are available. Eventually these establishments may be expected to provide a regular supply of trained artisans and mechanics able to adapt themselves readily to western processes. The proposals of the conference referred also to the creation of a technological institute. This institute was to have two branches—at Roorkee and Cawnpore respectively; it was intended that Roorkee should deal only with industries mainly dependent on engineering, while Cawnpore provided for those dependent on chemistry. The proposals allotted 2 lakhs capital expenditure with Rs. 88,000 annually to Roorkee, and 8 lakhs capital with 2½ lakhs annually to Cawnpore. Sir John Hewett said in his speech that the Cawnpore part of the scheme has been deferred, but that a commencement will be made at once with the development of a technological institute at Roorkee. Thomason College is to have the difficult task of working out the lines on which the functions of a technological institute can be carried out in India.

SOCIETIES AND ACADEMIES.

LONDON.

Geological Society, November 3.—Prof. W. J. Sollas, F.R.S., president, in the chair.—S. S. **Buckman**: Certain Jurassic (Lias-Oolite) strata of south Dorset, and their correlation. Descriptions of certain strata (Lower Bathonian to Pliensbachian) on the Dorset coast. Comparison is made with similar strata inland. The strata described are classified according to the scheme introduced for these strata in 1893. The strata are arranged among thirty-six zonal (hemeral) divisions. The Upper Lias part of the junction-bed of Down Cliffs, Chideock, is a very condensed, imperfect epitome in 20 inches of about 80 feet of strata on the Yorkshire coast. Between the *bifrons*-layer and the *striatulus*-layer of the junction-bed there is occasionally a 2-inch layer, which is all that represents some 250 feet of deposit in the Cotteswolds. The Upper Toarcian makes a great showing at Burton Bradstock and Down Cliffs as the Down Cliffs Clay and Bridport Sands. The sequence of *aalensis*-strata above *moorei*-beds is demonstrated at Chideock Quarry Hill, in the upper part of the Bridport Sands. The Inferior Oolite strata of Burton and Chideock are not counterparts of one another; they supplement each other to a certain extent. Mr. Thompson's zonal scheme for the Upper Lias is considered.—S. S. **Buckman**: Certain Jurassic ("Inferior Oolite") Ammonites and Brachiopoda. The paper describes certain species of Ammonites and Brachiopoda which are important for the identification, the correlation, or the dating of Inferior Oolite deposits, and certain other notable species which, having frequently attracted attention in the field, require naming in the interest of future workers.—Dr. W. F. **Hume**: The granite-ridges of Kharga Oasis: intrusive or tectonic? The author quotes the records given by Mr. Beadnell in his paper published in February, 1909, and although in agreement with the facts there stated, differs with regard to the interpretation of those facts. Whereas Mr. Beadnell regards the granite as intrusive, on account of the high dip of the sedimentaries, and the changes which they exhibit as regards colour and hardness, near the granite, the author considers that the dips are due to fold-movements almost at right angles to one another, since they lie on the same line as the crater-like basins, the rims of which are formed of the compact and steeply dipping limestones of the Lower Eocene, and he adduces as further evidence the fact that dykes and quartz-veins penetrating the crystalline rocks cease abruptly at the edge of the sandstone.—Dr. W. F. **Hume**: The Cretaceous and Eocene strata of Egypt. The fossiliferous Cretaceous strata are divided into three series:—(1) A northern Antonian type, marked by Cenomanian species, including typical Turonian strata. (2) A central Egyptian or Hammama type, Cenomanian strata being absent, Campanian marked by abundance of *Ostrea villei* and *Trigonarca multidentata*, and phosphatic beds; the Danian portion having an eastern facies, in which Pecten marls are a characteristic feature, and a western chalky limestone indicating a close affinity with the white chalk of northern Europe. (3) A southern or Dungul type, having close affinities with (2), but in the Campanian the phosphatic beds are inconspicuous, and the fauna consists of a group of specialised sea-urchins and of gastropods, among which Turritellæ are very prominent. The uniformity of the Lower Eocene throughout Egypt is emphasised, its triple subdivision being recognisable over vast areas. In the Middle Eocene this uniformity is replaced by differentiation. Five zones have been recognised in the lower division, while in the Upper Moqattam the Turritella-beds and the strata rich in *Carolia placunoides* and *Plicatula polymorpha* are of zonal importance. The Lower Moqattam is considered as beginning with the *Nummulites gizehensis* zone and closing with the Gistortia-bed. The relation between the Cretaceous and Eocene beds is discussed. Palæontologically, great groups such as the Ammonites, still abundant in the Upper Cretaceous, disappear in the Eocene, and are replaced by the characteristic nummulinid Foraminifera. Both periods bear a resemblance to each other in the dominance of oysters and sea-urchins. A notable feature is the rarity of Brachiopoda in Egypt throughout both periods, nor have belemnites been recorded from the Egyptian Cretaceous. Among post-Eocene formations the calcareous grits are shown to have a wide extension, but in the desert they differ in character from the mammal-yielding beds of the Fayûm. The Cretaceous period in Egypt was one, in the main, marked by the gain of sea over land, the Eocene was one of rest, while at the close of the Eocene and during the Oligocene the approach of a continental phase is clearly indicated.

