Hibbert be elected president for the year 1911." Sir Henry Hibbert will deliver his presidential address upon "The Duties and Difficulties of Education Authorities so far as Regards Evening Continuation Schools." The formal business of the association will then be transacted, including the election of the officers and council. On Saturday morning there will be two discussions, one upon the Board of Education's new regulations for the registration of evening and other students, to be opened by Messrs. Crowther, Graham, and Sumpner, and the other upon the course system, to be opened by Messrs. Coles, Duthie, and Graham.

IN a message from Cape Town, a *Times* correspondent points out that the agenda paper for the forthcoming Imperial Education Conference includes a large number of questions particularly concerning South Africa. Dr. Muir, F.R.S., the superintendent-general of education in the Cape Province, has suggested the following subjects, which it is expected will be discussed:—school curricula; bilingualism in the case of white children; the boy-scout movement and its relation to nature-study; problems connected with the education of aborigines; the collection and dissemination of information regarding the cost of instruction and cost of living in connection with advanced technical colleges and post-graduate departments of universities; the desirability of the formation of a permanent imperial education bureau; and arrangements for the mutual recognition of teachers' certificates. The director of education for the Transvaal has proposed for discussion the problems arising from the use of two languages as media of instruction, and the organisation of education in sparsely populated districts. In addition, one suggestion each from Nova Scotia and Sierra Leone has been received, so that it would appear likely that great prominence will be given at the conference to South African educational needs.

COPIES of the general and departmental reports for the session 1909–10 of the Bradford Technical College have been received. We notice that the total number of students in attendance during the session under review was slightly greater than in 1908–9, and that the college is in the front rank in the country as regards the number of day students in attendance. It is anticipated that the additional facilities provided in the new buildings, which are now approaching completion, will result in a decided increase in the number of such students. A gratifying feature of all the reports is the information provided showing the interest in the college of the various manufacturers in the district. Their gifts towards the equipment of the different departments and the other assistance given by them to the principal and his staff are evidences of their desire to make the college a centre for the technical education of their workmen. Though the regularity of attendance of evening students has been well maintained, there are, the principal points out, many causes of irregular attendance, the chief of which are overtime in the mills, changes of residence, and ill-health. It is not probable, he says, that a higher percentage attendance can be attained until the question of the overtime work of students is dealt with by legislation or in some other general manner. The large and increasing amount of testing and experimental investigation carried out in the engineering department for local firms and for trade purposes is further evidence of the close connection between the work of the college and the industries of the neighbourhood.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, January 19.—Sir Archibald Geikie, K.C.B., president, in the chair.—G. S. **Walpole**: The action of *B. lactis aerogenes* on glucose and mannitol. Part ii. The "crude glycol" obtained by the action of *B. lactis aerogenes* on glucose contains two optically inactive 2 : 3-butane diols, the diphenylurethanes of which melt at 199·5° and 157° respectively. The former constitutes well over 90 per cent. of the material. If fructose be substituted for glucose in one of the flasks, the yield of "crude butylene glycol" and acetylmethyl carbinol is of the same order as when glucose is employed. Acetylmethyl carbinol is formed abundantly when the bacillus is cultivated in a solution of butylene glycol in 1 per cent. peptone in a current of oxygen.—Dr. W. E. **Dixon**: The pharmacological action of *Gonioma Kamassi* (South African boxwood). South African boxwood, *Gonioma Kamassi*, has been employed occasionally in Lancashire as a substitute for common boxwood in the manufacture of shuttles; it is stated that symptoms of poisoning have occurred in a small proportion of the men engaged in sawing this wood or finishing the chiselled shuttles. From the wood an alkaloid can be obtained to about 0·07 per cent. This has a very characteristic physiological action, which places it in the curare group of drugs. The members of this group may be regarded as possessing three actions in common:—(1) paralysis of certain nerve cells; (2) increase of spinal and medullary reflexes; (3) paralysis of motor nerve endings. Boxwood exerts all these effects. It paralyses the nerve cells in the brain and medulla, as well as those on the course of the vagus and sympathetic nerves, and therefore after its exhibition to animals the stimulant action of nicotine cannot be obtained. In small doses the reflexes are increased, and if an injection be made into a vein going to the spinal cord of an animal, strychnine-like convulsions are produced. Boxwood causes death by paralysing the respiration; this is central in origin, but it occurs at a time when the phrenics and intercostals are depressed, though not paralysed. Boxwood has no direct action on the heart or on other form of muscle. Reasons are given for believing that the recorded cases of poisoning are not due to the specific action of the drug after absorption, but to the effect of the drug in facilitating certain local reflexes, principally of a respiratory nature, in the predisposed.—Dr. W. **Yorke**: Autoagglutination of red blood cells in trypanosomiasis. Autoagglutinin exists in small quantity in the blood of many normal animals. It is frequently present in much greater quantity in the blood of animals infected with trypanosomes. Reaction between autoagglutinin and erythrocytes takes place only at low temperatures. The strongest reactions are obtained when a suspension of washed erythrocytes in normal saline solution is treated at 0° C. with plasma, which has been prepared by defibrinating blood at 37° C. Autoagglutinin can be removed from plasma by absorption with the erythrocytes of the same animal. The reaction between autoagglutinin and red blood cells is reversible, the clumps disappearing on warming and reappearing on cooling. Iso- and hetero-agglutinin are also often present in much greater amount in the blood of infected animals than in that of normal animals of the same species. From the red blood cells of an infected animal, which have been agglutinated in the cold by the plasma of the same animal, an active substance can be extracted with normal saline solution at 37° C. This substance agglutinates, not only the red cells of the same animal and other members of the same species, but also those of many animals of different species. Observations of this kind indicate that auto-, iso-, and hetero-agglutinin are not different highly specific substances, but have closely related affinities. That a clumping together of the red blood cells is frequently observable in coverslip preparations of the fresh blood of animals and man infected with trypanosomiasis is due to the existence of an excess of autoagglutinin in the plasma, which reacts with the erythrocytes to a certain extent at the temperature (15°–20° C.) at which the preparations are usually made. It is to be inferred from the information at present available that a marked degree of autoagglutination of red blood cells is an extremely rare occurrence apart from an infection with trypanosomes. The phenomenon is therefore of some value as a diagnostic sign.—M. **Nierenstein**: The transformation of proteids into fats during the ripening of cheese (preliminary communication). Contrary to the accepted view, it was found that the so-called ripening of cheese is not accompanied by a transformation of proteids into fats, the increase of weight of the latter, as observed by other workers, being due to the presence of *free cholesterol, aminovaleric acid, putrescine, and cadaverine* in the etherial extract. This investigation disproves one of the frequently quoted evidences in favour of the theory that proteids serve as a source for the fat-formation in the animal body.—J. F.

