in all the operations of gardening with theoretical instruction in botany and the nature of soils and manures. The course is arranged so as to extend over three years.

THE list of entrance scholarships and exhibitions awarded at Pembroke, Gonville and Caius, King's, Jesus, Christ's, and Emmanuel Colleges, Cambridge, affords an indication of the comparative encouragement given to classics and science at the University. It appears from the list that the scholarships for classics have the value of 1360*l.* Mathematics comes second with scholarships amounting to the value of 640*l.*, and the natural sciences take the last place with scholarships having a total value of 390*l.* Considering that the Science Tripos is the largest, or nearly the largest, this seems a discouraging division of the scholarship fund. It is only fair to add that at Trinity and St. John's Colleges the authorities are far more liberal to science, the value of scholarships awarded for natural sciences at the former College being 330*l.*, and at the latter, 205*l.*

THE *Times* of Monday contains a detailed report of a conference held on Saturday last at the rooms of the Society of Arts, Adelphi, to consider the expediency of further development in the constitution of the Royal Holloway College in the light of the founder's expressed desire that powers should ultimately be sought enabling the college to confer degrees on its students. Mr. Bryce, M.P., one of the governors of the college, presided, and there was a large and influential gathering of educationists. Papers were read by Mr. R. D. Roberts in favour of an application from Holloway College for a separate charter to enable it to confer degrees upon its students; by Mr. Strachan Davidson, of Balliol College, Oxford, in support of the establishment of a women's university, of which Holloway College should form a part; and by Mrs. Bryant in advocacy of the proposal that Holloway College should become an integral member of the new teaching University of London. A number of letters from prominent educationists were read, expressing their views on the subject. A discussion followed, in which Mrs. Henry Fawcett, Miss Emily Davies, Mrs. Sidgwick, of Newnham, Miss M. Gurney, Sir Joshua Fitch, Mr. H. Sidgwick, and others took part. There was a practical consensus of opinion against the proposal that Holloway College should give degrees; a great majority of the speakers were opposed to the creation of a separate University for women, and many of them were in favour of connection with the new London University.

THE new Academic Hall of Edinburgh University, opened on Saturday last, is another testimony to the close and friendly connection which has always existed between the University and the city. In 1888, Mr. William M'Ewan, M.P. for the Central Division of Edinburgh, offered a sum of 40,000*l.* with which to build the Academic Hall, which had formed a part of the original plans of the new University buildings, which had already cost 250,000*l.* to complete. This offer Mr. M'Ewan afterwards, on its being made clear that the amount was inadequate if the hall was to be proportionate to the buildings already erected, agreed to increase to 62,000*l.*, which was the original estimate of the cost of the hall. As the scheme grew under the hands of the architect, artificers, decorators, and organ builders, the liberality of Mr. M'Ewan kept pace, and the hall, as it now stands completed, has cost him 115,000*l.* The gift is a noble one, and it provides a noble example of the interest which the citizens of Edinburgh take in the welfare of the University. In accepting the deed of conveyance, on behalf of the University, Mr. Balfour said: "I confess that I have seen with feelings of regret, sometimes almost amounting to shame, the extreme difficulty which there has been not merely in connection with Edinburgh, but in connection with other great seats of learning, to obtain from the liberality of a not illiberal public sufficient means to make our great British Universities all that British Universities should be. I fear that in this respect we can but ill stand comparison with our cousins of the United States. There, if my information is not incorrect, they have never failed to find men with the means and with the will to keep the institutions of

higher education in their country abreast with the ever-growing necessities of such institutions; and the number of generous benefactors which America has been able to show may well cause some feeling of shame, I think, in us on this side of the Atlantic, speaking the same language, possessing the same culture, aiming at the same objects, but who have not always shown in pursuit of those objects the same uninterested generosity. The relations between Edinburgh and the University, always close, almost always friendly, have not been diminished by changes in the status of the University. In connection with this very hall, or rather with the surroundings and accessories to the hall, the city of Edinburgh has shown itself possessed of the same generous public spirit, the same desire to do everything in its power to promote the interests of this great seat of learning which it has shown throughout all the centuries since this University was first founded." Mr. M'Ewan's liberality and Mr. Balfour's remarks upon the relations between the city of Edinburgh and the University should furnish food for reflection to the citizens of London.

