

Societies and Academies.

LONDON.

Royal Society, March 2.—Sir Charles Sherrington, president, in the chair.—L. N. G. Filon and H. T. Jessop: On the stress-optical effect in transparent solids strained beyond the elastic limit. The stress-optical effect in glass under simple pressure exhibits no time-effect at ordinary temperatures, but in celluloid under simple tension there is a marked creep in both stress-optical effect and strain even under very moderate loads. The observations can be explained on the assumption that celluloid consists of a mixture of two constituents having different elastic and plastic properties and different stress-optical coefficients, the optical-effect in each being strictly proportional to the stress.—W. E. Curtis: The structure of the band spectrum of helium. Measurements of grating photographs of three of the principal helium bands show that the chief features of their structure are accounted for by the quantum theory of band spectra. In each of the three bands a new type of series is found. The spectrum is considered to be due to an unstable helium molecule, having a moment of inertia of about 1.8×10^{-40} gm.cm.².—S. Datta: The spectrum of beryllium fluoride. The spectrum of beryllium fluoride consists of six groups of bands, all in the ultra-violet between λ 2800 and λ 3400, and all fading off towards the red. The strongest band at λ 3009 includes three series of lines, which depart considerably from the usual type of formula. The groups of bands are similar to one of the groups given by magnesium fluoride.—W. G. Palmer: The catalytic activity of copper. Pt. III. The effect upon the catalytic (dehydrogenating) activity of copper of adding to the metal varying proportions of weak dehydrogenating catalysts, ferric, manganous, zinc, and magnesium oxides, is described. Magnesium and manganous oxides enhance the activity of the copper, if present in quantity greater than 1 to 2 per cent., while zinc and ferric oxides reduce the activity. It is considered that small proportions of oxide (less than 1 to 2 per cent.) destroy the activity of the copper, owing to solution in the metal leading to diminished adsorption of the alcohol attacked.—G. B. Jeffery: (1) The motion of ellipsoidal particles immersed in a viscous fluid. (2) The rotation of two circular cylinders in a viscous fluid. (1) Einstein has shown that the viscosity of a fluid containing solid spherical particles in suspension is given by $\mu(1+2.5V)$, where μ is the viscosity of the pure fluid and V is the total volume of the particles per unit volume of the suspension. This result is extended to ellipsoidal particles and it is shown that the factor 2.5 is reduced but always lies between 2 and 2.5 and depends upon the shape of the particles. (2) The problem of the rotation of a circular cylinder in a fluid contained in a non-concentric cylindrical vessel which may itself rotate about its axis can be solved in finite terms; that of the rotation of two parallel cylinders in an infinite fluid is in general insoluble; *i.e.* there is no steady motion for which the fluid is at rest at infinity.

PARIS.

Academy of Sciences, February 13.—M. Emile Bertin in the chair.—Maurice Janet: The characters of the moduli of forms and systems of partial differential equations.—Witold Wilkosz: A fundamental point in the theory of potential.—E. Cartan: A geometrical definition of the energy tensor of Einstein.—M. Auric: The resolution of an indeterminate linear equation.—V. Dolejssek: The $K\alpha$ lines of the