Gaskell: The action of X-rays on the developing chick. No difference was observed in the action of X-rays upon any one tissue rather than another. The action is confined to the lowering of the mitotic activity of the growing tissues. If this diminution is not too great, complete recovery occurs, and the chicks hatch out at the usual time. If the diminution is above a certain degree, recovery does not take place, and further development is arrested forthwith. The critical dose, which just prevents recovery, varies with the stage of development of the embryo, decreasing as the mitotic index decreases. The "mitotic index" as defined by Minot represents the number of mitoses per 1000 cells in the various tissues of embryos of various ages, and he has shown that throughout embryonic life a rapid diminution of mitotic activity is going on. He calls the figures obtained the mitotic index for that particular tissue.—Colonel Sir David **Bruce** and Captains A. E. **Hamerton** and H. R. **Bateman.** (Sleeping Sickness Commission of the Royal Society, Uganda, 1908–10.) Experiments to ascertain if antelope may act as a reservoir of the virus of sleeping sickness (*Trypanosoma gambiense*). It is known that the tsetse-flies (*Glossina palpalis*) around the northern shores of the Victoria Nyanza still retain their infectivity for sleeping sickness, in spite of the fact that the native population was removed from the lake-shore some three years ago. A series of experiments was, therefore, carried out to ascertain if the antelope, which are fairly common along the uninhabited shores of the lake, were capable of acting as hosts of the parasite of sleeping sickness. Eleven antelope of the waterbuck, bushbuck, and reedbuck species were obtained from a district where tsetse-flies and sleeping sickness did not exist. Blood from these animals was first inoculated into monkeys to ascertain if they were already naturally infected with trypanosome disease. They proved to be healthy in this respect. Tsetse-flies (*Glossina palpalis*) that were known to be infected with the virus of sleeping sickness were then fed upon each of the eleven antelope. After about eight days the blood of these animals was again inoculated into susceptible animals, with the result that the latter became infected with *Trypanosoma gambiense* in every case. In eight out of the eleven buck under experiment *Trypanosoma gambiense* appeared in their blood for a few days only (some seven to twelve days) after they had been bitten by infected flies. Flies that were hatched out in the laboratory, and had never fed before, were now fed upon the infected antelope, and subsequently upon monkeys. After an interval of about thirty days, required for the development of trypanosomes within the fly, monkeys were infected with sleeping sickness from the antelope by the agency of *Glossina palpalis* in sixteen out of twenty-four experiments. On dissecting the flies which had been fed upon the infected antelope, it was found that 10·8 per cent. of them were infected with *Trypanosoma gambiense*. The highest percentage of infected flies in any one of the positive experiments was 21 per cent.; the lowest was 1·3 per cent. Nine of these antelope infected with *Trypanosoma gambiense* were under daily observation for more than four months. They remained in perfect health. Two of them (a waterbuck and a bushbuck) never showed trypanosomes in their blood, although examined every day. Both these antelope-infected flies fed upon them, one of them as long as fifty-five days after its infection. No wild antelope inhabiting the lake-shore has yet been found to be naturally infected with *Trypanosoma gambiense*.—Colonel Sir David **Bruce** and Captains A. E. **Hamerton** and H. R. **Bateman.** (Sleeping Sickness Commission of the Royal Society, Uganda, 1908–10.) Experiments to ascertain if the domestic fowl of Uganda may act as a reservoir of the virus of sleeping sickness (*Trypanosoma gambiense*). There is evidence that tsetse-flies (*Glossina palpalis*) feed on the blood of birds as well as that of mammals inhabiting the shores of Victoria Nyanza. Domestic fowls, as representing birds, were experimented with in the search for possible hosts or reservoirs of the virus of sleeping sickness. A series of twenty-one experiments was carried out to ascertain:—(1) if these birds can, like antelope, be infected with *Trypanosoma gambiense* by the bites of known infected flies; (2) if birds so infected can transmit the parasite to newly hatched *Glossina palpalis* which had not fed before they were allowed to bite the fowls; (3) if these flies can convey sleeping sickness to normal monkeys. About 2000 flies, many of which had been proved to be infected with virulent *Trypanosoma gambiense*, were fed upon twenty-one domestic fowls. The results were negative in every case, as ascertained by frequent microscopical examination of peripheral and centrifuged heart's blood, and inoculations of the fowls' blood into susceptible animals. Four hundred newly hatched flies were fed upon three of the fowls which had been bitten by infected flies. The former were subsequently fed upon monkeys, with the result that they failed to convey sleeping sickness from fowls to monkeys. Two hundred and eighty-three of these flies were dissected, and no flagellates could be found in them. *Conclusion.*—The Uganda fowl cannot act as a reservoir of the virus of sleeping sickness.