THE *Technical Education Gazette* publishes a few particulars with regard to the entries in the various classes at the nine polytechnics which are in receipt of aid from the Technical Education Board of the London County Council. The most significant fact in connection with the polytechnics is that, notwithstanding the opening of four new large polytechnics during the four years that the Board has been at work, no diminution has been caused in the number of students attending the older institutions, but on the contrary, every one of the nine institutions shows an increase in the number of class entries for the present session. Thus the remarkable result has been brought about that, although these four new institutions show this session a total of over 8000 class entries, representing a total number of nearly 5000 individual students, yet the enrolment of these new students has not only not decreased the membership of the other older institutions but has actually stimulated their growth. It may be estimated that there are now in attendance at the evening classes of the nine polytechnics about 18,000 individual students, the great majority of whom are engaged in systematic courses of evening instruction under the direction of the principal of the institution where they are studying. If we take the class entries in detail according to the various branches of study, we find that the classes in the building trades show in almost every case an increase in the number of students. In the engineering trades there is likewise a very general increase in the attendance at the classes. The great demand that exists for evening instruction in electrical engineering is shown by the fact that in both the two polytechnics in the south-west district of London, the Battersea Polytechnic and the South-west London Polytechnic at Chelsea, the number of students has increased during the past year with remarkable rapidity. Another satisfactory instance of increase is shown in the classes in typography and letterpress printing. Perhaps the most remarkable fact of all is that the original polytechnic at Regent Street, which draws its students from all parts of the metropolis, and which might therefore have been expected to suffer from the growth of new institutions, continues not only to maintain its numbers but even shows a further increase on last year. Last year the number of individual students attending on November 1 was 5583; this year there were in attendance on November 1 as many as 5848, representing an increase of about 5 per cent. A very rapid development has taken place in the classes at the South-west London Polytechnic. So numerous are the entries this session for both the day and the evening departments, that the resources of the building are taxed to the utmost, and very serious inconvenience is being caused in some of the departments by the want of sufficient accommodation.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 18.—"Account of a Comparison of Magnetic Instruments at Kew Observatory." By Dr. C. Chree, F.R.S., Superintendent.

Last July, M. T. Moureaux, of the Parc Saint-Maur Observatory, near Paris, brought over to England the travelling instruments employed in his magnetic survey of France, and a comparison was made between these and the standard magnetic instruments at Kew Observatory.

The comparison serves to connect the standard instruments at Kew Observatory with the standard French instruments at Parc Saint-Maur, the latter, as M. Moureaux has had the goodness to inform the author, being in excellent agreement with his travelling instruments. Parc Saint-Maur may be regarded as the base station for M. Moureaux's great survey of France and Algeria. M. Moureaux's observations occupied the afternoon of July 26, and the forenoons of July 27, 28 and 29. On the afternoons of the last three days, observations were made with the Kew standard instruments by Mr. T. W. Baker, chief assistant at the Observatory. The observations, being made at different hours of the day, had to be connected through the intermediary of the curves from the self-recording magnetic instruments.

The means of the declination and inclination readings from the Kew instruments exceeded the means from M. Moureaux's instruments by 0'5 and 2'0 respectively, but the mean horizontal force reading from the Kew instrument was lower than M. Moureaux's by '00012 C.G.S. unit. In calculating the last-mentioned element, M. Moureaux made use of new values of the constants of the French instruments, to be put into general use after January 1, 1898.

The comparison is utilised to extend a table ("Brit. Assoc. Report for 1896," p. 97) in which Prof. Rücker and Mr. W. Watson embodied the results of their comparison of the standard instruments at various English and Irish observatories, made by means of travelling instruments in 1895.

The results may be summarised as follows:—

Observatory	Departures from imaginary mean instrument of the five Observatories		
	Declination	(Hor. force) $\times 10^5$ C.G.S. units	Inclination
Kew	+ 0'2	- 1	+ 0'2
Parc Saint-Maur.	- 0'3	+ 11	- 1'8
Falmouth	+ 1'0	+ 17	+ 1'8
Stonyhurst	- 0'9	+ 5	- 2'0
Valencia	+ 0'2	- 30	+ 2'0

"On *Spencerites*, a new Genus of Lycopodiaceous Cones from the Coal-measures, founded on the *Lepidodendron Spenceri* of Williamson." By D. H. Scott, F.R.S.

