

## Early Science at Oxford.

March 23, 1685-6. An abstract of Mr. Bent's *travailes* in France, was communicated by Mr. Welsted, and read.—Mr. Walker delivered in papers on an empiricall way of curing ye Cramp by a piece of ye root of flagg, and on Second-sighted men in Scotland, concerning whom Dr. Garden was desired to give his opinion.

March 24, 1684-5. Mr. Dalgarno advocated the bringing of a Philosophicall Language into practice. He also presented a compendium of a book, not long since printed by him, entitled *Didascalophus*, which among other things undertakes to prove, that the Eye & Hand are more useful organs of knowledge, than the Tongue and Ear. This gave occasion to some discourse concerning the Vigour and improvement of some one Sense, upon the Defect, or non-employment of one or more of the others; upon which subject Mr. President was pleased to informe us, that Mr. Whaly (the deaf gentleman, whom he taught to speak) could, when within doors, distinguish a coach from a cart in ye street by the motion, it made; when those, who were in company with him, could not discern whether it were the one, or the other, by the noise, it made.

March 26, 1684-5. Ye Rt. Honorable the Lord Visct. Weymouth, in answer to Dr. Plot's queries, concerning ye splitting of Trees by ye late Frost, wrote that great damages in this kind have befallen ye timber trees in most of ye northward midland counteys, but very little or none in ye western counteys of England.

Ordered that ye thanks of this Society should be returned to Mr. Molineux of Dublin for his ingenious discourse concerning ye Petrifications of Lough-neagh: in which it having been affirmed, that these petrifications are sometimes found in ye earth near ye Lough, it was queried, whether ye earth, in which these petrifications are sometimes found, may be supposed to have been thrown up from ye Lough? It was then proposed by Dr. Beeston, that ye Petrifying Springs in, and near Oxon, should be strictly examin'd, particularly as to their chymicall principles; and that enquiry should be made into ye severall steps, and progress, of their respective petrifications.—Mr. Packer, Physitian of Reading, gave an account of some observations he made lately in ye dissection of a Bear; particularly that there was no *Cæcum*, & that ye *æsofagus* consisted of so narrow a channell; and ye stomach, and entrails, are so well fixed in ye abdomen, that it was altogether impossible, they could at any time fall into ye mouth, as it was formerly supposed it might be in some postures of this animall. It was ordered, that thanks should be returned to Mr. Packer, and that he be desired to continue a correspondence with us.

March 27, 1688. Dr. Plot gave the Society the sight of a Paper written for his Majesty's use, about felling Timber in Staffordshire, where they bark their trees in the spring and cutt them down in winter, which hardens the timber, soe that the outside is as hard as the heart of the tree. For felling wood in winter he brings the authority of the antients, Pliny, Theophrastus, Cato, &c. for the advantage of it. He shewed how the barking of it in the summer farders the hardening by closing the pores in the evaporation of the juice by the heat of the sun. There is no objection against it but that t'will be more troublesome to fell the Timber so hardened, and to bark it standing, and so dearer, but the goodness will sufficiently answer the price.

## Societies and Academies.

LONDON.

