THE Imperial Education Conference, at its meeting last year, recommended that there should be appointed in connection with that conference an advisory committee consisting of the accredited agents in London of the several Governments concerned, together with representatives of the Colonial Office, the India Office, the Board of Education, the Scotch Education Department, and the Irish Office. The functions of the committee as recommended by the conference were to be to keep itself acquainted with the progress of any courses of action that the conference had recommended, to facilitate that progress when necessary by communicating with the Governments concerned, and to consider such proposals as might be submitted for the agenda of any future meetings of the conference. The following representatives have been nominated by the various Governments and departments concerned to serve on the committee:—Mr. L. A. Selby-Bigge, C.B., Board of Education; Dr. H. Frank Heath, C.B., Board of Education; Sir John Struthers, K.C.B., Scotch Education Department; Dr. W. J. M. Starkie, Irish Government; Sir H. W. Just, K.C.M.G., Colonial Office (Dominions Division); Mr. J. F. N. Green, Colonial Office (Crown Colonies); Sir Theodore Morison, K.C.I.E., India Office; the Right Hon. Lord Strathcona and Mount Royal, G.C.M.G., G.C.V.O., Dominion of Canada; the Right Hon. Sir G. H. Reid, P.C., G.C.M.G., Commonwealth of Australia; the Hon. Thomas Mackenzie, Dominion of New Zealand; Mr. T. Slingsby Nightingale, Union of South Africa; Mr. T. A. Coghlan, New South Wales; the Hon. Sir John Taverner, Victoria; Major Sir Thomas Robinson, Queensland; the Hon. A. A. Kirkpatrick, South Australia; Mr. Cyril Jackson, Western Australia; the Hon. Sir John McCall, Tasmania. The Board of Education has placed at the disposal of the committee the ervices of Mr. W. W. Hornell, Assistant Director of Special Inquiries and Reports, to act as honorary secretary.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 7.—Sir Archibald Geikie, K.C.B., president, in the chair.—Louis V. **King**: The scattering and absorption of light in gaseous media, with applications to the intensity of sky radiation. The analysis of the present investigations seems to support the view that, at levels above Mount Wilson, molecular scattering is sufficient to account completely both for attenuation of solar radiation and for the intensity and quality of sky radiation. Even at sea-level the effect of "atmospheric dust" can be taken into account in a simple manner in formulæ for absorption and scattering.—Dr. P. E. **Shaw**: A standard measuring machine.—E. M. **Stubbs** and Dr. E. B. R. **Prideaux**: A spectro-photometric comparison of the emissivity of solid and liquid gold at high temperatures with that of a full radiator. (1) The emissivity of solid and liquid gold at high temperatures, relative to the emissivity of a full radiator at the same temperatures, has been measured throughout the visible spectrum. (2) A sharp discontinuity in the emissivity takes place at the melting point, the liquid gold emitting more strongly than the solid in the red and yellow, and less in the extreme blue. The shape of the "relative emissivity" curves is quite different in the two cases. (3) The curve of "relative emissivity" of solid gold at high temperatures is similar to that of absorptivity at low temperatures as determined from reflectivity measurements; whether it is identical, in which case the temperature coefficient of the absorptivity would be *nil*, could not be absolutely determined, owing to the change of structure which a polished surface undergoes on heating. (4) No temperature coefficient of "relative emissivity" could be detected for the liquid metal through a range of more than 100°. (5) "Black body" temperatures of solid and liquid gold at the melting point have been calculated. (6) It has been shown that the general equation expressing the radiation of a selective radiator is of the form