The fossils which form the subject of the present paper are Cryptogamic strobili, showing evident Lycopodiaceous affinities, but differing in important points from other fructifications of that family, so that it appears necessary to establish a new genus for their reception.

Two species are described, one of which (*Spencerites insignis*) is already known to us from the investigations of Williamson, who named it first *Lepidostrobus insignis*, and afterwards *Lepidodendron Spenceri*, while the other (*Spencerites majusculus*) is new.

In one of his latest publications, Williamson pointed out that it might ultimately be necessary to make his *Lepidodendron Spenceri* the type of a new genus. The separation thus suggested is now carried out, on the basis of a renewed investigation of the structure of this fossil.

Spencerites insignis is a pedunculate strobilus; the vegetative organs are not as yet identified. The specimens are calcified, and their structure admirably preserved.

The anatomy of the axis is of a simple Lycopodiaceous type, but differs in details (such as the course of the leaf-trace bundles) from that of the axis of *Lepidostrobus*. The peduncle bears sterile bracts, similar to the sporophylls of the cone itself; the latter are arranged spirally, or in some cases in alternating verticils.

The individual sporophylls are of peltate form, consisting of a short cylindrical pedicel, expanding into a relatively large lamina. The sporangia are approximately spherical bodies; unlike those of *Lepidostrobus*, they are quite free from the pedicel, and are attached by a narrow base to the upper surface of the lamina, where it begins to expand.

The details of the sporangial wall are quite different from those of *Lepidostrobus*, and the spores are also characteristic. In size they are intermediate between the microspores and macrospores of *Lepidostrobus*. They are of tetrahedral form, becoming spheroidal when mature, and each spore has a hollow, annular wing running round its equator. The wing is no doubt formed

by a dilation of the cuticle, and not, as Williamson supposed, from the abortive sister-cells.

Spencerites majusculus, the new species, is much larger than the former, the axis of the cone being twice as thick. The anatomy is similar, but the sporophylls, and consequently the leaf-traces, are more numerous. The sporophylls, which are arranged in alternating verticils, are relatively short, and of peculiar form; the lamina is very thick, and of great tangential width. The sporangia are like those of the former species, and similarly inserted, but the spores are quite different. They are smaller than those of *S. insignis*, and have the form of quadrants of a sphere, with narrow wings along their three angles.

The genus is separated from *Lepidostrobus*, mainly on account of the very different mode of insertion of the sporangia, a character which is accompanied by differences in the form of the sporophylls and sporangia, the structure of the sporangial wall and of the spores, and the whole habit of the strobilus.

Spencerites, and especially *S. insignis*, bears a considerable resemblance to the *Sigillariostrobus Crepini*, of Zeiller, but cannot be united with the genus *Sigillariostrobus*, for the insertion of the sporangia in the latter, as shown in the *Sigillariostrobus ciliatus*, of Kidston, is totally different. The author is much indebted both to M. Zeiller and Mr. Kidston, for the loan of their specimens for examination.