lighter elements. The $K\alpha$ lines have been measured for thirteen elements, ranging between chlorine and zinc.—A. Dauvillier: The complexity of the K series of the light elements and its theoretical interpretation. Results and details of measurements in the K series of copper and molybdenum.—C. E. Guye: The extension of the law of Paschen to polarised fluids.—M. Mercier: Harmonic synchronisation of electrical oscillators.—R. Bouloch: Calculation of the elements which determine a centred system formed by any number of surfaces.—A. Zimmern: The influence of temperature on the sensibility of emulsions in radiography. Over the range 15° to 80° C. the sensibility of a photographic plate to light varies slightly, if at all. With X-rays, on the other hand, the sensibility increases with rise of temperature, and this effect can in some cases be utilised with advantage. It would appear that the actions of light and X-rays on the silver salt are dissimilar.—C. Matignon and M. Fréjacques: The transformation of ammonia into urea. Quantitative study of the conversion of ammonium carbamate into urea, alone or in presence of catalysts.—Paul Pascal: The magneto-chemical investigation of constitution in mineral chemistry. The phosphoric acids. Measurements of the magnetic susceptibilities are given, and constants deduced for the groups, P, PO₂, PO₃, PO, and PO₄. The results agree with the rational formulæ PO(OH)₃ and RPO(OH)₃ for the phosphonic and phosphoric acids, and are opposed to H₂PO(OH) for hypophosphorous acid and HPO(OH)₂ for phosphorous acid.—E. Decarrière: The rôle of gaseous impurities in the catalytic oxidation of ammonia. The influence of hydrogen phosphide. Phosphoretted hydrogen poisons the catalyst (platinum) in ammonia oxidation, even in a proportion as low as 0.0002 per cent.—Marcel Godehot and Pierre Bédos: The oxide of cyclohexene and ortho-methylcyclohexanol. The ether oxide of cyclohexanol is obtained in quantitative yield by the oxidation of cyclohexene with perbenzoic acid. Methylmagnesium iodide reacts with the ether oxide giving *o*-methylcyclohexanol.—V. Thomas: A mixed organometallic compound of aluminium. Methylene iodide reacts slowly with aluminium at the ordinary temperature, no gas being evolved.—Alphonse Mailhe: A new preparation of amino-naphthenes. Cyclohexanone or its alkyl derivatives are converted into ketazines by reaction with hydrazine hydrate and these reduced to amines by catalytic reduction with nickel. The main product consists of primary amines, with a small proportion of secondary amines as a by-product.—G. Meunier: The action of mineral acids on crude celluloses: the formation and destruction of reducing substances. The utilisation of the by-products of this destruction. Dilute mineral acids at a high temperature attack the ligno-celluloses as vigorously as strong acids, used cold, with economy of acid. The by-products include fatty acids, furfural, acetone, and methyl alcohol, and suggestions are made for their utilisation.—Charles Jacob: The structure of southern Tonkin. Except for small differences in detail, the geological structure of southern Tonkin is the same as that of North Annam.—Mlle. Yvonne Boisse de Black: Russian erosion in the high valleys of the Cère and the Goul (Cantal).—P. Monnet: The Italian earthquake of September 7, 1920. A slight shock on September 6 was followed on the 7th by a disastrous earthquake by reason of which 250 lives were lost. The seismic zone is a rough oval the major axis of which is S.E.—N.W. and about 50 kilometres long.—C. and M. Schlumberger: Electrical phenomena produced by metallic deposits. It has been shown in an earlier communication that deposits of pyrites produce spontaneously differences of potential with the surrounding layers. The

phenomenon appears to be general and the presence of pyrites is not indispensable, similar effects being traced to the presence of galena, mispickel, sulphides of copper, pyrolusite, and other minerals. The effect can be reproduced in the laboratory.—Paul Guérin : The mucilage of the Urticaceæ. Mucilage is widely distributed in this order, and its presence in the various organs of these plants constitutes a character of real value, and should be taken into account along with other anatomical peculiarities.—H. Jumelle : The Neophloga, Madagascan palm trees.—A. Guilliermond and G. Mangelot : The signification of Holmgren's canals.—Eugène Bonnet : The action of soluble salts of lead on plants. The plants studied included wheat, peas, and beans, and the lead solution surrounding the rootlet between one-thousandth normal and half that amount of lead. Lead arrests the growth of the stem and diminishes the length of the roots.—Gabriel Bertrand and Mme. M. Rosenblatt : The variations in the proportions of manganese in leaves with age.—Gustave Rivière and Georges Pichard : The partial sterilisation of the soil. Experiments on the use of sodium arsenate for the partial sterilisation of the soil. Used in the proportion of between 21 and 42 kilograms per hectare the protozoa are destroyed and the useful bacteria multiply. This indirect fertilising action is shown by increased yields, which on the large scale have been shown to be 20 per cent. to 50 per cent.—Auguste Lumière and Henri Couturier : The resistance of females during pregnancy to anaphylactic and anaphylactoid shock. Female guinea-pigs during pregnancy are immune from shock caused either by the injection of serum or of flocculent inert material. The cause of the immunity has been traced to the increase in the volume of the blood: the immunity could be destroyed in females by bleeding and conferred on males by injecting physiological serum.—M. Champy : The conditions of the genesis of the sexual harpoxone in Batrachians.—Henri Jean Frossard : Respiratory gymnastics and the tests of Valsalva and of Muller.—Foveau de Courmelles : Combined radiotherapy of the breast and the ovaries against tumours of the breast.