Institute of Metals, January 18.—G D. **Bengough**: Report to the corrosion committee on the present state of our knowledge of the corrosion of non-ferrous metals and alloys, with suggestions for a research into the causes of the corrosion of brass condenser tubes by sea water. The report is intended to be a general review of present knowledge of the subject of the corrosion of non-ferrous metals, both in its practical and scientific aspects. The theory of corrosion is considered in some detail, and an attempt is made to lay a broader scientific foundation for the whole subject. Two series of experiments are proposed, which, in the author's opinion, should be taken in hand at once. One series is of an empirical nature, and is intended to test the validity of certain opinions held on the subject by practical men, and especially such opinions as are in dispute between different authorities. The other series of experiments is of a purely scientific nature, and is regarded as a means of elucidating certain causes of corrosion that have hitherto been obscure. —Engineer Rear-Admiral J. T. **Corner**: Some practical experience with corrosion of metals. Some of the causes of corrosion of metals on shipboard are so obscure, and the origin so difficult to trace, that a satisfactory explanation is seldom forthcoming. Corrosion of a minor character existed in the old wooden warships, but when iron was used for shipbuilding the conditions were different, and it was soon found that the ships' plates and angles suffered from contact with the copper pipes and bilge water, the *Megaera* being a case in point, where the copper so affected the ship as to necessitate beaching her to prevent her sinking. Trouble from corrosion largely increased about the time of the introduction of the electric light afloat. Suggested causes of corrosion were considered.—Prof. H. C. H. **Carpenter** and C. A. **Edwards**: A new critical point in copper-zinc alloys: its interpretation and influence on their properties, with an appendix, by C. A. **Edwards**, on the nature of solid solutions. A new critical point has been found in those alloys of copper-zinc which contain the β constituent. The temperature of this point is 470° C. The physical meaning of this change is that the β constituent decomposes at 470° C. into the α and γ constituents. In the appendix to the paper, Mr. C. A. Edwards concludes that a metallic crystalline mass, often described as a solid solution, is an intimate crystalline mixture, and whilst the primary crystals are so small that the mass appears quite homogeneous when viewed under the microscope, they are sufficiently large to retain their identity.—Prof. A. **McWilliam** and W. R. **Barclay**: The adhesion of electro-deposited silver in relation to the nature of the German silver basis metal. This paper gives details of researches undertaken with the view of determining the nature of the adhesion of electro-deposited silver to the German silver alloys generally used as a basis metal, and whether any differences exist between various grades of alloys as to their suitability for use in the manufacture of electro-plate which may be called upon to withstand rough usage. The authors find that under the severest conditions of wear there is a great tendency for thick electro-deposited silver coatings to strip from the alloys of high nickel contents known as firsts, that the plating adheres most firmly to the lowest grades known as fifths, but as these are generally too soft or too weak for the special purpose, the best medium is found somewhere in the region of the alloys known as thirds.—H. J.