Zoological Society, November 30.—Mr. E. T. Newton, F.R.S., in the chair.—Mr. Oldfield Thomas exhibited specimens of a remarkable partially white Antelope of the genus *Cervicapra*, which had been obtained by Mr. F. V. Kirby in the mountains of the Lydenburg district of the Transvaal, and read an account of them contributed by Mr. Kirby himself. Mr. Oldfield Thomas also exhibited a skin of a new Skunk of the genus *Spilogale* from Sinaloa, Mexico, proposed to be termed *Spilogale pygmaea*. It was interesting as being of barely half the size of any previously known species, and also differed from all its congeners in the median dorsal stripes being uninterrupted posteriorly, and in having white hands and feet.—Mr. Thomas likewise exhibited a Badger from Lower California, proposed to be termed *Taxidea taxus infusca*, which differed from the described forms of *T. taxus* in its dark coloration and broad nuchal stripe.—Mr. Sclater exhibited the head of a *Capra* from Arabia, which had been recently described as *Capra mengesi*. Mr. Sclater was inclined to believe that the specimen was referable to *Capra sinaitica*, in which opinion Mr. O. Thomas agreed with him.—Mr. R. E. Holding exhibited a pair of curiously deformed horns of the Fallow Deer, and made remarks on the associations between organic disease and defective horn-growth.—On behalf of Mr. R. Lydekker was exhibited a skin and antlers of a small form of the Mule Deer from Lower California, for which he suggested the name *Mazama hemionis peninsularis*. It differed from *M. h. californicus* in its small size, black dorsal line, and in the reduction of white on the tail.—Mr. G. A. Boulenger, F.R.S., exhibited some specimens of a South-American Siluroid Fish (*Vandellia cirrhosa*), and made remarks upon its curious habits.—A communication from Mr. H. H. Brindley, on regeneration of the legs in *Blattidae*, was read. It consisted of an account of the statistical and experimental evidence of the reproduction of lost or injured legs in the *Blattidae*, obtained since the publication of Mr. W. Bateson's book, "Materials for the Study of Variation," in 1894, and of some points in the post-embryonic development of the Cockroach (*Periplaneta orientalis*).—Mr. G. A. Boulenger, F.R.S., read a paper on a gigantic Sea-perch, *Stereolepis gigas*. This fish was described both externally and internally, and the author pointed out that *Megaperca ischinagi*, Hilgendorf, was specifically identical with it. Mr. G. A. Boulenger also described a new Tortoise of the African genus *Sternotherus*, a specimen of which had lately been received at, and was still living in, the Society's Gardens. It was proposed to name it *Sternotherus oxyrhinus*.—A communication from Mr. W. E. Collinge, on the structure and affinities of some further new species of slugs from Borneo, was read. Three new species, namely, *Parmarion fulloni*, *P. flavescens*, and *Microparmarion constrictus*, were described, and the author intimated that Simroth's genus *Microparmarion* would, on examination of more material, probably be found to be of only sectional value.

EDINBURGH.

Mathematical Society, November 12.—Mr. J. B. Clark, Vice-President, in the chair.—Prof. George A. Gibson contributed a paper on the "Treatment of Arithmetical Progress-

sions by Archimedes," and communicated a paper by M. Lemeray, entitled "Quatrième Algorithme Naturel." The following were elected office-bearers for the current session:—President, Mr. J. B. Clark; Vice-President, Dr. Alexander Morgan; Hon. Secretary, Mr. J. W. Butters; Hon. Treasurer, Mr. D. Tweedie; Editors of *Proceedings*, Mr. W. J. Macdonald, Dr. Knott, Mr. Charles Tweedie; Committee, Messrs. G. Duthie, R. F. Muirhead, and J. D. H. Dickson.

MANCHESTER.

Literary and Philosophical Society, November 30.—Mr. J. Cosmo Melville, President, in the chair.—Mr. H. W. Freston (Prestwich) and Mr. C. E. Stromeyer (Manchester) were elected ordinary members of the Society.—The President announced that the Council had awarded the Wilde Gold Medal of the Society for 1898 to Sir Joseph Dalton Hooker, C.B., K.C.S.I., F.R.S., in recognition of his eminent services to all branches of botanical science; and had awarded the Dalton Medal of the Society (struck in 1864) for 1898 to Dr. Edward Schunck, F.R.S., for his remarkable series of researches on the natural colouring matters; also that the premium for 1898 of fifteen guineas had been awarded to Mr. John Butterworth, of Shaw, for his paper, printed in the *Manchester Memoirs*, on some further investigations of fossil seeds of the genus *Lagenostoma* (Williamson).—Prof. H. Lamb read a paper entitled "On waves in a medium having a periodic discontinuity of structure." The main object of the paper is to examine the selective total reflection which takes place at the boundary of a medium of this character. In the examples chosen for discussion the medium is represented by a string supposed to be capable of longitudinal vibrations, and the periodic interruption of properties may consist in a series of attached masses, or of attached particles, which are, moreover, urged towards fixed positions by springs, or to particles connected with the string by loose springs. The same analysis applies to media constituted in many other ways, and it is further shown how the methods may be adapted to cases where dynamical systems of a much more general character are interpolated at regular intervals. There are some instructive contrasts between the results obtained in the special cases above enumerated; in particular, in the last-mentioned case (that of particles attached by loose springs) it appears that relatively short waves may be transmitted freely unless the wave-length happens to fall within certain narrowly defined intervals. We have here, perhaps, an illustration of the theory of refraction sketched by Sir George Stokes in the Wilde Lecture; but some caution is, of course, necessary in drawing inferences as to theories of radiation and absorption from the study of a one-dimensional model.

