

## Societies and Academies.

LONDON.

**Royal Society, Jan. 19.**—E. S. Horning and A. H. K. Petrie: Enzymatic function of mitochondria in the germination of cereals. In the resting stage of maize, wheat, and barley, mitochondria occur in the scutellum and endosperm. During germination they become numerous in the scutellum, and are secreted in large numbers from epithelial cells into adjacent starch-containing cells of endosperm. These secreted mitochondria aggregate round starch grains prior to their corrosion; as corrosion commences the associated mitochondria seem to disappear. Throughout the period of endosperm depletion, mitochondria are thus secreted and migrate through the emptied cells to the zone of active hydrolysis, where they become associated with the starch grains. In isolated endosperms, mitochondria of intracellular origin effect starch hydrolysis and depletion at a slower rate corresponding to their lesser numbers. There is no evidence for secretion of mitochondria from the aleurone layer or of depletion being affected by secretion of an enzyme therefrom.

**S. Dickinson:** Experiments on the physiology and genetics of the smut fungi. No infection of oat or barley seedlings by pure cultures of smut fungi occurs when one gender (sex) is present; but when two genders are present, 90 per cent. infection is obtained.

**P. H. H. Gray:** Formation of indigotin from indol by soil bacteria. Oxidation of indol to indigotin can be effected by bacteria. Two new species have been isolated from soil. *Pseudomonas indoloxidans* oxidises in solution cultures and on agar media; *Mycobacterium globerulum* produces very small amounts, on agar media only. A new species of *Micrococcus* can also produce crystals on indol agar. Indol does not act as a source of energy; of the carbon compounds tested, glycerol appears most readily to act as energy-source to the oxidation. Bacterial numbers and amount of indigotin produced increase with higher ratios of carbon to nitrogen. Indol is oxidised only by young growing cultures, and can be oxidised in the absence of other nitrogen compounds; it depresses multiplication of bacteria.

**R. A. Fisher:** Triplet children in Great Britain and Ireland. Results of measurements, and of genealogical inquiries on three years' data from recipients of the Royal Bounty, are given. Six physical measurements taken on 117 children show correlation between pairs of unlike sex conformable with that obtained by the author from Lauterbach's measurements on twins, and with that between adult brothers and sisters. Pairs of like sex are more highly correlated, the results being well fitted by the supposition that about 54 per cent. of the surviving like-sex pairs are monozygotic in origin, and that these have a correlation 0.94. Relationship data confirm paternal influence, and sex distribution of related twins strongly suggests that this is confined to causation of di-embryony. If maternal influence conditions both dizygosity and di-embryony, the slightly higher values obtained from these and other data for maternal influence indicate that di-embryony is the more strongly inherited phenomenon.

**J. W. H. Harrison:** A further induction of melanism in the lepidopterous insect, *Selenia bilunaria* Esp. and its inheritance. By administering food containing manganese chloride to a strain of *Selenia bilunaria*, known by the use of adequate controls to be free from heritable melanism, melanic insects have been developed. This melanism is inherited as a Mendelian recessive. Certain mosaics were

obtained in the critical treated brood, but these, from experimental tests, seem to represent cases of somatic induction, the germ plasma being apparently unaffected. The effect is not of the Lamarckian type, but rather illustrates a new evolutionary principle, that heritable variations may be induced by means of the food supplied. The metal seems to be the active agent.

**J. W. H. Harrison:** Induced changes in the pigmentation of the pupæ of the butterfly, *Pieris napi* L. and their inheritance. The pupæ of *Pieris napi*, when developed from larvæ exposed at the critical time to lights of different colours, are influenced in their pigmentation, like those of their congeners *Pieris brassicæ* and *P. rapæ*. As Dürken and Brecher found in the case of *P. brassicæ*, the green pupal colour, acquired under the influence of orange light, is inherited.

**F. G. Gregory:** The differential effect of the ions of three-salt solutions on the growth of potato plants in sand culture. A method of statistical analysis is developed enabling assessment of the effect of single ions on growth of plants in culture solution consisting of a mixture of salts, and has been applied to data published by E. S. Johnston. The cations in the solution have for each relative ionic concentration (ionic proportion) a greater effect than any of the anions used.

