

Botanic Garden, Oxford

"It is much to be regretted that the city of Oxford has not a botanic garden suited to the rank which it holds as a British university. Were a small sum contributed by each of the colleges yearly, even the present garden might be rendered doubly efficient: more especially if the adjoining ground at present occupied by Mr. Penson, were added to it, and a part, or the whole of the meadows of Christ Church. But the situation is altogether bad; and, for a botanic garden worthy of Oxford, a dry, open, ample, airy piece of ground should be selected outside of the town; say, somewhere about Jeffery's Nursery. The present botanic garden might still be continued as such, on a smaller scale, so as to suit the income destined for its support. Till lately there has been a great want of botanical taste among the Oxford professors; but hope that a taste for botany, as well as a taste for geology, is now dawning upon them; and, whenever it does, they will soon produce a botanic garden worthy of themselves. After a botanic garden is established, a zoological garden will follow; and, perhaps, ultimately, a public ornamental garden surrounding the whole city as a breathing zone." (J. C. Loudon, *Gardener's Magazine*, April, 1834.)

Societies and Academies

LONDON

Physical Society, March 2. A. O. RANKINE: A simple method of demonstrating the paramagnetism and diamagnetism of substances in magnetic fields of low intensity (see *NATURE*, 133, 150, Jan. 27, 1934). A. M. FERASAH: Anomalous changes in temperature due to thermionic emission in the filaments of valves. In some valves the steady filament temperature is lower when the anode is positive, as would be expected, but in other valves it is higher. This anomalous increase in temperature is due to radiation from the anode and is larger for valves which have a high anode dissipation and an anode which closely surrounds the filament. After correction for this effect has been applied, the work-function can be approximately calculated from measurements made on an ordinary valve. T. SMITH: Change of variables in Laplace's and other second-order differential equations. Transformations of variables are expressed as matrix products, the effect of transposition being particularly considered, and the results are applied to the transformation of the general second-order differential expression. MARY TAYLOR: The Appleton-Hartree formula and dispersion curves for the propagation of electromagnetic waves through an ionised medium in the presence of an external magnetic field. (2) Curves with collisional friction. Four typical frequencies have been chosen for the calculations, one from each of the classes into which the frequencies fall when collisional friction is absent, as described in part 1. The corresponding wavelengths are 80, 240, 400 and 1,000 metres. The various stages in the effect of increasing collisional friction have been found to be usefully represented by collisional frequencies of 10^5 , 10^6 , 10^7 c./sec. and curves are given showing the indices of refraction κ_r ($r=a, b$), and the real part and imaginary part of M_r^2 or $(\mu_r - i\kappa_r c/p)^2$, together with the polarisations of the basic modes as functions of the electronic density for each of the four frequencies and collision frequencies named. The process of evaluation of M_r

and of the polarisation is described. The attenuation and absorption are found to be, in general, greater for the right-handed component than for the left-handed component, with the direction of magnetic field appropriate for down-coming waves in the northern hemisphere. The use of the dispersion curves in the interpretation of propagation phenomena is discussed. J. MCGARVA BRUCKSHAW: An instrument for electrical prospecting by the inductive method. In the Bieler-Watson method of geophysical surveying, in general, the horizontal field is not in quadrature with the vertical field. An instrument has been designed which will allow the horizontal field to be compared completely with the vertical field, an important feature being that the horizontal components in phase and in quadrature with the vertical field are obtained directly from the instrument readings. The apparatus has been tested on elliptically polarised fields and has given satisfactory results.