PARIS.

Academy of Sciences, November 29.—M. A. Chatin in the chair.—New method of preparing carbides by the action of calcium carbide upon oxides, by M. Henri Moissan. Calcium carbide reacts with many metallic oxides at the temperature of the electric furnace, giving the carbide of the metal and lime, the latter being again partially converted into carbide by the carbon of the crucible. The carbides of aluminium, manganese, chromium, molybdenum, tungsten, titanium, and silicon were obtained by this method. The oxides of lead, bismuth and tin gave the pure metals on similar treatment.—Experimental typhoid infection, produced by the introduction of a virulent culture into a Thiry cavity, by MM. R. Lépine and B. Lyonnet.—M. Ditte was elected a Member in the Section of Chemistry, in the place of the late M. Schützenberger.—Report on a memoir of M. Le Roy, entitled "On the integration of the equations of heat."—Observations of the new planet Villiger (1897, November 19) made at the Observatory of Algiers, by MM. Rambaud and Sy.—On two occultations of the Pleiads by the moon, by M. Lagrula. The observations are utilised for the determination of the semi-diameter and parallax of the moon at its mean distance.—Employment of the method of least squares to reveal the presence of systematic errors, by M. Jean Mascart. The determination of the vertical by means of the meridian circle is subject to errors much larger than would follow from the possible error of each microscope reading. With a view to see how far these fluctuations were due to alterations of temperature, a series of fifty determinations was made, giving fifty equations of condition for each microscope for three unknowns, the deviations being assumed as a quadratic function of the temperature. The results showed, however,

that the fluctuations due to temperature changes are extremely small, and that the comparatively large errors observed must be due to other causes.—Observations of the sun made at the Observatory of Lyons, with the Brunner equatorial, during the third quarter of 1897, by M. J. Guillaume.—Influence of altitude and of heat upon the decomposition of oxalic acid by sunlight, by M. J. Vallot and Mme. Gabrielle Vallot. It has been found that, although oxalic acid is practically undecomposed by heat alone, the velocity of the reaction with actinic light is very greatly accelerated by a rise of temperature. Thus two solutions of oxalic acid exposed to sunlight under similar conditions, except that one was maintained 12° higher than the other, gave decompositions of 10 and 50 per cent. respectively. The rate of decomposition also increased rapidly with the altitude.—On the fundamental theorem of projective geometry, by M. H. G. Zeuthen.—On the equation to periods, by M. N. Stouff.—On the Bessel functions $S''(x)$ and $O''(x)$, by M. L. Crelier.—On the static and dynamical explosive potentials, by M. R. Swyngedauw. A reply to some criticisms of M. Jaumann.—A simple method of proving the change of period of sodium light in a magnetic field, by M. A. Cotton. A flame feebly tinged with sodium is observed through another flame also containing sodium. The edges of the second flame appear to be black, owing to its gaseous envelope being absorbent. Any small change in the period of vibration of the more distant flame, produced by the action of the magnetic field, suppresses the absorption, and causes the black border of the interposed flame to disappear. In this way it is easily shown that a change of period of light emitted parallel to the lines of force, completely extinguishes the dark border, whilst with observations made perpendicularly to the lines of force, the border grows lighter on completing the circuit round the magnet, but does not completely disappear.—Osmotic researches on very dilute solutions of cane sugar, by M. Ponsot. The author was successful in making membranes impermeable to sugar. With these measurements of osmotic pressure were made of sugar solutions containing only 1.235 and 0.6175 grams per litre. The mean of the observed pressures was exactly equal to that calculated by the Van t' Hoff formula, on the assumption that no dissociation of the sugar took place, or the coefficient $i = 1$.—On the alcoholic isocyanurates and the constitutional formula of cyanuric acid, by M. Paul Lemoult. The heats of combustion of methyl and ethyl isocyanurates were determined, and the conclusion drawn that isocyanuric acid has a ring-shaped constitution, a symmetrical tricarbimide.—Quinones and hydroquinones, by M. Amand Valeur. Determinations of the heats of combustion of toluquinone, thymoquinone, hydroquinone, hydrotoluquinone, and hydrothymoquinone.—On the transformation of sorbite into sorbose by the *Mycoderma vini*, by M. A. Matrot. The best experimental conditions for the production of sorbose from sorbite by means of the yeast *Mycoderma vini* are worked out in detail.—On the germinative plates of the Coleoptera, by M. A. Lécaillon. For certain Coleoptera it is shown that the blastula stage does not appear in development, the gastrula stage following immediately upon segmentation, and showing no typical invagination.—On the *Rouget*, a human parasite, by M. Brucker. This parasite, which appears as a parasite to man in August and September, is shown to be probably the larva of *Trombidium gymnopterorum*.—On the culture of the nostoch in presence of glucose, by M. Raoul Bouilhac.—On the characteristics of nerve and muscle stimulation, by M. G. Weiss. A reply to the criticisms of M. Dubois. The author claims that the experiments cited by M. Dubois are in reality confirmatory of his views.—Analysis of vocal sounds by the phonograph, by MM. Marichelle and Hémarinquer. In spite of the various influences which act upon the form of the period, such as musical pitch, intonation, intensity, and individual conformation of the sounding organ, each vowel is distinguished by certain invariable characters, constituting it a real individual.—On the absorption of organic materials by roots, by M. Jules Laurent. Experiments were made with maize upon solutions of glucose and invert sugar, and in every case a certain quantity of the sugar was absorbed by the roots, the amount of which appeared to be proportional to the dry weight of the plant. The sugars are utilised by the plant, and in great part excreted as carbon dioxide.—The favourable times in the treatment of black rot, by M. A. Prunet. A treatment with copper salts applied immediately after one invasion of the disease, acts beneficially against a future invasion, the maximum effect being pro-

