

Societies and Academies

LONDON

Royal Society, February 22. A. S. PARKES and M. HILL: Effect of absence of light on the breeding season of the ferret. Bissonnette's discovery that additional illumination would induce oestrus in ancestrous ferrets has naturally led to speculation as to what controls the onset of the breeding season in the normal ferret. An obvious interpretation of Bissonnette's results was that the beginning of the breeding season of the normal female ferret in April is due to the increasing duration of daylight. This hypothesis was put to experimental test by keeping ferrets in darkness from the latter part of ancestrus onwards. From the results it is concluded that while additional light will induce oestrus in ancestrous animals, the onset of the breeding season in the spring is not dependent on the increasing length of daylight. L. E. S. EASTHAM: Metachronial rhythms and gill movements in relation to water flow in the nymph of *Cænis horaria* (Ephemeroptera). By means of the oscillatory movements of four pairs of gills, the nymph produces a flow of water across the body from one side to the other, the current being reversible. The gills rise and fall in periodic motion, and in so doing they traverse an elliptical path and, by a pivoting movement, move at an angle with their own path of motion. The metachronial rhythm in the movements of the gills along each side of the body is from before backwards, but the gills of one side in motion are always out of phase with those of the other. A transverse rhythm therefore exists across each pair of gills, which rhythm is in the direction of the water flow across the body. It is reversed when the direction of the water current is reversed. Reversal of flow is associated with changes in the method of pivoting of the gills; their manner of overlapping as members of pairs; the direction of the transverse rhythm over the gills. F. J. W. ROUGHTON: The kinetics of hæmoglobin (4-7). The methods of Hartridge and Roughton for the study of the velocity of rapid reactions were first applied by them to the reaction between hæmoglobin and oxygen. The present papers extend the work to the 'sister' reactions of hæmoglobin with carbon monoxide. Velocity equations have been arrived at for (i) the combination of carbon monoxide with reduced hæmoglobin, $\text{CO} + \text{Hb} \rightarrow \text{COHb}$; (ii) both phases of the reversible reaction, $\text{CO} + \text{O}_2\text{Hb} \rightleftharpoons \text{O}_2 + \text{COHb}$. The results do not accord theoretically with a chemical mechanism of the type $\text{Hb}_n + n\text{CO} \rightleftharpoons \text{Hb}_n(\text{CO})_n$, but can in part be interpreted by Adair's intermediate compound hypothesis, according to which the reaction of oxygen or carbon monoxide with hæmoglobin takes place in successive stages. New possibilities are, however, brought to light, notably when trying to explain the paradoxical observations that $p\text{H}$ is almost without effect upon either phase of the reversible reaction $\text{CO} + \text{O}_2\text{Hb} \rightleftharpoons \text{O}_2 + \text{COHb}$.

PARIS

Academy of Sciences, January 8 (*C.R.*, 198, 129-112). J. COSTANTIN: The varieties of wheat resistant to rust. After summarising the unsuccessful efforts to produce rust-resisting wheats by hybridisation, and recalling the favourable results in combating sugar cane disease by employing plants of mountain origin, the author directs attention to the important work of Burton in Kenya on the effects of high altitude