PARIS

Academy of Sciences, February 26 (*C.R.*, 198, 777-860). C. MATIGNON and A. DE PASSILLÉ: The ammonium arsenates. An account of the preparation of anhydrous triammonium arsenate, of the dissociation of this and the diammonium arsenate. The properties of a new ammonium metarsenate are also described. MARIN MOLLIARD and ROBERT ECHEVIN: The ovarian fluid of rust (*Agrostemma Githago*) and its relations with the seminal tegument. R. DE MONTESSUS DE BALLORE: The determination of the median in the binomial function. PAUL LÉVY: The generalisation of the differential space of N. Wiener. RENÉ LAGRANGE: A class of congruences of circles. S. K. ZAREMBA: The course of the integral curves of the equation $Y(x,y)dx - X(x,y)dy = 0$ in the neighbourhood of an isolated singular point. A. KOVANKO: The structure of almost periodic generalised functions. JEAN GRÉGOIRE: Certain shock phenomena produced in differentials. R. SWYNGEDAÛW: The friction couple of ball bearings. LOÈVE: The integration of Dirac's equations. Y. ROCARD: The quantum absorption of sound in gases. ARCADIUS PIEKARA and BRUNO PIEKARA: The thermal hysteresis of the specific inductive capacity and of the conductivity of aqueous solutions of gelatine. J. THIBAUD and F. DUPRÉ LA TOUR: The diffusion and absorption of positive electrons traversing matter. Experiments based on photographic methods, using the Challenge-Lambert recording microphotometer, lead to the conclusion that positive electrons behave like negative electrons; they undergo multiple diffusions near the charged atomic centres, with progressive deceleration. G. A. BOUTRY and J. ORCEL: Remarks on the comparison of the properties of vacuum (photoelectric) cells with those containing a gaseous atmosphere. Criticism of work on the same subject by L. Capdecorme. ALB. PERRIER and MLE. T. KOUSMINE: The longitudinal magneto-thermoelectric effects in nickel and iron. The experimental laws. From experiments with an iron-nickel couple it is concluded that, with the magnetisation parallel to the temperature gradient, the thermoelectric power is increased: normal magnetisation, on the contrary, lowers it. O. MILLER and J. LECOMTE: The infra-red absorption spectra of the stereoisomeric orthodimethyl-cyclohexanes. Since the molecular structure of these two stereoisomers is not the same, different infra-red absorption spectra would be expected, and this is shown by experiment to be the case. The Raman spectra of the

same compounds are also given. A. KASTLER: The amount of polarisation of the fluorescence of mercury vapour in the presence of nitrogen. JEAN GENARD: The magnetic extinction of the fluorescence of the diatomic molecules of tellurium. Repetition of the work of Smoluchowski, utilising the large Bellevue electromagnet, which gives stronger fields. MME. BRANCA-EDMÉE MARQUES: The distribution of the radium in crystals of radiferous barium bromide. EDMOND BANDERET: The formation of Liesegang rings by electrolysis. Utilising the method of producing very clear rings described in an earlier note, Veil's relation, $\sqrt{\delta} = an + b$, where n is the order of ring and δ the distances between the rings, was verified; a was also found to be inversely proportional to the voltage applied. Mlle. LUCIA DE BROUCKERE: The adsorption of electrolytes by crystalline surfaces. The influence of the sign of the electric charge of the adsorbant. A. MICHEL-LÉVY and H. MURAOUR: The possibility of utilising the microscope in the study of the phenomena of detonation. Results obtained by detonation of lead azide, in quantities of the order of 0.5 mgm., and subsequent examination of the lead deposits under the microscope. P. JOB: The constitution of hydrobromic solutions of salts of copper and cobalt. A. TRAYERS and PIERRE LEDUC: A reaction differentiating various hydrated calcium aluminates. P. BASTIEN: The existence of three allotropic varieties of calcium. Differential thermal analysis, differential thermoelectric power, expansion and hardness all indicate allotropic changes at 260° C. and about 430° C., thus proving the existence of three allotropic varieties of calcium. M. CHÂTELET and MME. P. M. CHÂTELET: Some reactions of divalent chromium acetate. Descriptions of the preparation of dry chromous acetate and its reactions with dry hydrogen chloride, pyridine and ammonia. MAURICE LOURY: An acid alcohol containing the acetylene linkage: phenyl-phenyl ethynylglycollic acid, $C_{16}H_{12}O_3$. MARCEL GODCHOT and MAX MOUSSERON: The resolution of 1.2.trans-cycloheptanediol into its optical antipodes. MME. E. JÉRÉMINE: Some rocks from Kenya Colony. J. CHAZE: The mode of formation of the aleurone grains in the Gramineæ and the production in the latter of oxyflavonic and anthocyanic compounds. RENÉ VANDENDRIES: The haploid and diploid conidial cycle in the Basidiomycetes. R. KÜHNER: The utilisation of cresyl blue in systematic mycology. G. GUITTONNEAU and A. LEROY: Opothropic feeding in milch cows. The system of feeding suggested by G. Monnot has been tested on a herd of 35 cows with negative results. Mlle. A. DUSSEAU: A new duralloid hybrid strain resulting from the crossing of two *Triticum vulgare*. PIERRE GAUVAUDAN: The diffuse vital staining of flagella and the chemical affinities of the cytoplasm and of its various constituents. A. GIROUD, C. P. LEBLOND and M. GIROUX: Vitamin C in the ovary and the yellow body. Results of histological studies based on the reaction of ascorbic acid with silver nitrate. P. PORTIER and Mlle. A. RAFFY: The mechanism of the death of birds the plumage of which is impregnated with hydrocarbons. In the normal state the plumage of birds acts as a screen against losses of heat even in a prolonged dive under water near 0° C. These heat-insulating properties are lost when the feathers are covered with oil and this is the cause of death. Mlle. G. COUSIN: The normal fecundity and characters of the hybrids resulting from crossing two species of grasshoppers, *Acheta campestris* and *A. bimaculata*.