duced by treating the vine from five to eight days after the first appearance of the spots.—On the rational construction of mills with metallic rollers, by M. J. Schweitzer.—On the analysis of silicates, by M. A. Leclère. The conditions are prescribed under which silicates may be safely opened up in a platinum crucible by means of lead oxide, the chief points being the purity of the oxide, and the complete exclusion of reducing gases by the use of a muffle.—On some peculiar circumstances which appear to have accompanied the fall of a meteorite on April 9, 1891, at Indarek in Transcaucasia, by M. Stanislas Meunier.—On the contamination of the springs of Sauve (Gard), by M. E. A. Martel. The contamination of the water supply of Sauve by sewage was proved directly by means of fluorescein. The frequent epidemics which have decimated this town are thus explained.—On two radiographs of the thorax, by M. F. Garrigou.

DIARY OF SOCIETIES.

THURSDAY, DECEMBER 9.

ROYAL SOCIETY, at 4.30.—On the Densities of Carbonic Oxide, Carbonic Anhydride, and Nitrous Oxide: Lord Rayleigh, F.R.S.—On the Application of Harmonic Analysis to the Dynamical Theory of the Tides. Part II. On the General Integration of Laplace's Dynamical Equations: S. S. Hough.—A Note on some Further Determinations of the Dielectric Constants of Organic Bodies and Electrolytes at Very Low Temperatures: Prof. Dewar, F.R.S., and Prof. Fleming, F.R.S.—On Methods of making Magnets independent of Changes of Temperature, and some Experiments upon Negative Temperature Co-efficients in Magnets: J. R. Ashworth.—The Electric Conductivity of Nitric Acid: V. H. Veley, F.R.S., and J. J. Manley.—On the Calculation of the Co-efficient of Mutual Induction of a Circle and a Coaxial Helix, and of the Electromagnetic Force between a Helix and a Coaxial Circular Cylindrical Sheet: Prof. J. V. Jones, F.R.S.—On the Refractivities of Air, Nitrogen, Argon, Hydrogen, and Helium: Prof. W. Ramsay, F.R.S., and M. W. Travers.