Linnean Society, November 4.—Dr. D. H. Scott, F.R.S., president, in the chair.—Cecil **Carus-Wilson**: Natural inclusion of stones in woody tissue. About twenty-three years ago a gravel-pit was started in the valley-gravels occurring some three miles from Faversham, in Kent. Part of a wood covered the deposit; as the work progressed oak trees were felled, and the stumps and roots dislodged. The gravel consists of subangular, water-worn flints and occasional blocks of Sarsen-stone, the whole being mixed with flint grit and quartzose sand. The roots and stumps were distributed as the gravel in which they were embedded was removed. The work of excavating ceased about ten years ago, so the roots still remaining have been exposed for that length of time, the others having been cut up for fuel. Most of those now found were left intact because of the stones enclosed in the wood. Not only did these resist the work of saw and axe, but when burnt they burst asunder with force, becoming a source of danger. The stones are actually embedded in the solid oak. The tissue of the wood appears to have grown around the stones and enveloped them, indicating that the process was carried on under conditions of pressure. There are dozens of stones embedded in some of these roots, so that the substance may be described as "a conglomerate formed of flints enclosed in a woody matrix." In one specimen no fewer than sixty-seven flints were counted, the largest being several pounds in weight, and there are innumerable empty cavities showing where others existed before the shrinkage of the wood after exposure. Odd stones have been occasionally seen thus embedded in the trunks of trees. In Norton Churchyard, a few miles from Faversham, are three old yew trees, and in two of them flints and fragments of tiles have been seen embedded in the wood of the trunk 7 feet above the ground. In Molash Churchyard, six or seven miles south of Faversham, there are six very old and large yews. Some of these have flints embedded in their trunks 7 feet or 8 feet above the ground. The examples first described are unique, and if trees can enclose stones in such quantities, and retain them within their substance so tenaciously, we have transporting agents capable, under certain conditions, of distributing terrigenous material over sea-beds to an extent not hitherto appreciated.—Dr. A. B. **Rendle**: Specimen of heather (*Erica cinerea*) found near Axminster in which the flowers were replaced by dark red leaf-buds of about the same size as the flowers. The red leaf-buds, which occupy the position of flowers, consist each of short, strongly ascending leaves arranged in superposed whorls of four; the four lines have often a spiral twist in the upper part of the bud. The leaf-arrangement resembles that of the flower, not of the foliage leaves. The leaves of these special buds differ in form from the foliage leaves in that they are upwardly concave with a bluntly keeled back. They are thirty-two or more in

number, and thus considerably outnumber the parts of a typical flower (twenty-four, including bracteoles). The tip of the bud was always damaged, but in many a shrivelled pistil was present, and sometimes below this semi-foliaceous stamens were found. The specimen is of interest as resembling a teratological form of *Erica cinerea* described by Maxime Cornu in 1879.—Prof. H. H. W. **Pearson**: Types of the vegetation of Bushmanland, Namaqualand, Damaraland, and South Angola (a preliminary report of the Percy Sladen Memorial Expedition in South-west Africa, 1908–9). The floras of the regions named in the title are distinctly related if the vegetation found on the Huilla plateau in South Angola be excluded. Otherwise the differences that are observed are to be accounted for mainly as a result of differences of (1) elevation; (2) atmospheric humidity; (3) depth at which permanent supplies of underground water are available; (4) geographical position. In all the rainfall is scanty and inconstant, and there is a prolonged drought in the winter season. Near the coast, in some places up to elevations as great as 2700 feet, the total annual rainfall is never more than a few millimetres, and frequently fails altogether. The affinities of these floras are with those of the South Central African highlands. In South Angola many species are derived undoubtedly from the coast and Montane regions of West Tropical Africa. Throughout, the vegetation is xerophytic in character, and is marked either by a short period of duration or by the possession of those structural peculiarities which are found in dry climate perennials. Of these, hairiness is not a conspicuous feature; except in Lower Namaqualand, succulence is not common. A round, bushy habit is marked throughout. The root system is deep; the leaves are simple and of small size, and with a strongly developed cuticle. The formations and associations indicated are predominant by reason either of their great extent or of striking peculiarities of the plants composing them. They are arranged in the main geographically from south to north.