on producing rust-resisting wheats. D'OCAGNE: The idea of the instantaneous circle in the theory of plane motion. LOUIS DE BROGLIE: The nature of the photon. JEAN LOISEAU: Curves admitting one or several infinite families of circumscribed triangles equally between themselves. E. J. GUMBEL: The moments of the final distributions of the first and last value. N. ARONSAJN: The invariants of transformations in the domain of n complex variables. ALBERT PORTEVIN and MICHEL CYMBOLISTE: A method for the study of the elastic deformations in metallic pieces submitted to external stresses. J. BAUBIAC: The transitory regimes in the movement of liquids and the beginning of the turbulent regime. D. BARBIER: The eccentricity of double stars of very long period. MME. G. CAMILLE FLAMMARION and F. QUÉNISSET: Photographs of the variations in the brightness of the star RS Ophiuchi. MAURICE LAMBREY and S. KRAUTHAMER: The working of the bigrid frequency changer. ILIE C. PURCARU: Contribution to the experimental study of the electric discharge. Results obtained with a kinematograph with very rapid film. MME. THÉRÈSE MEYER: The electrical conductivity of insulating or feebly conducting liquids in thin layers. The variations with temperature. MME. O. JASSE: Measurements of the refractive indices of water by an interference method. The refractive index of water for four wavelengths is given for temperatures between 0° C. and 93.5° C. P. ROUARD: The change of phase by normal reflection on very thin gold layers. CHARLES LAGNEAU: The acyclic terpene alcohols, $\text{C}_{10}\text{H}_{20}\text{O}$, in the essential oils of citronella, geranium and rose. V. HENRI, CH. WEIZMANN and Y. HIRSHBERG: The action of the ultra-violet rays on glycoool. The first stage of the reaction is the formation of ammonia and glycollic acid. The gaseous products include a large proportion of carbon monoxide. P. LEBEAU and P. CORRIEZ: The electrical resistivity of the peranthracites. The resistivities of peranthracites, always greater than graphite, are, however, much smaller than those of true anthracites and coals. J. PERREU: The equation of solubility of hydrated salts. F. BOURION and E. ROUYER: The determination of the total hydration of the ions of calcium chloride. CH. LAPP and MME. G. ZALC: The rotatory dispersion of sparteine in aqueous solution. MME. M. DEMASSIEUX and EDWIN J. GRELLIS: Some complex halogen salts of lead. Study of the system lead bromide, ammonium bromide, water. P. CARRÉ: The mobilities of the organic radicals in their bromsulphites. ROBERT LESPIEAU and JOSEPH WIEMANN: Syntheses of dulcete and of allodulcete. L. ROYER: The foreign materials which, added to the mother liquor of a solution, are susceptible of modifying the facies of the crystals of the dissolved substance. LÉON BERTRAND: The relations of the primary axial zone of the Pyrenees and that of the north Pyrenees zone. M. BLUMENTHAL: The existence of antibiotic thrusts in Andalusia. ROBERT LAFFITTE: The presence of the Albian in Aurès (Algeria). RENÉ VANDENDRIES: The sexual barriers in *Lenzites betulina*. MME. HUREL-PY: Researches on the $p\text{H}$ conditions necessary to obtain the germination of pollen grains, and the vital coloration of their vacuoles. A. and R. SARTORY, J. MEYER and ERNST: The inhibiting influence of radium on the growth of the rootlets of *Lens esculenta*: modification of the minimum hindering dose under the influence of antagonistic ions. L. MAUME and J. DULAC: Differences due to variety in the absorption of water,

phosphoric acid and potash by wheats which have reached the same physiological period in the same medium. F. MARCEAU and L. ACOLAT: A new very sensitive cardiomyograph, with elastic wire, with both mechanical and optical amplification. A. PAILLOT: A new type of disease with an ultravirus in insects. E. BRUMPT: Seasonal frequency and larval diapause of the fly, *Lucilia bufonivora*. G. MOURIQUAND and A. LEULIER: The calcium-phosphorus ratio in the genesis of experimental rickets and human rickets. The greater tendency to rickets shown by infants fed on cows' milk compared with those fed on human milk cannot be explained by the change in the calcium-phosphorus ratio, since this is nearly the same in both milks.

CAPE TOWN

Royal Society of South Africa, October 18. A. OGG and E. N. GRINDLEY: Declination at the University of Cape Town Magnetic Observatory: August 1932–August 1933. A full programme of photographic recording of the declination, the horizontal intensity and the vertical intensity by two sets of la Cour instruments has been maintained at the Observatory during the year. The daily variation curves of declination for each month, which have been determined, show interesting changes from month to month. The curve for August 1933 is exactly similar to the curve for August 1932, with a secular variation of 4.2 minutes. B. F. J. SCHONLAND and B. DELATIZKY: Continuous recording of cosmic ray intensities. Instruments for obtaining continuous hourly measurements of the intensity of the cosmic radiation have been installed at the University of Cape Town. The records are obtained automatically. The station forms part of the international scheme for the study of variations in intensity of the rays with time organised by a European committee, and is the only one in the southern hemisphere. The station has been in continuous operation since February 1933, and will be carried on for another year. The accuracy of observation is 0.1 per cent. D. M. BEACH: Phonetics of the Hottentot language. The paper is based on the analysis of the pronunciation of more than a hundred Hottentot speakers, representative of all the Nama tribes, as well as Bergdama, Korana and Griqua. The Nama dialect is taken as a standard and described in detail. Hottentot is a tone-language of the Chinese type, and there are six inherent tonemes of roots. H. A. SHAPIRO and H. ZWARENSTEIN: A rapid test for pregnancy on *Xenopus Laevis*. Early morning urine from women is precipitated with 96 per cent alcohol. The precipitate is extracted with ether to remove œstrin and toxic substances, and the residue is then dissolved in distilled water. 2–3 c.c. of the aqueous extract is injected into each of four female South African clawed toads. 12–18 hours later a positive reaction is indicated by either (a) extrusion of macroscopic ova through the cloaca, or (b) post-mortem examination of the animal (in the absence of ovulation), when one ovum or more will be seen in either or both of the oviducts respectively. Correct positive tests have been obtained as early as 20 days after the first missed menstrual period.