$$E_{\lambda'} = f(\lambda, T) c_1 \lambda^{-5} e^{-c_2/\lambda T},$$

which in the case of gold and other metals cannot be reduced to the form of Wien's equation for a full radiator with changed values of the constants.—C. **Smith**: Optical properties of substances at the critical point.—Hon. R. J. **Strutt**: Absorption of helium and other gases under the electric discharge. Attempts to repeat Berthelot's absorption of helium by carbon disulphide under the influence of the silent discharge have given absolutely negative results. Helium is slightly absorbed by phosphorus under electric discharge, though in much less quantity than nitrogen or hydrogen. The absorption in the former case is regarded as mechanical, in the latter as chemical.—F. W. **Aston**: The discharge between concentric cylinders in gases at low pressures. (1) The relations between pressure, voltage, and the length of the Crookes dark space in the discharge between concentric cylinders take much the same form as those in the discharge between parallel planes. (2) Curvature of the surface of the kathode appears to have no influence upon the rate of alteration of the length of the dark space with change of current density, *so long as the latter is measured at the surface of the kathode.* (3) *Ceteris paribus,* the length of the dark space is greater for a convex cylindrical surface than a plane, and for a plane than a concave one.—F. W. **Aston**: The influence of the nature of the kathode on the length of the Crookes dark space. (1) The relations between the values of pressure, voltage, current, and the length of the dark space are determined for plane kathodes of many different materials, and found to satisfy the same form of equations as those previously given for aluminium, the constants varying considerably. (2) Roughness of the kathode surface does not appear to affect the discharge, if the dimensions of the irregularities are small compared with the length of the dark space. (3) The length of the dark space is shown, in the cases examined, to be greatest for silver and least for magnesium, the metals following the same order as in the case of the kathode fall. (4) The rate of change of length of the dark space with change of current density at the surface of the kathode seems much the same for all kathodes. (5) Difficulties in the way of arriving at a satisfactory explanation of these and other data connected with the dark space are indicated and shortly discussed.—A. **Campbell**: The determination of the absolute unit of resistance by alternating-current methods.—A. **Mallock**: Some unclassified properties of solids and liquids. This paper suggests that many qualities of solids and liquids, which, although well known and commonly recognised, are not classified (qualities, for instance, such as ductility and malleability), may be explained by reference to the relations of the limits of the principal elasticities of the substances. A real homogeneous isotropic substance, whether solid or liquid, offers two distinct kinds of resistance to deformation, viz., resistance to alteration of volume and resistance to shear. There are also two distinct and different limits to each of these kinds of deformation—limits which cannot be exceeded without causing rupture or permanent alteration of the substance. When a strain involves both shear and alteration of volume, the behaviour and properties of the strained material depend to a great extent on whether the limit of shear or the limit of

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volume alteration is the first to be overcome.—Sir W. de W. **Abney**: Trichromatic theory of colour vision. The measurement of fatigue of the retina.

November 14.—Sir Archibald Geikie, K.C.B., president, in the chair.—J. W. **Cropper**: The development of a parasite of earthworms. A description of "bodies" found within some of the epithelial cells of the vesiculæ seminales of the earthworm. They closely resemble "Kurloff's bodies" found within the lymphocytes of guinea-pigs. By means of the jelly method of examination, the development of these bodies into free spirochætes is demonstrated in the same way that it has recently been shown that "Kurloff's bodies" also become spirochætes. The author suggests that these new parasites be called *Spirochaeta lumbrici*.—Edith R. **Saunders**: Further contribution to the study of the inheritance of hoariness in stocks (Matthiola).—Prof. A. J. **Brown** and F. P. **Worley**: The influence of temperature on the absorption of water by seeds of *Hordeum vulgare* in relation to the temperature coefficient of chemical change.—R. **Kirkpatrick**: Note on *Merlia normani* and the "Monticuliporas."—James **Thompson**: The chemical action of *Bacillus cloacae* (Jordan) on citric and malic acids in the presence and absence of oxygen.—G. W. **Ellis** and J. A. **Gardner**: The origin and destiny of cholesterol in the animal organism. Part x., The excretion of cholesterol by man, when fed on various diets.—Prof. R. Boyd **Thomson**: The comparative anatomy and affinities of the Araucarineæ.—Muriel **Robertson**: Notes on the polymorphism of *Trypanosoma gambiense* in the blood and its relation to the exogenous cycle in *Glossina palpalis*.—H. L. **Duke**: Further observations on the recovery of *Trypanosoma gambiense* from *Tragelaphus spekei* on the islands of Lake Victoria Nyanza.—Colonel Sir David **Bruce**, Majors **Harvey** and **Hamerton**, Dr. J. B. **Davey**, and Lady **Bruce**: The morphology of *Trypanosoma simiae*, sp. nov.—H. L. **Duke**: (1) Some observations on *T. pecorum* (Bruce) and *T. uniforme* (Bruce). (2) A camel Trypanosome; with some remarks on the biometric method of diagnosing Trypanosomes. (3) Some experiments with arsenphenylglycin and *Trypanosoma gambiense* in *Glossina palpalis*.—Dr. H. **Bayon**: The cultivation of *Trypanosoma rhodesiense* (Stephens and Fantham).