Royal Society, March 12.—Sir Charles Sherrington: Remarks on some aspects of reflex inhibition. Attempt is made to schematise in a diagram certain features of the interaction of central inhibition and excitation. Assumption is made of an inhibitory agent liberated centrally which neutralises chemically an excitatory agent when this latter is present, but the liberation of which is not dependent on pre-existence of the excitatory agent. Tetanic inhibition is dealt with as due to iterate production of the inhibitory agent, with exhibition of temporal summation and "recruitment." Central after-action, both inhibitory and excitatory, is attributed to temporary persistence of a residuum of the liberated inhibitory or excitatory agent. The schema is designed to meet in particular the experimental data furnished by the knee-extensor under crossed excitation and ipsilateral exhibition. It does not attempt to deal with late successive effects such as successive induction and rebound.—E. G. T. Liddell and Sir Charles Sherrington: Recruitment and some other features of reflex inhibition. Under mere prolongation of an otherwise unaltered stimulus of the inhibitory afferent nerve, the central inhibitory process recruits more motoneurons as it proceeds. The "stimulation-plateau" of the reflex contraction is more easily inhibited than the "after-discharge plateau." Experiments suggest that a reflex maintains maximal response of the individual "motor-unit" by a degree of central excitation which is commonly "supramaximal," *i.e.* of intensity above the lower limit required for evoking the unit's maximal response. In the excitatory reflex a mechanism proximal to the motoneurone axon seems to react in an "all-or-none" manner when exposed to inhibition.—D. T. Harris: Studies on the biological action of light. Ultra-violet radiations exert a stimulant action on the gaseous metabolism of small animals, and on the movements of the frog's isolated stomach. This action is completely annulled by the presence of visible radiations, an action which seems to be physiological antagonism rather than physical interference. Exposure of an animal to mixed radiations of a powerful source of light depresses its heat production to an extent greater in pigmented animals than in albinos for the same rise of temperature in the surrounding medium. Thermo-electric measurements indicate that pigment, nevertheless, possesses high absorptive properties. Pigment appears to protect an animal against the lethal action of certain photo-dynamic substances.—H. Hartridge and F. J. W. Roughton: The kinetics of hæmogoblin. III. Velocity with which oxygen combines with reduced hæmogoblin. The reaction between oxygen and reduced hæmogoblin is very rapid, the time required for half-completion being 0.01 to 0.001 sec. The velocity-constants obtained at  $P_{H_2}$  7 and  $P_{H_2}$  10, with different concentrations of hæmoglobin and oxygen, agreed in showing that the reaction is bimolecular. The dissociation curve for dilute hæmoglobin solutions is approximately hyperbolic. The quotient of the two velocity-constants, oxidation and reduction, is practically equal to the equilibrium constant. The presence of hæmoglobin aggregates would not be expected to affect the velocity of oxidation, so long as the part of the molecule with which the oxygen combines is sharply localised and far removed from the aggregate-forming portion. This affords an explanation of the low-temperature coefficient obtained.—S. B. Schryver, H. W. Buston and D. H. Mukherjee: The isolation of a product of hydrolysis of the proteins hitherto undescribed. By

means of the "carbamate" method, a base  $C_6H_{14}O_3N_2$  has been isolated from isinglass. It differs from the other basic products of hydrolysis of the proteins in that it yields a barium carbamate insoluble in water. It gives a tri-benzoyl derivative  $C_6H_{11}O_3N_2(C_6H_5CO)_3$ , m.p. 68-69°, and it is assigned the formula  $CH_2 \cdot (NH_2) \cdot CH_2 \cdot CH_2 \cdot CH(OH)CH_2 \cdot (NH_2) \cdot CO_2H$ . It has been found after hydrolysis of fish gelatin, isinglass and three vegetable proteins of very diverse origin. It is absent from, or present only in very small traces in, the hydrolysis products of gelatin of mammalian origin, of casein, fibrin, and egg-white.—D. Keilin: On cytochrome: a respiratory pigment common to animals and yeast. Under names myohæmatin and cytohaematin, McMunn described a respiratory pigment, here named cytochrome. Cytochrome, in reduced form, shows a very characteristic spectrum, with four bands (*a, b, c, d*), with positions of maximum intensity: *a*, 603; *b*, 565; *c*, 550; *d*, 523. In the oxidised form no absorption bands can be seen. In different concentrations cytochrome exists in tissues of all animals, *e.g.*, worms, molluscs, arthropods and vertebrates. It is also present in cells of ordinary baker's yeast, a thin layer of which shows well the above four bands. The highest concentration of cytochrome is found in thoracic wing-muscles of insects, striated muscles of mammals, and yeast-cells. It yields various derivatives similar to hæmochromogen and its oxy- and CO-compounds, and porphyrin. Cytochrome may co-exist with other respiratory pigments, and may be considered an intracellular respiratory pigment, generally distributed, forming part of a complicated system of respiratory catalysts.