G. DELAMARE: Numerical variations of some primary sinusoids of the body of the Spirochetidæ.

MELBOURNE

Royal Society of Victoria, December 14. W. J. HARRIS: The eastern boundary of the Bendigo goldfield. A number of traverses across the eastern portion of the Bendigo goldfield show that the Lower Ordovician rocks (mostly Lancefieldian) near the east of the Bendigo city area, end abruptly and are succeeded farther to the east by beds which are uniformly much younger (Darrivilian). The break in the normal succession has been traced for a distance of about fourteen miles and is attributed to a fault named the Whitelaw fault, which runs almost parallel to the strike of the bed-rock N. 15° W. The presence of the Darrivilian non-auriferous beds accounts for the absence of profitable gold-mining east of the line indicated. F. A. SINGLETON and NELLY HOOPER WOODS: On the occurrence of the pelecypod genus *Miltha* in the Australian Tertiary. The Tertiary pelecypod, *Dosinia grandis*, Hooper Woods, from a boring near Adelaide, South Australia, is redescribed, refigured and transferred to *Miltha* (*Milthoidea*) in the family Lucinidæ. A new subspecies, *flindersensis*, is described and figured from a boring on Flinders Island, Tasmania. B. J. GRIEVE: The isolation of the organism causing crown gall on almond trees in Victoria. The galls have been shown to be related to the presence of bacteria. The causal organism has been isolated in pure culture and has been shown to be identical with *Bacterium tumefaciens*, Sm. and T. R. B. WITHERS and R. A. KEBLE: The Palæozoic star-fishes of Victoria. This contribution comprises the Palæozoic star-fishes of Victoria and nearly all those of Australia; they are wholly of Silurian age. Ten new species have been described. Several of the genera represented are new to Victoria; one of the most interesting is *Hudsonaster*, which is regarded as a somewhat primitive type and is only recorded from Ordovician beds elsewhere.

VIENNA

Academy of Sciences, December 7. HERBERT HABERLANDT, BERTA KARLIK and KARL PRZIBRAM: Synthesis of the blue fluorescence of fluorite. Examination of a number of mixtures of fluorite with small proportions of other substances shows that the fluorescence exhibits blue bands only when a rare earth metal, most probably europium, is present. After being heated and exposed to radium radiation, calcium fluoride, either pure or containing 0.1 per cent of cerium, praseodymium, neodymium or samarium, gives no blue bands, which, however, appear when either impure samarium (containing europium) or pure europium is added (see also NATURE, 133, 99, Jan. 20, 1934). ALEXANDER KÖHLER and HERBERT HABERLANDT: Luminescence of apatite and other phosphates. As with fluorite, so also with many apatites, either in the natural state or after heating, the occurrence of lines in the fluorescence spectrum affords a sensitive means of detecting rare earths. Certain other phosphates may be examined similarly. GEORG STETTER: (1) Process of charging in the ionisation chamber. (2) Choice of the grid resistance for a highly sensitive amplifier. GUSTAV ORTNER and GEORG STETTER: (1) Choice of the coupling element in making an amplifier with low time constant. (2) Experiments on atom-disintegration with radium B+C as source of radiation (1). By