Humphries and Prof. C. A. **Smith**: Some tests on white anti-friction bearing metals. The authors, being persuaded that friction tests on bearing metals as usually conducted are for many reasons inconclusive, have endeavoured to stimulate a search for a series of static tests which shall be conclusive.

MANCHESTER.

Literary and Philosophical Society, December 13, 1910.—Mr. Francis Jones, president, in the chair.—Miss Margaret C. **March**: Preliminary note on *Unio pictorum, U. tumidus,* and *Onodonta cygnea.* The form of the British Unionids can be shown to be dependent on current and soil, and is therefore useless for systematic purposes when taken alone. The umbonal markings of these animals, merge into one another, and are therefore useless specifically. Phylogenetically they show that *U. pictorum* is most archaic, Anodon least, Tumidus being intermediate. The edentulousness of American Anodons illustrates heterogeneric homæomorphy. The ornament and dentition of Unionoids show relationship to Trigonids, and a descent from a pre-trigonid ancestor.—D. M. S. **Watson**: Notes on some British Mesozoic crocodiles. The author discussed some systematic and nomenclatural difficulties, recording the occurrence of a new variety of *Metriorhynchus hastifer* in the Corallian of Headington, of *M. hastifer* itself in the Kimmeridge clay of Britain, and discussing *Petrosuchus laevidens* and *Steneosaurus Stephani.*—Prof. F. E. **Weiss**: Sigillaria and Stigmariopsis. The author exhibited some specimens of axes of Sigillaria associated with Stigmarian bark. From the repeated occurrence of these specimens it was suggested that they represented the base of the aërial or the subterranean axes of Sigillaria, probably of the Eusigillaria type. The secondary wood was more copiously developed than is general in the aërial axes. The primary wood was of Sigillarian type, so that these Stigmarian axes have centripetal primary wood, and their pithcasts would be striated like those described for Stigmariopsis. It was noticed that in some instances small axes were found in contiguity, and apparently in continuity, with the main axes. These smaller axes resemble the ordinary Stigmarian axes very nearly, and do not show the centripetal primary wood of the main axis, but only a few fine tracheids in the pith region.