Zoological Society. November 9.—Dr. S. F. Harmer, F.R.S., vice-president, in the chair.—Sir H. H. **Howorth**: Some living shells, their recent biology, and the light they throw on the latest physical changes in the earth, i., *Mya arenaria*. The author stated that the *Mya arenaria* or clam is widely distributed in the North Boreal, European, and North American seas, and claimed to prove that it is a recent migrant into the former, and has probably not been there more than 300 years. The notion that it is an Arctic shell is a mistake. In the Arctic lists *Mya truncata*, var. *oblonga*, has been mistaken for it, and the glacial character of the beds in which it has occurred, which has been postulated from its occurrence there, has accordingly been a wrong inference. Brögger has argued that it migrated from America. It was abundant in the Crag seas, and occurs in derivative fragments in the Drift-beds, but it does not occur in the estuarine deposits or raised beaches, proving that after the period of the Crag it became extinct in Europe, and has since been re-introduced. He regarded the cause of its extinction as a mystery, since the group of estuarine shells with which it is found has lived continuously in Europe since later Crag times.—C. Tate **Regan**: The Asiatic fishes of the family Anabantidæ (including the Osphromenidæ). The author remarked that the order Labyrinthici was an isolated and terminal group, probably derived from a cyprinodontoid stock, and that it comprised two suborders, Ophiocephaloidei and Anabantoidei, the latter including the families Anabantidæ and Luciocephalidæ. The Indian element in the fresh-water fish-fauna of Celebes, including two labyrinthic fishes, was shown to consist of (1) species which had travelled by sea, and (2) species which had probably been introduced by man. The great importance of Wallace's line for fresh-water fishes was thus vindicated. The Asiatic genera and species of Anabantidæ were described, including several new forms of Betta and Trichopodus, and the Asiatic genus Anabas was shown to differ markedly from the African Ctenopoma and Spirobranchus.—J. Lewis **Bonhote**: Some mammals brought home from Egypt. The paper dealt with about twenty-eight species, chiefly small rodents, and the main points of interest were the recognition of *Procavia burtoni*, the Egyptian hyrax, as a valid species, the re-discovery of *Acomys russatus*, hitherto only known from Palestine, and the description of a small species of Dipodillus, the last two species having been taken on the Mokattam Hills within three miles of Cairo.

Mathematical Society, November 11.—Sir W. D. Niven, president, in the chair.—G. H. **Hardy**: (1) The ordinal relations of the terms of a convergent sequence; (2) the application to Dirichlet's series of Borel's exponential method of summation; (3) theorems relating to the summability and convergence of slowly oscillating series.—Prof. W. **Esson**: Notes on synthetic geometry.—H. **Bateman**: Kummer's quartic surface as a wave surface.—Prof. H. S. **Carslaw**: The Green's function in a wedge and other problems in the conduction of heat.—J. L. S. **Hatton**: The envelope of a line cut harmonically by two conics.—Rev. F. H. **Jackson**: A class of q-hypergeometric series.—Informal communications were made as follows:—Dr. E. W. **Hobson**: An extension of Abel's theorem concerning the sums of series at points on the circle of convergence to oscillatory series.—Prof. A. E. H. **Love**: The effect of the earth's rotation upon the observed values of the lunar disturbance of gravity.

CAMBRIDGE.