Official Publications Received.

Meddelanden från Statens Skogsförsöksanstalt. Hälften 18, Nr. 4 : Stamforns-Undersökningar en Sammanfattande Analys av Norrlands Skogstallmateria med Avseende på de Faktorer som Bestämmer Noggrannheten vid Apterung på Rot. (Stem Form Investigations : Accuracy of Yield Estimation of Standing Trees.) By Sven Petrin. Pp. 165-220. Hälften 18, Nr. 5 : Till Kännedomen om Förhållandet mellan Solbladens och Skuggbladens Kolhydratsproduktion. By M. G. Stålfelt. Pp. 221-280. Hälften 18, Nr. 6-9 : Skogsinsekternas Skadegörelse under 1918, die Beschädigungen der Forstinsekten im Jahre 1918. By Ivar Trägårdh. Bidrag till Kännedomen om Splintborrnas Näringsnag: Beitrag zur Kenntnis des Ernährungsfrasses bei den europäischen Splintkäfern. By Paul Spessivtseff. Årsberättelser 1920. Årsberättelser 1921. Pp. 281-352. (Stockholm.)

I.—1922. Ceylon. Report of the Industries Commission. Pp. 91. (Colombo : Government Record Office.) 2.75 rupees.

Nigeria. Annual Report on the Forest Administration for the Year 1920 and period 1st January to 31st March 1921. Pp. 24. (Ibadan : Forestry Department.)

Bulletin of the American Museum of Natural History. Vol. 45. I. : On the Distribution of the Ants of the Ethiopian and Malagasy Regions. By Wm. M. Wheeler. II. : The Ants collected by the American Museum Congo Expedition. By Wm. M. Wheeler. Pp. 13-269 + plates 2-23. (New York.)

U.S. Department of Agriculture : Bureau of Biological Survey. North American Fauna, No. 45 : A Biological Survey of Alabama. By Arthur H. Howell. 1 : Physiography and Life Zones. 2 : The Mammals. Pp. 88 + 11 plates. (Washington : Government Printing Office.)

The Carnegie Foundation for the Advancement of Teaching. Sixteenth Annual Report of the President and of the Treasurer. Pp. vi + 205. (New York City.)

Hydro-Electric Survey of India. Vol. 3 : Triennial Report, with a Preliminary Forecast of the Water Power Resources of India, 1919 to 1921. By J. W. Meares. Pp. ix + 199. (Calcutta : Government Printing Office.) 4 rupees.

Ministry of Agriculture, Egypt. Report on the Motor Tractor Trials organized by the Ministry of Agriculture. Part A : At Kafr Bata—December 1920. Part B : At Damanhur—April 1921. Pp. iv + 55 + plates. (Cairo : Government Press.) P.T. 15.

Department of Agriculture, Mysore. Mysore Agricultural Calendar 1922. Pp. iii + 56. (Bangalore : Government Press.) 1 anna.

Imperial Department of Agriculture for the West Indies. Report on the Agricultural Department, St. Lucia, 1920. Pp. iv + 28. (Barbados.) 6d.

Trinidad and Tobago. Council Paper No. 100 of 1921. Department of Agriculture. Administration Reports of the Director of Agriculture for the Years 1919 and 1920. Pp. 84. (Port of Spain : Government Printing Office.) 2s. 3d.

Department of the Interior : Bureau of Education. Bulletin, 1920, No. 39 : Facilities for Foreign Students in American Colleges and Universities. By Samuel P. Capen. Pp. 269. (Washington : Government Printing Office.)

Department of the Interior : U.S. Geological Survey. Water-Supply Paper 459 : Surface Water Supply of the United States, 1917. Part IX. : Colorado River Basin. Pp. 192 + xxxiii. Water-Supply Paper 460 : Surface Water Supply of the United States, 1917. Part X. : The Great Basin. Pp. 277 + xl. Water-Supply Paper 475 : Surface Water Supply of the United States, 1918. Part V. : Hudson Bay and Upper Mississippi River Basins. Pp. 153 + xxx. (Washington : Government Printing Office.)

Annual Report of the Board of Regents of the Smithsonian Institution, showing the Operations, Expenditures, and Condition of the Institution for the Year ending June 30, 1919. (Publication 2590.) Pp. xii + 557. (Washington.)

Diary of Societies.

FRIDAY, MARCH 10.