January 10.—Mr. Francis Jones, president, in the chair.—H. S. **Holden**: An abnormal fertile spike of *Ophioglossum vulgatum.* The spike in question exhibited a branching structure comparable to a certain extent with the condition normally characterising *Oph. palmatum.* The various features of the vegetative anatomy all serve to demonstrate that the condition described has arisen by a process of chorisis or splitting, thus confirming the work of Prof. Bower on the group to which the genus belongs.—Dr. A. N. **Meldrum**: The development of the atomic theory: (4) Dalton's physical atomic theory. The physical atomic theory, otherwise the theory of "mixed gases," is specially interesting because it marks a stage in the development of Dalton's ideas. Both it and the experiments connected with it arose out of the meteorological observations and studies of his early life. It reveals him as a student of Newton, and as the upholder of a physical atomic theory years before he formed the chemical one. Dalton's theory of mixed gases was an attempt to explain the diffusion of gases, especially of the oxygen and nitrogen in the atmosphere. He ascribed diffusion to physical forces, and not to chemical union, then the accepted explanation in nearly all quarters. In the course of the mixed gases controversy, Dalton had the support of William Henry only, whilst his opponents, who held that the diffusion of gases was due to chemical affinity, included C. L. Berthollet, John Gough, Thomas Thomson, and Humphrey Davy. The water vapour in the atmosphere is a special case of the mixed gases question. Dalton made observations of the dew-point, and used them as a measure of the water vapour in the atmosphere. In this way he raised "hygrometry to the rank of an exact science." Dalton expressly alluded to the hypothesis now associated with the name of Avogadro as a possibility, but rejected it on the ground that, if it were true, the density of a compound gas must be greater than that of its constituent elements, which was not always the case. He knew that nitric oxide and water vapour are lighter than the oxygen they contain.

PARIS.

Academy of Sciences, January 16.—M. Armand Gautier in the chair.—C. **Guichard**: Surfaces the normals of which touch a quadric.—Gaston **Darboux**: Remarks on the preceding communication.—E. **Cahen**: Prime (*intégro-entières*) series.—M. **Girardville**: Increasing the stability of aëroplanes by means of gyroscopes. The gyroscope used in these experiments had a rotating mass of 5·8 kilograms, and a velocity of rotation of 6000 turns a minute. Model aëroplanes, used as gliders without motors, when fitted with the gyroscope governor were found to be free from periodic oscillations, and re-established equilibrium when disturbed.—J. A. **Le Bel**: A singular heating of thin patinum wires.—A. **Cotton**: The delicacy of intereference measurements and the means of increasing them. Shadow interference apparatus. The delicacy of the ordinary interference methods is much increased by the use of polarised light, and means are suggested for applying this to the determination of double refraction.—Jacques **Boselli**: The resistance to the movement of small non-spherical bodies in a fluid. Stoke's theorem has been successfully applied to the study of the movement of spherical bodies in a fluid; in the present paper the motion of red blood corpuscles has been studied. Using the corpuscles of different shapes derived from the blood of different animals, it has been found that, other conditions remaining the same, the velocity of fall is inversely proportional to the viscosity.—M. **de Broglie** and L. **Brizard**: The radiation of quinine sulphate. Ionisation and luminescence. As a working hypothesis it is suggested that the scintillations, and perhaps the continuous light, are due to small electric discharges produced at the moment of the sudden breaking of small crystals.—M. **Hanriot**: Brown gold. This name is applied to the product resulting from the action of acid upon a gold-silver alloy. A study of the changes in volume produced in this modification of gold by increase of temperature—G. **Urbain**: A new element accompanying lutecium and scandium in the gadolinite earths. Celtium. From the rare earths obtained by treating xenotime on the large scale, impure ytterbium was extracted, and by the fractionation of this a new element, lutecium, was isolated. With the view of obtaining larger amounts of lutecium, large quantities of gadolinite have been worked up. The mother liquor resulting from a series of fractional crystallisations from nitric acid contains a metal the oxide of which is characterised by a very low coefficient of magnetisation. Spectrographic analysis revealed the presence of lutecium, scandium, and traces of neoytterbium, calcium and magnesium, and a large number of new lines due to a new element, for which the name of celtium is proposed.—R. **Fourtau**: The metalliferous layer of Gebel-Roussas (Egypt). A detailed description of the zinc and lead deposits.—MM. **Melchissédec** and **Frossard**: The buccal resonator.—M. **Doyon**, A. **Morel**, and A. **Policard**: The isolation of hepatic antithrombine, with a description of some of its properties.—Gabriel **Bertrand** and F. **Rogozinski**: Hæmoglobin as a peroxydase. The compounds of hæmoglobin with oxygen, carbon monoxide, and hydrocyanic acid, were compared as regards their action as oxydases; the catalytic power of each of these compounds was found to be exactly the same.—Aug **Michel**: Autotomy and regeneration of the bodies and elytra in the Polynoïdians.—J. **Granier** and L. **Boule**: The somatic kineses in *Endymion nutans.*—L. **Spillman** and L. **Bruntz**: The eliminating *rôle* of the leucocytes. The elimination of liquid substances foreign to the organism is effected in three phases: fixation, during which the liquids are fixed mechanically by certain forms of leucocytes; transport, the white corpuscles carrying the fixed substances to the excretory organs; excretion, the excretory organs taking possession of the products fixed by the leucocytes by a glandular process.—H. **Coutière**: The Eucyphote shrimps collected in 1910 with the Bourée net by the *Princesse Alice.*—E. **Roubaud**: The biology and pæcilogonic viviparity of the cattle-fly in tropical Africa (*Musca corvina*).—Ph. **Glangéaud**: The volcanic region of Forez and its rocks. In the Forez region during the Miocene or early Pliocene period more than eighty volcanoes were active. The lavas from these show numerous points of similarity with those of Limogne, Mt. Dore, and Velay.