Philosophical Society, October 25.—Dr. Hobson, vice-president, in the chair.—A. A. **Robb**: Discussion of a difference equation relating to the tension of overhead wires supported by equidistant poles.—F. G. **Sinclair**: Note on the abnormal pair of appendages in Lithobius.—J. E. **Littlewood**: A class of integral functions.—J. A. **Crowther**: The scattering of the β rays from radium by air.—R. **Whiddington**: Note on the electrical behaviour of fluorescing iodine vapour. The note describes an experiment showing that iodine vapour is un-ionised when brilliantly fluorescing under the action of the arc light.—Rev. H. J. **Sharpe**: The reflection of sound at a paraboloid.—G. W. C. **Kaye**: The emission of Röntgen rays from thin metallic sheets. Thin metal leaf antikathodes were subjected to bombardment by kathode rays, and the (emergent) X-rays proceeding from the remote side of the leaf were compared with those which left on the near side (incident). In general, the emergent Röntgen radiation in such cases exceeds the incident in intensity, markedly so in the case of aluminium. The ratio of the emergent intensity to the incident increases with the speed of the kathode rays employed. As the thickness of the metal leaf is increased, the emergent intensity increases to a maximum and then dies away, the incident intensity meanwhile gradually increasing to a constant value.—F. **Horton**: The emission of positive rays from heated phosphorus compounds.

November 8.—Prof. Bateson, F.R.S., president, in the chair.—N. R. **Campbell**: Discontinuities in light emission. An account is given of an attempt to test the theories of Sir J. J. Thomson and of Planck as to the atomic nature of radiation by means of observations on the fluctuations in the intensity of a source of light. The experiments are similar in nature to those of Meyer and Regener, based on the theory of von Schweidler, on the fluctuations of an ionisation current due to the α rays of radium. The theory and the methods of the experiments are discussed at length, and also the nature and cause of an unexpected difficulty which has prevented, up to the present time, the attainment of definite results; but it is hoped that such results may be reached in the near future.—J. A. **Orange**: The shape of beams of canal rays. An appendix to a paper previously communicated to the society. In that paper it was suggested that the component rays in a beam of canal rays are straight, the curved boundaries of the beam being envelopes merely. This appendix describes one or two simple experiments which support that view.—H. **Bateman**: The determination of solutions of the equation of wave motion which involve an arbitrary function of three variables which satisfies a partial differential equation.—H. J. **Priestley**: The oscillations of superposed fluids.—L. B. **Turner**: The stresses in a thick hollow cylinder subjected to internal pressure.—Sir J. J. **Thomson**: The theory of the motion of a charged particle through a gas. It is pointed out in this paper that, in consequence of the "persistence of velocities," which is

especially marked when the mass of an ion is much greater than that of a molecule of the gas through which the ion is moving, methods founded on the conception of the free path are not suited for the calculation of the velocities of the ions. If we suppose that the operative forces acting between the ions are such as exist between a charged body and a conducting sphere, the force between the ions and the molecules would, except close to the molecules, be proportional to the inverse fifth power of the distance, and we can apply Maxwell's results to this case, making the slight alterations which are necessary when the force is an attraction instead of a repulsion, as in Maxwell's investigation. The expressions deduced in this way for the mobility are such that, considered as a function of M, the mass of the ion, and m, the mass of a molecule of the gas, the mobility varies as $\left\{\frac{M+m}{M}\right\}^{\frac{1}{2}}$, and thus, when M is large compared with m, varies very slowly with the mass of the ion. The diffusion of the emanations of radio-active substances through air or other gases would, since the molecules of the emanation carry electrical charges, follow the same law, so that the rate of diffusion of the emanation would only vary very slowly with the atomic weight; thus we cannot attach much importance to determinations of the atomic weight of the emanation made by observing their rate of diffusion through other gases.

MANCHESTER.

Literary and Philosophical Society, November 2.—Mr. Francis Jones, president, in the chair.—T. G. B. **Osborn**: A note on the staminal mechanism of *Passiflora coerulea*. The paper contained a record of observations made during the summer of this year on *Passiflora coerulea*, and directed attention to three staminal movements which occur in the order in which they are given below, viz.:—(1) A radial movement of the anthers on the filament of 180°, which occurs as soon as the flower opens. (2) A second movement of the anther through 90° into a plane at right angles to the first, *i.e.* into the tangential plane, in which position a special mechanism is called into play to retain it there. (3) The radial movement, in two stages, of the stamen as a whole, so as to bring it from an erect to a drooping position, the first stage of this movement being in part concurrent with (2), and coextensive with the first stage of anthesis.—D. M. S. **Watson**: A preliminary note on two new genera of Upper Liassic Plesiosaurs. The Manchester Museum contains two important skeletons of *Plesiosaurus homalospondylus*, Owen, which show that the pectoral girdle does not conform to the type of that of Plesiosaurus, but is elasmosaurian, resembling that of Cryptocleidus. The coracoids are narrow; the scapulæ meet in the middle line and pass back as a bar to join the coracoids. The clavicular arch is reduced, lying on the visceral surface of the anterior plates of the scapulæ. There is no interclavicle. A new genus, Microcleidus, is founded for the species. Another skeleton, lacking the head, also in the Manchester Museum, is made the type of the new genus and species *Sthenarosaurus dawkinsi*. The genus is remarkable for the smallness of the coracoids and the strong clavicular arch, which resembles that of Thaumatosaurus, as determined by Lydekker, but has a posterior process in the centre.