MATHEMATICAL SOCIETY, at 8.—The Construction of the Straight Line joining Two Given Points: Prof. W. Burnside, F.R.S.—A Theorem concerning the Special Systems of Point Groups on a Particular Type of Base Curve: Miss F. Hardcastle.—A General Type of Vortex Motion; R. Hargreaves.—Note on a Property of Pfaffians: H. F. Baker.

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

FRIDAY, DECEMBER 10.

PHYSICAL SOCIETY, at 5.—An Exhibition of an Apparatus for Self-acting Temperature Compensation of a Standard Cell: Albert Campbell.—On Lord Kelvin's Absolute Method of Graduating Thermometers: Rose Innes.

ROYAL ASTRONOMICAL SOCIETY, at 8.—Occultation of Ceres by the Moon on 1897 November 13, observed at the Hamburg Observatory: G. Rümker.—A Determination of the Latitude Variation and of the Constant of Aberration from Observations made at the Royal Observatory, Cape of Good Hope, 1892-94: W. H. Finlay.—The Binary Star λ 5014: R. T. A. Innes.—Mean Areas and Heliographic Latitudes of Sun-spots in the Year 1895, deduced from Photographs taken at the Royal Observatory, Greenwich, at Dehra Dûn (India) and in Mauritius.

MALACOLOGICAL SOCIETY, at 8.—A Description of a Supposed New Species of *Monodonta (Austrocochlea)* from Tablas Island: G. B. Sowerby.—On a New Species of *Ambiphotronus* from the Malay Archipelago (Alor Island): Hugh Fulton.—On a New Species and Probable New Sub-Genus of *Endodina* from Ceylon, collected by O. Collett: Lieut.-Colonel H. H. Godwin-Austen, F.R.S.—Notes on a Second Collection of Marine Shells from the Andaman Islands, with Descriptions of New Forms: J. Cosmo Melville and E. R. Sykes.—On a Small Collection of Marine Shells from New Zealand and Macquarie Island, with Descriptions of New Species: E. A. Smith.

SATURDAY, DECEMBER 11.

ESSEX FIELD CLUB (at Chingford), at 6.30.—Notes on the Conference of Delegates of Corresponding Societies of the British Association at Toronto: Prof. Meldola, F.R.S.—Two Essex Minerals: T. S. Dymond and F. W. Maryon.

SUNDAY, DECEMBER 12.

SUNDAY LECTURE SOCIETY, at 4.—Colour: Dr. C. W. Kimmins.

MONDAY, DECEMBER 13.

SOCIETY OF ARTS, at 8.—Gutta-Percha: Dr. Eugene F. A. Obach. IMPERIAL INSTITUTE, at 8.30.—Canada's Metals: Prof. W. C. Roberts-Austen, C.B., F.R.S.

TUESDAY, DECEMBER 14.

ZOOLOGICAL SOCIETY, at 8.30.—On the *Lepidosiren paradoxa* from the Amazon: Dr. E. A. Goeldi.—On a Small Collection of Lepidoptera made by Mr. F. Gillett in Somaliland: Dr. A. G. Butler.—On the Mammals obtained by Mr. A. Whyte in N. Nyasaland, and presented to the British Museum by Sir H. H. Johnston, K.C.B.; being a Fifth Contribution to the Mammalogy of Nyasaland: Oldfield Thomas.—On a New Genus and Species of *Acaridea*: Rev. O. Pickard Cambridge, F.R.S.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Great Land Slides on the Canadian Pacific Railway in British Columbia: Robt. B. Stanton.

ROYAL STATISTICAL SOCIETY, at 5.30

ROYAL PHOTOGRAPHIC SOCIETY (Society of Arts, John Street, Adelphi), at 8.—Colour Photography: Prof. Gabriel Lippmann.

WEDNESDAY, DECEMBER 15.

SOCIETY OF ARTS, at 8.—The Purification of Sewage by Bacteria: Dr. Samuel Rideal.

GEOLOGICAL SOCIETY, at 8.—On the Pyromerides of Boulay Bay, Jersey: John Parkinson.—The Exploration of the Ty Newydd Cave, Ffynnon Beuno, North Wales: Rev. G. C. H. Pollen.