**Royal Microscopical Society (Industrial Applications Section)**, January 28.—R. Stenhouse Williams: The microscope of fundamental importance to the dairying industry.—Norman Wright: The structure of the udder, normal and abnormal. The solids-not-fat (lactose, protein, and ash of milk) are secreted in very constant concentration, owing probably to their osmotic properties; the fat bears no relation to the other constituents, since, owing to its insolubility, it has no osmotic pressure. The control of rate of fat secretion is dependent upon the rate of formation in the gland (probably constant), and the fact that the cell membrane must be penetrated in order to liberate the fat globules. The importance of correlation between the constituents of blood and of milk is emphasised.—A. T. R. Mattick: The enumeration and differentiation of the various cellular elements of milk, by means of the microscope. On account of the enormous differences in numbers of cells found in the milk of different cows and even in different quarters of the same cow, no such standard can justly be adopted. The method of differentiating between the various types of cells by the use of stains such as Jenners, and finding by means of the microscope the relative frequency of occurrence of the different types, is more promising. Whilst the differential method of Varrier-Jones seems to offer considerable promise, more work on the varieties of cells found in different breeds and under different conditions must be done.—L. J. Meanwell: The application of the microscope to the detection of tuberculous infection. Great care must be exercised before assuming that acid-fast bacilli in market milk are of tubercular origin. By the use of the usual routine method of microscopical examination, 20 per cent. of infected milks are detected. As this method is not satisfactory, animal inoculation must be performed before a report can be given. The disadvantages of the animal inoculation method of examination are said to be: (1) Expense, (2) the

lapse of time necessary before a report can be given, and (3) the difficulty in tracing the source of infection. 25 per cent. of milking cows are affected with tuberculosis, and in certain districts 4 per cent. of the milking cows show, on post-mortem examination, tuberculous lesions of the mammary gland.—J. Golding: Fat globules. "Adsorption films" of the nature of "gels" seem to explain the observations made on milk globules as well as on other emulsions. Observations on the differences in time of churning of the milk of individual cows support the conclusion of other workers that "individuality" may play at least as important a part as "breed" in this respect. The expense and difficulty of accurate estimations of size of fat globules do not encourage the use of the microscope in this direction. The microscopical examination of butter under polarised light yields more definite results in the comparison of butter and margarine.—Miss E. R. Hiscox: The separation and identification of the micro-organisms causing faults in milk products. In the first method (moist chamber) a well-isolated cell is kept under observation under the microscope until the resultant colony is large enough to be transferred to a tube of culture medium. In the second (Barber's method) small drops of an emulsion of the cells are blown on the lower surface of a coverslip by means of a micropipette. Drops containing a single cell are transferred to tubes of the culture medium. Although physiological reactions are of primary importance in the identification of micro-organisms, microscopical observation of the size and shape (bacteria), form of budding and spore formation (yeasts), form of branching and type of fructification (moulds), may also be of great value.

**Physical Society**, February 13.—F. E. Smith: A system of electrical measurements. The study of the absolute measurement of electrical quantities, though usually regarded as difficult, is not beyond the comprehension of junior students if suitably presented. The electrical units as theoretically defined and the practical standards by which they are represented differ, but an incorrect standard can be brought into more precise accordance with its theoretical unit without inconvenience to industry. The increased refinement of measurements calls for a redefinition of the practical standards, and this could be effected without inconvenience, since the most probable values of the standards lie within the limits prescribed by the errors permissible in industrial measurements.