GENEVA

Society of Physics and Natural History, November 2. C. E. GUYE: Molecular dissymmetry and micellar dissymmetry. The author refers to the works of Curie on this subject. The action of the isolated

molecules or of the large directed molecules should be favourable to the production of dissymmetry in the medium which surrounds them, and hence the molecules have more numerous possibilities of action in this medium. In this connexion, the author considers the results of work carried out on colloids by Lumière, De Vaux and others, who have shown that the vital element of the cell or of the serum would not be the micelle element but rather the molecular element. He quotes a certain number of facts in favour of the molecular theory of the vital element. A. SCHIDLOF: The constitution of heavy nuclei. J. WEIGLE: A precision method for measuring rhombohedral lattices. A method of extrapolation of the experimental results gives an average of the exact values of the X-rays for the constants characterising non-cubical lattices. This method applied to sodium nitrate gives for the wave-lengths of the edges of the elementary rhombohedron 6.3108×10^{-8} cm. and $47^{\circ} 15' 59''$ for the angles which they form between them. H. SAINT: The thermal expansion of silver by X-rays. The author has determined the coefficient of expansion of silver by X-rays between 20° C. and 300° C. using a Seeman-Böhlén chamber specially constructed for the study of expansions. Results: lattice constant of silver at 18° C., $a = 4.0772 \times 10^{-8}$, coefficient of expansion $(19.1 \pm 0.2)10^{-6}$ degrees $^{-1}$. E. FRIEDHEIM: Two natural reversible oxido-reduction systems: Lawson and juglon. The pigment of the sarcocarp of nuts. The Juglan walnut and the pigment of *Lawsonia Inermis*, Lawson, or henna, are systems of reversible oxido-reduction. Their normal potential is for pH 7.0 at 20° C., $E = +0.033$ (Juglan), $E = -0.139$ (Lawson). Since the juglon in the living plant is found essentially in the reduced state and the Lawson in the oxidised state, the oxido-reduction potential of the plant cells in question is determined by the two values indicated. E. FRIEDHEIM: Concerning the mechanism of the respiratory catalysis by systems of reversible oxido-reduction. The two reversible natural pigments, Lawson and juglon, increase the respiration of the red corpuscles of the rabbit by about 600 per cent, juglon forms methæmoglobin but Lawson does not. The respiratory catalysis of the red corpuscles by systems of reversible oxido-reduction is thus independent of the formation of methæmoglobin as would follow from the theory of Wendel and Warburg. The formation of the methæmoglobin is in fact concomitant, depending on the oxido-reduction potential level and in addition, on conditions of kinetic order. J. J. PITTARD: Observations concerning the proportion of gold in the water courses of the Canton of Geneva. The author has proved that the stream is richest in gold in the middle part of its course in Swiss soil.

December 7. R. WAVRE: Some remarks on the theory of harmonic functions. The author presents three notes: a reciprocal of Green's theorem, the unity of a potential defined by its line of ramification and its period function, and the development of Poisson's integral in a series of powers of the distance from the centre; if the Fourier coefficients are taken only on an arc ψ_1 and ψ_2 from the circumference, the harmonic function given by the integral admits the two points ψ_1 and ψ_2 as points of ramification. G. TIERCY: The new 40-cm. reflector of the [Geneva] Observatory. F. BATELLI, D. ZIMMET and P. GAZEL: The muscular contraction of the discharge after the passage of continuous current.