November 16.—Mr. Francis Jones, president, in the chair.—C. E. **Stromeyer**: Relative periods of revolution of planets and satellites. The author pointed out that, if the solar system has been built up out of meteorites, certain relations as regards periods of revolution should exist both amongst the planets and their satellites. The periods, not only of the planets, but also of their satellites, should be expected to stand in the ratios 1, 2, 4, 8, &c., or 1, 3/2, 2, 3, 4, &c. The first of these series is well represented by Jupiter's satellites, I., II., and III. of which stand in the exact ratio of 4, 8, 16; V. has a period of 1·1, IV. has a period of 37·8 instead of 32, and VI. and VII. combined have a period of 576, or little more than 512, which would be the tenth term of the series. The outermost satellite, the exact period of which has not yet been determined, should, if the above rule holds good, have a period of twice 260 days, say one and a half years. Saturn's satellites agree with the second series, which includes thirds. The mean periods of the several pairs are 1, 2, 3·96, —, 16·5, —, 68·1.—F. **Nicholson**: Some early correspondence between Mrs. Hemans and Mr. Matthew Nicholson, a former member of the society.

PARIS.

Academy of Sciences, November 15.—M. Bouchard in the chair.—G. **Darboux**: Congruences of curves.—M. **Gouy**: The vapour pressure of an electrified liquid. The total effect, at least for liquids having a high specific inductive capacity, is for an electric field to increase the vapour pressure. The dielectric polarisation, when the field is normal to the surface, produces an increase in the vapour pressure; the increase of the ions in the surface layer of the electrolyte diminishes the vapour pressure, and the net result is the difference of these two effects.—M. **de Forcrand**: The acid carbonates of the alkalies.—Édouard **Heckel**: The influence of anæsthetics and frost on plants containing coumarin. Plasmolysis is produced by the action of chloroform, ether, or by cold, the coumarin being immediately given off.—Édouard **Heckel**: Fixation of the cultural bud-formation of *Solanum maglia*.—M. **Idrac**: Ocular and photographic observations of the planet Mars. An account of observations made at the Meudon Observatory with the large double telescope during the recent opposition of Mars. In some instances details were shown on the photographs which could not be observed by simultaneous eye observations.—E. M. **Antoniadi**: Observations of the planet Mars made at the Observatory of Meudon. A map of the planet, on Mercator's projection, is given, summarising observations made between September 20 and November 9.—A. de la Baume **Pluvinel** and F. **Baldet**: The photography of the planet Mars. An account of work done with the new equatorial at the astronomical station on the Pic du Midi.—N. E. **Norlund**: Equations of finite differences.—G. A. **Miller**: Groups produced by two operators, each of which transforms the square of the other into its inverse.—Albert **Grumbach**: Contact electrification. A study of the electromotive forces produced by the filtration of solutions of potassium chloride, with and without an added non-electrolyte (phenol).—Vasilesco **Karpen**: Telephony at great distances.—André **Léaute**: The destructive effects of oscillating discharges of high frequency.—Gargam **de Moncetz**: A formula for sensitising plates for the extreme red, commencing with the infra-red. The solutions given, used on silver iodobromide plates, enable lines up to the calcium line λ 860 to be photographed.—Paul **Gaubert**: A new highly fluorescent substance derived from physostigmine. Physostigmine in aqueous solution is allowed to stand for several months until it has acquired a deep blue colour, and to this phthalic acid is added. The substance produced forms deep blue crystals, which in solution are intensely fluorescent.—W. **Broniewski**: The electrical properties of the aluminium-copper alloys. Twenty alloys of aluminium and copper were prepared. The measurements made on these included the electrical conductivity at 0° C., the temperature coefficient of the resistance, the electromotive force against carbon in a solution of ammonium chloride, and the thermoelectric power. The results are given both in tabular and graphical form. In addition to the definite compounds of aluminium and copper already known, the existence of Al_2Cu_3 has been brought out by these experiments.—Georges **Meslin**: The magnetic properties of liquids constituted by siderose. Aniline or carbon bisulphide containing powdered siderose in suspension exhibit the phenomenon of magnetic dichroïsm to an extent much greater than with any substances previously examined.—Abel **Buguet**: The cryoscopy of organic mixtures and addition compounds. An account of the cryoscopic study of mixtures of acenaphthene and phenanthrene with two nitrotoluenes.—H. **Baubigny**: The action of heat and light on silver sulphite and the double alkaline sulphites. The determination of the yield of dithionic acid.—V. **Auger**: The mixed halogen stannic compounds. The bromiodide $SnBr_2I_2$ was submitted to a series of slow crystallisations, and the ratio of iodine to bromine found to vary. The study of the cooling curve of the supposed $SnBr_2I_2$ showed that this also behaved as a mixture.—P. J. **Tarbouriech**: The dehydration of oxycyclohexyldimethylcarbinol.—M. **Deprat**: The eruptive and metamorphic formations of Tonkin, and