Zoological Society, October 29.—Prof. E. A. Minchin, F.R.S., vice-president, in the chair.—Mrs. Rose Haig **Thomas**: Eggs of *Phasianus versicolor*, *P. formosus*, and of the F_1 and F_2 offspring of an experimental cross between a male *P. versicolor* and a female *P. formosus*. Attention was directed to the resemblance in size of the eggs of the offspring and of the male parent species, whereas the expectation was a likeness to those of *P. formosus*, thus showing the descent through the male to his female offspring of the small egg of his species.—E. G. **Boulenger**: The breeding-habits of the "Millions" fish (*Girardinus poeciloides*). Cases were recorded of the male of this species breeding before assuming the livery of its sex. The author directed attention to parallel cases among fishes, in which, however, except in one case, the question was one of degree only.—Rev. T. R. R. **Stebbing** read a paper on the crustacea Isopoda of the *Porcupine* expedition.—Dr. F. E. **Beddard**: The anatomy and sytematic arrangement of the Cestoidea.—E. Dukinfield **Jones**: Thirteen new species of butterflies of the genus Thecla, collected at various localities in south-east Brazil.

Challenger Society, October 30.—Prof. E. W. MacBride in the chair.—D. J. **Matthews**: (1) A bacteriological water-bottle. This bottle consists essentially of a glass-lined brass cylinder, closed at each end by rubber washers. It is lowered closed and full of alcohol, sterility being thus ensured and external pressure counteracted; it is then opened (when sea-water replaces the alcohol) and closed by messengers. (2) The observations of Mr. G. H. Drew in the Tongue of the Ocean. The Tongue is an inlet of deep water (700 to 1000 fathoms) running southward into the Great Bahama Bank. The salinity and temperature in the depths agreed with those of nearest stations of *Challenger* and *Michael Sars*; surface temperatures were higher. A layer of water of high salinity was found near the surface near the coast, but not farther out, and as it was not accompanied by irregularities of the temperature curve, a strong current was probable.—E. **Heron-Allen** and A. **Earland**: *Saccammina sphaerica* (M. Sars) and *Psammosphaera fusca* (Schulze). The views of Dr. Ludwig Rhümbler as to the life-history of these forms were combated, and the stages of the life-cycle he described referred to different species, namely *Crithionina mammilla* (Goes) and the above. The three species were found to differ widely in distribution, though they sometimes occur together.

Geological Society, November 6.—Dr. Aubrey Strahan, F.R.S., president, in the chair.—Prof. A. C. **Seward**: A contribution to our knowledge of Wealden floras, with special reference to a collection of plants from Sussex. In this paper an account is given of specimens of Wealden plants from the Sussex coast, for the most part from the neighbourhood of Fairlight, acquired by the British Museum since 1895, the date of publication of the second part of the Wealden Flora (British Museum catalogue).—E. **Proctor**: Notes on the discovery of fossiliferous Old Red Sandstone in a boring at Southall, near Ealing. With a note on the fish-remains, by Dr. A. Smith **Woodward**. The boring described in this paper is situated at Southall, and was made for the purpose of obtaining water from the Lower Greensand. For this purpose, however, the boring was a complete failure, as it passed directly from the Gault into Palæozoic rocks. The older rocks were met with at a depth of 1130 ft., and continued with slight variation to a depth of 1261 ft., the lower limit of the borehole. The fossils were yielded by definite bands, which varied from 1 in. to an eighth of an inch in thickness; they consisted mainly of scales and teeth of Holoptychius and plates of Bothriolepis, both characteristic genera of the Old Red Sandstone.