SYDNEY

Linnean Society of New South Wales, October 28. T. G. SLOANE: Notes on the Australian species of the family Paussidae. This paper has been prepared by H. J. Carter from notebooks of the late T. G. Sloane which are now in the Linnean Society's possession. Various groups of the genus *Arthropterus* are tabulated, and notes given on a number of species described in 1924 by H. Kolbe. Five species are described as new. H. M. R. RUPP: The genus *Pterostylis* (Orchidaceae). A new scheme of classification, with notes on the distribution of the Australian species. The primary sections are two in number, based upon the character of the labellum—laminated or filiform-terete. The latter section contains two species only, strikingly distinct from all others in other features besides the labellum. The much larger laminated section is divided first into subsections based upon the character of foliation. T. L. BANCROFT: Further observations on the rearing of *Ceratodus*. Attention is directed to the variations in size found in young fish of the same age and to the errors that may consequently appear in embryological work when length is used as an indication of age. LILLIAN FRASER: An investigation of the sooty moulds of New South Wales (1). Historical and introductory account. There are two types: (a) perennial moulds which develop on shrubs and trees, and (b) annual moulds which develop on annual herbs attacked by aphids and often precede the perennial moulds on trees and shrubs. G. H. HARDY: Miscellaneous notes on Australian Diptera (1). Thirteen species are described as new in various families of the Brachycera; generic keys are given to subfamilies Hermetiinae and Pachygasterinae, and a key to the genus *Pelecorrhynchus*. Two species of Scenopinidae are the first to be described from Australia.

Forthcoming Events

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

Saturday, March 3

ROYAL INSTITUTION, at 3.—Lord Rutherford: "The Transmutation of Matter" (succeeding lectures on March 10, 17 and 24).

Monday, March 5

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.—D. Dilwyn John: "The Second Antarctic Commission of R.R.S. Discovery".

Tuesday, March 6

ROYAL SOCIETY OF ARTS, at 4.30.—Sir Wilfred Grenfell: "Newfoundland and Labrador".

Wednesday, March 7

ROYAL SOCIETY OF ARTS, at 8.—J. W. Ryde: "Electric Discharge Lamps".

ROYAL ENTOMOLOGICAL SOCIETY OF LONDON, at 8.—Prof. P. A. Buxton: "Glossina and Climate; Studies in the Laboratory".

Thursday, March 8

ROYAL SOCIETY, at 4.30.—Dr. J. Chadwick, Prof. P.M.S. Blackett and G. Occhialini: "Some Experiments on the Production of Positive Electrons".

G. Temple: "The Quantum Theory of the Neutron".

EAST LONDON COLLEGE, at 5.30.—Prof. J. Kendall: "Elements, Old and New".*

Friday, March 9

ROYAL SOCIETY OF ARTS.—D. G. Harris: "The Recent Progress of Irrigation in India".

ROYAL INSTITUTION, at 9.—Sir Claude Hill: "Society and Caste in the India of To-day".

INSTITUTE OF METALS, March 7–8.—Twenty-sixth annual general meeting to be held at the Institution of Mechanical Engineers, Storey's Gate, London, S.W.1. March 7, at 10.—Dr. H. Moore: Presidential Address.

Official Publications Received

GREAT BRITAIN AND IRELAND

Grading Rules and Standard Sizes for Empire Hardwoods intended for Shipment to the United Kingdom. Prepared by the Advisory Committee on Timbers, Imperial Institute. Pp. 17. (London: Imperial Institute.) 1s.

Lecture on "Electrometric Methods in Physical and Analytical Chemistry". By Dr. Samuel Glasstone. Pp. 39. The Chemist as a Directing Force in Industry. By Dr. Herbert Levinstein. (The Fifth S. M. Gluckstein Memorial Lecture, 1933.) Pp. 22. (London: Institute of Chemistry.)

Department of Scientific and Industrial Research. Report of the Water Pollution Research Board for the Year ended 30th June 1933; with Report of the Director of Water Pollution Research. Pp. iii+50. (London: H.M. Stationery Office.) 1s. net.