**Sir Kenneth Goadby:** Bacterial proteins: presence of alcohol-soluble proteins in bacteria. By a method, shown to produce minimum change on protein constituents, an alcohol-soluble protein, having many of the characters of the similar proteins of cereal seeds, has been extracted from *Streptococci*, *Staphylococci*, *Bacilli Hoffmann*, *typhosus*, *coli com.*, *paracoloides*, and *Micrococcus catarrhalis*. The Molisch-reacting substance seems to form an important constituent of bacterial structure.

**F. W. R. Brambell:** Development and morphology of the gonads of the mouse. (Part 2.) The paper deals with 64 animals irradiated during pregnancy or lactation. Degenerative changes in corpora lutea start at the same age in the sterile as in the normal ovary. They proceed slowly, and the old corpora lutea become practically permanent components of the sterile ovary. This is attributed to absence of competition with maturing follicles and new corpora lutea.

**R. C. Punnett:** Linkage groups and chromosome number in *Lathyrus*. A fundamental requirement of the chromosome heredity-theory is that the number of linkage groups and characters showing independent assortment in a species should not exceed the haploid number of chromosomes. This holds good for the only species—*Drosophila*—hitherto tested adequately. Experiments over twenty years and involving 19 characters have shown that in a plant also (*Lathyrus odoratus*) the number of linkage groups and characters showing independent assortment is 7, the same as the haploid number of chromosomes in this species.

**S. Ochoa:** Action of guanidins on the melanophores of the skin of *Rana temporaria*. The guanidin hydrochlorides cause contraction of skin melanophores in frogs. This is a direct action, either on the melanophores or the nerve endings in them. Calcium salts antagonise the effect, as they do many of the other effects. It is probable that Collip's parathyroid hormone also antagonises the action of guanidins.

**E. J. Maskell:** Experimental researches on vegetable assimilation and respiration. (Parts 17 and 18.) In cherry-laurel leaves, at limiting concentrations but under constant lighting, there is marked diurnal rhythm of apparent assimilation, falling to

very low values at night and rising in morning. At any point in the diurnal march, assimilation can be increased by increasing carbon dioxide up to the limit set by the light-intensity used. Diurnal rhythm of assimilation is due to a rhythm of stomatal opening. At small opening, assimilation rate is approximately proportional to porometer rate; as the stomata open and the porometer rate increases, the assimilation rate approaches asymptotically to a level determined by non-stomatal resistances in the diffusion path of the carbon dioxide.