the procedure described, processes of nuclei transformation occurring when $RaB + C$ is used as source of radiation may, in spite of the presence of β - and γ -rays, be recorded electrically with the same reliability as when polonium is used. GEORG KOLLER and ADOLF KLEIN: Saxatilis acid. On the basis of the known chemical behaviour, together with new data, a structural formula for this acid is proposed. KASIMIR GRAFF: (1) Colorimetric and photometric observations on δ -Cephei and η -Aquilæ. The spectral changes of these two stars show also in the visual colour and are readily detectable with a colorimeter. The colour curve of δ -Cephei is very similar to, but not quite synchronous with, the light curve. With η -Aquilæ, however, larger deviations occur. (2) Regularities in the change in colour of stars on the horizon. The excess colour of stars on the horizon, observed in Majorca, is related linearly to the path of the rays in the homogeneous atmosphere. RUDOLF GRILL: Oligocene and miocene in the Gallneukirchen basin east of Linz on the Danube and the neighbouring regions. WOLFGANG HOLZER: Action of rapid electrical vibrations on electrolyte solutions in relation to biological effects of short waves.

December 14. STEFAN PELZ: Crystal photo-effect in coloured rock salt. A. SKRABAL: Unstable intermediate products and classical chemical mechanics. In investigations on chemical kinetics, it is often necessary to decide, from a given scheme of reactions in which unstable reactants take part, the actual gross reactions occurring and their velocity equations. A method of solving this problem, based on classical chemical mechanics, is now given. K. W. F. KOHL-RAUSCH and A. PONGRATZ: Studies on the Raman effect (31). Raman spectrum of organic substances (polysubstituted benzenes). Each of the four spectra for the molecular types C_6H_5X and $CH_3.C_6H_4X$ (X in the ortho-, meta-, or para-position) is analysed for the cases where X is NH_2 , OH , F , CH_3 , CN , Cl , Br , or I .

Forthcoming Events

[Meetings marked with an asterisk are open to the public.]

Monday, April 23

VICTORIA INSTITUTE, at 4.30.—Sir Charles Marston: "Bible and Spade".

ROYAL GEOGRAPHICAL SOCIETY, at 5.30.—"Life in Hungary" (film).

Tuesday, April 24

ROYAL SOCIETY OF ARTS, at 4.30.—C. F. Strickland: "The Co-operative Movement among African Races".

Thursday, April 26

ROYAL SOCIETY, at 4.30.—F. W. P. Götz, A. R. Meetham and Dr. G. M. B. Dobson: "The Vertical Distribution of Ozone in the Atmosphere".

Dr. F. P. Bowden and Dr. C. P. Snow: "Physico-Chemical Studies of Complex Organic Molecules" (1).

Dr. F. P. Bowden and S. D. D. Morris: "Physico-Chemical Studies of Complex Organic Molecules" (2).

LONDON MATHEMATICAL SOCIETY, at 5—(at Burlington House, W.1).—Discussion on: "Integral Functions". Speakers: Prof. E. C. Titchmarsh, Dr. E. F. Collingwood, Dr. M. L. Cartwright, Prof. J. M. Whittaker, A. J. Macintyre, Prof. J. E. Littlewood.

WORSHIPFUL COMPANY OF ARMOURERS AND BRASIERS, at 5.30—(in the Metallurgy Lecture Theatre, Royal School of Mines, Prince Consort Road, South Kensington).—Prof. J. H. Andrew: "Alloy Steels" (succeeding lectures on May 3 and 10).*

INSTITUTION OF ELECTRICAL ENGINEERS, at 6.—Prof. J. C. McLennan: "Electrical Phenomena at Extremely Low Temperatures". (Twenty-fifth Kelvin Lecture.)

Friday, April 27

ROYAL INSTITUTION, at 9.—J. M. Stagg: "The British Polar Year Expedition to Fort Rae, N.W. Canada, 1932-33".

Official Publications Received

GREAT BRITAIN AND IRELAND

City and County of Bristol: Bristol Museum and Art Gallery. Report of the Museum and Art Gallery Committee for the Year ending 31 December 1933. Pp. 26+4 plates. (Bristol.)

Report of the Rugby School Natural History Society for the Year 1933. (Sixty-seventh issue.) Pp. 44. (Rugby: George Over (Rugby), Ltd.)

Annual Report of the Council of the Yorkshire Philosophical Society for the Year 1933; The Yorkshire Museum, York—Report of the Museum Committee for the Year 1933. Pp. 47. (York.)