ROYAL ASTRONOMICAL SOCIETY, at 5.

PHYSICAL SOCIETY OF LONDON (at Imperial College of Science and Technology), at 5.—R. L. Smith-Rose : The Electromagnetic Screening of a Triode Oscillator.—Dr. H. P. Waran : A New Form of High Vacuum Automatic Mercury Pump.—W. N. Bond : Viscosity Determination by means of Orifices and Short Tubes.

MALACOLOGICAL SOCIETY OF LONDON (at Linnean Society).

ROYAL SOCIETY OF MEDICINE (Clinical Section), at 5.30.—Prof. H. Maclean and Dr. I. Jones : Some Observations on the Production of Lactic Acid in Stomach Diseases.

JUNIOR INSTITUTION OF ENGINEERS, at 8.—C. H. Plant : Friction.

ROYAL SOCIETY OF MEDICINE (Ophthalmology Section), at 8.30.—P. G. Doyne : Coloured Vision.—R. A. Greeves : A Series of Sympathising Eyes examined Microscopically.

ROYAL INSTITUTION OF GREAT BRITAIN, at 9.—Prof. T. R. Merton : Problems in the Variability of Spectra.

SATURDAY, MARCH 11.

ROYAL INSTITUTION OF GREAT BRITAIN, at 3.—Sir Ernest Rutherford : Radioactivity (2).

MONDAY, MARCH 13.

ROYAL GEOGRAPHICAL SOCIETY (at Lowther Lodge, Kensington Gore, S.W.7), at 5.—C. C. Fagg : A Description of the Regional Survey of the Croydon Natural History and Scientific Society.

ROYAL SOCIETY OF MEDICINE (Wat Section), at 5.30.—Squadron Leader H. E. Whittingham : Observations on Sandfly Fever in Malta.

INSTITUTE OF TRANSPORT (at Institution of Civil Engineers), at 5.30.—T. R. Johnson : Railway Problems in China and Australia.

MEDICAL SOCIETY OF LONDON (at 11 Chandos Street, W.1), at 8.—Dr. E. W. Goodall : The Differential Diagnosis of the Common Exanthemata.

TUESDAY, MARCH 14.

ROYAL INSTITUTION OF GREAT BRITAIN, at 3.—Sir Arthur Keith : Anthropological Problems of the British Empire. Series I. Racial Problems in Asia and Australasia (4).

ROYAL SOCIETY OF MEDICINE (Therapeutics and Pharmacology Section) (at University College), at 4.30.

EUGENICS EDUCATION SOCIETY (at Royal Society), at 5.—H. Cox : The Reduction of the Birth Rate as a Necessary Instrument for the Improvement of the Race.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, at 5.—Dr. M. Greenwood : The Influence of Industrial Employment on General Health (Milroy Lectures) (2).

ROYAL SANITARY INSTITUTE (90 Buckingham Palace Road, S.W.1), at 5.30.—A. H. Barker, and others : Central Heating in Relation to Domestic and other Buildings.

WOMEN'S ENGINEERING SOCIETY (at 26 George Street, W.1), at 6.15.—F. S. Button : Women's Place in Industry.

INSTITUTION OF PETROLEUM TECHNOLOGISTS (at Royal Society of Arts), at 6.30.—Prof. J. S. S. Brame : Presidential Address.

ROYAL PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN, at 7.—Annual General Meeting.

QUEKETT MICROSCOPICAL CLUB, at 7.30.—B. S. Curwen : Mounting in Glycerine with Wax Seals, with Special Reference to Entomostraca.

ROYAL ANTHROPOLOGICAL INSTITUTE, at 8.15.—J. P. Mills : The Lhota Nagas.

ROYAL SOCIETY OF MEDICINE (Psychiatry Section), at 8.30.—Adjourned Discussion on the Ideal Clinic for Nervous and Borderland Cases.

WEDNESDAY, MARCH 15.

ROYAL SOCIETY OF MEDICINE (History of Medicine Section), at 5.—F. Romer : A Short History of Boneseating.

INSTITUTION OF CIVIL ENGINEERS (Students' Meeting), at 6.—G. FitzGibbon : The Great Ship-Canals of the World (Vernon Harcourt Lectures) (1).

ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Dr. E. M. Wedderburn : Seiches; and the effect of Wind and Atmospheric Pressure on Inland Lakes.