## PARIS.

Academy of Sciences, Dec. 19.—A. Lacroix: The hyperalkaline quartziferous rhyolites and trachytes, with reference to those of Korea.—P. Villard: The law of absorption of the X-rays by matter. The total absorption coefficient is regarded as the sum of two terms, a diffusion coefficient taken as independent of the wave-length and the true absorption coefficient,  $C\lambda^3$  (Bragg and Pierce).  $C$  is considered as a function of the wave-length  $C_0\phi(\lambda)$ , and from a study of the experimental curve  $C = C_0\phi(\lambda)$  it is recognised as a Bjerknes resonance curve, and a formula is developed based on this view. The calculated and experimental figures for zinc are compared.—Gabriel Bertrand and Jules Labarre: The acetolysis of manno-cellulose. The preparation of new sugars, tetramannoholosite and pentamannoholosite. These sugars were produced by the controlled acetylation of manno-cellulose by a mixture of sulphuric acid and acetic anhydride, the acetates being afterwards saponified by alcoholic potash and the potassium removed as perchlorate. Details of their chemical and physical properties are given.—E. Mathias: Magnetic measurements in the Hautes-Pyrénées, Gers, and Haute-Garonne.—Sir Ernest Rutherford was elected a foreign associate in the place of the late C. Walcott, and Joseph Auclair, *correspondant* for the section of mechanics in succession to Torres Quevedo, elected foreign associate.—André Weil: Arithmetic on an algebraic curve.—Paul Mentré: The projective displacements of two plane pencils with a common right line.—Lainé: The equations  $s = f(x, y, z, p, q)$  which are of the first class.—Paul Flamant: The development of a linear transformation in series of powers of the finite differentiation.—J. Favard: The normal meromorph functions of the group of translations.—Henri Milloux: The theory of integral functions of finite order.—Georges Valiron: Some properties of integral functions.—A. Véronnet: The evolution of the figures of equilibrium of a heterogeneous fluid mass. The impossibility of a breaking up.—Belzecki: A case of critical velocities in the movements of a locomotive on rails.—G. Rougier: Observations of the third satellite of Jupiter. A drawing of the spot on the third satellite, previously seen by Antoniadi, is given. From observations of this spot it is concluded that the period of rotation of the satellite equals its time of revolution round Jupiter.—A. Levêque: An attempt at an approximate theory of the transmission of heat by convection in a circular cylindrical tube through which is flowing a real fluid in turbulent motion.—Cordonnier and Guinchant: Inductive capacity in the gaseous state. The results of measurements of thirty-three gases and vapours are given, and their relationship with the refractive indices and chemical constitution discussed.—Rouelle: The demultiplier of ferromagnetic frequency.—Georges Déjardin: Spectra of phosphorus for different degrees of ionisation. The study of the variations observed in the electrodeless discharge leads to the separation of the spectra characteristic of the different degrees of ionisation

of the phosphorus atom. The whole of the results obtained may serve as a starting-point for the development of the classification outlined by Millikan and Bowen. The presence in the photographs of a large number of new lines shows that the spectrum of phosphorus is still imperfectly known, particularly in the ultra-violet, below 2700 Å.—Georges Simon: Superposition fringes between two half-silvered plates formed by media of different refractive indices.—Pierre Leroux: Study of the pleochroism of tourmaline.—E. Brylinski: The velocity of the earth. The author holds that the results obtained by A. Piccard and E. Stahel on the Rigi in September 1927, do not disprove Miller's results.—Edmond Bayle, Henri George, Augustin Mache: The identification of works of art. The finger-print of the artist placed on some part of the work has been proposed as a remedy against a forged signature on pictures and other works of art; but it is pointed out that this would be insufficient, since the finger-print could be copied by photomechanical methods. The method suggested as more trustworthy is a combination of photography and radiography.—A. Dauvillier: An X-ray tube with an effective wave-length of 8 Angström units. The important feature of the tube proposed, a detailed description of which is given, is a window of very thin cellophane, 0.02 mm. thick, 20 sq. cm. surface, with a support of metallic gauze.—Henri Belliot: An attempt at the interpretation of the phenomena of photographic inversion and solarisation.—W. H. Keesom and M. Wolfke: Two different liquid states of helium. In a series of measurements of the dielectric constant of liquid helium, with diminishing temperatures, at a certain temperature this constant undergoes a sudden change. Earlier observations have given similar indications based on the variation with the temperature of density, specific heat, latent heat of evaporation and surface tension. The change from one state to the other takes place when the pressure of saturated helium vapour is about 38 mm. of mercury.—B. Bogitch: Some properties of electrolytic nickel. Measurements of hardness, density, and velocity of solution in hydrochloric acid are given for specimens of nickel of varying degrees of purity. Analyses of the samples are appended: nickel bought as electrolytic is not necessarily pure.—René Delaplace: Study of the gas, obtained by cracking oil, for lighting for coast beacons. Analyses of original gas, liquefied gas and residue after rectification of liquid are given.—I. N. Longinescu: A new additive property of liquids.—A. Colani: Study of the systems uranyl nitrate—alkaline nitrate—water at 25° C.—R. Locquin and R. Heilmann: The mechanism of the oxidation of the pyrazolines. The basic compounds isolated included the pyrazol corresponding to the pyrazoline oxidised, azines and pyrazoline compounds of the same molecular weight as the azines.—L. Palfray and Mille. Th. Duboc: 1, 3, 4, Metaxylenol and some of its derivatives.—Albert Kirmann: The reactions of the  $\alpha$ -bromaldehydes. Besides normal aldehyde reactions, other reactions are obtained suggesting an acid bromide. It is shown that with  $\alpha$ -bromocanthol there is no tautomerism, and a probable explanation of the abnormal reactions is suggested.—W. Ipatief and B. Dolgof: The catalytic hydrogenation of  $p$ -oxytriphenylcarbinol and  $p$ -oxydiphenylmethane under pressure. The first step in the reduction of  $p$ -oxytriphenylcarbinol (catalyst nickel, pressure 80 to 100 atmospheres) is  $p$ -oxytriphenylmethane and 50 per cent. of this decomposes into phenol and diphenylmethane at 220° C., and pressure 100 atmospheres. The remainder is converted nearly quantitatively into tricyclohexylmethane.—James Chappuis and A. Pignot:

The compression of town gas. Town gas may contain from 1 to 4 per cent. of oxygen, and at ordinary atmospheric pressure this is outside the limit of inflammability. Experiments are described showing that mixtures of coal gas and oxygen, compressed to 150 to 200 kgm., are not inflammable if they contain less than 10 per cent. of oxygen.—R. Lantz and A. Wahl: The action of the primary amines on nitroso- $\beta$ -naphthol.—Robert Gibrat: The focal structure of smectic bodies.—M. E. Denaeyer and Jacques Bourcart: The chemical composition of the lavas of Ahaggar, Central Sahara (Jacques Bourcart Expedition, 1922-1923).—Pierre Bonnet: The characters of the south Transcaucasian geosynclinal.—Henri Schoeller: The Embrunais layer and the outside edge of the Briançonnais layer, traced from France into Switzerland.—Paul Fallot: The geology of the region of Antequera (Andalusia).—J. Thoulet: The double oceanic circulation and the abyssal volcanic columns.—M. and Mme. A. Chauchard: The variations in salinity of estuaries measured *in situ* by the electrical conductivity.—Marcel Mascré: The action of some fixing reagents on the nucleus of the plant cell.—A. Maige: Observations on the phenomena of chloroplastogenesis and plastidal regression in the cotyledons of various Leguminosae.—A. Guilliermond: The cytology of the Nematosporea.—A. de Puymaly: A fixed Spirogyra, perennial and multiplying by layering.—M. Bridel and Mlle. M. Desmarest: A method permitting the extraction from the oil cake of bitter almonds of amygdaloside (amygdalin) and emulsin.—E. Carrière and Brunet: Contribution to the study of grape pip oil.—G. Guittonneau: The influence of sulphur and the products of its solvation in the soil on nitrification.—J. Legendre: The battle between mosquitoes by the larval concurrence between zoophiles and androphiles.—Maurice Azéma: The excretion *in vitro* of methylene blue by the renal vesicles of an ascidian.—Edouard Fischer: The relation between the reducing power of sea water and the distribution of the organisms of the coast line.—Chevey, L. Roule, and Mlle. Verrier: The interruption of the movement of salmon up rivers by the reduction of the amount of dissolved oxygen in the water course. If the dissolved oxygen in a river falls below 6 c.c. per litre, salmon will not ascend. Salmon appear to be more sensitive in this respect than other fish.—René Fabre and Henri Simonnet: Contribution to the physiological study of glutathione by the method of perfusion.—P. Delauney: The biochemical synthesis of  $\beta$ -5, bromosalicylglucoside. An attempt at the synthesis of  $\beta$ -3-5-dichlorosalicylglucoside.—Marcel Labbé, Roubeau, and F. Nèpreux: The influence of nickel and cobalt on the hypoglycæmic action of insulin in the rabbit.—G. Lavier: The structure of the parabasal body in trypanosomes.—Mme. Phisalix: Properties of the serum of snakes belonging to the genus *Coluber*.—Daniel Florentin: The composition of the air of the streets of Paris. A series of determinations of the proportions of carbon monoxide and dioxide. The amount of impurity diminishes rapidly as the height above the ground increases.—P. Lassablière: The biological and therapeutic effects of the serosity of blisters.—Jules Amar: Mass action and vital defence.