#### PARIS.

**Academy of Sciences**, February 2.—Maurice Hamy: The determination of the radial velocities of stars. The application of the Doppler principle to the determination of the radial velocities of stars is now known to require certain corrections. The alteration of the wave-length by pressure has been proved, and the Einstein gravitation effect must also be taken into account. A. Michelson has also pointed out the necessity for another correction due to the fact that most radiations are not simple. An international agreement relating to the comparison lines to be used in the determination of radial velocities is much to be desired.—G. Bigourdan: The perturbations of the Hertzian waves during transmission to great distances. A table is given showing monthly, quarterly and annual means; the general mean of the annual values is 0.013 sec.—André Blondel: A new method for the harmonic analysis of the curves of electromotive force of alternators. Two methods are described and discussed, one making use of a thermionic amplifier, the other working with a condenser.—Pierre Weiss:

The magnetic equation of state and variation of the atomic moment.—M. Eugène Fichot was elected a member of the section of geography and navigation in succession to the late E. Bertin.—A. Kolmogoroff: The possibility of the general definition of the differential, the integral, and the summation of divergent series.—J. Haag: Euclidian action at a distance.—P. Fatou: The movement of a material point submitted to the attraction of a flattened spheroid.—A. Barbaud and R. Le Petit: The measurement of the wind in an aeroplane and its effects on the route followed.—J. Cathala: A recording apparatus for the control of the insulation of enamelled wires. Enamel has been used in late years to an increasing extent as an insulating material for wires, but the wire thus covered always has a certain number of microscopic cracks, where the insulation is nil. In the apparatus described and figured the wire is rapidly drawn through a mercury bath and the weak spots detected.—Léon Guillet and Albert Portevin: The influence of tempering on the mechanical properties of steel after reheating. Whenever the nature of the metal permits the production of different constitutions by tempering, the results of mechanical tests obey the following rule: for equal final hardness after reheating, the resilience is better for the completely tempered states, that is to say, those formed of pure martensite. Inversely, for equality of resilience after reheating, the final hardness is always higher as the temper hardness is higher.—V. Auger and Milles. L. Lafontaine and Ch. Caspar: Some salts of cupferron. Details of the properties of 21 metallic compounds of cupferron.—O. Gaubert: The modification of the facies of crystals as the result of their syncrystallisation with a foreign material dissolved in the mother liquor.—Albert Michel Levy: The birth of biotite in the crushed granites and rhyolites of Morvan.—E. Tabesse: Magnetic measurements in Normandy and Brittany.—H. Hérissé and J. Cheymol: The extraction and properties of geïne, a glucoside giving rise to eugenol, contained in *Geum urbanum*. This glucoside was extracted from the fresh underground parts of herb-bennet, in the proportion of about 0.1 per cent. On hydrolysis, it gives eugenol, *d*-glucose and *l*-arabinose in equimolecular proportions.—M. Bridel and C. Charaux: The process of blackening of Orobanché in the course of drying.—L. Blaringhem: New observations on *Xenia* in wheat.—Ad. Davy de Virville: The biological relations between a liver-wort (*Lophocolea bibentata*) and various Muscinæ.—N. Kleitmann and H. Piéron: The velocity of establishment of the light sensation and the magnitude of the undulation of pre-equilibrium for monochromatic stimulations of variable intensity.—E. Fauré-Fremiet: The quiescent state and active state in the amibocytes of *Arenicola*.—C. Hosselet: The oenocytes of *Culex annulatus* and their chondriome in the course of secretion.—C. Levaditi and A. Girard: The mode of action of bismuth in syphilis. A quantitative method has been developed capable of detecting 0.001 milligram of bismuth, and this has been applied to the estimation of bismuth in various organs of the rabbit after treatment with trepol (alkaline tartro-bismuthate). Infinitesimal traces of bismuth (0.002 mgm.) are sufficient to destroy the parasite.