The Scientific Proceedings of the Royal Dublin Society. Vol. 21 (N.S.), No. 3: Abnormal Cones of *Fitzroya* and their Bearing on the Nature of the Conifer Strobilus. By Joseph Doyle and Mary O'Leary. Pp. 23–35+1 plate. (Dublin: Hodges, Figgis and Co.; London: Williams and Norgate, Ltd.) 1s. 6d.

OTHER COUNTRIES

The Indian Forest Records. Vol. 18, Part 13: Entomological Investigations on the Spike Diseases of Sandal. (12): The Life-History and Morphology of *Eurybrachys tomentosa* Fabr. Fulgoridae (Homopt.). By N. C. Chatterjee. Pp. iv+26+2 plates. (Delhi: Manager of Publications.) 12 annas; 1s. 3d.

Bibliography of Lac. By A. C. Chatterjee. Pp. 129. 2.8 rupees. Bulletin No. 16: *Aepidiolus (Furcaspis) orientalis*. Newstead (Coccidae), its Economic Importance in Lac Cultivation and its Control. By P. M. Glover. Pp. 23+1 plate. 1.4 rupees. (Ranchi: Indian Lac Research Institute.)

Borough of Durban: Durban Museum and Art Gallery. Annual Report for Municipal Year, 1932–33. Pp. 12+4 plates. (Durban.) An Outline of the Physiography, Geology and Mineral Resources of Nyasaland, 1932. By Dr. F. Dixey. Pp. 34. (Zomba: Geological Survey Department.)

N.Z. Department of Scientific and Industrial Research. Bulletin No. 43: Report of the Hawke's Bay Earthquake (3rd February 1931). Pp. 116. 2s. Seventh Annual Report for the Year 1932–33. Pp. 82. 2s. 6d. (Wellington: Government Printer.)

Obras completas y correspondencia científica de Florentino Ameghino. Vol. 11: Ungulados, aves y desdentados. Dirigida por Alfredo J. Torcelli. Pp. 917. (Buenos Aires: El Gobierno de la Provincia de Buenos Aires.)

Report of the United States National Museum, 1933. (Part 2 of the Report of the Secretary of the Smithsonian Institution to the Board of Regents for the Fiscal Year ended June 30, 1933.) Pp. 69–194. (Washington, D.C.: Smithsonian Institution.)

The Nosu Tribes of West Szechwan: Notes on the Country and its Peoples and on the Diseases of the Region. By Dr. E. R. Cunningham, Dr. Leslie G. Kilborn, Dr. James L. Maxwell, Dr. W. R. Morse, Dr. Harrison J. Mullett and F. Dickinson. (Supplement to the *Chinese Medical Journal*.) Pp. iv+56+3 plates. (Shanghai: Henry Lester Institute.)

U.S. Department of the Interior: National Park Service. Fauna of the National Parks of the United States: a Preliminary Survey of Faunal Relations in National Parks. By George M. Wright, Joseph M. Dixon and Ben H. Thompson. (Contribution of Wild Life Survey, Fauna Series No. 1.) Pp. iv+157. 20 cents. History and Present Status of the Breeding Colonies of the White Pelican (*Pelecanus erythrorhynchos*) in the United States. By Ben H. Thompson. (Contribution of Wild Life Division, Occasional Paper No. 1.) Pp. vii+84. (Washington, D.C.: Government Printing Office.)

State of Connecticut: State Geological and Natural History Survey. Bulletin No. 52: Fifteenth Biennial Report of the Commissioners of the State Geological and Natural History Survey, 1931–1932. (Public Document No. 47.) Pp. 24. (Hartford, Conn.)

U.S. Department of the Interior: Office of Education. Bulletin, 1933, No. 12: The Education of Native and Minority Groups; a Bibliography, 1923–1932. By Katherine M. Cook and Florence E. Reynolds. Pp. v+57. (Washington, D.C.: Government Printing Office.) 5 cents.

CATALOGUES

Anepidem: for the Treatment of Influenza and the Common Cold. Pp. 2. Radio-Malt: the Vitamin Malt Food containing Standardised Amounts of Vitamins A, B₁, B₂ and D. Pp. 10. Radiostoleum (Standardised Vitamins A and D). Pp. 4. (London: The British Drug Houses, Ltd.)

Scientia Naturalis ante annum 1800. Pp. 60. (Berlin: W. Junk.)