on the frequency of laminated types.—F. **Grandjean**: The optical study of the absorption of heavy vapours by certain zeolites. The substances absorbed by the crystal of zeolite affect the optical properties of the crystal to a marked extent. The optical properties found are never intermediary between those of the crystal and those of the body absorbed.—Fernand **Guéguen**: The existence of sclerotes in *Mucor sphaerosporus*.—R. **Anthony** and W. B. **Pietkiewicz**: New experiments on the *rôle* of crotaphytic muscle (temporal) on the morphological constitution of the skull and face.—Louis **Lapicque**: The theory of electrical stimulation: a hydraulic analogy.—M. **Baudran**: Artificial media capable of attenuating or strengthening the virulence of Koch's bacillus. The formulæ of the two media differ only in the use of iron in the one and manganese in the other. The one containing iron causes a marked attenuation in the virulence of the bacilli grown in it; the replacement of the iron by manganese, on the other hand, has the exactly contrary effect.—MM. **Trillat** and **Sauton**: The action of putrid gases on micro-organisms. The putrid gases arising from the decomposition of animal extracts were allowed to act on yeast, parallel cultures of the same yeast without the addition of such gases being made at the same time. The effect on the yeast was measured by the alcohol produced. Both increases and decreases in the fermentative action were observed, the effect depending on the proportion of gas present.—Alfred **Angot**: The earthquake of November 10, 1909. Details of the traces of the seismographs at Parc Saint-Maur Observatory. The epicentre was calculated to be at a distance of 8700 kilometres.—M. **Audouin**: Observations made in the course of the Tilho expedition.—M. **de Beauchamp**: The working of the apparatus for the protection of the Vienne district against hail and thunderstorms during the year 1909. The protection during the year has been very satisfactory, and the system is to be further extended.—A. **Gruvel**: *Résumé* of some scientific observations made on the coasts of Mauritania (N. Africa) from 1905 to 1909.

DIARY OF SOCIETIES.

THURSDAY, NOVEMBER 25.

ROYAL SOCIETY, at 4.30.—On the Change in Hue of Spectrum Colours by Dilution with White Light: Sir William de W. Abney, K.C.B., F.R.S.—On the Nature of the Hydrogen Flocculi and their Structure at Different Levels in the Solar Atmosphere: Prof. G. E. Hale, For.Mem.R.S., and F. Ellerman.—The Boiling Point of Sulphur corrected by Reference to New Observations on the Absolute Expansion of Mercury: Prof. H. L. Callendar, F.R.S., and H. Moss.—(1) On the Refraction and Dispersion of Neon; (2) On the Refraction and Dispersion of Air, Oxygen, Hydrogen, and Nitrogen; (3) On the Refraction and Dispersion of Sulphur Dioxide and Hydrogen Sulphide, and their Relation to those of their Constituents: C. Cuthbertson and M. Cuthbertson.—On Flapping Flight: Prof. M. F. Fitzgerald.—The Crystalline Structure of Iron at High Temperatures: W. Rosenhain and J. C. W. Humfrey.—The Relation of Thallium to the Alkali Metals: a Study of Thallium-zinc Sulphate and Selenate: Dr. A. E. H. Tutton, F.R.S.—On the Nature of the Diffraction Figures due to the Heliometer: P. F. Everitt.—The Motional Effects of the Maxwell Æther-Stress: E. Cunningham.—The Aberrations of a Symmetrical Optical Instrument: Dr. H. C. Pocklington, F.R.S.—The Spectrum of Radium Emanation: H. E. Watson.—The Electric Conductivity and Density of Solutions of Hydrogen Fluoride: Prof. E. G. Hill and Dr. A. P. Sinkar.—Sleeping Sickness in Uganda. Duration of the Infectivity of the *Glossina palpalis* after the Removal of the Lake-shore Population: Colonel Sir David Bruce, C.B., F.R.S., Captains A. E. Hamerton and H. R. Bateman, R.A.M.C., and Captain F. P. Mackie, I.M.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—The Present Aspects of Electric Lighting: H. W. Handcock and A. H. Dykes.