### Official Publications Received.

Department of the Interior: Bureau of Education. Bulletin, 1924, No. 10: Statistics of Teachers Colleges and Normal Schools, 1921-22. Prepared under the Direction of Frank M. Phillips. Pp. 76. 10 cents. Bulletin, 1924, No. 22: Technique of Procedure in Collegiate Registration. By Prof. George T. Avery. Pp. 26. 5 cents. Bulletin, 1924, No. 24: Organization and Administration of the Duplicate School in Philadelphia, Pa. By Edwin Y. Montany. Pp. 16. 5 cents. Bulletin, 1924, No. 25: A Platoon School in Kansas City, Missouri. By G. W. Diemer. Pp. iii+25. 5 cents. (Washington: Government Printing Office.)

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United States Department of Agriculture: Department Bulletin No. 1313: Fumigation against Grain Weevils with various Volatile Organic Compounds. By Ira E. Neifert, F. C. Cook, R. C. Roark, W. H. Tonkin, E. A. Back and R. T. Cotton. Pp. 40. (Washington: Government Printing Office.) 10 cents.

Contributions from the Princeton University Observatory, No. 7. Photometric Researches: The Eclipsing Variables, TV Cassiopeia, TW Cassiopeia, TX Cassiopeia, T Leonis minoris, SS Camelopardalis. By Richard John McDiarmid. Pp. 64. (Princeton, N.J.)

Bulletin of the National Research Council. Vol. 8, Part 2, No. 44: The Continental Shelf of the Coast of California. By Andrew C. Lawson. Pp. 23. 25 cents. Vol. 8, Part 4, No. 46: The Geological Implications of the Doctrine of Isostasy. By Andrew C. Lawson. Pp. 22. 40 cents. (Washington: National Academy of Sciences.)

Cornell University Agricultural Experiment Station. Memoir 68: The Lepidoptera of New York and neighboring States. Primitive Forms, Microlepidoptera, Pyraloids, Bombyces. By William T. M. Forbes. Pp. 729. (Ithaca, N.Y.)

Library of Congress. Report of the Librarian of Congress for the Fiscal Year ending June 30, 1924. Pp. vi+290. (Washington: Government Printing Office.) 60 cents.

International Geodetic and Geophysical Union (Union Géodésique et Géophysique Internationale): Section of Terrestrial Magnetism and Electricity. Bulletin No. 4: Terrestrial Magnetism and Electricity at the Madrid Meeting, October 1924; General Report. By Louis A. Bauer. Pp. 10. (Baltimore, Md.: Johns Hopkins Press.) 25 cents.

Department of the Interior, Canada. Publications of the Dominion Astrophysical Observatory, Victoria, B.C. Vol. 3, No. 1: The Absolute Magnitudes and Parallaxes of 1105 Stars. By R. K. Young and W. E. Harper. Pp. 143+4 plates. (Ottawa: F. A. Acland.)

Journal and Proceedings of the Royal Society of Western Australia. Vol. 10, 1923-1924. Pp. xxvii+129+11 plates. (Perth.)

Department of Commerce: U.S. Coast and Geodetic Survey. Serial No. 275: Results of Observations made at the United States Coast and Geodetic Survey Magnetic Observatory at Cheltenham, Md., in 1921 and 1922. By Daniel L. Hazard. Pp. 96+5 plates. (Washington: Government Printing Office.) 10 cents.

Legislative Assembly: New South Wales. Report of the Director-General of Public Health, New South Wales, for the year 1923. Pp. v+157+19 graphs. (Sydney: Alfred James Kent.) 7s. 3d.

Ministry of Finance, Egypt: Coastguards and Fisheries Service. Report on the Fisheries of Egypt for the year 1923. By G. W. Paget. Pp. v+43. (Cairo: Government Publications Office.) 5 P.T.

Instituts Scientifiques de Buitenzorg "'s Lands Plantentuin." Treubia: Recueil de travaux zoologiques, hydrobiologiques et océanographiques. Rédigé par Dr. W. M. Doetens van Leeuwen, Dr. K. W. Dammersman et Dr. H. C. Delsman. Vol. 5: Supplément, Septembre 1924. Pp. 142+5 Tafeln. (Batavia: Landsdrukkerij.)