The London School of Economics and Political Science (University of London). Register, 1895-1932. Edited by the Registrar of the School. Pp. xix+266. (London.) 3s. 6d. net.

Thirty-third Report of the Felsted School Scientific Society, 1932-1933. Pp. 54+4 plates. (Felsted.)

University Grants Committee. Returns from Universities and University Colleges in receipt of Treasury Grant, Academic Year 1932-33. Pp. 26. (London: H.M. Stationery Office.) 1s. 3d. net.

Transactions of the Royal Society of Edinburgh. Vol. 57, Part 3, No. 34: Geology of the Outer Hebrides, Part 5: North Harris and Lewis. By Prof. T. J. Jehu and Dr. R. M. Craig. Pp. 839-874+5 plates. (Edinburgh: Robert Grant and Son; London: Williams and Norgate, Ltd.) 6s. 6d.

OTHER COUNTRIES

The Indian Lac Research Institute. Annual Report for the Year 1932-33. Pp. 39+6 plates. (Nankam.)

Columbia University. Bulletin of Information, Thirty-fourth Series, No. 24: Announcement of Professional Courses in Optometry for the Winter and Spring Seasons, 1934-1935. Pp. 31. (New York: Columbia University Press.)

Summary Proceedings of the Twenty-seventh Meeting of the Indian Central Cotton Committee, Bombay, held on the 29th and 30th August 1933. Pp. 40. The Indian Central Cotton Committee: its Objects, Activities and Achievements, with Special Reference to the Punjab, Sind, the United Provinces and Central India. Pp. 32. Annual Report of the Indian Central Cotton Committee, Bombay, for the Year ending 31st August 1933. Pp. ii+155. 2 rupees. (Bombay.)

Proceedings of the American Academy of Arts and Sciences. Vol. 69, No. 5: Studies on Histomoniasis or "Blackhead" Infection in the Chicken and the Turkey. By Ernest Edward Tyzzer. Pp. 189-264+6 plates. 1.25 dollars. Vol. 69, No. 6: Critical Examination of Physical Anthropometry on the Living. By C. B. Davenport, Morris Steggerda and William Drager. Pp. 265-284. 45 cents. (Boston, Mass.)

Sulphur, an Essential to Industry and Agriculture: a Treatise on the Properties and Applications of Sulphur. Pp. vi+45. (New York: Texas Gulf Sulphur Co.). Free.

Southern Rhodesia: Geological Survey. Short Report No. 29: Geological Observations in the Nata Native Reserve, Bulalima-Mangwe District. By J. C. Ferguson. Pp. 8. (Salisbury.)

Records of the Survey of India. Vol. 24: Riverain Surveys in the Punjab, 1901 to 1929. Pp. v+33+2 plates. (Dehra Dun.) 1.8 rupees; 2s. 6d.

Journal of the Faculty of Science, Hokkaido Imperial University. Series 2, Physics, Vol. 1, No. 5: Physical Investigations on Snow, Part 1: Snow Crystals observed in 1933 at Sapporo and some Relations with Meteorological Conditions. By Ukitoro Nakaya and Tuneso Iizima. Pp. 149-162+4 plates. (Sapporo: Hokkaido Imperial University.)

Koninklijk Magnetisch en Meteorologisch Observatorium te Batavia. Verhandelingen No. 26: Further Researches into the Possibility of Long-range Forecasting in Netherlands India. By Dr. H. P. Berlage, Jr. Pp. 31+6 plates. Verhandelingen No. 27: Daily Forecast of Windforce on Java. By Prof. Dr. J. Boerema. Pp. 8+1 plate. (Batavia.)

CATALOGUES

Nephelo- and Absorptiometers for White and Monochromatic Light. (Ex 34.) Pp. 2. A.C. Standard Cell. (Normal 34.) Pp. 2. Moll Recording Microphotometers. (Review 34.) Pp. 4. Mill Thermopiles. (Ther 34.) Pp. 2. (Delft: P. J. Kipp en Zonen.)

The Applications of Marmite (Yeast Extract) in Medicine and Dietsetics. Pp. 23. (London: The Marmite Food Extract Co., Ltd.)

B.D.H. Vitamin Products. Pp. 4. (London: The British Drug Houses, Ltd.)

The "Glamat" Lamp Protector. Pp. 8. (London: The Glamat Co.)