Linnean Society, November 7.—Prof. E. B. Poulton, president, in the chair.—Dr. R. R. **Gates**: Mutating Oenotheras The following facts and views regarding mutation as an evolutionary factor were referred to:—(1) *Oenothera Lamarckiana* has probably undergone crossing in the wild state to the same extent that other open pollinated species intercross. (2) The mutation phenomena are an evidence of germinal instability resulting from crossing, change of climate, or cultivation. (3) Hybrid splitting is inadequate to account for the forms which suddenly appear. (4) Some of the mutants differ from the parent in their physiological adjustments, and this may account for cases of "climatic adaptation," but mutations will not suffice to explain the more complex adaptations which involve inter-relationships between several organisms. (5) *O. rubricalyx* has originated as a heterozygous mutant, but there are obvious difficulties in applying the same explanation to the other mutants of Oenothera. (6) The origin of certain of the mutations, at least (*e.g. O. lata*, *O. gigas*), is intimately concerned with chromosome mechanisms; that of certain others may be concerned with the action of releasing stimuli. (7) Darwinian natural selection always assumed an original environmental change for the organism, either (*a*) a change of climate in a given area, or (*b*) the introduction of new organisms, lead-

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ing to the gradual modification of the species. (8) But neither chance-wise mutations in all directions nor the vicissitudes of changing climates and distributions can account for the orderly phylogenies which larger groups of organisms frequently show. (9) There is no single evolutionary factor, but the process is a multifarious one.—H. N. **Ridley**: A collection of plants from Mount Menuang Gasing, Selangor. In February, 1912, Mr. C. B. Kloss made an expedition to Mt. Menuang Gasing in Selangor to collect the fauna and flora of this mountain. In this paper is an account of the expedition and of the plants collected by him in four or five days spent at an altitude of 4900 ft. there. Menuang Gasing is the most southern high point of the great chain of the granite mountains which form the backbone of the peninsula, and the object of the expedition was to discover whether the high mountain fauna and flora descended so far south as this point. The mountain is 4900 ft. high, and though there are other hills a little south of this, this is the highest and most likely to bear the high hill flora. The fauna was found to belong to that of high northern ranges, and the flora shows clearly that it corresponds. Among the characteristic plants found were the golden balsam, *Impatiens oncidioides*, Ridl., *Bucklandia populnea*, R. Br., the rare *Polyosma parviflora*, King, *Pratia begonifolia*, Lindl., *Dilochia Cantleyi*, Ridl., and *Goodyera gracilis*, Hook. fil. The only mountain south of this one of approximate altitude is Mt. Ophir in Malacca; the flora of this is well known, and is very different from that of the main range. Indeed, there is every evidence that Mt. Ophir was never connected with the main chain, at least during the period of the evolution of the flora. One hundred and forty-three species were collected by Mr. Kloss, of which fourteen were undescribed; of these the most noteworthy were what is probably the biggest species of the large genus Oberonia, a remarkable species of Blastus, and a new species of Balanophora.

Mathematical Society, November 14.—Annual meeting. Dr. H. F. Baker (president, 1910–11), and afterwards Prof. A. E. H. Love (the newly elected president), in the chair. After the election of council and officers for the coming session, the following papers were communicated:—A. B. **Grieve**: Some properties of cubic surfaces.—Prof. W. H. **Young**: The determination of the summability of a function by means of its Fourier constants.—Prof. W. **Burnside**: Groups of linear substitutions which possess quadratic invariants.—J. B. **Holt**: The irreducibility of Legendre's polynomials.—Prof. E. W. **Hobson**: The representation of a summable function by means of a series of finite polynomials.—E. **Cunningham**: Theory of functions of a real vector.—G. N. **Watson**: Some solutions of Laplace's equation.

PARIS.