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Daily Values of Non-Instrumental Meteorological Phenomena in London, 1763-1896: R. C. Mossman.—The Rainfall of Seathwaite, Borrowdale, Cumberland: William Marriott.

CHEMICAL SOCIETY (Extra Meeting), at 8.30.—Kekulé Memorial Lecture: Prof. F. R. Japp, F.R.S. ROYAL MICROSCOPICAL SOCIETY, at 8.—A New Form of Photomicrographic Camera and Condensing System: E. B. Stringer.

THURSDAY, DECEMBER 16.

ROYAL SOCIETY, at 4.30. LINNEAN SOCIETY, at 8.—On the Affinities of the Madreporarian Genus *Alveopora*: H. M. Bernard.—On West Indian *Characeæ* collected by T. B. Blow: H. and J. Groves.

CHEMICAL SOCIETY, at 8.—Stereo-Chemistry of Unsaturated Compounds. Part I. Esterification of Substituted Acrylic Acids: Dr. J. J. Sudborough and Lorenzo Lloyd.—Formation and Hydrolysis of Esters: Dr. J. J. Sudborough and M. E. Feilmann.—A New Method of Determining Freezing Points of very Dilute Solutions: Dr. M. Wilderman.

FRIDAY, DECEMBER 17.

INSTITUTION OF ELECTRICAL ENGINEERS (Chemical Society's Rooms), at 8.—Accumulator Traction on Rails and Ordinary Roads: L. Epstein.

INSTITUTION OF CIVIL ENGINEERS, at 8.—The Elastic Properties of Steel Wire: Archer D. Keigwin.—The Elasticity of Portland Cement: W. L. Brown.

BOOKS, PAMPHLETS, and SERIALS RECEIVED.

BOOKS.—By Roadside and River: H. M. Briggs (Stock).—Catalogue of the Books in the Library of the Indian Museum, Supplement 2 (Calcutta).—Memoirs of the Geological Survey, Scotland: The Geology of Cowal: W. Gunn, C. T. Clough, and J. B. Hill (Edinburgh, Neill).—Stipriculture: Dr. M. L. Holbrook (Fowler).—Studies in Psychological Research: F. Podmore (Paul).—Student's Guide to Submarine Cable Testing: H. K. C. Fisher and J. C. H. Darby (*Electrician* Company).—The Book of the Dead: Dr. E. A. W. Budge, 3 Vols. (Paul).—The Rod in India: H. S. Thomas, 3rd edition (Thacker).—Wild Life in Southern Seas: L. Becke (Unwin).—Famous Problems of Elementary Geometry: Profs. Beman and Smith (Boston, Ginn).—A Text-Book of Special Pathological Anatomy: Prof. E. Ziegler, translated and edited by Drs. D. MacAlister and H. W. Cattell, Sections ix.-xv. (Macmillan).—The Lepidoptera of the British Islands: C. G. Barrett, Vol. 4 (Reeve).—Philip's Revolving Planisphere and Perpetual Calendar (Philip).—Le Végétaux et les Milieux Cosmiques. J. Costantin (Paris, Alcan).

PAMPHLETS.—Radiography in Marine Zoology: Dr. R. N. Wolfenden (Rebman).—Untersuchung über die Bahn des Cometen 1822 IV.: Dr. A. Stichtenoß (Leipzig, Engelmann).

SERIALS.—Contemporary Review, December (Isbister).—Bulletin of the American Mathematical Society, November (New York, Macmillan).—Knowledge, December (Holborn).—National Review, December (Arnold).—Proceedings of the Liverpool Geological Society, Session: Thirty-eight (Liverpool).—Geological Magazine, December (Dulau).—Fortnightly Review, December (Chapman).—An Illustrated Manual of British Birds: H. Saunders, 2nd edition, Part 2 (Gurney).—Physical Review, October (Macmillan).—Archives of the Roentgen Ray, November (Rebman).—Zeitschrift für Physikalische Chemie, xxiv, Band, 3 Heft (Leipzig, Engelmann).—L'Anthropologie, Tome viii, No. 5 (Paris, Masson).—Gazzetta Chimica Italiana, 1897, fasc. v. (Roma).—Revue de l'Université de Bruxelles December (Bruxelles).

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