MELBOURNE.

Royal Society of Victoria December 28, 1910.—Prof. E. W. Skeats in the chair.—Bertha **Rees**: The structure of the seed coats of hard seeds, and their longevity. The paper deals mainly with the investigation into the nature of the impermeable layer of hard seeds. The cuticularised layer may consist either of cuticle alone or may extend to a varying depth in the wall of the superficial palisade cells. The cuticle is usually deposited on a basis of hemicellulose, but in *Acacia melanoxylon* the basis is pectose.—Janet W. **Raff**: Protozoa parasitic in the large intestine of Australian frogs, part i. *Hyla aurea, H. ewingii, H. peronii, Limnodynastes dorsalis,* and *L. tasmaniensis* were examined. The forms found most commonly were *Nyctotheus cordiformis, Opalina intestinalis,* two new species of Opalina, *Copromonas subtilis, Trichomonas batrachorum,* and *Trichomastix batrachorum.*—J. T. **Jutson**: The structure and general geology of the Warrandyte goldfield and adjacent country.—J. T. **Jutson**: A contribution to the physiography of the Yarra River and Dandenong Creek basins, Victoria. The Yarra Flats area and its extension south through Croydon and Port Phillip Bay is a Senkungsfeld. The Nillumbik peneplain was uplifted so gradually that the Yarra kept its old course to Templestowe, and is antecedent to the present topography.—A. C. **Stone**: The aborigines of Lake Boga, Victoria. The paper consists principally of vocabularies and folklore.—F. **Chapman**: Some supposed pyritised sponges from Queensland. Two melon-shaped masses are compared externally with Lithistid sponges. They are probably of Desert Sandstone (Upper Cretaceous age).—F. **Chapman**: A revision of the species of Limopsis in the Tertiary beds of southern Australia. Five species are recognised (*L. morningtonensis*, Pritchard; *L. maccoyi*, n.sp.=*L. belcheri*, M'Coy non Adams and Reeve; *L. multiradiata*, Tate; *L. beaumariensis*, n.sp.=? *L. forskali*, Tate non Adams; and *L. insolita*, G. Sow). The latter also occurs in the Santa Cruz beds of Patagonia.—K. A. **Mickle**: The flotation of minerals. The metallurgical method of separation by flotation is due to an adherent gas film on the granules of ore. An account of a large series of experiments is given.

DIARY OF SOCIETIES.

THURSDAY, JANUARY 26.

ROYAL SOCIETY, at 4.30.—Memoir on the Theory of the Partitions of Numbers. Part V.—Partitions in Two-dimensionals Space: Major P. A. MacMahon, F.R.S.—(1) The Origin of Magnetic Storms; (2) On the Periodicity of Sun-spots: Dr. A. Schuster, F.R.S.—Atmospheric Electricity over the Ocean: Dr. G. C. Simpson and C. S. Wright.—On the Fourier Constants of a Function: Dr. W. H. Young, F.R.S.—On the Energy and Distribution of Scattered Röntgen Radiation: J. A. Crowther.—On some new Facts connected with the Motion of Oscillating Water: Mrs. H. Ayrton.

ROYAL INSTITUTION, at 3.—Recent Progress in Astronomy: F. W. Dyson, F.R.S., Astronomer Royal.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Long Distance Transmission of Electrical Energy: W. T. Taylor.—Extra High Pressure Transmission Lines: R. Borlase Matthews and C. T. Wilkinson.

FRIDAY, JANUARY 27.