Department of Agriculture, Ceylon. Bulletin No. 70: Guide to the Central Experiment Station, Peradeniya. By T. H. Holland and H. A. Deutrom. Pp. 112+6 plans. Bulletin No. 71: Entomogenous Fungi and their Use in Controlling Insect Pests. By T. Fetch. Pp. 40+2 plates. (Colombo.) 40 cents each.

Union of South Africa: Department of Agriculture. Science Bulletin No. 34: Kemp Fibres in the Merino Sheep. By Prof. J. E. Duerden and Miss M. Ritchie. Pp. ii+18. (Cape Town: Cape Times, Ltd.) 3d.

South Australia: Department of Mines. Mining Review for the Half-year ended June 30th, 1924. (No. 40.) Pp. 66+5 plates. (Adelaide: R. E. Rogers.)

Ministry of Agriculture, Egypt: Technical and Scientific Service. Bulletin No. 53: The Effect of Irrigation upon Soil Temperatures. By Dr. E. McKenzie Taylor. Pp. 18+7 plates. Bulletin No. 51: A Statistical Note on the Cotton Variety Tests at Sakha, 1916-1920. By Trevor Trought. Pp. 16. (Cairo: Government Publications Office.) 5 P.T. each.

Torquay Natural History Society. Transactions and Proceedings for the Year 1923-24. Edited by the Rev. James A. Balleine and H. L. Earle. Vol. 4, Part 2. Pp. 101-198. (Torquay.)

The Carnegie United Kingdom Trust. Eleventh Annual Report (for the Year ending 31st December 1924) submitted by the Executive Committee to the Trustees on Friday, 27th February 1925. Pp. ii+89. (East Port, Dunfermline.)

Smoke Abatement League of Great Britain. Report of the Smoke Abatement Conference held at the Town Hall, Manchester, November 4th, 5th and 6th, 1924. Pp. xi+308. (Manchester: Hon. Secretary, 33 Blackfriars Street.) 5s. 6d.

### Diary of Societies.

SATURDAY, MARCH 21.

BRITISH MYCOLOGICAL SOCIETY (in Botany Department, University College), at 11 A.M.—Miss E. Green: The Development of *Zygorhynchus*.

—W. F. Hauna: Sax in the Genus *Coprinus*.—J. Ramsbottom: Fragmenta Mycologica III.—Dr. M. C. Rayner: Sectoring in Cultures of *Phoma radialis-Calluna*.—Miss A. Lorrain Smith: (I.) Notes on Myxobacteriaceae; (II.) Templeton's Drawings of Fungi and Lichens.

PHYSIOLOGICAL SOCIETY (Annual General Meeting) (at University College), at 8.—E. H. J. Schuster: Adjustable Pump for Artificial Respiration or Perfusion.—A. C. Downing: (a) Magnet Systems for Sensitive Galvanometers; (b) Some Recent Muscle Thermopiles; (c) A Sensitive Compton Electrometer.—N. Kubo and Prof. A. V. Hill: The Effect of Length on the Heat-production of Muscle.—Phyllis M. Kerridge: Modified Glass Electrodes.—J. Wyman: The Viscous-elastic Properties of Turtle's Muscle.—W. Shaw: The Relation of the Corpus Luteum to the Pre-menstrual Changes of the Endometrium.—J. R. Pereira: The Patellometer: Measurement of the Threshold Stimulus and Recording of the Knee-jerk.—D. T. Harris: Action of Light on the Affinity of Haemoglobin for Oxygen.—W. K. Slater: A Micro-respiration Apparatus.—H. A. Ellis: A Rapid Colorimetric Method of Measuring the  $C_{11}$  of Blood.—Dr. C. Da Fano: Modification of the Hewer Method for Staining in Bulk with Hamatoxylin and Eosin.—H. I. Coombs and T. S. Hele: The