Official Publications Received.

BRITISH.

The Association of Special Libraries and Information Bureaux. Report of Proceedings of the Fourth Conference held at Trinity College, Cambridge, September 23rd-26th, 1927. Pp. xiv+170. (London.)  
 The Quarterly Journal of the Geological Society. Vol. 83, Part 4, No. 332, December 15th. Pp. 551-652. (London: Longmans, Green and Co., Ltd.) 7s. 6d.

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Madras Fisheries Department. Administration Report for the Year 1925-26. By Dr. B. Sundara Raj. (Report No. 1 of 1927, Madras Fisheries Bulletin, Vol. 21.) Pp. v+91+6 plates. (Madras: Government Press.) 2.4 rupees.

The Physical Society Proceedings. Vol. 40, Part 1, December 15. Pp. 36. (London: The Fleetway Press, Ltd.) 7s. net.

Aeronautical Research Committee: Reports and Memoranda. No. 1059 (Ae. 241): Experiments on a Model of a Fokker (F. VII) Monoplane Wing. By A. S. Batson, D. H. Williams and A. S. Halliday. (A.3.e. Aerofoils-General, 167.—T. 232f and a.) Pp. 21+19 plates. 1s. 3d. net. No. 1106 (Ae. 233): The Theoretical Pressure Distribution around Joukowski Aerofoils. By W. G. A. Perring. (A.3.a. Aerofoils-General, 173.—T. 2498.) Pp. 13+11 plates. 9d. net. (London: H.M. Stationery Office.)

Proceedings of the Malacological Society of London. Edited by G. C. Robson. Vol. 17, Parts 5 and 6, December. Pp. 175-254+plates 15-35. (London: Dulau and Co., Ltd.) 20s. net.

Royal Botanic Gardens, Kew. Picture Postcards. Nos. 85-91, Ornamental Geese. (Set 13.) 1d. each; 6d. per set of 7. Nos. 97-102, Ornamental Waterfowl. (Set 17.) 2d. each; 1s. per set of 6. Nos. 103-108. 2d. each; 1s. per set of 6. (Kew.)

Chemists and Dividends. By S. M. Gluckstein. Pp. 24. (London: Institute of Chemistry of Great Britain and Ireland.)

Indian Central Cotton Committee, Bombay. Annual Report for the Year ending 31st August 1924. Pp. iv+73. 2 rupees. Annual Report for 1926. Pp. iv+169. 2 rupees. Annual Report for the Year ending August 31st, 1927. Pp. ii+116+14 plates. 2 rupees. (Bombay.)

Memoirs of the Department of Agriculture in India. Botanical Series, Vol. 14, No. 3: Pennisetum Typhoideum, Studies on the Bajri Crop. I: The Morphology of Pennisetum Typhoideum. By S. V. Godbole. Pp. 247-268+10 plates. (Calcutta: Government of India Central Publication Branch.) 12 annas; 1s. 3d.

Amgueddfa Genedlaethol Cymru: National Museum of Wales. Twentieth Annual Report, 1926-27, presented by the Council to the Court of Governors on the 27th October 1927. Pp. 54+11 plates. (Cardiff.)

Guide to the Seventh Congress of the Far Eastern Association of Tropical Medicine, Calcutta, December 5th to 24th, 1927. Pp. vi+115. Seventh Congress of the Far Eastern Association of Tropical Medicine: Abstracts of Papers and Programme of Scientific Sessions. Pp. iv+176. (Calcutta.)

FOREIGN.

Department of the Interior: Bureau of Education. Bulletin, 1927 No. 23: Nursery-Kindergarten-Primary Education in 1924-1926. By Mary Dabney Davis. Pp. 46. (Washington, D.C.: Government Printing Office.) 10 cents.