ROYAL INSTITUTION, at 9.—Radioactivity as a Kinetic Theory of a Fourth State of Matter: Prof. W. H. Bragg, F.R.S.

PHYSICAL SOCIETY, at 5 (at University College).—A Demonstration of Phase Difference between the Primary and Secondary Currents of a Transformer by means of a Simple Apparatus: Prof. F. T. Trouton, F.R.S.—A Note on the Experimental Measurement of the High Frequency Resistance of Wires: Prof. J. A. Fleming, F.R.S.—(1) The Measurement of Energy Losses in Condensers traversed by High Frequency Oscillations; (2) Some Resonance Curves taken with Impact and Spark Discharges: Prof. J. A. Fleming, F.R.S., and G. B. Dyke.—Council Meeting at 4.30 p.m.

SATURDAY, JANUARY 28.

ESSEX FIELD CLUB, at 6 (at Essex Museum of Natural History, Stratford).—Exhibition of Coloured Photographs of Alpine Flowering Plants: Somerville Hastings.—Note on the Occurrence of Stony Beds underlying Harwich Harbour: Percy Thompson.—On a Pre-historic Interment found near Walton-on-Naze: Hazzledine Warren.

MONDAY, JANUARY 30.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—Recent Explorations in Dutch New Guinea: Dr. H. A. Lorentz.

INSTITUTE OF ACTUARIES, at 5.—On Staff Pension Funds: The Progress of the Accumulation of the Funds; The Identity of a Valuation with the Future Progress of a Fund; The Manner of Dealing with Funds which are Insolvent; and Sundry Observations: H. W. Manly.

TUESDAY, JANUARY 31.

ROYAL INSTITUTION, at 3.—Heredity: Prof. F. W. Mott, F.R.S.

ROYAL SOCIETY OF ARTS, at 4.30.—The Tin Resources of the Empire: F. Douglas Osborne.

ILLUMINATING ENGINEERING SOCIETY, at 8.—*Dicussion* on Library Lighting opened by J. Duff Brown and S. L. Jast.

INSTITUTION OF CIVIL ENGINEERS, at 8.—*Further discussion*: Sand movements at Newcastle Entrance, N.S.W.: C. W. King.—Fremantle Harbour-works, Western Australia: C. S. R. Palmer.—The Bar Harbours of New South Wales: G. H. Halligan.

WEDNESDAY, FEBRUARY 1.

ROYAL SOCIETY OF ARTS, at 8.—Examinations and their Bearing on National Efficiency: P. J. Hartog.

SOCIETY OF PUBLIC ANALYSTS, at 8.—President's Annual Address.—Note on the Detection and Estimation of Small Quantities of Antimony: Dr. P. Schidrowitz and H. A. Goldsbrough.—The Analytical and Microscopical Examination of Compound Liquorice Powder: G. E. Scott-Smith and John Evans.—Commercial Analysis and Arithmetic: C. A. Seyler.

ENTOMOLOGICAL SOCIETY, at 8.

THURSDAY, FEBRUARY 2.

ROYAL SOCIETY, at 4.30.—*Probable Papers*: (1) Experiments to investigate the Infectivity of *Glossina palpalis* Fed on Sleeping Sickness Patients under Treatment; (2) Experiments to Ascertain if *Trypanosoma gambiense* during its Development within *Glossina palpalis* is infective: Col. Sir D. Bruce, F.R.S., and others.—Further Experimental Researches on the Etiology of Endemic Goitre: Captain R. McCarrison.—On the Leaves of Calamites (*Calamocladus Section*): H. H. Thomas.—Complement Deviation in Mouse Carcinoma: Dr. J. O. W. Barratt.

ROYAL INSTITUTION, at 3.—Recent Progress in Astronomy: F. W. Dyson, F.R.S., Astronomer Royal.

LINNEAN SOCIETY, at 8.

RÖNTGEN SOCIETY, at 8.15.—The Work of Action of an Induction Coil: Prof. Salomonson.

FRIDAY, FEBRUARY 3.

ROYAL INSTITUTION, at 9.—Grouse Disease: A. E. Shipley, F.R.S.

GEOLOGISTS' ASSOCIATION, at 7.30.—Annual General Meeting.—President's Address: Flint and Chart: W. Hill.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Rivers and Estuaries: W. H. Hunter, M.Inst.C.E.

CONTENTS.