Academy of Sciences, November 11.—M. Lippmann in the chair.—Edouard **Branly**: The intermittent conductivity of thin dielectric layers. An experimental study of the electrical conductivity of thin sheets of dielectrics (gutta-percha, collodion, mica, celluloid, varnish) under varying conditions of pressure and electromotive force, and submitted to the effects of shock or induced oscillatory currents set up at a distance by the spark discharge of a condenser. The results are applied to explain the action of radio-conductors utilised in wireless telegraphy.—M. **Borrelly**: Observations of the Borrelly comet (1912*c*) made at the Observatory of Marseilles with the comet-finder. Positions are given for November 3, 6, and 8.—M. **Coggia**: Observations of the Borrelly comet (*c*, November 2, 1912) made at the Observatory of Marseilles with the 26 cm. Eichens equatorial. Positions given for November 4 and 8.—M. **Giacobini**: Observations of the new Borrelly comet (1912*c*) made at the Paris Observatory with the 40 cm. equatorial. Positions given for November 6 and 7.—J. **Guillaume**: Observations of the Schaumasse comet (1912*b*) made at the Observatory of Lyons. Positions given for October 2, 3, 6, and 7.—MM. **Luizet** and **Guillaume**: Observations of the Borrelly comet (1912*c*) made at the Observatory of Lyons. Six positions given for November 7, 8, and 9.—P. **Chofardet**: Observations of the Borrelly comet made at the Besançon Observatory. Five positions given for November 4, 6, and 7.—P. **Brück**: Observations and elements of the Borrelly comet (1912*c*) obtained at the Observatory of Besançon.—Louis **Fabry**: The identification of the small planets.—Jean **Chazy**: A differential system formed by M. Schlesinger.—Ch. J. de la Vallée **Poussin**: The development of trigonometrical series.—M. **Hisely**: A new theorem on the effects of moments.—M. **Poincet**: The wake and suction at the back of ships. A discussion of the results of experiments carried out by Creusot on the torpedo-destroyer *ST*, and their bearing on the propulsion of turbine vessels.—M. **Duchêne**: The use of the carrying planes in the construction of an aëroplane.—Alphonse **Berget**: A velocity formula applicable to aëroplanes. An empirical formula, $V=A\left(\frac{F}{S}\right)^{\frac{1}{3}}$, is given, in which V is the velocity, S the supporting surface of the planes, F the h.p. of the motor, and A a numerical coefficient. In eleven types of aeroplane actually in use the coefficient A varies between 7 and 8.—C. **Raveau**: The fringes of holohedral crystalline plates with parallel faces.—Georges **Claude**: The phenomena of electrical pseudo-resonance.—M. **Hanriot**: Drawing down metals.—L. **Grimbert** and M. **Laudat**: The estimation of lipoids in blood serum. A description of a rapid and moderately accurate method of determining cholesterol, lipoids containing phosphorus, fatty acids, and neutral fats in a small quantity of blood serum. Analytical figures are given for normal and pathogenic serum.—H. **Vincent**: The diagnosis of typhoid fever by the spleen reaction. The injection of a preparation made from typhoid bacilli determines a characteristic hypertrophy of the spleen in cases of typhoid fever, and this reaction appears to be specific. It has given positive results in cases where the blood culture remained sterile.—Léon **Bernard**, A. Le **Play**, and Ch. **Mantoux**: The minimum pulmonary capacity compatible with life.—C. **Schlegel**: The influence of temperature on the course of development of *Maïa squinado*.—Henri **Martin**: The distribution of the human deposits in the Mousterian layer of La Quina (Charente).—Léon **Bertrand** and Louis **Mengaud**: The structure of the Cantabrian Pyrenees, and their probable relations with the western Pyrenees.—G. **Vasseur**: The discovery of a layer of vertebrates in the upper Agenais Aquitanian. The geological age of the fauna of Saint-Gérand-le-Puy.

BOOKS RECEIVED.

Der Kautschuk: Eine kolloid-chemische Monographie. By Dr. R. Ditmar. Pp. viii+140+plate. (Berlin: J. Springer.) 6 marks.

Elektrobiologie: die Lehre von den elektrischen Vorgängen im Organismus auf moderner Grundlage dargestellt. By Prof. J. Bernstein. Pp. ix+215. (Braunschweig: F. Vieweg und Sohn.) 6 marks.

The Electrical Conductivity, Dissociation, and Temperature Coefficients of Conductivity from Zero to Sixty-five Degrees of Aqueous Solutions of a Number of Salts and Organic Acids. By Prof. H. C. Jones and others. Pp. iv+148. (Washington: Carnegie Institution.)

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