FRIDAY, NOVEMBER 26.

PHYSICAL SOCIETY, at 5.—The Effective Resistance and Inductance of a Helical Coil: Dr. J. W. Nicholson.—Ductile Materials under Combined Stress: W. A. Scoble.—The Recoil of Radium C from Radium B: Dr. W. Makower and Dr. Sidney Russ.—The Sun's Motion with Respect to the Æther: Dr. C. V. Burton.

MONDAY, NOVEMBER 29.

ROYAL SOCIETY OF ARTS, at 8.—Aëronautics: C. C. Turner.

INSTITUTE OF ACTUARIES, at 5.—American Railway Securities as Investments for Insurance Companies: H. Ansell.

TUESDAY, NOVEMBER 30.

ROYAL SOCIETY OF ARTS, at 4.30.—Agricultural Development in Nyasaland: S. Simpson.

ROYAL ANTHROPOLOGICAL INSTITUTE, at 8.15.—The Pit Dwellings at Holderness: Canon Greenwell, F.R.S., and Rev. R. A. Gatty.

FARADAY SOCIETY, at 8.—On the Electro-analytical Determination of Lead as Peroxide: Dr. H. J. S. Sand.—The Calorimetrical Analysis of Hydrated Salt: Prof. F. G. Donnan and Dr. G. D. Hope.—(1) On the Influence of Dissolved Gases on the Electrode Potential in the System Silver-Silver Acetate, aq.; (2) Contributions to the Study of Ionisation in Aqueous Solutions of Lead Acetate and Cadmium Acetate: A. Jacques.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*Further discussion*: The Single-phase Electrification of the Heysham, Morecambe and Lancaster Branch of the Midland Railway: J. Dalziel and J. Sayers.—The Equipment and Working-results of the Mersey Railway under Steam and under Electric Traction: J. Shaw.—The Effect of Electrical Operation on the Permanent-way Maintenance of Railways, as Illustrated on the Tynemouth Branches of the North-Eastern Railway: Dr. C. A. Harrison.

WEDNESDAY, DECEMBER 1.

ROYAL SOCIETY OF ARTS, at 8.—Improvements in Resilient Wheels for Vehicles: Hon. R. C. Parsons.

SOCIETY OF PUBLIC ANALYSTS, at 8.—The Composition of Cream: R. R. Tatlock and R. T. Thomson.—Analyses of Vulcanised Rubber Goods: Clayton Beadle and Henry P. Stevens.—On the Gravimetric Estimation of Nickel in Nickel Steel: E. L. Rhead.—Notes on the Milk Supply of Two Large Towns: F. W. F. Arnaud and Edward Russell.

GEOLOGICAL SOCIETY, at 8.—The Tremadoc Slates and Associated Rocks of South-east Carnarvonshire: W. G. Fearnsides.—On some Small Trilobites from the Cambrian Rocks of Comley, Shropshire: E. S. Cobbold.—(1) The Rock of Pulau Ubin and Pulau Nanas, Singapore; (2) The Tourmaline-Corundum Rocks of Kinta, Federated Malay States: J. B. Scrivenor.

ENTOMOLOGICAL SOCIETY, at 8.—Discussion on *Agriades coridon* and *A. thetis* (*bellargus*), opened by Mr. J. W. Tutt.

THURSDAY, DECEMBER 2.

ROYAL SOCIETY, at 4.30.

RÖNTGEN SOCIETY, at 8.15.—Some Effects of Electrical Discharges on Photographic Plates: Prof. A. W. Porter.

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