Mitteilungen des Geologischen Instituts der Landbouwhoogeschool, Wageningen (Holland). No. 11: Düne und Moor bei Vogelenzang; Beiträge zur Frage der quartären Niveaueveränderungen an der holländischen Nordseeküste. Von Prof. J. van Baren. Pp. 39+10 Tafeln. (Wageningen: H. Veenman en Zonen.)

Proceedings of the Academy of Natural Sciences of Philadelphia. Vol. 79, 1927, Supplement. Synopsis of North American Diatomaceae. Part 2: Naviculatae, Surirellatae. By Charles S. Boyer. Pp. 229-533. (Philadelphia, Pa.)

Journal of the College of Agriculture, Hokkaido Imperial University, Sapporo, Japan. Vol. 19, Part 2: On the Difference in Physico-Chemical Properties of various Proteins in Plant Seeds. Second Report: On the Differences in the Physico-Chemical Properties of the Four Kinds of Rice Proteins which vary in their Iso-Electric Points, by Tetsutaro Tadokoro, Taro Tsuji and Shukichi Watanabe; Chemical Studies on Sex Differences of Proteins in Animals and Plants. First Report: Sex Differences of Muscle and Serum-Proteins, by Tetsutaro Tadokoro, Makoto Abe and Shukichi Watanabe. Pp. 93-134. Vol. 21, Part 2: On the Alcohol-Soluble Proteins of Naked Barley, by Eiji Takahashi and Kiyoshi Shirahara. Pp. 43-62. (Tokyo: Maruzen Co., Ltd.)

Bulletin of the National Research Council. No. 59: Chemiluminescence. Report of the Subcommittee on Chemiluminescence. Pp. 62. (Washington, D.C.: National Academy of Sciences.) 1 dollar.

Proceedings of the American Academy of Arts and Sciences. Vol. 62, No. 5: Ionization in Nebular Matter. By B. P. Gerasimovič. Pp. 155-171. 45 cents. Vol. 62, No. 6: Astrophysical Aspects of the General Field of Penetrating Radiation. By B. P. Gerasimovič. Pp. 173-185. 45 cents. (Boston, Mass.)

Proceedings of the Imperial Academy. Vol. 3, No. 8, October. Pp. xix-xx+477-578. (Tokyo.)

Geofysiske Publikasjoner utgitt av det Norske Videnskaps-Akademi i Oslo. Vol. 5, No. 3: On Periodic Variations in Terrestrial Magnetism; Studies based upon Photographic Records from the Polar Station Gjøhavn. By K. F. Wasserfall. Pp. 33. (Oslo: A. W. Brøgger Boktrykkeri A.-S.) 4.00 kr.

Journal of the College of Agriculture, Hokkaido Imperial University, Sapporo, Japan. Vol. 20, Part 3: Studies on the Inheritance of Sterility in Rice. By Junichi Ishikawa. Pp. 79-201+plates 5-8. (Tokyo: Maruzen Co., Ltd.)

Instituts scientifiques de Buitenzorg. "s Lands Plantentuin." Treubia: recueil de travaux zoologiques, hydrobiologiques et océanographiques. Vol. 9, Livraison 4, août. Pp. 293-472. (Buitenzorg.) 2.50 f.

Bulletin of the American Museum of Natural History. Vol. 57, Art. 3: The Fishes of the Rio Chucunaque Drainage, Eastern Panama. By C. M. Breder, Jr. Pp. 91-176+5 plates. Vol. 56, Art. 5: A Study of the Crystallography of the Calcites of the New Jersey Diabase Region. By Herbert P. Whitlock. Pp. 351-377. (New York City.)

Bulletin of the National Research Council. No. 60: Industrial Research Laboratories of the United States, including Consulting Research Laboratories. Third edition, revised and enlarged. Compiled by Clarence J. West and Eryve L. Risher. Pp. 153. 1 dollar. No. 61: Transactions of the American Geophysical Union, Eighth Annual Meeting, April 28 and 29, 1927, Washington, D.C. Pp. 297. 3 dollars. (Washington, D.C.: National Academy of Sciences.)

Methods and Problems of Medical Education (Eighth Series). Pp. iv+372. (New York City: The Rockefeller Foundation.)